

Intermodal Transportation Institute

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Executive Summary

With the leadership and support of President Daniel M. Johnson, the University of Toledo (UT) has initiated efforts to establish an Intermodal Transportation Institute (ITI). The purpose of the ITI is to work cooperatively with public and private sector partners in transportation, logistics, and supply chain management to increase economic opportunity and improve the quality of life. The ITI's purpose is strongly linked to the goals and objectives of UT, which embrace learning, discovery, and engagement and which focus heavily on outreach and external constituents. The ITI builds upon the unique features of the region, it offers the potential for sustained external funding, and it is a way to access and assemble resources from various disciplines at UT to address opportunities defined with the help of its public and private sector partners.

To ensure that the strategic plan for the ITI fits the mission, goals, and objectives of UT and meets the needs of our external constituents, the ITI worked closely with its internal Operating Committee and external Advisory Board to determine its mission and scope of work. This included focus groups with public and private sector participants. From these efforts, the mission of the ITI was created: *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. The institute capitalizes on the region's strategic position as an intermodal transportation hub and international trading center with the objective of creating an economically strong and dynamic community.* The projects currently underway or in the planning stage include: the Upper Midwest Freight Corridor Study, Freight Research and Planning Institute, U.S. DOT Sponsored University Transportation Center, U.S. DOD Sponsored Supply Chain Development Project, Transit Corridor Study and Technology Corridor, Transportation Opportunity District, KACI Intermodal System, and School Bus Emissions Study. The ITI is involved in developing instructional programs ranging from certificate programs to doctoral degrees.

The administrative structure for the ITI is designed to provide access to resources throughout the university. The director of the ITI reports to the Office of the Provost and is governed by an Operating Committee that includes the Vice Provost for Research, Graduate Education, and Economic Development, and the Deans of Arts and Sciences, Business Administration, Engineering, and Law. An external Advisory Board provides support and direction to the Institute so that it maintains quality and competitive programs that are responsive to community needs.

The ITI has long-term viability. UT has made a strong economic and strategic commitment to support efforts in transportation including the ITI. There are important synergies between the ITI and other existing UT efforts in alternate fuels, GIS, supply chain management, and transportation infrastructure management, design and planning that fit well with the strategic view of a technology corridor in Northwest Ohio. The public and private sectors are committed to the long-term development of transportation, logistics, and supply chain management projects as a springboard for economic development. There is a high level of faculty interest, and there are a series of projects that are currently underway or in the planning stages that have the potential to generate ample funding. These efforts should lay the foundation for future support and success.

1. Purpose

In the late 1990s, private and public sector organizations encouraged the University of Toledo (UT) to develop a center or institute that focused on transportation, logistics, and supply chain issues because of the potential to enhance economic development and improve quality of life. When President Daniel Johnson arrived on campus in July of 2001, he quickly recognized these opportunities because of his transportation background and expertise. With his leadership and support, UT initiated efforts to establish the Intermodal Transportation Institute (ITI) in January of 2002. The decision to move forward with the ITI was the result of university interest and expertise in this field, location advantages of our region, an array of major transportation assets currently in place across all modes of transportation, and very strong support from the community. Leaders from the public and private sectors had been working together for more than a decade to develop and market the transportation assets in our region in order to attract logistics and distribution intensive companies as well as manufacturing and service operations that rely heavily on their capabilities. President Johnson and the Board of Trustees grasped the significance of these efforts and quickly moved to join forces with the community by initiating the ITI with clear instructions to work with public and private sector organizations.

The ITI is an interdisciplinary research, education, and outreach center. 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 expand economic development opportunities and improve quality of life through increased safety, mobility, and access. The ITI actively seeks ways to work with its partners by providing research capabilities, educational programs, and planning and technical assistance. The ITI fosters collaborative efforts among faculty, staff, and students that contribute to learning and success, and it provides a convenient way for those outside UT to access University resources. The link between the University and the external community is an integral part of the ITI as demonstrated by the Advisory Board (see Appendix A), which contains more than 40 representatives from outside UT.

The ITI's purpose is strongly linked to the mission, goals, and objectives of UT, which embrace learning, discovery, and engagement and which focus heavily on building relationships with external constituents. The 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. UT currently offers several educational programs in Arts and Sciences, Engineering, and Business Administration that focus on transportation planning, infrastructure management and design, logistics, and supply chain management, which will benefit from the efforts of the ITI. In addition, new programs in supply chain management are under consideration. The ITI is part of a community team that understands the unique transportation capabilities in our region and that works to create an attractive environment for logistics and distribution activities. As a point of confirmation that our region has potential in this area, Toledo was recently given "America's Five Star Logistics Rating" as one of the 50 most logistics-friendly cities in America. Toledo's rank was 5th out of 331 Metropolitan Statistical

Areas in the U.S. (King, B. and Keating M., 2003. “100 Most Logistics-Friendly Cities in America.” *CLO/Chief Logistics Officer*, October, 12-26.) A copy of the article is in Appendix B.

With input from university administration, faculty, and external constituents, the ITI developed a strategic plan that describes its vision, mission, and scope of work. Since January of 2002, the ITI has begun a set of projects that enhance the research and educational mission of the University. These efforts are described in the follow sections.

2. Strategic Plan and Program Activities

The criteria for the formation of centers and institutes at the University of Toledo list three elements that relate to program activities.

- A program of activities that enhance the research and educational mission of the University
- Evidence that program activities are of high quality
- Success (or potential for success) in attracting external support for its activities

To address effectively the program activities, it is necessary to develop and discuss the strategic plan for the ITI. From this discussion, the program activities naturally follow.

2.1. Strategic Planning Process

To ensure that the strategic plan for the ITI fits the mission, goals, and objectives of the University of Toledo and that it meets the needs of our external constituents, the ITI worked closely with both the Operating Committee and the external Advisory Board to determine its vision, mission, and scope of work. (The Operating Committee is chaired by the Vice Provost for Research, Graduate Education, and Economic Development. The committee members include the Deans of the Colleges of Arts and Sciences, Business Administration, Engineering, and Law.) To ensure that these efforts had the broadest possible participation, the ITI sought input from transportation providers, users of transportation services including warehouse, distributors, and manufacturers, academic and industry experts, and government agencies.

There were several important steps in the process of developing the vision, mission, and scope of work for the Institute.

- The process began with involvement of the Operating Committee and the external Advisory Board. The initial Advisory Board meetings, which included the Operating Committee and faculty representatives and which occurred monthly from January through May of 2002, focused on discussing the vision, mission, and scope of work.
- Simultaneously, a faculty committee was meeting with the Director to transform the ideas generated in the Advisory Board meetings to working documents. This was facilitated by the fact that four of the members of the faculty committee were invited to the Advisory Board meeting.
- Early in the process, Dr. Hayden Green, Dean of the College of Business at the University of Alaska at Anchorage, visited the UT to describe his experience with developing a transportation center.

- Once an initial draft of the vision, mission, and scope of work were generated, they were presented to a series of focused groups and meeting of transportation constituent including:
 - The Transportation Club
 - Transportation Advocacy Group of Northwest Ohio
 - Toledo Trucking Association
 - Toledo Metropolitan Area Council of Governments – Transportation Council
 - Toledo Metropolitan Area Council of Governments – Freight Committee
- At the TMACOG-led Transportation Summit on September 30, 2002, the vision, mission, scope of work, and concept design were presented. The Transportation Summit includes all of the transportation stakeholders in the region. This provided an opportunity for all to understand and give comment about the direction of the ITI.
- Also at the Transportation Summit in 2002, the interim director met with and discussed the ITI vision, mission, and scope of work with Dr. Clifford Bragdon, AICP, who works on transportation issues at a national level.

Following are the vision, mission, scope of work, and programs and projects that are part of the strategic plan for the ITI.

2.2. Vision

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

2.3. Mission

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. The institute capitalizes on the region's strategic position as an intermodal transportation hub and international trading center with the objective of creating an economically strong and dynamic community.

2.4. Scope of Work

The scope of work for the ITI is defined in the grid shown in Exhibit 1. The ITI strengths lie in research, instruction, and planning and technical assistance. The design and execution of research contracts is an important part of the mission of not only the ITI but the University of Toledo as well. The ITI is capable of working with various parts of the University to bring together educational opportunities that include general organizational development and non-credit and for-credit certificate programs as well as associate, bachelors, masters, and doctorate degrees related to transportation, logistics, and supply chain management. The university currently has resources and capabilities that can be used effectively by public and private sector firms in transportation related activities.

The ITI has defined three areas of focus: supply chains, transportation and distribution of consumer products, and transportation, storage, and distribution of bulk commodities. These

areas are critical to local, national, and global economic development. Supply chains have become the next frontier for innovation in business. At the turn of the 20th century, manufacturing firms were attempting to optimize the interface between the machine and its operator, by creating major improvements in productivity. During the last half of the 20th century, the focus shifted from creating these islands of automation to applying just-in-time and lean manufacturing principles in the factory to eliminate waste, reduce costs, improve quality, and increase productivity of supervisors and managers. As we entered the 21st century, the focus shifted to supply chain management where groups of companies attempt to optimize the entire transaction from raw material extractions to delivery of the final product. A major aspect of supply chain management is the effective and efficient movement of raw materials and component parts among facilities spread around the globe. The ITI has a major role to play as we examine and improve supply chain operations. Distribution systems are becoming more important as they represent an increasing portion of the cost of the final products. The location, design, and management of these large and complex operations and the transportation systems that support them are important. To maintain the level of service necessary for successful operations, the infrastructure (e.g. the physical parts of the transportation system: roads, bridge, pavements) must be economically designed, easy to repair and maintain, and capable of maintaining traffic flow during rehabilitation, maintenance, and incidents. Agricultural commodities and industrial materials are another important dimension of the transportation systems in our region. To maintain competitiveness, it is essential that our transportation, storage, and distribution systems are both effective and efficient. This focus is clearly dependent upon an adequate and stable supply of low cost and clean energy to fuel these processes. Alternate energy is an important part of the ITI's focus.

2.5. Goal and Objectives

The goal and objectives of the ITI are described carefully and succinctly in the vision, mission, and scope of work, as are the means of achieving them.

- Goal: The ITI seeks to enhance economic development and quality of life through the design and effective utilization of transportation systems, logistics processes, and supply chains.
- Objectives: The steps that we take to reach the goal are:
 - Develop and implement new, innovative transportation ideas, management practices, and infrastructure that are efficient, secure, and environmentally responsible
 - Increase the effective utilization of existing transportation infrastructure through technology application, bottleneck analysis, and management practices to extend the life of the existing infrastructure, reduce life-cycle costs, and avoid building new infrastructure that can be both expensive and environmentally intrusive.
 - Increase mobility in the transportation system to enhance the effective implementation of distribution systems and supply chains.
 - Increase the speed with which repairs and additions to the infrastructure can be made to minimize disruption to the overall system.

- Means: The activities that the ITI will engage in to achieve these goal and objectives are:
 - Develop joint research projects among universities, public sector organizations, and private companies
 - Organize transportation consortia among universities to combine strength to solve super-regional, national, and international transportation problems.
 - Develop new curricula that focus on transportation systems and infrastructure, logistics, and supply chain management.
 - Refocus and strengthen existing programs at the baccalaureate, masters, and doctoral levels to address critical needs identified in the vision and mission statements of the Institute.

2.6. Programs and Projects

The programs and projects represent the steps that are underway and being planned so the ITI can demonstrate long-term viability. The programs described here represent the efforts of ITI since its inception, and are only a subset of the entire transportation portfolio of The University of Toledo. A copy of the 2002 Annual Report for the Intermodal Transportation Institute (ITI) is available, which illustrates the level and duration of effort that has taken place in the growth of the ITI. Following is a summary of the programs and projects that are currently underway or being planned.

Upper Midwest Freight Corridor Study: The Upper Midwest is a critical corridor for domestic and international freight that moves in all directions. These freight movements are projected to increase significantly. Current practices may not be sufficient to meet the increased demands on the infrastructure and/or increased costs associated with freight transportation. Shifts in federal and public agency policy relative to infrastructure management and expansion, budgeting decisions and staff resource allocations have and will impact the safe and efficient movement of goods within the region. Without proper collaboration and communication between the two sectors, and between the states and planning agencies of the region, the impacts of projected freight growth will pose an even greater challenge.

The University of Toledo is working with the University of Wisconsin at Madison and the University of Illinois at Chicago to establish a regional approach for improving freight transportation in the Upper Midwest based on a multi-state, multi-jurisdictional partnership of public and private sector stakeholder interests. This partnership will consider and address short- and long-term issues surrounding anticipated increases in freight movement within the region and the likely impacts on the region's infrastructure and economic health. The study area is I-94 / I-90 / I-80 that links Ohio, Michigan, Indiana, Illinois, Wisconsin, Iowa and Minnesota as well as adjacent Canadian Provinces. The study is funded by the state Departments of Transportation. See Appendix C for the full proposal. Currently, nearly \$100,000 in funding has been awarded to the University of Toledo with an expectation that more will be coming as the project progress. Faculty participants include Dr. Peter Lindquist from Geography and Planning and Dr. Jiwan Gupta from Civil Engineering.

Freight Research and Planning Institute: Working again with the University of Wisconsin at Madison and the University of Illinois at Chicago, the ITI is pursuing a Freight Research and

Planning Institute that would build on the work done in the Upper Midwest Freight Corridor Study. This study focuses primarily on data collection. The Freight Research and Planning Institute would analyze these data to identify system-wide bottleneck, investigate alternatives to address the identified problems, and work with its partners at the state DOTs to formulate a plan to address those needs. The three universities are seeking \$2,000,000 per year for the next six years from the upcoming transportation bill to engage in these activities. A copy of the problem statement is provided in Appendix D. If funding for this proposal is received, Dr. Peter Lindquist and Dr. Jiwan Gupta will play key roles in this project. It may be necessary to add additional faculty.

U.S. DOT Sponsored University Transportation Center: The University of Toledo has taken the lead to secure a U.S. DOT University Transportation Center. The focus of the Center is on improving economic vitality through better infrastructure utilization, implementation of alternate fuels, and increased transportation mobility to improve the productivity of supply chains. The proposal, which is currently sitting before Congress, includes Bowling Green State University, Cleveland State University, Kent State University, and Wayne State University. Each of these universities is coordinating efforts to lobby for this appropriation. It is supported by the Ohio Department of Transportation (ODOT) as well as public and private section organizations from around the state. The proposal is seeking \$2,000,000 per year for six years. (The original proposal stated \$6,000,000 per year, but that request has been scaled back to fit the parameters of the program.) The concept paper presented to Congress and a power point presentation that summarizes the effort are presented in Appendix E. Copies of the letters of support, including a letter of support from President Johnson and Gordon Proctor, Director of ODOT are included in Appendix F. See Exhibit 2 for a list of the letters of support. If we are successful in achieving this project, all of the faculty listed in the Section 5.4 and more would be involved in these projects.

U.S. DOD Sponsored Dynamic Partnering in the Forging Supply Chain: The U.S. Military has adopted policies that favor upgrading and updating existing weapon platforms, which extend their useful life. As a result, forged parts that were designed to function for the original life of the weapon must be replaced. These weapons were developed many years or even decades ago. For example, the B-52, which was developed in the early 1950s, is expected to fly until 2040. The information listing which company supplied the forged parts for these weapons is often unavailable, and the location of the tooling is unknown. This has caused long delays, often a year or more, in producing forged parts. The purpose of this project is to develop a tooling database that will link the DOD's need for parts to the tooling currently sitting idle at the forging company. In cases where the tooling cannot be located, part characteristics can be defined and matched with forging company capabilities so replacement parts can be produced quickly. This should reduce acquisition and tooling costs and reduce downtime for weapons. To date, funding for this project totals about \$170,000 with another \$40,000 committed for next year. Funding beyond next year is likely. Dr. Mark Vonderembse and Dr. T.S. Ragu-Nathan are working on this project.

Transit Corridor Study Technology Corridor: Working with the Toledo Metropolitan Area Council of Governments and the Toledo Area Regional Transit Authority, the ITI developed a concept paper and a request for \$1,000,000 for a transit study to support the Technology

Corridor concept. The application of public transit is often seen as a method for moving people from point to point quickly and in ways that reduce congestion, urban sprawl, and pollution in dense urban areas. Public transit also provides transportation opportunities for people without the means to own and operate private vehicles. While these outcomes are certainly important and are part of the perspective in developing a transit system for Toledo, Ohio, it is becoming clear that public transit is fundamental for developing the regional economy because of its strategic role in creating the Technology Corridor. The public transit system under consideration would attract businesses to the city, which stimulates economic development and provides resources that enable neighborhood rehabilitation. The system would apply innovative transportation solutions that could include alternate energy, hybrid power units, and/or new types of vehicles within the technology corridor. The transit system would serve as a laboratory to apply and evaluate new technology on an on-going basis. Since this original proposal, the ITI has been asked to work with Chris Shove in the GIS Center so the people-moving portion of the Technology Corridor could be more carefully integrated with its economic development aspects. A copy of the original proposal is provided in Appendix G. Dr. Chris Shove from the GISAG Center is currently leading this project.

Transportation Opportunity District: The ITI is working with the Toledo-Lucas County Port Authority and the Toledo Metropolitan Area Council of Governments to investigate the advantages of creating a Transportation Opportunity District (TOD). A TOD is a geographically defined economic development space that focuses on the logistics and transportation of manufactured goods and agricultural products as well as the distribution needs of wholesale and retail operators. A TOD attempts to bring together two or more modes of transportation to create a distribution hub that improves delivery time, enhances system reliability, increases productivity, and reduces operating costs. The administrative agency that operates the TOD provides one-stop access to and support for incentive programs currently available from federal, state, and local authorities that might support these efforts. A copy of the concept paper is provided in Appendix H. This project, which is in the development stage, is being directed by Dr. Mark Vonderembse. As the project matures and additional work is needed, additional faculty will be brought into the project.

KACI Intermodal System: The ITI will take a leadership role in a study to evaluate the effectiveness of a proposed intermodal connection between truck and rail. This proposed connection should allow trailers to be loaded onto and unloaded from rail cars in less than an hour rather than the several hours currently required. This substantial time reduction would increase transportation productivity and reduce investment in transportation infrastructure. The most important benefit may be that this time reduction should make the transfer of truck trailer via rail economically and chronologically feasible for distances of 200 miles. With current costs and time delays, shipping trailers via rail is limited to trips in excess of 500 miles. If the KACI Intermodal System is successful, it has the potential to reduce substantially truck traffic on the interstate system. The ITI is partnering with the Toledo-Lucas County Port Authority, KACI Intermodal Systems Limited, and TranSystems Corporation to examine the feasibility and assess the economic impact of this technology. A copy of the proposal is provided in Appendix I. This project, which is in the development stage, is being directed by Dr. Mark Vonderembse. As the project matures and additional work is needed, additional faculty will be brought into the project.

Toledo Public School System: “Clean School Bus USA Grant Program: The University of Toledo, Toledo Area Regional Transit Authority (TARTA), and Toledo Public Schools (TPS) are participating in a project to reduce emissions from school buses. TPS will purchase emissions testing equipment through this grant to measure the emissions reductions from the use of bio-diesel, to track reductions from other TPS pollution abatement activities, and to assist the school district with identifying buses in most need of equipment upgrades or replacement. TPS will work with TARTA and the University of Toledo’s College of Engineering to measure bus emissions from the TPS and TARTA fleet dedicated to student transport. Emissions monitoring during on-road testing is unique, so new methodologies will be developed to collect data that will provide real-world verification of laboratory expectations. Faculty and staff from The University of Toledo, TPS, TARTA, and if appropriate, U.S. EPA, will establish a testing protocol. This protocol will ensure that there is a sufficient sampling size to give statistically significant results and to allow for comparisons across different bus types and model years. The students will collect data on a rotating basis from student transport buses within the TPS and TARTA fleet. A copy of the proposal is available in Appendix J. This project is directed by Dr. Martin Abraham.

Instructional Program Development:

The University of Toledo offers education options in organizational development, non-credit certificate programs, and for-credit certificate programs as well as associate, bachelors, masters, and doctorate degrees. The already-significant instructional efforts of The University of Toledo in transportation, logistics, and supply chain management will be expanded through these efforts.

- Continuing education is offering a bachelors degree in supply chain management on-site for BAX Global.
- Continuing education is offering a bachelors degree in business on-site for United Parcel Service.
- The College of Engineering offers both a Bachelor of Science in Civil Engineering and a Master of Science in Civil Engineering that deal directly with transportation planning and infrastructure management and design issues. The Ph.D. in Engineering can also be completed with an emphasis in transportation engineering.
- The College of Arts and Sciences is offering a Bachelors of Arts in Geography that focuses on GIS and regional planning as well as contributing relevant course work in political science, sociology, and economics.
- The College of Business offers a Bachelor of Business Administration with a major in Supply Chain Management as well as a major in Electronic Commerce.
- The College of Business Administration is considering the development of a master’s degree in supply chain management. Currently, college faculty are writing a grant to secure funding to carefully evaluate this opportunity.
- The Colleges of Engineering and Business Administration currently offer a joint Ph.D. in Manufacturing Management and Engineering. Faculty are examining the feasibility of offering a track in that degree that relates to supply chain management.

2.7. Timeline

The following table lists key milestone in the development and the future of the ITI.

| Date | Milestone |
|--------------------|--|
| December 1999 | Private and public sector organizations encourage the University to develop a center or institute focusing on transportation, logistics, and supply chain management |
| March 2001 | Toledo-Lucas County Port Authority, Toledo Metropolitan Area Council of Governments, Transportation Advocacy Group of Northwest Ohio, Nagle Lines, Inc., and Toledo Trucking Association contribute funds to commission a study to determine the feasibility of initiating the ITI |
| October 2001 | President Johnson announces creation of the ITI |
| January 2002 | Interim Director is appointed and the ITI begins operations |
| March 2002 | Advisory Board defines vision and mission for the ITI |
| July 2002 | The University of Toledo joins with BGSU to discuss the possibility of creating a University Transportation Center with Congresswoman Kaptur |
| November 2002 | Presidents Johnson and Ribeau send a joint letter to Congresswoman Kaptur pledging their support for the University Transportation Center; in addition, there are more than 20 letters of support from Advisory Board members |
| January 2003 | A consortium of five universities is formed to seek the University Transportation Center with UT in the lead |
| March 2003 | Proposal for the University Transportation Center is submitted to congress |
| June 2003 | UT hosted a national and international meeting of Departments of Transportation, Federal Highway Administration, Canadian Provinces, and industry executives to discuss the Upper Midwest Freight Study |
| August 2003 | Notification of funding for the Upper Midwest Freight Study |
| November 2003 | Submission of the proposal to achieve Board of Trustee approval for the ITI |
| <i>May 2004</i> | <i>Completion of plans to revise the Ph.D. in Manufacturing Management and Engineering in the College of Business Administration to offer a Ph.D. in Supply Chain Management</i> |
| <i>July 2004</i> | <i>Notification of funding for the University Transportation Center</i> |
| <i>August 2004</i> | <i>Notification of funding for the Freight Research and Planning Institute</i> |

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| <i>September 2004</i> | <i>Completion of plans to develop an M.S. in the Management of Technology that has a track in Global Supply Chain Management</i> |
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3. Administrative Structure

An effective ITI requires an administrative structure that meets the needs as defined in the strategic plan. The management structure is designed to enable the ITI to access resources throughout the university. As shown in Exhibit 3, the director of the ITI reports to the Office of the Provost and is governed by an Operating Committee. The director should hold an academic position in one or more colleges. In addition, an external Advisory Board provides support and direction to the Institute so that it maintains quality and competitive programs that are responsive to community needs. To help coordinate efforts and activities, members of the Operating Committee also serve on the Advisory Board. The director is responsible for developing a set of activities that are consistent with the vision and mission of the ITI, which have been set by the Advisory Board and Operating Committee. The director must organize the resources of the University as well as the resources of private and public sector organization, including other universities, to address these problems.

3.1. Operating Committee

The Vice Provost for Research, Graduate Education, and Economic Development is the Chair of the Operating Committee. The committee members include the Deans of the Colleges of Arts and Sciences, Business Administration, Engineering, and Law. The Operating Committee provides the direct oversight of the ITI, including monitoring the budget, participation of faculty and students, the involvement of courses and academic programs, and interaction with outside constituents. The close oversight of the Operating Committee is to ensure that faculty members, courses, and other resources from across the campus are provided to support the interdisciplinary programs of the ITI. In particular, the involvement of the deans will help ensure that faculty participation in projects has the full endorsement of the colleges.

3.2. Director

The Director of the ITI is responsible for the daily operations of the Institute and the promotion and expansion of the Institute. The Director has the following responsibilities:

- Oversight of the budget
- Developing a plan for the future growth and funding of the Institute
- Communication with the Operating Committee, Advisory Board, and others
- Providing leadership in developing research projects and seeking research funding
- Identifying faculty strengths and interests in the area of transportation and working with the deans to marshal faculty resources as part of a university-wide institute
- Working with deans and chairs in promoting academic programs relating to transportation and the development of new courses and programs
- Organizing conferences, meetings, workshops and other avenues to provide support to local industry and development organizations

The Director will have a strong record of refereed publications and competitive grants and will hold a tenured faculty position in one or more departments. The Director will be appointed by the Provost, after consultation with the Operating Committee and the Advisory Board. The Interim Director is Dr. Mark A. Vonderembse. A copy of his vitae is available in Appendix K.

3.3. Advisory Board

The Advisory Board is composed of public and private sector organizations, which have an interest in developing a strong Intermodal Transportation Institute at the University of Toledo. Members include representatives of industry, economic development organizations, and government agencies. New Advisory Board members are nominated by the ITI Director and approved by the Board. Once appointed, membership is continuing. Organizations such as the Toledo-Lucas County Port Authority, Toledo Metropolitan Area Council of Governments, Transportation Advocacy Group of Northwest Ohio, and Ohio Department of Transportation, as well as private sector transportation providers and users should be represented.

The Advisory Board recommends projects for ITI study, provides project support, and helps to secure project funding. The Advisory Board may suggest topics that they believe are important where faculty might develop courses, academic programs, training sessions, workshops, and other activities. The Advisory Board meets four times a year, with the Operating Committee, the Director, and faculty representatives to review progress. The Advisory Board has an executive committee that meets approximately monthly to provide guidance and support for the Director. A list of the Executive Committee and Advisory Board are contained in Appendix A.

4. Budget and Staff

During the start-up period, the ITI budget is currently being funded in the following manner. The College of Business Administration is covering the Interim Director's 9-month salary and fringe benefits. The provost's office is funding the summer support and fringe benefits, travel costs, and meeting expense. Secretarial support is being provided by the College of Business through access to existing staff on an as needed basis. The Advisory Board has provided \$15,000 to do the initial feasibility study.

Budget 2003-2004

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|---|-----------------|
| Interim Director's 9-Month Salary (40 % release time) | \$44,000 |
| Fringe Benefits for 9-Month Salary | \$13,640 |
| Interim Director's Summer Support | \$21,000 |
| Fringe Benefits for Summer Support | \$ 3,360 |
| Travel and Meeting Expense | \$ 5,000 |
| Secretarial Support | <u>\$ 3,000</u> |
| Total | \$90,000 |

"The annual administrative costs for the ITI are at \$90,000 per year. It is recommended that \$30,000 be provided as contributions from external sponsors and advisory board members; \$30,000 per year from indirect reimbursements; and \$30K per year from university contributions. University contributions will be \$15K per year from the Office of Research and

\$4,000 per year from the Colleges of Arts and Sciences, Business Administration, and Engineering with \$3,000 per year from the College of Law. The commitments are for five years.

Given the contributions by the Colleges, the ITI will advocate and seek funding for research, education and outreach projects across campus and will work with college faculty and their administration in the development of funded projects. If there is no involvement in the ultimate project of staff of the ITI, then the project will run through departmental accounts and not through ITI accounts, although it will be listed in ITI annual reports as an ITI project. Projects involving ITI staff will bring F&A to the ITI and departments according to UT policy.

5. Potential for Long-Term Viability

The potential for long-term viability is defined by the University's commitment (both economic and strategic), synergies with existing research and education programs at UT, the community's long-term emphasis on transportation, logistics, and supply chain management, a high level of faculty interest, initial support levels, and the potential for long-term support.

5.1. University Commitment

The University of Toledo has made a strategic commitment to support efforts in transportation including the ITI. Within a few months of arriving on campus, President Johnson announced the creation of the Intermodal Transportation Institute. In addition, transportation is an important element of his vision for creating a technology corridor in Northwest Ohio.

5.2. Synergy with Existing Research and Education Programs

The administrative structure of the ITI has been developed to ensure that there will be significant cooperation among the various parts of the University. There are important synergies between the ITI and other existing UT efforts in alternate fuels, GIS, supply chain management, and transportation infrastructure design, maintenance, and planning. Alternate fuels that burn clean, are readily available, and are cost competitive are essential for the continuing success of freight transportation. The ITI is currently working cooperatively with the Geographic Information Sciences and Applied Geography (GISAG) Center on the Upper Midwest Freight Study. The ITI is interested in working with the colleges to evaluate existing educational programs and to develop new educational opportunities in transportation design and planning as well as supply chain management.

5.3. Community Commitment

The public and private sectors are committed to the long-term development of transportation planning, infrastructure management and design, logistics, and supply chain management projects as a springboard for economic development. They have worked closely with the ITI to provide strong guidance and support. The list of Advisory Board member is Appendix A clearly illustrates their commitment. In addition, the ITI has been prominently displayed in the

Legislative Agenda for 2001, 2002, and 2003 for the transportation agencies and advocacy groups in the region. This includes:

- The Toledo Metropolitan Area Council of Governments
- The Toledo-Lucas County Port Authority
- The Toledo Area Chamber of Commerce
- The Toledo Area Regional Transit Authority
- Northwest Ohio Mayors and Managers Association
- Transportation Advocacy Group of Northwest Ohio
- The Toledo Trucking Association
- The Ohio Contractors Association – Toledo Chapter
- The Wood County Engineer’s Office
- The Lucas County Engineer’s Office
- The City of Toledo

Copies of the 2001, 2002, and 2003 Legislative Agenda’s are available in Appendix L.

5.4. Faculty Interest

There is a high level of faculty interest. The following faculty have expressed an interest in participating in the ITI.

| Faculty | Department and College |
|----------------------|--|
| Martin Abraham | Chemical and Environmental Engineering, College of Engineering |
| Bhal Bhatt | Department of International Business, Entrepreneurship, and Strategy; College of Business Administration |
| Eddie Yein-Juin Chou | Department of Civil Engineering; College of Engineering |
| Kevin Czajkowski | Department of Geography and Planning; College of Arts and Sciences |
| Jiwan Gupta | Department of Civil Engineering; College of Engineering |
| Anand Kunnathur | Department of Information, Marketing, E-Commerce, and Sales; College of Business Administration |
| Peter Lindquist | Department of Geography and Planning; College of Arts and Sciences |
| Douglas Nims | Department of Civil Engineering; College of Engineering |
| Ram Rachamadugu | Department of Management, College of Business Administration |
| T.S. Ragu-Nathan | Department of Information, Marketing, E-Commerce, and Sales; College of Business Administration |
| Brian Randolph | Department of Civil Engineering; College of Engineering |
| Subba Rao | Department of Management, College of Business Administration |
| Neil Reid | Department of Geography and Planning; College of Arts and Sciences |

| | |
|-------------------|---|
| Christopher Shove | Director, Center for Geographic Information Science & Applied Geographics, Department of Geography and Planning; College of Arts and Sciences |
| Mark Vonderembse | Department of Management; College of Business Administration |

Copies of the resumes are in Appendix M.

5.5. Funding and Potential for Funding

Currently, the ITI has nearly \$100,000 in funding to support the Upper Midwest Freight Study. This is phase 1 of what should be a multiple year study. In the project, the University of Toledo has been designated as the warehouse for all of the data collected as part of the study. This provides significant opportunities for additional funding as this project moves through the second and third phases. Funding of \$170,000 has been received for research on the forging supply chain with additional funding committed for next year and funding beyond next year likely.

In addition, the other projects identified earlier have the potential to generate substantial funding for transportation research and education. The U.S. DOT University Transportation Center designation has a coalition of five universities and Ohio and Michigan and has significant congressional support. As this status is achieved, avenues of additional research funding for transportation will become available.

5.6. Review Process

Each calendar year, the Advisory Board and the Operating Committee will meet with the director to reassess the ITI's strategic direction and to set specific goals for the coming year. As part of this review process, the Director will prepare an annual report. Based on the annual report, the Advisory Board and the Operating Committee will assess the performance of the Director and the Institute. Every five years, beginning in January 2004, this review will include an in-depth review of the Institutes long-term potential and determine whether it should continue.

Exhibit 1: Scope of the Intermodal Transportation Institute

Focus Areas for the Intermodal Transportation Institute

| | | | |
|--|--|--|--|
| <i>University Strengths</i> | Supply Chains: Transportation and information links between suppliers and manufacturers | Transportation and Distribution for Consumer Products | Transportation, Storage & Distribution for Bulk Commodities |
| | Infrastructure Planning, Design, Utilization and Maintenance and Alternate Fuels efforts are essential parts of these focus areas | | |
| Research | | | |
| Education & Training | | | |
| Planning & Technical Assistance | | | |

Exhibit 2: Letters of Support

- President Daniel Johnson and President Sidney Ribeau
- Gordon Proctor, Director, Ohio Department of Transportation
- Government
 - City of Toledo
 - Lucas County
 - Wood County Economic Development
 - Wood County Engineers
- Agencies
 - EISC, Inc
 - Regional Growth Partnership
 - Regional Technology Alliance
 - Toledo Area Regional Transit Authority
 - Toledo-Lucas County Port Authority
 - Toledo Metropolitan Area Council of Governments
- Private Sector
 - Bax Global
 - Dana Corporation
 - Grand Aire
 - Hub Group, Inc
 - N-Viro International Corporation
 - Nagle Lines, Inc.
 - Ohio Trucking Association
 - Roadway Express
 - Transportation Advocacy Group of Northwest Ohio
 - Toledo Trucking Association

Exhibit 3: Administrative Structure

