Development, Deployment, and Assessment of a New Educational Paradigm for Transportation Professionals and University Students:

A Collaboration of the Region X Transportation Consortium
Proposal submitted by:

The National Institute for Advanced Transportation Technology, University of Idaho

On Behalf of Member UTCs:
Transportation Northwest Regional Center
Oregon Transportation Research and Education Consortium
Alaska University Transportation Center

And Member State Departments of Transportation:
Washington State Department of Transportation
Oregon Department of Transportation
Alaska Department of Transportation and Public Facilities
Idaho Transportation Department

Excerpts from FHWA Proposal/Project Overview

Project Team Meeting

Moscow, Idaho

10 June 2010
1. Executive Summary (Excerpt from proposal)

The National Institute for Advanced Transportation Technology (NIATT) at the University of Idaho (UI) is pleased to submit this proposal on behalf of the Region X Transportation Consortium in response to the FHWA RFA Number DTFH61-07-RA-00118 Open Focus Area. The Region X Consortium is poised to deliver a new educational program to a target audience of university students and transportation professionals in the Pacific Northwest in order to address pipeline, training, and retention issues in the transportation industry. The program is based on a new paradigm for educational content delivery—an active, problem-based learning environment conducted at a distance. Supported by educational research and the expertise of the faculty from the proposing institutions, this program seeks to enhance the quality of the learning environment for transportation students, thereby advancing the cause of transportation workforce recruitment, and to provide pedagogically sound, cost effective training to practicing professionals in order to hone essential skills and promote workforce retention.

If funded, the Region X Transportation Consortium will develop four course modules, deliver these modules in a unique distance-based learning environment, test the efficacy of the modules in meeting program goals, and provide a means to disseminate materials and lessons learned to a national audience.

The modules will be learner-centered, built upon our extensive experience in creating active, problem-based learning environments for our transportation students, and validated by pedagogical research funded through the National Science Foundation and others. A substantial body of research demonstrates that problem-based environments produce students who perform better at solving novel problems and other positive learning outcomes.

The modules will be offered over a distance to our target audience of university students and practicing professionals. This learning environment will provide many benefits to both groups. Students and professionals will develop essential communication and collaboration skills in a distance-separated work environment that replicates the work environment at most agencies. Students will network with professionals and gain a real understanding of the field, as well as forge relationships and perhaps, find mentors. Students will benefit from the professionals’ perspectives, work ethic and occupational pride. Students will contribute a fresh perspective and technological savvy. Professionals will gain essential training in technical skills by solving generative problems stated in their complex contexts. This professional development can aid in improving job retention by building core competencies and fostering networking. Enhanced learning and self-assessment skills, developed in both groups, will contribute to the creation of an engineering workforce of “life-long learners.” According to the National Academy of Engineering, this is an imperative for the 21st century.

We have established a unique and active regional consortium, recognized and promoted by the U.S. Department of Transportation and the FHWA. This consortium, known as the Region X Transportation Consortium, includes the four state departments of transportation and the four...
University Transportation Centers (UTCs) from Washington, Oregon, Alaska, and Idaho. The four UTCs will develop and deliver these new curricula to university students and practitioners from the state DOTs and their partners (including local transportation agencies and private consultants).

Our team is uniquely qualified to deliver this new program. Principal investigator Michael Kyte has over 35 years experience in transportation practice, education and research. He has developed new transportation learning environments and products including the widely recognized Traffic Signal Summer Workshop. He co-developed the Highway Capacity Manual Applications Guide and the Mobile Traffic Signal Timing Training program. The team includes faculty from the UI, University of Washington, Portland State University, Washington State University and the University of Alaska who have significant experience in technical training, program and project management, educational curriculum development, educational research and testing, and program evaluation and assessment.
2. Goals and Objectives (Excerpt from proposal)
The objective of the Transportation Education Development Pilot Program (TEDPP) is to “develop, test, and revise new curricula and education programs to train individuals at all levels of the transportation workforce.” This proposal falls under the open focus area solicitation in the RFA. We intend to target a diverse audience of university students and transportation professionals from the four states of the Region X Transportation Consortium who work in the area of transportation engineering and planning. The transportation professionals will include a mix of state DOT personnel, local agency personnel, and the consultants who do work for both groups. There are nearly 960 members of the Institute of Transportation Engineers (ITE) in these four states, an indicator of the size of the potential audience for this work.

Our goal is to attract new students to the field of transportation engineering and to train and retain practicing professionals by creating a learner-centered educational environment that addresses crucial issues in transportation engineering and planning. To meet this goal, we have established the following objectives for our work:
1. Develop a set of four modules (defined below) and the relevant learning materials based on the principles of active, problem-based learning.
2. Develop distance-separated, interactive learning environments based on sound educational practices in which the modules can be deployed and tested.
3. Create teams of students and practitioners to pilot test materials.
4. Design and implement a detailed evaluation and improvement cycle for each module.
5. Assess the learning process and student outcomes.
6. Disseminate what we’ve learned in this project to a National audience.

1. IMPACT: Assess the impact of major new residential, commercial, and industrial developments and ensure that the impacts on the transportation infrastructure can be mitigated and are sustainable.
2. FLOW: Manage the flow of all traffic modes on signalized arterials to encourage optimal flow for all users and minimize waste and environmental impact.
3. RURAL: Increase the safety and improve the operations of rural highways, without adversely affecting the environments through which these highways traverse.
4. URBAN: Manage congestion and incidents in heavily traveled urban freeway corridors to maintain safety and provide reliable trip times for freeway users, including both commuters and commercial operators.
5. TRANSIT: Effectively and efficiently manage the movement of goods and services between and within the urban areas and small cities of the Pacific Northwest.
6. INVESTMENT: Make decisions on future transportation investments, including decisions that consider multi-modal systems and a diverse set of travel needs of a region and its residents.
7. TECHNOLOGY: Identify technology strategies, and then deploy the resulting systems, that will result in improved capacity and safety of a region’s transportation system.
8. CLIMATE: Operate and maintain a transportation system in an environment of changing weather and climactic conditions, including the diverse environment of the Pacific Northwest.
3. Work Scope and Schedule

Task 1: Establish Project Oversight Committee and Develop Expanded Work Scope

Work to Be Done: Establish a Project Oversight Committee to monitor and oversee the work conducted during this project. The committee will consist of transportation educators with a range of experiences and transportation professionals from diverse groups who are both content experts and educational delivery experts who are knowledgeable about active, problem-based learning. The committee will review the work scope contained in this proposal and provide suggestions for enhancing the work scope. The project team will expand and modify the work scope as per the suggestions from the committee and publish a final work scope document. The project team will also develop strategies and procedures for team communications and collaboration during the project.

Responsibility for Task: Michael Kyte, project PI, and the Management Team.

Schedule: The Project Oversight Committee will be established during January and February 2008 (months 1 and 2) and will function during the entire 46 months of this project. Meetings will be held as described below.

Results of Task: Formation of a Project Oversight Committee and a project website that will include a revised scope of work, and serve as a repository for all materials developed during the project.

Task 2: Conduct Workshop on Problem-Based Learning and Develop Guidance Document for the Development of the Course Modules

Work to Be Done: Consolidate our knowledge-base on active, problem-based learning and create a consistent approach to develop the course modules and learning environment. The Learning Team will conduct the workshop for university faculty from the four UTCs. Based on the results of the workshop, the Learning Team will prepare a guidance document on best practices to be used by the Module Development Teams. The guidance document will ensure that problem-based learning principles are at the core of the module development and that the modules will be developed consistently. The guidance document will be revisited periodically and updated by the Learning Team as the project proceeds.

Responsibility for Task: The Learning Team will be responsible for this task.

Schedule: This task will be conducted between March and June 2008 (months 3 through 6)

Results of Task: A guidance document establishing best and consistent practices for the development of the course modules.

Task 3: Develop Educational Materials for Course Modules 1 and 2

Work to Be Done: Develop the educational materials for the first two course modules. This work will include a literature review of existing educational and professional materials in the specific areas covered by the modules in order to leverage existing resources. The educational materials will include a detailed description of the generative problem and sub-problems addressed in the module, student learning materials, the instructor support materials, and a document defining the learning environment. Materials may include readings, Internet resources, animations, videos, podcasts, presentations, handouts, exercises, and other
references. Efforts will include developing materials using the latest technology tools that can be adapted for use anywhere.

**Responsibility for Task:** The Module Development Teams for Module 1 (from the University of Idaho) and Module 2 (from Portland State University) will be responsible for this task.

**Schedule:** This task will be conducted between June and December 2008 (months 6 through 12).

**Results of Task:** A draft set of educational materials, instructor support materials, and a description of the proposed learning environment.

**Task 4: Workshop and Peer Review of the Materials for Course Modules 1 and 2**

**Work to Be Done:** Conduct an interactive workshop with the Project Oversight Committee and others to review the materials developed for Modules 1 and 2. Candidates for participation will include constituents such as current students, professionals, subject matter experts, transportation faculty, and other faculty with expertise in related areas or in teaching, learning, and assessment. The workshop will be conducted by the Assessment Team and will be video-recorded for archiving and assessment purposes. The workshop will be peer reviewed and a summary document will be prepared. A list of suggested modifications to the materials will be identified and documented. These suggested modifications will be made to the materials by the Module Development Teams.

**Responsibility for Task:** The Assessment Team will be responsible for conducting the peer review and documenting the results of the workshop. The Module Development Teams will be responsible for modifying the materials as appropriate, based on the suggestions generated by this workshop.

**Schedule:** The workshop and peer review will be conducted during January 2009 (month 13).

**Results of Task:** Archived, peer-reviewed workshop and modifications of Modules 1 and 2.

**Task 5: Deploy Course Modules 1 and 2**

**Work to Be Done:** Pilot test the first two course modules with a group of university students and transportation professionals from the four states involved in this project. Documentation of the group-based activities and the distance-collaborative environment for different groups involved in this pilot test will be developed.

**Responsibility for Task:** Module Development Teams for Modules 1 and 2 will be responsible for this task.

**Schedule:** This task will be conducted between January and May 2009 (months 13 through 17).

**Results of Task:** Delivery of Modules 1 and 2 to a first group of students.

**Task 6: Assess Course Modules 1 and 2**

**Work to Be Done:** Comprehensively assess the two modules, based on direct observations and regular assessment exercises conducted with both the students and the instruction teams. The Assessment Team will prepare a memorandum summarizing the results of their assessment, including recommendations for improvements to the materials, the learning environment, course delivery, and student outcomes.

**Responsibility for Task:** The Assessment Team will be responsible for this task.
Development, Deployment, and Assessment of a New Educational Paradigm for Transportation Professionals and University Students

Schedule: The assessment will occur during the delivery of the course modules (January through May 2009) and continue through August 2009 (months 13 through 20).

Results of Task: A technical memorandum summarizing the results of the assessment, identifying ideas for modifying the course materials, a revision to the guidance document based on its use in the preparation of Modules 1 and 2, and other suggestions to inform the development of Modules 3 and 4.

Task 7: Revise Course Modules 1 and 2 Based on Assessment
Work to Be Done: Revise and improve Modules 1 and 2 based on the assessment completed in Task 6.
Responsibility for Task: Module Development Teams for Modules 1 and 2 will be responsible for this task.
Schedule: This task will be conducted between September and December 2009 (months 21 through 24).
Results of Task: A revised set of course materials for Modules 1 and 2 that address the outcomes of task 6.

Task 8: Develop Educational Materials for Course Modules 3 and 4
Work to Be Done: Develop the materials for the final modules based on the lessons learned in tasks 3 through 7. The materials include student learning materials, instructor support materials, and a defined learning environment.
Responsibility for Task: Module Development Teams for Modules 3 and 4 will be responsible for this task.
Schedule: This task will be conducted between June and December 2009 (months 18 through 24).
Results of Task: A draft set of materials will be prepared for Modules 3 and 4.

Task 9: Workshop and Peer Review for Modules 3 and 4
Work to Be Done: Conduct a workshop with the Project Oversight Committee and other participants to review the materials developed for Modules 3 and 4. The workshop will be conducted by the Assessment Team. A summary document will be prepared of this peer review and a list of suggested modifications to the materials will be identified and documented. These modifications will be made to the materials by the Module Development Teams.
Responsibility for Task: The Assessment Team will conduct the peer review and document the results of the workshop. The Module Development Teams modify the materials based on the ideas generated by this workshop.
Schedule: The workshop and peer review will be conducted during January 2010 (month 25).
Results of Task: Archived, peer-reviewed workshop, modified materials for Modules 3 and 4.

Task 10: Deploy Course Modules 3 and 4
Work to Be Done: Pilot test the final two course modules with a group of students and transportation professionals.
Responsibility for Task: Module Development Teams for Modules 3 and 4 will be responsible for this task.

Schedule: The modules will be pilot tested from January 2010 to May 2010 (months 25 through 29)

Results of Task: Delivery of Modules 3 and 4 to a first group of students.

Task 11: Assess Course Modules 3 and 4

Work to Be Done: Assess Modules 3 and 4. The assessment will be based on direct observations of the delivery of the modules and regular assessment exercises conducted with both the students and the instruction teams. The Assessment Team will prepare a memorandum summarizing the results of their assessment.

Responsibility for Task: The Assessment Team will be responsible for this task.

Schedule: The assessment will occur during the delivery of the course modules (January through May 2010) and continue through August 2010 (months 25 through 32).

Results of Task: A technical memorandum summarizing the assessment and identifying modifications of the course materials for Modules 3 and 4.

Task 12: Revise Course Modules 3 and 4 Based on Assessment

Work to Be Done: Revise Modules 3 and 4 based on the assessment completed in Task 11.

Responsibility for Task: Module Development Teams for Modules 3 and 4 will be responsible for this task.

Schedule: This task will be conducted between September and December 2010 (months 33 through 36).

Results of Task: A revised set of course materials will be prepared for Modules 3 and 4.

Task 13: Final Workshop and Peer Review

Work to Be Done: Conduct a final workshop with the Project Oversight Committee and others to review all of the materials developed for the four modules. The workshop will be conducted by the Assessment Team. A summary document will be prepared of this peer review and a list of suggested modifications to the materials will be identified and documented. These suggested modifications will be made to the materials by the Module Development Teams. A workshop summary will be prepared by the Assessment Team.

Responsibility for Task: The Assessment Team will be responsible for conducting the peer review and documenting the results of the workshop. The Module Development Teams will be responsible for modifying the materials as appropriate based on the suggestions generated by this workshop.

Schedule: The workshop and peer review will be conducted during January 2011 (month 37).

Results of Task: Archived, peer-reviewed final workshop, modified materials, workshop summary.
Development, Deployment, and Assessment of a New Educational Paradigm for Transportation Professionals and University Students

Task 14: Conduct Workshop to Train Others
Work to Be Done: After developing the four modules and pilot testing them within Region X, conduct and video record a national-level workshop in order to train other instructors who may wish to use the materials and learning environments developed during this project. The results of the workshop will be published in a conference proceedings format and widely disseminated. Presentations of the workshop results will be made to the FHWA, the Transportation Research Board, the Institute of Transportation Engineers, and other appropriate forums.

Responsibility for Task: The Learning Team will be responsible for this task.
Schedule: The workshop will be conducted between March and May 2011 (months 39 through 41).
Results of Task: A set of trained instructors who will be able to disseminate the results of this project to other environments and areas of the U.S.

Task 15: Publish Course Materials
Work to Be Done: Publish all course materials in electronic formats and make available via the project website.
Responsibility for Task: Project PI Michael Kyte and Module Development Teams are responsible for this task.
Schedule: This task will be conducted between March and August 2011 (months 39 through 44).
Results of Task: A final set of course materials made available electronically on the project website.

Task 16: Prepare Final Report
Work to Be Done: Prepare a final report that describes the work undertaken during this project. This report will include a description of the learning environments that were considered, a description of the materials that were developed, a summary of the assessments that were conducted and the lessons learned from these assessments, the project evaluation and recommendations for how to transfer what was learned during this project to other areas. The draft report will be made available for review by the Project Oversight Committee. The final report will reflect suggestions and comments made by the oversight committee.
Responsibility for Task: The Management Team will be responsible for this task.
Schedule: This task will be conducted between July and October 2011 (months 43 and 46).
Results of Task: A final report made available to the FHWA and through the project website.
4. Deliverables

The work scope described above listed a set of results for each of the sixteen project tasks. We summarize here the project deliverables based on that material.

- Guidance document summarizing best practices for active, problem-based learning that will guide the development of each of the four modules.
- Course materials for each of the four course modules delivered electronically on the project website.
- Assessment reports generated during tasks 5 and 11.
- Workshop summary reports generated during tasks 4, 9, and 13.
- Final project report developed during task 16.
- Quarterly progress reports and annual budget reviews as required by the Request for Application.
5. Team Members, Roles, Responsibilities

Management Team: The Management Team consists of: Dr Michael Kyte, from the University of Idaho; Dr. Nancy Nihan, from the University of Washington, Dr. Chris Monsere from Portland State University, and Mr. Billy Connor, from the University of Alaska. Dr. Michael Kyte is the Principal Investigator for the Project, and is responsible for the overall management of the project and its component tasks, as well as the successful delivery of all products within the timeframe and scope described in the proposal. The Management Team is responsible for overall management and oversight throughout the life of the project. The team is also responsible for the following work tasks, as described in Section 1.1.4 of the proposal:
- Establishment of the Project Oversight Committee (Task 1)
- Development of strategic communication methods (Task 1)
- Oversight of all work tasks (All Tasks)
- Preparation of a Final Report (Task 16)

Learning Team: The Learning Team consists of Dr. Steven Beyerlein of the University of Idaho and Dr. Barry Willis of the University of Idaho. The Learning Team is primarily responsible for ensuring the development of high quality educational materials for a distance-based format.
The team is also responsible for the following work tasks, as described in Section 1.1.4 of the proposal:

- Consolidating current knowledge on active and problem based learning techniques (Task 2)
- Creating a Guidance Document for the development of the four course modules (Task 2)
- Conducting a workshop for faculty of participating institutions (Task 2)
- Reviewing and updating the project Guidance Document as needed (Tasks 2-16)
- Conducting a National Educational Workshop to train instructors in the use of materials developed during this project (Task 14)
- Publishing workshop proceedings (Task 14)

Module Development Teams: The module development teams for Modules 1-4 consist of: Dr. Michael Dixon and Dr. Ahmed Abdel-Rahim from the University of Idaho (Team 1); Dr. Chris Monsere and Dr. Miguel Figliozzi of Portland State University (Team 2); Dr. Anne Goodchild from the University of Washington (Team 3); and Dr. Leroy Hulsey and Dr. Ming Lee from the University of Alaska (Team 4). The four Module Development Teams are primarily responsible for the creation of learning materials, learning environments and instructor materials. The teams are also responsible for the following work tasks, as described in Section 1.1.4 of the proposal:

- Conducting preliminary literature review (Task 3)
- Developing materials and learning environment for Modules 1-4 (Task 3, Task 8)
- Revising materials based on preliminary assessment (Task 4, Task 9)
- Pilot testing of Modules 1-4 at participating universities (Task 5, Task 10)
- Documenting results from the pilot tests (Task 5, Task 10)
- Revising Modules 1-4 based on assessment during pilot test (Task 7, Task 12)
- Final revising of all modules (Task 13)
- Publishing results on the project website (Task 15)

Assessment Team: The Assessment Team consists of Dr. James Gregson from the University of Idaho and Dr. Shane Brown from Washington State University. These team members are experts in educational assessment and are primarily responsible for providing regular feedback to the Module Development Team and using high quality assessment instruments for documenting measurable results throughout the project. They are also responsible for the following tasks, as described in Section 1.1.4 in the proposal:

- Conducting a workshop/peer review with the Project Oversight Committee to assess the draft of Modules 1&2 (Task 4)
- On-going assessment of the pilot test of Modules 1&2 (Task 6)
- Writing a technical memorandum on the results of assessments of Modules 1&2 (Task 6)
- Suggesting revisions to the guidance document based on assessment of Modules 1&2 (Task 6)
- Suggesting strategies for development of Modules 3&4 based on assessment of Modules 1&2 (Task 6)
- Conducting a workshop/peer review with the Project Oversight Committee to assess the draft of Modules 3&4 (Task 9)
- On-going assessment of the pilot test of Modules 3&4 (Task 11)
- Writing a technical memorandum on the results of assessments of Modules 3&4 (Task 11)
- Conducting a final assessment workshop and peer review of all modules (Task 13)
- Documenting final assessment and workshop results (Task 13)
6. What Will a Ten-Week Course Module Look Like?

A fundamental difference between what we are proposing here and the more traditional university or professional development course is that courses will not be lecture-based. Rather, we are proposing an approach based on validated educational research that combines the methods known as active and problem-based learning. Too often, transportation courses focus on the use of a particular tool, such as traffic simulation or transportation planning models. Research has shown that reorienting a course to focus on a generative problem, then allowing the student instructor teams to develop the material needed to solve the problem, builds not only the technical skills required but also the communication and collaboration skills needed in today’s work environment. A substantial body of research has shown that the outcomes from such learner-centered environments are more significant than those produced by more traditional educational approaches. The following illustrates what a course module might look like.

A course module would begin with a two day on-site workshop involving the participation of the instruction team and all students. During this workshop, the generative problem will be described and the process and schedule to address the problem will be developed. Team building exercises will be conducted to develop communications and work group processes that will be used during the course. The instruction team will present the learning objectives that will guide the course and the available tools for addressing the problem.

Subsequent to the initial workshop, weekly two-hour meetings will be held during the ten-week course via video conferencing facilities. Mini-teams will be formed at each video conferencing site. Mini-lectures (about 20 minutes in length) will be presented in which a specific subproblem for the week will be described. The remaining class period will be focused on participant teams working on the problem and developing material to address the assigned problem. Selected student teams will summarize the work completed during the class. Students will prepare for each subsequent class through assigned readings, group problems, writing exercises or reflective self-assessment.

An electronic environment will provide the tools for instructors and participants to collaborate and communicate. Video conferencing will be used for all class meetings. All course materials will be stored on the class website. Webinars, wikis, threaded email discussion groups and instant messaging tools will also be available.
7. Evaluation Plan

The Assessment Team is responsible for the on-going assessment and evaluation of the project. The work of the Assessment Team is described in tasks 4, 6, 9, 11 and 13. The purpose of the assessment is to provide regular feedback to the course Module Development Teams, to ensure that these teams are using the principles developed in the guidance document, and to determine the effectiveness of the course materials and their delivery. The Assessment Team will be led by James Gregson and Shane Brown.

Project evaluation will consist of developing indicators of success for the project objectives, coupled with designing and implementing specific tools to determine if and to what extent the measures of success are accomplished during the course of the proposed project. Measures will include both technical and non-technical components. Technical measures are related to the technical content of the workshops and will include homework and exam type problems, typical of a university class, and exercises that are used over the course of instruction to FHWA determine students’ understanding of the concepts in a particular module. Non-technical measures will be focused on workshop participants’ attitudes and perceptions towards the effectiveness of the materials and implementation of the materials. For example, participants will be interviewed after the workshop to determine what they thought was the most/least effective about the workshop and modules. In addition, participants will be interviewed before and after the course to determine attitudes toward the transportation profession, and participants will be interviewed regarding growth in their professional knowledge and competency.

Table 1: Indicators and Tools for Measuring Success Indicators of Success

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**Development, Deployment, and Assessment of a New Educational Paradigm for Transportation Professionals and University Students**

- Surveying participants at conclusion of workshop
  - Learning environments are effective for module implementation
  - Homework and exams to assess technical knowledge and concepts
  - Observations of workshops
  - Surveying participants at conclusion of workshop

Workshop participants utilize knowledge gained from workshops in practice
- Interviews with participants before and after workshops

Materials and implementation methods are transferred to other agencies
- Tracking implementation of materials by other agencies

Lessons learned are shared with broader community in journals and conference proceedings
- Tracking the number of publications associated with this project
8. Expected Challenges

Developing a new educational paradigm brings with it the potential for great payoff but it also brings inherent challenges. The project team has considered the challenges that may arise during this project, generated mainly by the level of innovation that we are proposing here. We have identified four such potential challenges and provide our thoughts for the way we intend to address these challenges as they arise.

**Communications**
We will be challenged to ensure effective and timely communications between all members of the project team. To address this challenge, the Management Team, consisting of one member from each of the four UTCs, will meet monthly via video conferencing to review all aspects of the project including task completion, budget and expenditures, and any other related issues. Minutes of the team meetings will be posted on the project website to ensure that all members of the team have access to formal discussions that take place amongst team members. All issues will be documented and all decisions will be clearly described.

The Learning Team, the Module Development Teams and the Assessment Team will meet regularly and maintain similar records of their discussions. The project PI will be responsible for regular communications with each team leader. The project PI will also be responsible for regular communications with the FHWA program officer and with the Project Oversight Committee.

**Working Remotely**
We will be challenged to create the technology support system needed for effective remote work that is a basic part of this project. The project team understands the challenge inherent with this task, but recognizes that this remote based multidisciplinary working environment is a reality for many if not most projects undertaken in transportation today. We also have established both the video conferencing technology and the experience with this technology within the Management Team that will be essential to working remotely. Further, we are creating distance learning and working environments for each of the course modules. In addition to holding an in-person workshop at the beginning of each class, we have established state-of-the-art video communications and computing technology that will support for each of the course modules.

**Innovative Educational Paradigm**
We recognize that we are proposing a new way of developing and delivering transportation education to transportation professionals and university students. This active problem-based learning environment with teams working together over a distance is new to many students. We are prepared to address the kinds of issues that commonly arise in these new educational environments.
Institutional Issues
This project is also innovative because it will offer the courses through four different universities. We have identified several issues and the process that we intend to follow to address them. For example, the four universities offer their programs in both quarter and semester system formats. We have agreed to identify ten-week blocks that are common to both the fall and spring quarters and semesters to minimize administration problems and inconvenience to the university students taking these courses. We will identify on-site facilitators for all remote sites. Each facilitator will be identified as the instructor responsible for the course and will manage all administrative issues relevant to the class at his or her home university. No additional fees will be charged for regularly enrolled university students. Transportation professionals will be charged a fee consistent with the policies of the home university where the professional registers. Each university will impose its regular standards for admission for transportation professionals seeking to enroll in one of our courses.