

**Intermodal Transportation Institute
The University of Toledo (UT- ITI)
Annual Report 2004-2005**

**Prepared by Mark Vonderembse, Director
August 19, 2005**

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The ITI had a very successful year in 2004-2005 with several important activities taking place:

- Approval of the ITI by the University of Toledo Board of Trustees
- Appointment of a permanent director of the ITI
- Securing slightly more than three million dollars in external funding including designation as a U.S. Department of Transportation University Transportation Center

Following are the ITI's vision and mission statements as well as its focus areas.

Vision Statement

To develop technology-enabled intermodal transportation systems and supply chains that promote *economic development* and *quality of life*.

Mission Statement

To provide **research, education and training**, and **planning and technical assistance** in developing and maintaining technology enabled, efficient, secure, and environmentally sound **transportation systems, supply chains, and logistic processes**.

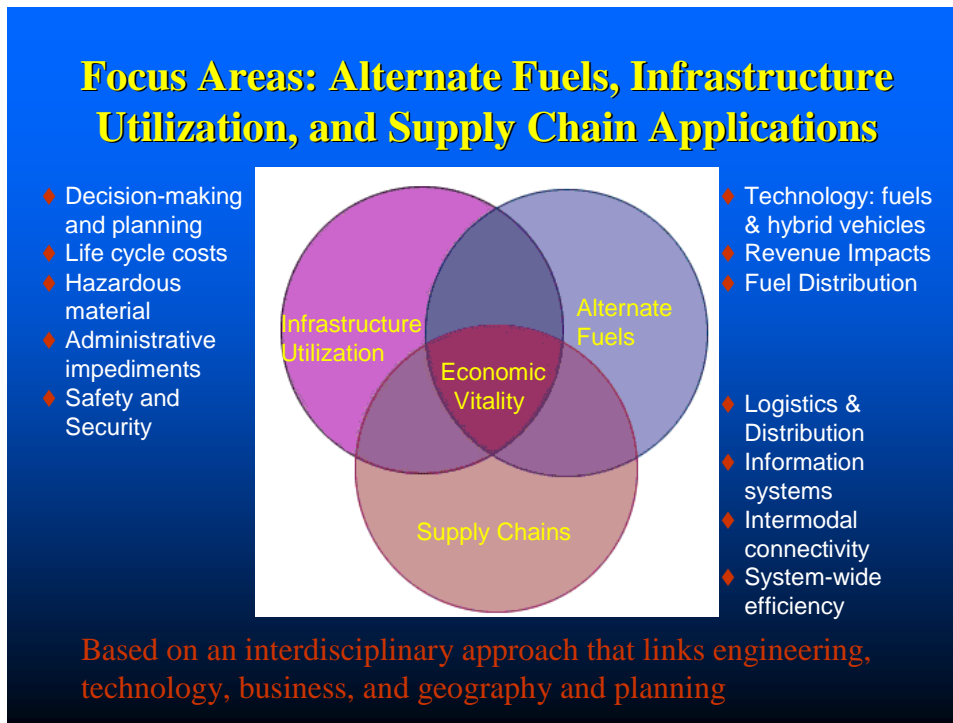
Focus Areas:

Transportation as a vehicle for economic development (see Figure 1):

- Alternate Energy: Continuing dependence on high-cost, non-renewable fossil fuels imported from politically unstable regions of the world is a threat to the future development, security, and effective use of the transportation network in the U.S. The UTC would focus on research and commercialization to develop and distribute renewable, homegrown, low-polluting energy sources to support transportation.
- Infrastructure Utilization: Growing demand for transportation is stretching current infrastructure to, and in many cases beyond, its capacity. By 2020, the demand for moving freight is expected to increase by more than 50 %. Expanding infrastructure, by itself, may not be an effective solution because it is expensive and consumes valuable land that could be used for agriculture, recreation, and commerce.
- Supply Chains: The emergence of supply chains and sophisticated distribution systems is placing new demands on transportation. Understanding transportation's role in this new paradigm and adapting the transportation systems to meet the needs of suppliers, manufacturers, and customers is fundamentally important for economic development.

¹ For 2004 2005, the Annual Report covers January 2004 through July 2005. The ITI Executive Committee approved this switch from a calendar-year to an academic-year format to coincide with university budget and planning processes.

Figure 1: Focus Areas for the Intermodal Transportation Institute



Active Projects

The following projects are currently active. A brief description of each is provided. Table 1 provides a summary of the fund status.

1. Upper Midwest States Freight Study: Phase 1 funded and completed in February 2005, Phase 2 funding begins in September 2005. Assess freight flow, capacity, and administrative impediments for freight movements across Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin as well as Ontario. UT-ITI is working with University of Wisconsin at Madison and University of Illinois at Chicago to build a regional coalition of states for transportation planning.
2. Midwest Regional Freight Planning and Research Institute: Funding is pending in the Transportation Reauthorization bill. Partnership among University of Wisconsin at Madison, University of Illinois at Chicago, and the University of Toledo will focus on long-term freight planning and research in the states defined in project 1.
3. Transportation Cluster Leadership: Partial funding secured. The ITI is providing leadership for the Transportation Cluster. A detailed marketing planning is in preparation. Economic development activities include international air freight and distribution via highway, ship to rail to truck connectivity, and warehousing and distribution center development that support retail operations.
4. Facility Management Information System: Project is funded. Assessing the impact of information systems use on maintenance effectiveness.

5. Information Management for the Maumee River Crossing: Project is funded. Uses information systems to collect and analyze data to verify construction and recognize possible damage.
6. BIO-Diesel Fuel Study: Project is funded and the project has begun. Buses will begin to use bio-diesel in October 2005. The project evaluate the impact of using a mixture of bio-fuel and diesel fuel on operating costs, emissions, engine performance, and engine life. The project involves TARTA and Toledo Public Schools as well as the ITI.
7. Hybrid Vehicle: This project is funded by NASA. Development work on hybrid buses is being done by Bowling Green State University and the University of Toledo.
8. Research in Alternate Fuel: Project is jointly funded by the U.S. Department of Energy and the Ohio Department of Development. Involve the production of hydrogen from sun light and uses that in a fuel cell to power a vehicle on UT's campus.
9. Global Network of Universities through ICHCA and North American Secretariat: ICHCA International Limited (IIL) and the Intermodal Transportation Institute have agreed to work together to develop a global network of universities that focus on enhancing global supply chain performance. This affiliation of universities will function as a Panel of IIL and will cooperate with IIL to define focus areas for investigation and education within the board area of global supply chain management. In addition, the ITI has agreed to take on the responsibility for ICHCA North America including data management, recruiting, and program planning and development. Some funding will be available from ICHCA.
10. Center for International Business Education and Research – Global Supply Chain Management: Seeking funding from the U.S. Department of Education. Proposal is currently under development and will request approximately 1.6 million dollars. It involves the Colleges of Business Administration and Arts and Sciences. The ITI is working with the International Business Institute to fund education and research in global supply chain management.
11. U.S. DOT University Transportation Center (UTC): Through the efforts of the ITI and with the support of our public and private sector partners, the University of Toledo has been designated as a University Transportation Center by the U.S. Department of Transportation. The University of Toledo is also part of the UTC designation that includes the University of Detroit Mercy (lead university) Bowling Green State University, Grand Valley State University, and Wayne State University. This brings to campus more than 2.0 million dollars in federal money over the next four years plus the needed match. A UTC is an internationally recognized center of excellence that is fully integrated within an institution of higher learning. It is designed to advance technology and expertise in the many disciplines comprising transportation.
12. Metropolitan Utility Link for Transportation to Industry: Seeking funding from the U.S. DOT. This project facilitates the movement of materials between suppliers and manufacturers on a just-in-time basis in an urban environment. It moves freight without using city streets or expressways.
13. Short Sea Shipping: Seeking funding from the U.S. DOT: It is the ability to move freight by water as an alternative to overland hauling via rail or truck. Shipping routes in the Great Lakes and along the coast of the U.S. are substantially underutilized. This is an opportunity to move freight off of congested highways and rail corridors and onto water. There is an appropriation request to support this activity.

14. KACI Intermodal System: Seeking funding from the U.S. DOT: It is an operational concept that can provide a very quick, inexpensive, and uniquely simple exchange of highway vehicles onto and off trains. This breakthrough in time, equipment, and labor savings changes the limit that prevents intermodal trains from being cost-effective in short and medium haul markets. There is an appropriation request to support this activity.
15. Plug-in Hybrid Electric Vehicles: The Plug-in Hybrid Electric Vehicles (PHEV) is an important alternative to continued dependence on expensive petroleum-based fuels that are imported from politically unstable parts of the world. PHEV can use inexpensive plug-in power at home or at work, a clean internal combustion engine for long distance driving, and have the added efficiency of regenerative braking and fuel optimization. The market penetration that can be achieved by PHEV depends on the vehicle cost versus the value perceived by the customer. The ITI is working with the Electric Power Research Institute, First Energy, the Toledo-Lucas County Port Authority, and other partners to raise 1 million dollars for a detailed preliminary study.
16. Affiliation with Great Lakes Maritime Research Institute: The ITI and the University of Toledo have become affiliated with the Great Lakes Maritime Research Institute. As the first project, the ITI will work on the river crossing between Detroit and Windsor. The U.S. Federal Highway Administration lists the Detroit Windsor border crossing as the most active in the United States and their Freight Analysis Framework 2020 forecast has the crossing exceeding its current capacity. The study develops a business case to examine alternative to expand capacity.
17. Ship and Port Design for Short Sea Shipping on the Great Lakes: To help relieve growing congestion on the highways and rail lines around the Great Lakes, the ITI is working with public and private sector organizations as well as unions to identify and develop new technologies in ship and port design that could expand shipping on the Great Lakes.

Table 1: Projects Summary and Funding Status (Current new funding for projects through ITI = \$3,070,722)

Project	Status
1. Upper Midwest States Freight Study: Phase 1 complete, Phase 2 starting 9/1/2005	Phase 2 currently funded \$32,400 ; PI Pete Lindquist
2. Midwest Regional Freight Planning and Research Institute	Funding is pending
3. Transportation Cluster Leadership:	Current funding \$8,317 ; PI Pete Lindquist; Additional funding requested \$83,400
4. Facility Management Information System	Project funded through Civil Engineering
5. Information Management for the Maumee River Crossing	Project funded through Civil Engineering
6. BIO-Diesel Fuel Study	Current funding \$575,605 ; PI Mark

	Vonderembse
7. Hybrid Vehicle (BGSU)	Project funded through BGSU
8. Research in Alternate Fuel	Current funding \$72,400 ; PI: Glenn Lipscomb
9. Global Network of Universities through ICHCA and North American Secretariat	Funds will be provided by ICHCA to support this effort. The amounts are not known. Also funding is possible through the United Nations
10. Center for International Business Education and Research: Global Supply Chain Management	Proposal in development with a funding request of \$1,600,000
11. U.S. DOT University Transportation Center (UTC) Stand alone and with the University of Detroit	Current funding (stand alone): \$2,000,000 Current funding (partnership with University of Detroit) estimated \$300,000 to 400,000
12. Metropolitan Utility Link for Transportation to Industry	Funding source being sought
13. Short Sea Shipping: Seeking funding from the U.S. DOT	Funding requested through appropriation \$450,000
14. KACI Intermodal System	Funding requested through appropriation \$450,000
15. Plug-in Hybrid Electric Vehicle EPRI	Funding source being sought
16. Affiliation with Great Lakes Maritime Research Institute -- River crossing project	Current funding \$32,000 , PI Jiwan Gupta
17. Ship and port design for short sea shipping on the Great Lakes	Funding source being sought

Private and Public Sector Funding for ITI:

- 2005: \$10,000 received and \$20,000 pledged
- 2006: \$30,000 pledged