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

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CONTENTS

PART 1 – TECHNICAL APPLICATION .......................................................................................................1

1.0 Executive Summary .....................................................................................................................1

1.1 Technical and Management Approach ........................................................................................3

1.1.1 The Problem ..........................................................................................................................3

1.1.2 A New Education Paradigm ..................................................................................................4

1.1.3 The Region X Transportation Consortium ............................................................................5

1.1.4 Proposed Work .......................................................................................................................7

1.1.5 Qualifications of Team to Do the Proposed Work ...............................................................18

1.1.6 Expected Challenges and How We Will Meet Them .........................................................21

1.1.7 Transferring the Model .......................................................................................................22

1.2 Staffing Application ...................................................................................................................24

1.2.1 Organization Chart ...............................................................................................................24

1.2.2 Resumes ...............................................................................................................................26

APPENDIX A: STATE DOT LETTERS OF SUPPORT .................................................................30

APPENDIX B: REFERENCES .............................................................................................................36
PART 1 – TECHNICAL APPLICATION

1.0 Executive Summary

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.\(^1\)

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.

For this project, we are requesting a total of $1,199,700 for four years. The FHWA requires matching funds only during the fourth year of the project, and we are therefore only permitted to show this amount in the proposal. However, each of the UTCs in the Region X Transportation Consortium is committed to leveraging FHWA funding by using faculty time and by establishing supporting projects with UTC funds to meet the level of effort described in the proposed work tasks.

The information in this proposal is organized as follows:

- Section 1.1.1 describes the problem that we intend to address.
- Section 1.1.2 asserts that a new educational paradigm must be central to any curricula developed.
- Section 1.1.3 describes our new Region X Consortium and its qualifications to deliver these curricula.
- Section 1.1.4 outlines the specific work scope, deliverables and schedule.
- Section 1.1.5 defines the unique qualifications of our team to undertake this work.
- Section 1.1.6 identifies the challenges of this project and how we intend to manage them.
Section 1.1.7 depicts the method of transfer of the results and lessons learned to other parts of the country.

Section 1.1.8 summarizes how we have met the evaluation criteria specified in the FHWA’s RFA.

1.1 Technical and Management Approach

1.1.1 The Problem

A compelling need exists in the transportation industry for the development and retention of a “skilled, technically competent workforce.” The transportation industry in the U.S. is growing. According to the Bureau of Labor Statistics, transportation sector employment is expected to have increased 16 percent between 1998 and 2008. Yet, a significant number of professionals are reaching retirement age; approximately 42 percent of state and local government employees are between the ages of 45 and 64. And, while the industry relies upon an educational “pipeline” of students to fill these positions, enrollment in relevant degree programs is down and agencies must recruit from other professions.

The financial reality in state and local agencies is that while program budgets continue to grow, many state legislatures seek to reduce the size of agencies, including state departments of transportation. Downsizing in these departments has resulted in increased outsourcing to consulting firms as well as a loss of agency knowledge base and skills. The Idaho Transportation Department, for example, contracts out 70 percent of its design work. This use of contractors has created a “distance separated” work environment, which demands a new set of collaborative, communication and technology skills of the professionals involved. Professionals in these agencies also face radical technological and market changes that require competency in a different arena of skill sets. Not only must they possess the technical competencies of their field, but also a “host of capabilities” including information technology, financial and human resources management, policy-making and knowledge of the socio-political complexities of their region. The multidisciplinary demands facing the 21st century transportation professional have been addressed in the research literature since the late 1990s, and the list of requisite professional qualities is extensive. Therefore, to promote competency and retention, training for all levels of the transportation workforce must be a key priority.

We suggest that the solution to the problem facing the transportation industry is two-fold. Transportation agencies must partner with educational institutions to create programs that attract students to the profession and adequately train them. And, educational institutions must do their part to address training and retention issues by helping professionals experience competency and hone the technical skills needed to address modern transportation problems, which are inseparable from their complex technological, socio-political and financial contexts.
1.1.2 A New Education Paradigm

In order to respond to the transportation training needs addressed above, we propose to develop, deploy and assess a new learning environment and curricula that will serve to attract more students to the field of transportation, help train and retain practicing professionals, and develop the technical skills of both groups in an innovative, yet cost-effective way.

On the educational front, experts have long noted a need for change in the way that engineering is taught. Technological advances and rapid access to information led Zimpher to assert that “helping learners to know how to access information, evaluate it critically, and use it to solve problems” will be the role of education in the information age. Additionally, understanding how people learn has become the focus of many studies. The National Research Council concludes that “when students learn [subject matter] in only a limited context, they often miss seeing the applicability of that information to solving novel problems. . . . Faculty can help students apply subject matter to other contexts by engaging them in learning experiences that draw directly upon real-world applications. . . Problem-based learning . . create(s) opportunities for students to engage in practices similar to those of experts.”

Active, problem-based learning, which poses generative open-ended questions in an environment where students actively participate in their own learning processes, is being used in engineering classrooms in the proposing institutions and across the nation, and results are encouraging.

At the University of Idaho’s annual Traffic Signal Summer Workshop, students develop essential traffic engineering competencies in a hands-on learning environment. Seven years of student feedback from these workshops has been overwhelmingly positive, indicating both improved technical knowledge and a heightened interest in transportation engineering as a career. Learning assessments show that these learner-centered teaching methods yield superior outcomes in “short-term mastery, long-term retention, depth of understanding of course material, acquisition of critical thinking or creative problem-solving skills, formation of positive attitudes toward the subject being taught, (and) level of confidence in knowledge or skills.”

Agrawal and Dill surveyed over 1800 civil engineering undergraduates examining the factors that led students to choose transportation as their specialty. Their results show that what students learned in the transportation courses and the quality of the faculty are the two most important educational factors in determining their choice. In addition, the researchers conclude that the opportunity for internships, which give students the chance to interact directly with professionals in the field, is another leading factor in choosing transportation. The studies above point to direct
solutions that educational institutions, in partnership with State DOTs and industry, can undertake to attract students to the field of transportation engineering.

Similarly, training experiences for practicing professionals can and should be enhanced. A National Cooperative Highway Research Program study of training needs in state DOTs concludes that “much of the training delivery within state DOTs is still based on a traditional classroom approach….However, future training delivery will require new techniques . . . .”\(^\text{15}\) In addition, the findings of the Transportation Research Board support the examination of distance learning as a cost effective solution to workforce training needs, and encourage partnering with universities to provide employees with core competency skills.\(^\text{16}\) Research also shows that to enhance retention, employers must provide employees with “opportunities for learning, growth and challenge.”\(^\text{17}\) The activities proposed here will provide educational access to practicing professionals in a cost-effective way and hone the critical thinking skills needed in the rapidly changing work environment. We, in the Region X Transportation Consortium, have the professional training, educational expertise, and access to a target audience necessary to develop, deploy, and assess a new educational paradigm to reach both students and professionals and address these pressing needs.

1.1.3 The Region X Transportation Consortium

**Twenty Years of Working Together**

There is a rich history of collaboration between the universities and state departments of transportation in the Pacific Northwest. In 1988, the University of Washington led the formation of the Transportation Northwest Regional Center (TransNow), the regional UTC representing the states of Washington, Oregon, Alaska, and Idaho. In addition to the University of Washington, TransNow has included, at various times, Portland State University, Oregon State University, the University of Idaho, Washington State University, and the University of Alaska. Since 1988, TransNow funded nearly $20 million in research, education, and technology transfer projects.

Education has been a priority for TransNow since its inception. Four examples are presented here. In 1999, TransNow hosted transportation professionals, educators, and students for a two-day conference on how to educate the 21\(^\text{st}\) century transportation professional, setting the stage for a series of discussions and meetings focused on effective education and training in the Pacific Northwest. The following year, a team of educators from Oregon State University, Portland State University, and the University of Idaho produced the Transportation Engineering Online Laboratory Manual using funding provided by TransNow.\(^\text{18}\) These materials are available on NIATT’s website and
UI NIATT: Development, Deployment, and Assessment of a New Educational Paradigm for Transportation Professionals and University Students

are regularly used in undergraduate transportation engineering courses around the U.S. In 2002, a traffic operations education and training retreat held in Portland produced an agenda for immediate and long term improvements in transportation education.\(^{19}\) And, as recently as fall 2006, faculty and students at Portland State University and the University of Idaho participated in a series of ten seminars using a variety of distance-based delivery methods.

A New Regional Landscape and New Opportunities

In the summer of 2005, the passage of the surface transportation reauthorization legislation, SAFETEA-LU, created a new research and education landscape in the Pacific Northwest. Two new national UTCs were established, one each in Oregon and Alaska, while continued funding was provided to the region’s existing UTCs—TransNow and NIATT. In 2006, both TransNow and NIATT were successful in national competitions that awarded the two UTCs continued funding through 2010. Each of the four states now has its own UTC, each with a significant funding level through the life of the SAFETEA-LU authorization period.

In fall 2005, with a desire to further improve collaboration amongst the four UTCs and four state DOTs in the region, TransNow sponsored a workshop to identify ways in which the eight organizations could more effectively work together. Task forces were established for research, education, video conferencing, and training, and participants envisioned an umbrella organization that would serve the disparate needs of the participating groups. The seven universities participating in the workshop signed a letter of intent to continue to cooperate in research, education, and technology transfer.

The Consortium

A direct result of the fall 2005 meeting was the decision by the four state DOTs and the four UTCs to form the Region X Transportation Consortium. A memorandum of understanding (MOU) establishing the consortium has been prepared and will be signed by the eight members in September 2007. The memorandum outlines five intentions of the consortium: to meet twice yearly to conduct the business of the consortium; to regularly exchange information on research and educational needs, interests, and programs; to promote interest in transportation related fields within the region; to leverage research funding through pooled fund projects and other opportunities; and to develop shared educational and training programs.

The consortium also established a transportation pooled fund program with the objective of developing regional solutions to common transportation problems. The program will harness the financial, professional, and academic resources of the region and use them to conduct research and develop improved methods of dealing with
common problems in the planning, design, construction, maintenance, management and operation of transportation systems in the participating states. Each of the eight members has agreed to commit at least $25,000 annually to fund one to two regional research projects each year.

Since 2005, the group has met every six months to work on one specific issue related to regional collaboration. The most recent meeting, held at the University of Idaho in May 2007, focused on distance education. The work proposed here is a direct result of the discussions that took place at that meeting.

The Region X Transportation Consortium has received significant and positive attention from the U.S. Department of Transportation as a model for regions to collaborate on transportation research and education. FHWA research engineer James Colyar recently acknowledged a new collaboration of the Region X UTCs that jointly supports FHWA’s next generation simulation program (NGSIM). Another senior DOT administrator recently commended the consortium for helping the States and the UTCs in several ways “by providing a good opportunity to leverage research, reducing the chance of duplication, facilitating the UTCs working together, and in providing another mechanism for UTCs to find the matching funds they need.”

Perhaps the greatest value of the consortium is the desire and commitment of its members to bring together both state DOT and university resources in a regular forum to address transportation issues and challenges in the region and the nation. This collaboration serves to harness the diverse expertise of the four UTC’s faculty members, whose specialties vary from the metropolitan to the rural, from transit to freight. The four institutions are demographically diverse, increasing the relevance of the proposed project to a larger national audience. Finally, the Consortium can serve as a model for collaboration in other locations.

1.1.4 Proposed Work

**Basis for Proposed Work**

We recognize the critical transportation workforce problems: recruitment, training and retention. We understand the need for new learning models that are learner-centered and use an active, problems-based approach. We have established a consortium that is proactive and passionate about working together and that offers an effective process to manage this project. We understand that a distance-separated work environment is growing in importance and that a distance learning environment will hone communication and collaboration skills necessary in this work environment. We understand that diverse, multi-disciplinary work groups must collaborate to solve today’s transportation problems, and curricula will be developed with this in mind. We propose that mixing university
students and practitioners, with their unique characteristics and needs will benefit the learning experience of both groups. We understand that traditional two- to three-day short courses do not provide the learning time needed to understand complex topics and processes, and therefore propose to offer ten-week course modules to address crucial transportation topics.

**Goals and Objectives**

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.

**What We Will Do**

We will develop a set of four course modules, each addressing a critical topic in transportation engineering and planning in the Pacific Northwest. Each module will consist of a generative field-based problem, student learning materials, instructor support materials, and a well-defined learning environment/process. Each module will be
delivered over a ten-week period through a distance-separated learning/work environment to both university students and practicing professionals. Each module will be designed as active and problem-based, using the lessons learned from the pedagogical research cited earlier in this proposal. Each module and its delivery method will be evaluated to determine the quality of the learning environment for each participant, and revised accordingly. The generative problems to be addressed in the course modules, which will set the context for participants to focus on specific transportation engineering and planning solutions, will be drawn from the following list:

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 climatic conditions, including the diverse environment of the Pacific Northwest.

These generative questions address real-world transportation issues in their complex contexts. Students will have to use critical thinking, call upon collaborative skills and use a variety of multidisciplinary tools and solutions to balance the trade-offs inherent in each scenario. The problems chosen for pilot testing in this project are just examples of the broad problems that can be addressed in a future full deployment of this training program.
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 sub-problem 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.

Project Work Scope

The six objectives identified on page 8 will be met by completing the 16 tasks described here. Each task describes the work that will be done, who is responsible, the schedule, and the key results of the task. The period of performance for this project is 46 months. The assumed start date for this project is January 2008.
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.

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.

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.

The following chart graphically summarizes the time schedule for tasks.
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.

Management Plan

Michael Kyte and the other members of the Management Team will have overall responsibility of the management and oversight of the project. The Management Team will meet monthly to review all aspects of the progress of the project. A project website will be developed that will include notes from all team meetings, the current versions of all course materials, and current versions of all project reports. Video conferencing will be used for all management meetings.

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
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. Please see Table 1 for indicators and measures.

<table>
<thead>
<tr>
<th>Indicators of Success</th>
<th>Specific Tools for Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed modules are effective in terms of student learning</td>
<td>Homework and exams to assess technical knowledge and concepts, Observations of workshops, Surveying participants at conclusion of workshop</td>
</tr>
<tr>
<td>Developed modules are effective in terms of student satisfaction</td>
<td>Observations of workshops, Interviews with participants before and after workshops, Surveying participants at conclusion of workshop</td>
</tr>
<tr>
<td>Learning environments are effective in terms of student learning</td>
<td>Homework and exams to assess technical knowledge and concepts, Observations of workshops, Surveying participants at conclusion of workshop</td>
</tr>
<tr>
<td>Learning environments are effective in terms of student satisfaction</td>
<td>Observations of workshops, Interviews with participants before and after workshops, Surveying participants at conclusion of workshop</td>
</tr>
<tr>
<td>Learning environments are effective for module implementation</td>
<td>Homework and exams to assess technical knowledge and concepts, Observations of workshops, Surveying participants at conclusion of workshop</td>
</tr>
<tr>
<td>Workshop participants utilize knowledge gained from workshops in practice</td>
<td>Interviews with participants before and after workshops</td>
</tr>
<tr>
<td>Materials and implementation methods are transferred to other agencies</td>
<td>Tracking implementation of materials by other agencies</td>
</tr>
<tr>
<td>Lessons learned are shared with broader community in journals and conference proceedings</td>
<td>Tracking the number of publications associated with this project</td>
</tr>
</tbody>
</table>

1.1.5 Qualifications of Team to Do the Proposed Work

The project team organizational chart is found on page 25. The qualifications of the various team members are summarized below. Resumes for the project team members are given in section 1.2.2 (page 26) of this proposal.

**Team Members**

The Management Team consists of Dr. Michael Kyte, director of UI NIATT, and the project principal investigator; Dr. Nancy Nihan; Dr. Robert Bertini; and Mr. Billy Connor. Dr. Kyte has more than 35 years of experience in
transportation practice, research, and education, and has extensive experience managing large and complex projects. He is the co-author of a laboratory manual for a transportation engineering textbook published by Prentice-Hall, and was the PI or co-investigator for three major transportation education projects including an on-line laboratory manual,\textsuperscript{22} the NCHRP-funded \textit{Highway Capacity Manual Applications Guide}\textsuperscript{23} and the FHWA-funded Mobile Signal Timing Training project. He is the founder and PI of NIATT’s Traffic Signal Summer Workshop.

Dr. Robert Bertini is an Associate Professor of Civil and Environmental Engineering and of Urban Studies and Planning at Portland State University (PSU) and director of OTREC at PSU. Dr. Bertini has been with PSU since 2000, following many years of experience in planning, design, and construction of highway, rail and airport facilities. At PSU, Bertini has developed a research program, laboratory, and graduate curriculum in Intelligent Transportation Systems (ITS), attracting more than $3.2 million in external funding. Bertini is the recipient of the National Science Foundation CAREER Award, which is supporting the development of PORTAL, an online transportation data archive. Bertini works in partnership with local, regional, state, federal, and international transportation organizations on research that integrates new technologies aimed at making our transportation system more efficient, effective, and equitable.

Dr. Nancy Nihan is Professor of Civil Engineering and Director of TransNow at the University of Washington (UW). She has more than 40 years of experience in transportation practice, research and education. She was a faculty member at the University of Illinois, Chicago Circle Campus for five years and has been on the faculty of UW for 33 years. She has served as head of the Transportation and Construction Division of the Department of Civil and Environmental Engineering at UW and has served on several professional committees involved in traffic engineering including the TRB Committee on Freeway Operations, the ITS America Advanced Traffic Management Systems Committee and the ITS Council of the International Institute of Transportation Engineers. She has served as president of the Research and Education Division of the American Road & Transportation Builders, treasurer of the Council of UTCs, and chair of the Student Chapter Committee of ITE. She has served on the editorial boards of the \textit{International Journal of Transportation, Privatization and Public Policy}, \textit{The Journal of Advanced Transportation}, and \textit{Transportation Research}, Dr. Nihan has published more than 55 refereed journal articles and served as principal investigator on over $26 million and co-principal investigator on $0.5 million in externally funded research and education projects.
Mr. Billy Connor is director of the Alaska University Transportation Center. He previously served for more than 30 years with the Alaska Department of Transportation and Public Facilities. He spent twenty years in the AKDOT&PF’s research branch as a research engineer, ten of these as the Chief of Research for the department. His work covered a wide range of transportation activities including developing Alaska’s pavement design procedures, pavement management, maintenance and forensic engineering, permafrost, frost heave and thaw weakening research, hydraulic research including fish passage, rip rap design and development of Alaska’s Hydraulic Manual, and numerous other transportation related activities. Mr. Connor has also worked as a Construction Project Manager for AKDOT&PF, managing over $30 million in construction projects per year.

The Module Development Team includes Dr. Michael Dixon and Dr. Ahmed Abdel-Rahim of the University of Idaho, Dr. Chris Monsere and Dr. Miguel Figliozzi of Portland State University, Dr. Mark Hallenbeck and Dr. Yinhai Wang of the University of Washington, and Dr. Leroy Hulsey and Dr. Ming Lee of the University of Alaska. Each team member has significant experience in developing and delivering educational materials and working with active or problem-based learning environments.

The Learning Team includes Dr. Steven Beyerlein and Dr. Barry Willis of the University of Idaho. Dr. Beyerlein has been principal investigator for several educational research and assessment projects funded by the National Science Foundation. Most recently, he co-authored a widely used guidebook for improving faculty performance.24 Dr. Willis is the director of the University of Idaho’s Engineering Outreach program and is a nationally-recognized expert in distance education. He is the author of a textbook on distance-based learning.25

The Assessment Team includes Dr. James Gregson of the University of Idaho and Dr. Shane Brown of Washington State University. Dr. Gregson is a professor of the University of Idaho’s Department of Adult, Career and Technology Education. Dr. Gregson’s expertise includes adult technical, teacher and workforce training. Dr. Brown is a Clinical Assistant Professor in Washington State University’s Department of Civil and Environmental Engineering. Dr. Brown received the Pacific Northwest Section Outstanding Teaching Award for 2007 from the American Society for Engineering Education.

Qualifications of Lead Organization to Manage Program

The University of Idaho’s National Institute for Advanced Transportation Technology (NIATT) will be the lead organization for this project. NIATT is one of seven interdisciplinary research institutes at the University of Idaho. NIATT currently manages 28 separate research contracts with a total dollar value of $3.5 million. NIATT staff
UI NIATT: Development, Deployment, and Assessment of a New Educational Paradigm for Transportation Professionals and University Students

provides extensive management, budget, and financial support for these projects. NIATT has been a member of the U.S. DOTs University Transportation Centers program since 1998, and as a part of that program has managed individual research contracts with a total value of over $7 million. NIATT’s new Strategic Plan, a requirement of the UTC program, was approved in July 2007 by the U.S. DOT staff.

1.1.6 Expected Challenges and How We Will Meet Them

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.

**1.1.7 Transferring the Model**

One of FHWA’s objectives is to create successful models that can be transferred to other situations. We have been mindful of this objective in the development of this proposal. We specifically address this objective in task 14 described earlier in this proposal. This transfer process is not easy and must be methodically planned if it is to be successful. We will work with a variety of organizations to seek their participation in our workshop, including the FHWA, the Transportation Research Board’s Education and Training Committee, the Institute of Transportation Engineer’s Education Council, and other interested organizations.
1.1.8 Meeting the Evaluation Criteria

Following is a discussion of how this project meets each of the proposal evaluation criteria.

**Target Population**

This project will address training needs for two clearly identified target groups: students enrolled in one of the Region X Transportation Consortium universities and employees of state departments of transportation (and the consultants that do work for them) in the four states making up the consortium. These participants will have a direct interest or responsibility in transportation careers. We will conduct a survey of the Idaho Transportation Department in fall 2007 to update our understanding of the training needs of the department. We will also rely on surveys that have been conducted in the past several years by each state DOT and by Portland State University.

Since our course modules are problem-based and linked to real world problems, we believe that the curricula developed for this project will provide for practical experiences for both university students and transportation professionals. Benefits to both groups are listed on page 1. The multidisciplinary nature of our generative problems will ensure that the issues considered in our course modules will provide experiences in both engineering and non-engineering disciplines. We have received letters of support (see Appendix A) from each of the four state DOTs.

**Nature and Infrastructure of the Partnership**

We have established an active and strong consortium that will ensure that the project is both carried out in an effective way (with the university partners) and delivered to our intended audiences (university students and state DOT personnel). The role of the partners is illustrated on page 25. The MOU that defines the Region X Transportation Consortium clearly sets out what we intend to do and the means to accomplish these intentions.

**Quality of the Work Plan**

We have clearly established goals and objectives that will guide our work (p. 8), and defined the work tasks and activities that will help us accomplish these goals and objectives. We have delineated tasks, set a clear timeline, defined the level of effort required (p. 25), and identified the responsible party for each task (pp. 11-16).

**Quality of the Personnel**

We have assembled a high quality team with significant technical experience, as well as experience in project management, innovative educational program development and delivery, and in the evaluation and assessment of education programs. The qualifications of the personnel, and the roles they will fill are discussed on pages 18-20.
Sustainability of the Proposed Project

For this project, we are requesting a total of $1,199,700 for four years. The FHWA requires matching funds only during the fourth year of the project, and we are therefore only permitted by university policy and federal regulations to show this amount in the proposal. However, each of the UTCs in the Region X Transportation Consortium is committed to leveraging FHWA funding by using faculty time and by establishing supporting projects with UTC funds to meet the level of effort in the proposed work tasks.

Evaluation Plan

The evaluation plan proposed here (pp. 17-18) includes assessment and evaluation components. The methods proposed are measurable and clearly tied to the goals and objectives established for this work. The experience of the Assessment Team will ensure that state-of-the-art methods will be used for the assessment and evaluation work.

Cost

Our budget demonstrates both cost reasonableness and conformance to application principles. The budget that we have submitted is based directly on the level of effort that we are proposing and falls within the funding constraints ($300,000 per year and a total of $1.2 million) set by the RFA. Budget information is found in Part 2 of the application.

Past Performance

The University of Idaho and each of the other participating institutions have significant experience in delivering high quality products to their customers. The letters from the four Region X state departments of transportation (found in Appendix A) provide support for this assertion. In addition, the annual reports from each of the four university transportation centers provide additional details on their past performance. For example, NIATT’s annual report (found at http://www.niatt.org) provides a number of examples of the satisfaction of its customers. Past performance of the consortium is also discussed on pages 5-7.

1.2 Staffing Application

1.2.1 Organization Chart

The chart below show the organization of the project team and the reporting links for its members. The table below shows each of the proposed staff members, the title and description of each position’s responsibilities (as referenced by the task number in the section 1.1.4) and the proposed level of effort over the duration of this project.
Proposed staff | Title | Responsibility (Task number) | Level of Effort (Hours) | Year 1 | Year 2 | Year 3 | Year 4
---|---|---|---|---|---|---|---
Dr. Michael Kyte (UI) | Principal investigator | P: 1, 15, 16 S: 3 | 400 | 80 | 480 | 320
Dr. Robert Bertini (PSU) | Management Team | P: 1, 16 S: 15 | 296 | 160 | 160 | 160
Mr. Billy Connor (UA) | Management Team | P: 1, 16 S: 15 | 40 | 80 | 80 | 40
Dr. Steven Beyerlein (UI) | Learning Team | P: 2, 14 S: 15 | 104 | 206 | 206 | 200
Dr. Barry Willis (UI) | Learning Team | P: 2, 14 S: - | 104 | 205 | 205 | 200
Dr. James Gregson (UI) | Assessment Team | P: 1, 16 S: - | 104 | 206 | 206 | 200
Dr. Shane Brown (WSU) | Assessment Team | P: 1, 16 S: | 80 | 80 | 160 | 160
Dr. Michael Dixon (UI) | Module Development Team | P: 3, 5, 7 S: 13, 15 | 520 | 240 | 320 | 288
Dr. Ahmed Abdel-Rahim (UI) | Module Development Team | P: 3, 5, 7 S: 13, 15 | 520 | 240 | 320 | 288
Dr. Chris Monsere (PSU) | Module Development Team | P: 3, 5, 7 S: 13, 15 | 592 | 240 | 160 | 160
Dr. Miguel Figliozzi (PSU) | Module Development Team | P: 3, 5, 7 S: 13, 15 | 424 | 192 | 160 | 160
Dr. Leroy Hulsey (UA) | Module Development Team | P: 8, 10, 12 S: 13, 15 | 270 | 300 | 230 | 0
Dr. Ming Lee (UA) | Module Development Team | P: 8, 10, 12 S: 13, 15 | 270 | 300 | 230 | 0

Note: “P” indicates primary responsibility for the task; “S” indicates secondary responsibility or general involvement in the task.
### 1.2.2 Resumes

The resumes of the members of the Management Team are given in this section.

<table>
<thead>
<tr>
<th>Name</th>
<th>Dr. Michael Kyte, PE</th>
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<tbody>
<tr>
<td></td>
<td>Director, National Institute for Advanced Transportation Technology</td>
</tr>
<tr>
<td></td>
<td>Professor, Civil Engineering University of Idaho</td>
</tr>
</tbody>
</table>

### Proposed role in project

- Principal investigator
- Member, Management Team

### Education

- B.S., Systems Engineering, UCLA, 1970
- M.S., Civil Engineering, University of California, Berkeley, 1972
- Ph.D., Civil Engineering, University of Iowa, 1986

### Current position

- University of Idaho faculty since 1986.
- Director of National Institute for Advanced Transportation Technology since 1994.

### Previous employment


### Research and education experience

- Research interests include traffic operations and planning, traffic signal systems, highway capacity, and transportation education.
- Authored more than forty peer reviewed journal articles in transportation education, highway capacity, and traffic signal systems.
- Developed the transportation engineering curriculum at the University of Idaho that has been in place since 1990.

### Other relevant information

- Current or former member of several Transportation Research Board committees including Highway Capacity and Quality of Service, Traffic Flow Theory, and Education and Training.
- Member of the Institute of Transportation Engineer’s Education Council.
- Registered professional engineer in the State of Idaho.
- Received the Crawford Graduate Faculty Mentoring Award in 2007, the Outstanding Faculty Award for the University of Idaho’s College of Engineering in 1992, and Honorable Mention for the Award for Excellence in Public Administration, American Society for Public Administration, Oregon Chapter, 1982.
| Name | Dr. Robert L. Bertini  
|---|---|---|---|
| Director, Oregon Transportation Research and Education Consortium  
| Associate Professor, Civil and Environmental Engineering Portland State University | Proposed role in project | Member, Management Team |  
| Education | B.S., Civil Engineering, California Polytechnic State University, San Luis Obispo, 1988  
| M.S., Civil Engineering, San Jose State University, 1991  
| Ph.D., Civil Engineering, University of California at Berkeley, 1999 | Current position | Portland State University faculty member since 2000.  
| Director of the university transportation center since 2002.  
| Affiliate faculty, School of Urban Studies and Planning. | Previous employment | He was previously employed as a senior research scientist by DaimlerChrysler Research and Technology North America, Inc., Palo Alto, California, 1999–2000. |  
| Research and education experience | Taught twelve different courses in transportation engineering and planning at Portland State University and San Jose State University.  
<p>| Actively integrates technology into coursework at both graduate and undergraduate level, including course websites, presentations, syllabi, problem sets, exams and large transportation data sets for laboratory exercises. Students are actively involved with intelligent transportation systems technology and use classroom presentation technology for individual and group projects. Developed new curriculum in Intelligent Transportation Systems, including courses, laboratory, and real-time data connection with Oregon Department of Transportation, City of Portland and TriMet. |<br />
| Served on graduate committees for more than 20 students and supervised more than 80 students in their research projects. | Substantial record of continuing education. | Developed program for the Graduate Certificate in Transportation, approved by Portland State University in 2005. |<br />
| Other relevant information | Serves as the advisor for the student chapters of Engineers Without Borders, Tau Beta Pi, the American Society of Civil Engineers, and Institute of Transportation Engineers (ITE). |<br />
| Received the Distinguished Faculty Achievement Award in 2007; the Outstanding Transportation Educator, Institute of Transportation Engineers, District 6, 2006; the Excellence in Community-Based Research Civic Engagement Award in 2006, the Women’s Transportation Seminar in 2006; and the Diversity Achievement Award Teaching Excellence Award, 2004-2005 among others. | For a complete vitae, including publications and research, please visit: <a href="http://web.pdx.edu/~bertini/psu_cv.pdf">http://web.pdx.edu/~bertini/psu_cv.pdf</a> |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Dr. Nancy Nihan</th>
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<tbody>
<tr>
<td></td>
<td>Director, Transportation Northwest</td>
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<tr>
<td></td>
<td>Professor, Civil Engineering</td>
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<td></td>
<td>University of Washington</td>
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</table>

**Proposed role in project**  
Member, Management Team

**Education**
- B.S.I.E., Northwestern University, 1964
- M.S.E., Civil Engineering, Northwestern University, 1967
- Ph.D., Civil Engineering, Northwestern University, 1970

**Current position**  
University of Washington faculty since 1974.  
Director, TransNow since 1988.  
Director, Northern Plains–Pacific Northwest, Freight Mobility Center.

**Previous employment**
- Head, Transportation and Construction Division, Department of Civil & Environmental Engineering, University of Washington.
- Visiting scholar, Transport Studies Group, University College London.
- Assistant professor, Systems Engineering Department, University of Illinois Chicago Circle.
- Consultant to the Alaska Highway Data Program, the Illinois Institute for Social Policy, and the Transportation Center, Northwestern University.

**Research and education experience**
Served on professional committees in traffic engineering:  
- TRB Committee on Freeway Operations.  
- ITS America Advanced Traffic Management Systems Committee.  
- ITS Council of the International Institute of Transportation Engineers.  
- President of the Research and Education Division of the American Road & Transportation Builders.  
- Treasurer of the Council of UTCs.  
- Chair of the Student Chapter Committee of ITE.  

Published more than 55 refereed journal articles

Served as principal investigator on over $26 million and co-principal investigator on $0.5 million in externally funded research and education projects.

**Other relevant information**
- ITE Wayne T. Van Wagoner Award for paper with Karl Westby “Predicting the 24-Hour Delay at Signalized Intersections”, 1997.
| Name | Mr. Billy Conner, PE  
Director, Alaska University Transportation Center  
University of Alaska |
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</thead>
<tbody>
<tr>
<td>Proposed role in project</td>
<td>Member, Management Team</td>
</tr>
</tbody>
</table>
| Education | B.S., Civil Engineering, University of Alaska, 1975  
M.S, Engineering Science Management, University of Alaska, 1981 |
| Current position | Director of the Alaska University Transportation Center |
| Previous employment | Thirty years of service with Alaska Department of Transportation and Public Facilities, including 20 years as a research engineer, and ten as the department’s Chief of Research.  
Construction Project Manager for AKDOT&PF, managing projects with value of over $30 million per year. |
| Research and education experience | Published over 30 journal articles or reports on transportation engineering.  
Chief of Research, Alaska Department of Transportation and Public Facilities. Work covered a wide range of transportation activities, including developing Alaska’s pavement design procedures, pavement management, maintenance and forensic engineering, permafrost impacts, frost heave and thaw weakening research, as well as hydraulic research, including fish passage, rip rap design and development of Alaska’s Hydraulic Manual, and numerous other transportation related activities. |
| Other relevant information | Member ASCE  
Past-President of the Fairbanks Chapter of ASCE  
Chair ASCE TCCRE Committee on Frost Action  
TRB Committees AFP50, AFP60  
Member of TransNow Advisory Board  
Alaska Society of Professional Engineers, Fairbanks Chapter  
Engineer of the Year 2003  
Emeritus Member Transportation Research Board 2003  
ASCE Cold Regions Journal Paper of the Year 1988  
TRB K.B. Woods Award 1982  
Chaired two TRB committees and been active in numerous other TRB committees and activities. He has also served on the AASHTO Research Advisory Committee, ASCE Technical Council of Cold Regions Engineering (currently chairing the Frost Action Committee), and numerous other state and national activities. Mr. Connor has also worked as a Construction Project Manager for AKDOT&PF, managing over $30 million per year. |
APPENDIX A: LETTERS OF SUPPORT
August 27, 2007

Dr. Michael Kyte, Director
National Institute for Advanced Transportation Technology
University of Idaho
115 Engineering Physics Building
Moscow, ID 83844-0901

Dear Dr. Kyte,

As Director of Transportation Northwest (TransNow), I submit this letter of intent to collaborate with the following research project:

Title: Development, Deployment and Assessment of a New Paradigm for Transportation Professionals and University Students
Principal Investigator: Dr. Michael Kyte
Sponsor: U.S. Department of Transportation – Federal Highway Administration
Award Number and Type: RFA Number DTFH61-07-RA-00118, Transportation Education Development Pilot Program
Award Period: January 1, 2008 – December 31, 2011

TransNow is willing to provide a portion of UTC match and establish a subcontract agreement, subject to UW authorization, for this project in the event the proposal is approved.

Sincerely,

Nancy L. Nihan
Professor, Department of Civil & Environmental Engineering and Director, Transportation Northwest
University of Washington
August 27, 2007

Michael Kyte
Director, National Institute for Advanced Transportation Technology
Professor, Civil Engineering
University of Idaho
PO Box 440901
Moscow, ID 83844-0901

Dear Mr. Kyte:

I am writing to express the support of the Washington State Department of Transportation (WSDOT) for the Development, Deployment, and Assessment of a New Educational Paradigm for Transportation Professionals and University Students: A Collaboration of the Region X Transportation Consortium that has been proposed by the University of Idaho on behalf of the Region X Transportation Consortium.

WSDOT has benefited from the education of future transportation professionals in our region. Despite this, there is a tremendous need for more students to be interested in transportation studies and for education to be more broadly accessible to potential students. This proposal addresses both needs. It excites students by exposing them to current challenges in transportation management and improves access to a wider audience of students that might choose to learn about and work in the transportation field.

Sincerely,

Lori Oman
Director, Office of Research and Library Services

LO:jt
August 24, 2007

Michael Kyte  
Director, National Institute for Advanced Transportation Technology  
Professor, Civil Engineering  
University of Idaho  
PO Box 440901  
Moscow, ID 83844-0901

Dear Dr. Kyte:

I believe your proposal, *Development, Deployment, and Assessment of a New Paradigm (Based on Active, Problem-Based Learning) for Transportation Professionals and University Students: A Collaboration of the Region X Transportation Consortium* will help address critical workforce development needs facing The Alaska Department of Transportation & Public Facilities and transportation agencies nationwide. I hereby express support for this proposal on behalf of the Department.

Today’s and tomorrow’s transportation professionals face greater demands for practical problem solving skills in multidisciplinary topics. The traditional academic curriculum certainly has room for improvement in preparing students for these new challenges. Today’s busy practitioners also need increased access to timely and accessible continuing education opportunities. Your proposal also addresses this need while without sacrificing emphasis on teamwork which is so necessary for modern transportation professionals.

Please keep me informed about the progress of your efforts, and let us know if there are other ways that we can assist your efforts.

Sincerely,

Clint Adler, P.E.  
Chief, Research & Technology Transfer

"Providing for the movement of people and goods and the delivery of State services."
August 20, 2007

Michael Kyte, Ph.D.
Director, National Institute for Advanced Transportation Technology
University of Idaho
115 Engineering Physics Building
Moscow, ID 83844-0901

Dear Dr. Kyte:

I am writing to lend the Idaho Transportation Department’s (ITD) strong support to the grant proposal you developed on behalf of the Region X Transportation Consortium. The proposal, titled “Development, Deployment, and Assessment of a New Educational Paradigm for Transportation Professionals and University Students,” is a worthy candidate for funding through the Transportation Education Development Pilot Program.

The course modules outlined in the proposal address important issues facing the department, and would readily expand the training opportunities available to our employees. Further, we believe the active, problem-based training approach described in the application holds great promise as a tool to educate transportation professionals.

Your proposal reflects the discussions of consortium members and responds to critical workforce development needs identified by the state transportation departments and university transportation centers in the Pacific Northwest. Since 2005, we at ITD have been active members of the consortium, and we are committed to continuing to work cooperatively with our partners to promote research, development, and technology transfer in our states.

Finally, we are confident in the National Institute for Advanced Transportation Technology’s (NIATT) ability to lead this project. Our past collaborations with NIATT have demonstrated the institute’s capabilities in successfully managing and completing projects of importance to the region.

We strongly endorse this proposal and believe the project would greatly benefit the Idaho Transportation Department.

Sincerely,

[Signature]

Matthew E. Moore, M.A.
Administrator, Division of Planning and Programming
August 21, 2007

Michael Kyte
Director, National Institute for Advanced Transportation Technology
Professor, Civil Engineering
University of Idaho
PO Box 440901
Moscow, ID 83844-0901

I am writing to voice my agency’s support for the proposal, Development, Deployment, and Assessment of a New Educational Paradigm for Transportation Professionals and University Students.

As you well know, workforce development in transportation is a critical need. We believe that the problem based approach is highly applicable and relevant to continuing education for transportation professionals, and will lead to the development of more general problem solving skills. We also anticipate that this approach will foster skills that support future collaborative work over distance, which increasingly characterizes our work situation.

In addition, a key obstacle for many transportation agencies, and ours is no exception, is physical access to training resources. In the past, distance learning has struggled to gain a foothold in our agency despite many obvious advantages. We believe that the proposed course format, by incorporating an initial short, intense period of face-to-face interaction, will help to establish interpersonal relationships that will help to sustain interest and participation during the distance learning phase.

Our past collaborations with NIATT have demonstrated the institute’s capabilities to successfully manage and complete projects of importance to the region.

Please keep us informed about the progress of your efforts, and let us know if there are other ways that we can assist your efforts.

Sincerely,

Bernie Jones
Research Manager
APPENDIX B: REFERENCES


6. Personal communication with Matthew Moore, Planning Administrator, Idaho Transportation Department, August 15, 2007.


20 Email communication, James Colyar, Highway Research Engineer, Federal Highway Administration, March 14, 2007.

21 Email communication Tom Marchessault, former acting director, University Transportation Centers Program, May 22, 2007.

22 [http://www.webs1.uidaho.edu/niatt_labmanual/](http://www.webs1.uidaho.edu/niatt_labmanual/)

