



*Improving the Quality of Life  
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**University Transportation Center for Mobility**

**DOT Grant No. DTRT06-G-0044**

# **Developing an Interdisciplinary Certificate Program in Transportation Planning**

## **Phase 2: The eCertificate**

# ***Final Report***

**Forster Ndubisi and Eric Dumbaugh**

***Performing Organization***

University Transportation Center for Mobility™  
Texas Transportation Institute  
The Texas A&M University System  
College Station, TX

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# **Developing an Interdisciplinary Certificate Program in Transportation Planning, Phase 2: The eCertificate**

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**TABLE OF CONTENTS**

**EXECUTIVE SUMMARY ..... 5**

**PROJECT SIGNIFICANCE..... 7**

**PROJECT OUTCOMES ..... 7**

    Certificate Structure..... 7

    Logistic Assessment..... 8

    Course Delivery Methods ..... 10

    Online Course Development Process..... 10

**PROJECT ACTIVITIES, TIMELINE, AND BENCHMARKS ..... 14**

**CONCLUSION..... 14**

**APPENDIX A. PROPOSAL: AN ECERTIFICATE IN TRANSPORTATION PLANNING ..... 17**

**APPENDIX B. LOGISTIC ASSESSMENT REPORT ..... 30**

**APPENDIX C. STAGES OF PROGRAM DESIGN (ECERTIFICATE PROGRAM) ..... 42**

**LIST OF FIGURES**

Figure 1: eCertificate in Transportation Planning Curriculum Structure. .... 8

**LIST OF TABLES**

Table 1: A Comparison of Methods of Education Delivery Systems. ....11  
Table 2: Project Tasks and Implementation Timeline. ....14

## EXECUTIVE SUMMARY

This proposal examines the feasibility of extending the delivery of the recently developed graduate Certificate in Transportation Planning to a wider audience through the establishment of an Executive Certificate Program by distance (eCertificate). While the need for an interdisciplinary approach to transportation is widely recognized by the professional community, there are few educational programs that address the field of transportation in a truly comprehensive, interdisciplinary manner. Texas A&M University's (TAMU's) university-wide graduate Certificate in Transportation Planning was established in August 2008 to address this need. This program has proved to be very successful. To date, a total of 115 students have taken these certificate courses, and 30 students have received certificates.

A limitation of the existing certificate program is that it is available only to graduate students at TAMU in College Station. The eCertificate program will extend the delivery of the existing certificate to a wider audience of professionals interested in transportation in selected metropolitan areas in Texas. Preliminary indications suggest that an audience for the certificate exists in major metropolitan areas in Texas, especially Austin, Dallas, Houston, and San Antonio. The eCertificate will increase access, expand Texas A&M's transportation curriculum, and enhance the university's position as a national leader in transportation education and beyond.

This proposal has five components:

- proposal development,
- university approval process,
- logistic assessment,
- online course development process, and
- certificate administration.

The existing Transportation Certificate involves a 15-credit sequence comprised of one required foundational course (three credits), three focus-area courses (nine credits), and a capstone course (three credits) providing a comprehensive overview and application of the skills and techniques learned during the completion of the certificate program. The focus-area courses are:

- multimodal systems planning,
- transportation and urban design, and
- transportation policy.

A proposal for an eCertificate was developed by the principal investigator (PI) and is currently moving through the university approval processes. It was approved by the Department of Landscape Architecture and Urban Planning and the College of Architecture in September 2011. The proposal was approved further by the Texas A&M Graduate Curriculum Committee on November 3, 2011, and has been forwarded to the University Senate. If all goes as expected, it should be approved by the university president and forwarded to the Board of Regents in the spring semester for delivery by September 1, 2012.

In the proposed eCertificate program, a comprehensive examination may be substituted for the capstone course. The proposed program differs in three minor ways from the existing certificate program. First, the prospective student does not necessarily need to be enrolled in a graduate

degree at the university to be enrolled in the certificate since it is targeted to place-bound students. As such, students can enroll directly into the program, similar to the way the Bush School enrolls students into the online certificates it offers. Second, the certificate does not need to be awarded concurrent with a graduate degree. Third, the courses will be delivered as appropriate in a condensed and flexible format to increase access, as is also done in the Bush School.

Findings from the logistic assessment indicate that a hybrid course delivery system that blends traditional face-to-face instruction with online instruction is very effective in delivering the eCertificate courses to a wider audience. Distance delivery of certificate courses is very effective when it blends synchronous (real-time) and asynchronous (interaction through virtual course material access) modes of delivery. Texas A&M Instructional Technology Services (ITS) manages a virtual learning platform supported by an extensive repertoire of e-learning tools, software, and applications that is adequate to deliver the proposed eCertificate in Transportation Planning.

The development of four online courses for the eCertificate program is currently underway, scheduled to be completed by April 30, 2012. These are PLAN 612 (Transportation in City Planning), PLAN 672 (Transportation and Environment), PLAN 673 (Sustainable Transportation), and PLAN 676 (Transportation Investment Decisions). Except for PLAN 672, these are existing courses. The development of these courses is funded through another grant from the University Transportation Center for Mobility™ (UTCM).

With the departure of the co-PI, Dr. Eric Dumbaugh, Dr. Ken Joh was appointed as the new coordinator of the Transportation Certificate. He will also coordinate the eCertificate program in the interim until enrollment in the program grows substantially. The existing administrative processes established in spring 2008 to process student admissions and guide students through the current program will be utilized as needed for the eCertificate program. The existing Certificate Council comprised of faculty from the participating units that provide advisory input into the administration of the certificate program will also provide input for the eCertificate program.

## **PROJECT SIGNIFICANCE**

The field of transportation has become increasingly complex and multifaceted. While the need for an interdisciplinary approach to transportation is widely recognized by the professional community, there are few, if any, educational programs that address the field of transportation in a truly comprehensive, interdisciplinary manner. Yet, increasingly, the transportation profession needs practitioners that can complement their traditional areas of expertise with a broader, interdisciplinary perspective of how economics, public policy, finance, and urban design influence the effectiveness of the transportation system. To address this need, a TAMU university-wide graduate Certificate in Transportation Planning was established in August 2008. This program has proved to be very successful. To date, five core certificate courses have either been restructured (three) or created (two) and delivered successfully. A total of 115 students have taken these certificate courses, and 30 students have received certificates to date.

A major limitation of the existing certificate program is that it is available only to graduate students at TAMU in College Station. Put differently, the certificate is not accessible to place-bound students, thereby limiting access. Through the many advances in technology, new degree program formats are providing the flexibility to meet the needs of today's university students who must balance family, work, and school. To address this limitation and ensure continued education of transportation professionals, this proposal explores the feasibility of extending the delivery of the existing certificate via distance to a wider audience of professionals interested in transportation in selected metropolitan areas in Texas and beyond.

Preliminary indications suggest that an audience for the certificate exists in major metropolitan areas in Texas, especially Austin, Dallas, Houston, and San Antonio. Transportation professionals, therefore, will be positioned to receive a coherent interdisciplinary program in transportation at on-site and off-site locations. If feasible, the eCertificate will increase access, expand Texas A&M's transportation curriculum, and enhance the university's position as a national leader in transportation education. Additionally, the certificate serves as a stepping stone toward the pursuit of a Master in Urban Planning (MUP) degree since certificate courses are an integral part of the MUP curriculum.

The project outcomes are organized around three themes:

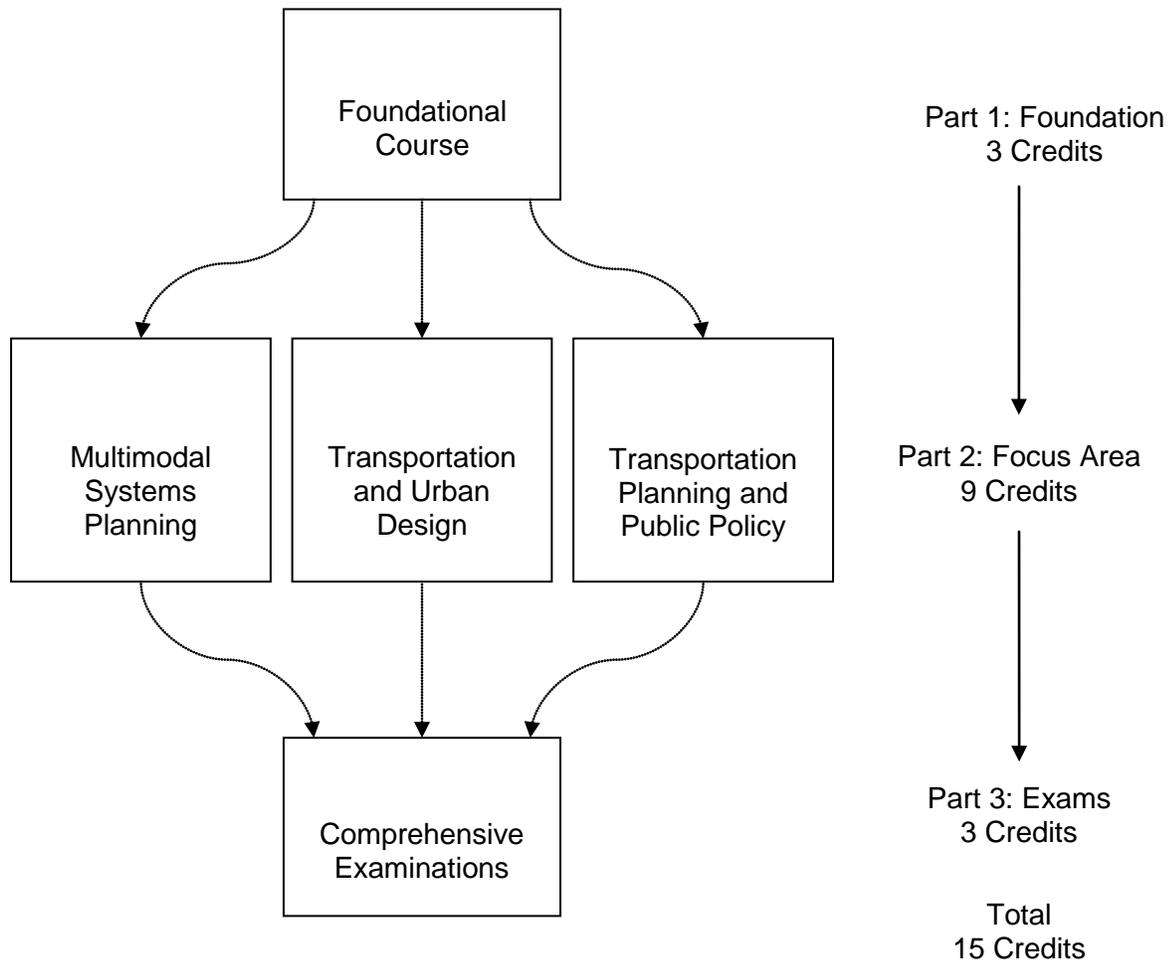
- certificate structure,
- logistic assessment and course delivery mechanisms, and
- project activities, timelines, and benchmarks.

## **PROJECT OUTCOMES**

### ***Certificate Structure***

The eCertificate in Transportation Planning involves a 15-credit sequence comprised of one required foundational course (three credits), three focus-area courses (nine credits), and a capstone course (three credits) providing a comprehensive overview and application of the skills and techniques learned during the completion of the certificate program. Figure 1 depicts the overall structure of the 15-credit certificate program.

In the proposed eCertificate program, a comprehensive examination may be for the capstone course. The proposed program differs in three minor ways from the existing certificate program. First, the prospective student does not necessarily need to be enrolled in a graduate degree at the university to be enrolled in the certificate since it is targeted to place-bound students. As such, students can enroll directly into the program similar to the way the Bush School enrolls students into the online certificates it offers. Second, the certificate does not need to be awarded concurrent with a graduate degree. Third, the courses will be delivered as appropriate in a condensed and flexible (executive) format to increase access.



**Figure 1: eCertificate in Transportation Planning Curriculum Structure.**

***Logistic Assessment***

A logistic assessment was conducted to identify and evaluate the feasibility of developing and implementing the delivery of the eCertificate, to evaluate the various methods for delivering the program, and to design a course development process and delivery system. The detailed logistic assessment report is included in Appendix B. Findings from the assessment indicate that:

- A hybrid course delivery system that blends traditional face-to-face instruction with online instruction is very effective in delivering the eCertificate courses to a wider audience.
- An executive program (delivery in a condensed format) further increases access as well as flexibility in course delivery by targeting working professionals looking for a real-world educational platform.
- Distance delivery of certificate courses is very effective when it blends synchronous (real-time) and asynchronous (interaction through virtual course material access) modes of delivery.
- Texas A&M ITS manages a virtual learning platform supported by an extensive repertoire of e-learning tools, software, and applications, such as Blackboard Vista, video conferencing tools, video Internet streaming systems, and Second Life 3D Virtual World. This virtual learning platform is adequate to deliver the proposed eCertificate in Transportation Planning. For instance, online certificate programs offered by the Bush School of Government use the ITS system for course delivery.

The proposed eCertificate can utilize a fully interactive online format including asynchronous and synchronous delivery. Asynchronous activities will include but not be limited to threaded discussions, video and audio presentations, written lectures linked to video and audio presentations, blogs and journals, document sharing, and shared online assessment. Synchronous activities will include live chat and web conferencing including video and audio interactions, small group forums, student presentations, and live assessment methodologies. The university-wide learning management platform, Blackboard Vista (formerly Web CT Vista), is a proven virtual platform for delivering the proposed online certificate. Delivery tools include QuickTime, Adobe Presenter, Podcasts, Audacity, Calibrated Peer Review, Camtasia, Snagit, and Centra Web Conferencing System.

Texas A&M ITS, a unit under the vice president for technology, is the hub for technology-related services pertaining to online programs in the university including the proposed distance program in transportation planning. ITS also provides professional development opportunities and administers e-learning resources. Faculty teaching online have participated in workshops on e-learning and use of Blackboard Vista, which is the university-wide platform for uploading syllabi, managing grades, and teaching courses in either a hybrid format or completely online. Its features include managing course content, grade books, assignments, chat rooms, bulletin boards, audio/video presentations, and assessments such as quizzes and examinations. The ITS can provide continuing training for certificate program faculty members to increase their expertise, if needed.

The ITS staff can also deliver specialized workshops as needed. For instance, during the 2010/11 academic year and in preparation for the development and delivery of online courses, the Department of Landscape Architecture and Urban Planning (LAUP) worked with ITS to design and deliver six specialized tailored workshops (two to three hours each) for 12 departmental faculty members, including those that teach courses in transportation planning, as well as three graduate students. These workshops focused on designing and implementing effective online courses as well as the tools most appropriate for doing so. Topics covered included developing effective syllabi; managing grade books, discussion forums, and chat rooms; and using other content-management tools. Also covered were tools such as Audacity, Camtasia, and Centra Web Conferencing System. Program faculty members that teach courses in transportation planning will be expected to continue to participate systematically and regularly

in institutional professional development opportunities to maintain currency of technological expertise.

### ***Course Delivery Methods***

Table 1 compares different methods for delivering the Transportation Certificate. It compares four basic methods: face-to-face (condensed), technology-mediated, online, and blended. These methods were compared along several dimensions: delivery strategy, delivery tools, technology, and hardware/software requirements. Each method has its strengths and weaknesses. A hybrid course delivery system, however, combines the strengths of traditional face-to-face instruction with online instruction. It holds promise for effectively delivering the eCertificate courses to a wider audience; however, full online capability extends the delivery of certificate courses beyond Texas, thereby increasing students' access substantially.

### ***Online Course Development Process***

Online courses can be developed in a number of ways. At one end of the spectrum, each faculty member develops his or her individual online course working collaboratively with staff from TAMU ITS. At the other end of the spectrum, an instructional design specialist (IDS) is hired to work with appropriate faculty—subject matter experts (SMEs)—to develop and implement the online course. The IDS serves as the liaison between the program director or department head who oversees a program, the program's faculty, and ITS staff. A combination of both modes of course development and delivery may be used. Nevertheless, the mode employed has ramifications, including resource commitment. A course development process for the eCertificate in Transportation Planning that involves using an IDS is presented in Appendix C. Essentially, the IDS works with faculty to design the course, develop course content, create engagement activities, and help integrate technology into the classroom (such as web conferencing, social media, flash, simulations, etc.). The process may be adapted/modified as needed.

Moreover, the initial proposal involved implementing a pilot course development process. The co-PI, whose responsibility it was to develop the pilot, is no longer at Texas A&M. However, the investigation received another UTCM grant to develop four online transportation courses for the eCertificate program by April 30, 2011.

**Table 1: A Comparison of Methods of Education Delivery Systems.**

|                          | 1  | 2  | 3   | 4   |
|--------------------------|--|--|---|---|
|                          | Face-to-Face (Condensed)   | Technology-Mediated  | Online  | Blended (1, 2, & 3)   |
| <b>Delivery Strategy</b> | Direct-instruction method<br>Fixed schedule<br>Fixed location<br>Specific instructor<br>(Specific date & time) | Use of technology to support face-to-face method<br>Technology's role is to enhance: <ul style="list-style-type: none"> <li>• efficiency</li> <li>• explanation</li> <li>• use of time</li> <li>• delivery and presentation</li> </ul> | Virtual<br>Synchronic<br>Asynchronic<br>Heavy reliance on technology<br>Indirect-instruction method<br>Flexible schedule<br>Flexible location<br>No specific instructor   | Optimal use of all other methods<br>Heavy reliance on technology  |
| <b>Delivery Tools</b>    | Classroom sessions<br>Live presentations<br>Demonstration<br>Discussion  | Use of computers/Internet<br>Use of slide presentations<br>Use of televisions/videos<br>Use of teleconferencing  | Computers/Internet<br>Video streaming<br>Teleconferencing<br>IP-based teleconferencing<br>Fixed network<br>Virtual sessions<br>Live chat rooms<br>Web portals<br>Emails<br>Web conferencing<br>Televisions/videos | Computers/Internet<br>Videoconference<br>Multimedia-text & graphics<br>Document camera<br>Computer graphics<br>Websites<br>Videotapes<br>Web conferencing<br>Emails<br>Web portals<br>Live chat rooms<br>Televisions/videos |
| <b>Technology</b>        | Projectors<br>Computers<br>Videos  | Videos<br>Videoconferencing<br>Audio conferencing  | Web-based<br>Web-portal access<br>Facebook  | Blackboard (Texas A&M)<br>Web CT<br>Videos  |

|   |  |   |  |  |
|---|--|---|--|--|
|   | Emails   | Web based<br>Computers  | Twitter<br>Videoconferencing<br>Audio conferencing   | Multimedia software<br>Web-based<br>Web-portal access<br>Facebook<br>Twitter<br>Videoconferencing<br>Audio conferencing  |
| <b>Hardware/Software (specifications)</b> | <p><b>Hardware:</b><br/>PC/Mac/Laptops</p> <p><b>Software:</b><br/>Generic software (MS package)<br/>Specialty software (Specific/need based)<br/>Pop-up blocker</p> | <p><b>Hardware:</b><br/>PC/Mac/Laptops<br/>Microphones<br/>Webcams<br/>TVs/VCRs</p> <p><b>Software:*</b><br/>Real Media Player<br/>Windows Media Player<br/>PowerPoint<br/>MS Office<br/>Audio/video presentations<br/>Pop-up blocker</p> | <p><b>Hardware:</b><br/>PC/Mac/Laptops<br/>Microphones<br/>Webcams</p> <p><b>Software:*</b><br/>Flash player<br/>Adobe Reader<br/>Java plugin<br/>Real Media Player<br/>Windows Media Player<br/>PowerPoint<br/>MS Office<br/>Camtasia<br/>Centra Web Conferencing<br/>Audio/video presentations<br/>Impatica<br/>Podcasts<br/>Vodcasts<br/>Eco 360**<br/>Pop-up blocker</p> | <p><b>Hardware:</b><br/>PC/Mac/Laptops<br/>Microphones<br/>Webcams</p> <p><b>Software:*</b><br/>Flash player<br/>Adobe Reader<br/>Java plugin<br/>Real Media Player<br/>Windows Media Player<br/>PowerPoint<br/>MS Office<br/>Camtasia<br/>Centra Web Conferencing<br/>Audio/video presentations<br/>Impatica<br/>Podcasts<br/>Vodcasts<br/>Eco 360**<br/>Pop-up blocker</p> |

|                   |   |  |  |   |
|-------------------|---|--|--|---|
| <b>Weaknesses</b> | Time constraint<br>Lacks flexibility<br>Limited student involvement<br>limited in human element<br>Cost element | Software/hardware problems<br>Reduces interactions   | Software/hardware problems<br>Facilitator's limited online<br>teaching skills/experience<br>Participants' study modes<br>limited interactions        | Software/hardware problems<br>Facilitator's limited online<br>teaching skills/experience<br>Participants' study modes<br>Limited interactions |
| <b>Comments:</b>  | Online delivery method is<br>competing with traditional<br><br>or face-to-face mode.                            | Technology-mediated method<br>leads to favorable results for<br><br>it supports and enhances the<br>outcome from an instructional<br>Method that mainly relies on<br>face-to-face. | The flexibility offered by<br>online delivery method is<br>attracting more candidates<br>who<br>are unable to attend school on<br>a full-time basis. | It provides an alternative to<br>those who seek a combination<br><br>of different systems in one<br>package.                                  |

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\*Some of the software is institution or university specific.

For example, some faculty at Texas A&M University use the list below to develop courses:

Camtasia (can be purchased through <http://software.tamu.edu>)

Audacity (freeware that can be found online)

Centra (web conferencing—available through the university)

Dreamweaver (used to create course pages)

Photoshop and Illustrator (used to create graphics and illustrations that can stand alone in the course or be included with lecture slides)

## PROJECT ACTIVITIES, TIMELINE, AND BENCHMARKS

Five key project activities were developed and implemented. Table 2 displays the key components of these activities, benchmarks, and delivery schedules. Forster Ndubisi (lead PI) provided overall project management and coordination for the development, approval, and implementation of the certificate program. Eric Dumbaugh served as the co-PI for the project. As presented in the table, the logistic assessment was completed in the fall semester of 2010. Proposal development for the eCertificate was completed in July 2011, and the department, college, and university approval processes were initiated in September 2011. The proposal was approved by the TAMU Graduate Curriculum Committee on November 3, 2011, and we expect the process to be completed by March 2012, for delivery beginning September 1, 2012.

As noted earlier, the development of four online courses for the eCertificate program is currently underway, scheduled to be completed by April 30, 2012. These are PLAN 612 (Transportation in City Planning), PLAN 672 (Transportation and Environment), PLAN 673 (Sustainable Transportation), and PLAN 676 (Transportation Investment Decisions). The development of these courses is funded through another grant from the UTCM.

**Table 2: Project Tasks and Implementation Timeline.**

|  | 2010        |             |           | 2011        |             |                    |
|--|-------------|-------------|-----------|-------------|-------------|--------------------|
|  | Spring 2010 | Summer 2010 | Fall 2010 | Spring 2011 | Summer 2011 | Fall 2011          |
| <b>Task i: Working Group Formation</b>             | X           |             |           |             |             |                    |
| <b>Task ii: Logistics Assessment</b>               | X           | X           | X         |             |             |                    |
| <b>Task iii: eCertificate Proposal Development</b> |             |             |           |             | X           | X<br>(in progress) |
| <b>Task iv: University Approval Process</b>        |             |             |           |             |             |                    |
| <b>Task v: Online course development design</b>    |             |             |           |             | X           |                    |
| <b>Task vi: Online course development</b>          |             |             |           |             |             | X<br>(in progress) |

## CONCLUSION

It is expected that the university approval processes for the eCertificate program will be completed in the spring 2012 semester for delivery beginning September 1, 2012. The project will vastly increase access to transportation courses and Texas A&M transportation curriculum, and, as a result, increase access of the certificate for a much wider audience beyond Texas and the United States. The proposed certificate's emphasis on executive education (condensed format for delivery) will further increase access to working professionals looking for a real-world educational platform. The project will ultimately result in the restructuring of the existing courses, development of new course content, and implementation of a hybrid course delivery mode with full capacity for online delivery. It will further ensure timely graduation of students enrolled in the existing certificate since they will have access to courses in the eCertificate.

Dr. Ken Joh will serve as the interim coordinator of the eCertificate program until enrollment in the program grows substantially. The existing administrative processes established in spring 2008 to process student admissions and guide students through the current program will be utilized as needed for the eCertificate program. Marketing materials will be developed once the approval process is completed, and emphasis will be placed on recruiting students into the program within the next two years. The existing Certificate Council comprised of faculty from the participating units that provide advisory input into the administration of the certificate program will take on the additional responsibility of providing input for the eCertificate program. With the development and implementation of an eCertificate program in transportation, Texas A&M has moved one step closer to becoming a national leader in the education of transportation professionals.



**APPENDIX A. PROPOSAL: AN ECERTIFICATE IN TRANSPORTATION PLANNING**



# 2011

## PROPOSAL: AN eCERTIFICATE IN TRANSPORTATION PLANNING



Texas A&M University

November, 2011

**PROPOSAL FOR THE GRADUATE CERTIFICATE  
IN TRANSPORTATION PLANNING BY DISTANCE (CERTIFICATE)**

**Department of Landscape Architecture and Urban Planning  
College Of Architecture  
Texas A&M University, College Station**

**REQUEST TO OFFER EXISTING DEGREE PROGRAM VIA DISTANCE**

The Department of Landscape Architecture and Urban Planning (LAUP) in the College of Architecture at Texas A&M (TAMU), College Station, is seeking permission to offer the existing graduate certificate in transportation planning via distance education (online to individuals) beginning August 2012.

**Graduate eCertificate in Transportation Planning**

The field of transportation has become increasingly complex and multifaceted. While the need for an interdisciplinary approach to transportation is widely recognized by the professional community, there are few, if any, educational programs that address the field of transportation in a truly comprehensive, interdisciplinary manner. Yet, increasingly, the transportation profession needs practitioners that can complement their traditional areas of expertise with a broader, interdisciplinary perspective of how economics, public policy, finance, and urban design influence the effectiveness of the transportation system. To address this need, a TAMU university-wide graduate Certificate in Transportation Planning was established in August 2008. This program has proved to be very successful. To date, five core certificate courses have either been restructured (three) or created (two) and delivered successfully. A total of 115 students have taken these certificate courses, and 30 students have received certificates to date.

A major limitation of the existing certificate program is that it is available only to graduate students at TAMU in College Station. Put differently, the certificate is not accessible to place-bound students, thereby limiting access. Through the many advances in technology, new degree program formats are providing the flexibility to meet the needs of today's university students who must balance family, work, and school. To address this limitation and ensure continued education of transportation professionals, LAUP is requesting permission to extend the delivery of the existing certificate via distance to a wider audience of professionals interested in transportation in selected metropolitan areas in Texas and beyond.

Preliminary indications suggest that an audience for the certificate exists in major metropolitan areas in Texas, especially Austin, Dallas, Houston, and San Antonio. Transportation professionals, therefore, will be positioned to receive a coherent interdisciplinary program in transportation at on-site and off-site locations.

The certificate will increase access, expand Texas A&M's transportation curriculum, and enhance the university's position as a national leader in transportation education. Additionally, the certificate serves as a stepping stone toward the pursuit of a Master in Urban Planning (MUP) degree since certificate courses are an integral part of the MUP curriculum. Finally, this request advances the imperatives of TAMU's **Education First Initiative**.

In support of this request, LAUP offers the following information:

**A. Describe the delivery system(s) to be used:**

The Certificate in Transportation Planning will utilize a fully interactive online format including asynchronous and synchronous delivery. Asynchronous activities will include but not be limited to threaded discussions, video and audio presentations, written lectures linked to video and audio presentations, blogs and journals, document sharing, and shared online assessment. Synchronous activities will include live chat and web conferencing including video and audio interactions, small group forums, student presentations, and live assessment methodologies. The university-wide learning management platform, Blackboard Vista (formerly Web CT Vista), will be the primary virtual platform for delivering the proposed online certificate. Delivery tools will include QuickTime, Adobe Presenter, Podcasts, Audacity, Calibrated Peer Review, Camtasia, Snagit, and Centra Web Conferencing System.

The platform and tools are currently managed by the Texas A&M Instructional Technology Services (ITS), which represents the hub for technology-related services pertaining to online programs. ITS also provides professional development opportunities, administers e-learning resources, and empowers instructors to use best practices in higher education to enhance student learning through technology. During the 2010/11 academic year and in preparation for the development and delivery of online courses, LAUP worked with ITS to design and deliver six specialized tailored workshops (two to three hours each) for 12 departmental faculty members including those that teach courses in transportation planning as well as three graduate students. These workshops focused on designing and implementing effective online courses as well as the tools most appropriate for doing so.

Topics covered include developing effective syllabi; managing grade books, discussion forums, and chat rooms; and using other content-management tools. Also covered are tools such as Audacity, Camtasia, and Centra Web Conferencing System. Program faculty members that teach courses in transportation planning are expected to continue to participate systematically and regularly in institutional professional development opportunities to maintain currency of technological expertise.

**B. Indicate expected enrollment for five years**

Expected enrollment for the next five years is anticipated to be 10-15 graduate students per year. We expect that professionals taking transportation courses will be approximately 20-25 per year.

**C. Confirm compliance with Sections of Subchapter E (Attach separately a certificate of compliance statement)**

The College of Architecture certifies that the graduate certificate in transportation planning to be delivered by distance meets the standards and criteria established in Chapter 4, Subchapter E of the Rules and Regulations of the Texas Higher Education Coordinating Board.

**D. Attach in a tabular format, a list of the courses to be taught, including course number and title; the number of semester credit hours for each; and the mode of instruction for each. Indicate which courses have already been developed as distance courses and the timeline for others to be developed as distance courses.**

See table in Attachment A.

**E. Attach a chart showing semester credit hour requirements for the program, including total SCH.**

See chart in Attachment B.

**F. Attach a roster of instructional staff, following the format required by the Southern Association of Colleges and Schools.**

See roster and accompanying information in Attachment C.

**Also describe faculty training to develop and deliver distance courses.**

Texas A&M ITS, a unit under the vice president for technology, is the hub for technology-related services pertaining to online programs in the university including the proposed distance program in transportation planning. ITS also provides professional development opportunities and administers e-learning resources. Faculty teaching online have participated in workshops on e-learning and use of Blackboard Vista, which is the university-wide platform for uploading syllabi, managing grades, and teaching courses in either a hybrid format or completely online. Its features include managing course content, grade books, assignments, chat rooms, bulletin boards, audio-video presentations, and assessments such as quizzes and examinations. The ITS will provide continuing training for certificate program faculty members to increase their expertise. In addition, more experienced faculty members involved in technology-mediated instruction are actively involved as peer mentors for less-experienced faculty members.

**Address impact of the program on teaching loads**

The normal teaching load for a full-time faculty member in LAUP at TAMU is nine semester credit hours (i.e., three courses) per semester. Tenure-track faculty members with clear expectations for research and active participation in graduate committees and service typically teach two courses per semester. Three of the proposed certificate courses are currently taught by a non-tenure-track faculty member jointly appointed with the Texas Transportation Institute. Since only five courses will be taught online, we do not expect the teaching loads to be adversely affected by the proposed online Certificate in Transportation Planning.

**Describe the evaluation plan to be used, addressing SACS criteria.**

Transportation planning is a concentration area in the urban planning and allied disciplines such as civil and transportation engineering. Faculty members who teach the core transportation planning course are members of the department. These faculty members, like others, participate annually in faculty evaluations. Each member of the department completes an annual evaluation based on the mutually agreed upon goals for teaching, research, service, and engagement between the faculty and department head. In addition, tenure-track faculty members are reviewed in two phases, first by the department's Promotion and Tenure Committee and then the department head.

The head reviews the evaluation and discusses it with each faculty member. A signed copy is then forwarded to the dean of the College of Architecture for onward transmittal to the dean of faculty and provost in accordance with approved university policies and procedures.

Student evaluations, pedagogical innovations, workshop participation (including technology-mediated instruction), innovative assessments linked to learning outcomes, and participation in the scholarship of teaching are some of the criteria used to evaluate faculty for teaching.

More specifically, student evaluations and assessments linked to learning outcomes will be conducted for each proposed online course, and these will be compared to similar courses offered on site.

Additionally, other factors are assessed when considering a program that is provided to students via distance education. The approval processes at the university level (Graduate Committee, Faculty Senate, as well as other pertinent committees) jointly review the program's proposal to ensure the following factors have been addressed:

- faculty readiness (faculty knowledge and skills; sufficient number of qualified faculty, including the market availability of future qualified faculty members in the discipline; sufficient university resources, including projected travel expenses if it is an off-campus program, computer resources and software, etc.);
- student support services (the availability of library resources and plans for accomplishing other learning experiences unique to the discipline, e.g., residency if it is a doctoral program, laboratory experiences, etc.); and
- alignment with the strategic plans of the College of Architecture and Texas A&M University.

Student learning outcomes for all academic programs in LAUP including those for the MUP program have been entered in the WEAVE, the university's data planning and assessment system. LAUP, in conjunction with the college, is responsible for ensuring comparable achievement of learner outcomes, student persistence and completion rates, graduate placement, and follow-ups. These criteria will be assessed annually and addressed in the department's plans and assessment reports. In instances where any part of an academic program is offered off campus, or using other distance education modalities (web-based instruction, interactive television, etc.), as will be the case with the proposed Certificate in Transportation Planning by distance, the department head, certificate coordinator, and/or faculty will develop assessment techniques that evaluate the comparability of student achievement and learning outcomes with on-campus course delivery annually and respond to any discrepancies in a timely manner, if they arise. Regardless of modality or location of instruction, the university is committed to comparing on-campus and off-campus student achievement for all programs.

Results of these various evaluation methods that assess learning outcomes will be reviewed by the certificate/program faculty and the department's Curriculum Committee/Coordinator Council. Weaknesses identified during the certificate assessment and review processes are triggers for program and/or course change. The College of Architecture and TAMU are committed to program assessment and continuous improvement for all degree and certificate programs.

**H. Attach Cost Estimate Form that indicates additional costs associated with this request and sources of funds to meet the costs.**

The Certificate of Transportation Planning has been offered at TAMU since 2008. The

department head (Dr. Ndubisi) along with two faculty members that teach courses in transportation planning received two grants totaling \$120,000 in 2009 and 2010 from the Federal Department of Transportation via the Texas Transportation Institute University Transportation Center for Mobility™, to assess the capability of delivering the certificate by distance and to convert four certificate courses for online delivery by April 2012. These are the key budgetary expenditures for implementing this distance program. As such, the department's current budget will cover program expenses including administration, faculty, clerical/staff, supplies, materials, and other costs associated with delivering the certificate by distance.

**I. Describe the arrangement made to share educational resources through consortia with other institutions, if any.**

N/A

**J. Additional Information that would be useful in evaluating this request.**

## Attachment A

### Graduate Certificate in Transportation Planning: Certificate Structure and Credit Hour Requirement

| <b>Prefix and Number</b> | <b>Required Courses</b>               | <b>SCH</b> | <b>Campus FTF</b> | <b>Online*</b> |
|--------------------------|---------------------------------------|------------|-------------------|----------------|
| PLAN 612                 | Transportation in City Planning       | 3          | X                 | X              |
| PLAN 673                 | Design for Sustainable Transportation | 3          | X                 | X              |
| PLAN 674                 | Transportation Systems Analysis       | 3          | X                 | X              |
| PLAN 676                 | Transportation Investment Decisions   | 3          | X                 | X              |
| PLAN 691                 | Comprehensive Examination             | 3          | X                 | X              |
|                          | Total Required SCH                    | 15         |                   |                |
|                          |                                       |            |                   |                |
| <b>Prefix and Number</b> | <b>Elective/Substitute Courses</b>    | <b>SCH</b> | <b>Campus FTF</b> | <b>Online*</b> |
| PLAN 670                 | Urban Public Transportation Planning  | 3          | X                 | N/A            |
| PLAN 678                 | Transportation Studio                 | 3          | X                 | N/A            |
|                          | Total Required SCH                    | 6          |                   |                |

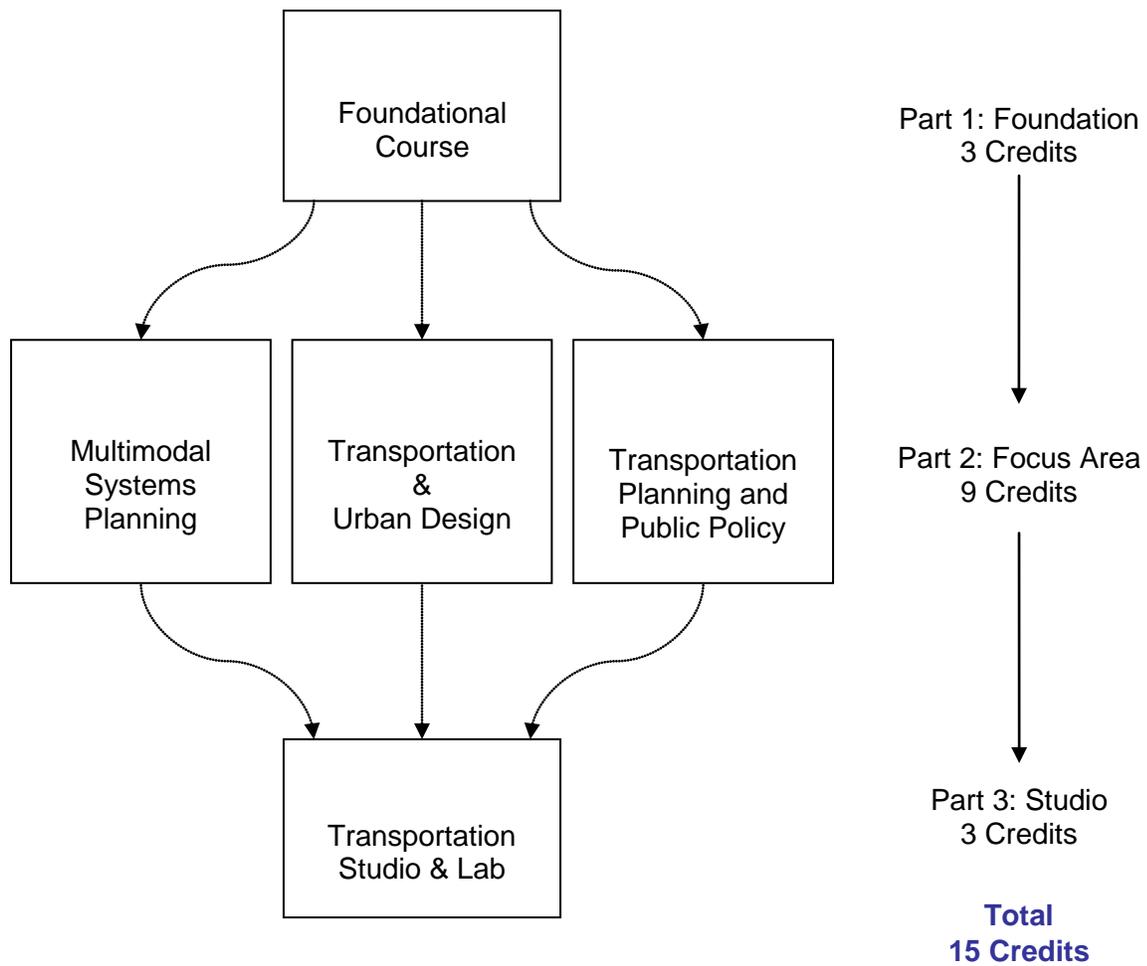
\*Under Development: Due April 30, 2012 (course development supported through a grant from the Federal Department of Transportation via TTI's University Transportation Center for Mobility™)

## **Attachment B**

### **Certificate Structure and Credit Hour Requirement**

The Transportation Certificate will involve a 15-credit sequence comprised of one required foundational course (three credits), three focus-area courses (nine credits), and a capstone course (three credits) providing a comprehensive overview and application of the skills and techniques learned during the completion of the certificate program. A comprehensive examination may be substituted for the capstone course. The proposed program differs in three minor ways from the existing certificate program. First, the prospective student does not necessarily need to be enrolled in a graduate degree at the university to be enrolled in the certificate since it is targeted to place-bound students. As such, students can enroll directly into the program, similar to the way the Bush School enrolls students into the online certificates it offers. Second, the certificate does not need to be awarded concurrent with a graduate degree. Third, the courses will be delivered as appropriate in a condensed and flexible format to increase access, as is also done in the Bush School.

Figure A1 (next page) depicts the overall structure of the 15-credit certificate program, comprised of the following components:



**Figure A1: Certificate in Transportation Curriculum Structure.**

## Attachment C

### Instructional Faculty

Table D1 depicts faculty members who teach core courses in the Graduate Certificate of Transportation Planning Program.

| <b>Name of Core Faculty and Faculty Rank</b> | <b>Highest Degree and Awarding Institution</b>                                  | <b>Courses Assigned in Program</b>   | <b>% Time Assigned to the Program*</b> |
|--|---|--|--|
| Joh, Ken; Assistant Professor                | Ph.D. in Planning, Policy, and Design from the University of California, Irvine | PLAN 604: Planning Methods I; PLAN 670: Public Transportation; PLAN 673: Design Sustainable Transportation | 75%                                    |
| Eisele, Bill; Visiting Associate Professor   | Ph.D. in Civil Engineering from Texas A&M University                            | PLAN 678: Applied Transportation Studio  | 25%                                    |
| Perkinson, Dennis; Lecturer                  | Ph.D. in Urban and Regional Science from Texas A&M University                   | PLAN 612: Transportation in City Planning  | 10%                                    |
| Lomax, Tim; Lecturer                         | Ph.D. in Civil Engineering from Texas A&M University                            | PLAN 612: Transportation in City Planning  | 10%                                    |
| Turnbull, Katherine; Lecturer                | Ph.D. in Urban and Regional Science from Texas A&M University                   | PLAN 612: Transportation in City Planning  | 10%                                    |
| Ellis, David; Visiting Associate Professor   | Ph.D. in Urban and Regional Science from Texas A&M University                   | PLAN 676: Transportation Investment Decisions  | 25%                                    |

Note: 25% assignment is the equivalent of teaching one course

Table D2 depicts faculty members who teach supportive electives in the Certificate of Transportation Planning Program as well as transportation concentration courses in the MUP and Ph.D. programs.

| <b>Name of Core Faculty and Faculty Rank</b> | <b>Highest Degree and Awarding Institution</b>  | <b>Courses Assigned in Program</b>   | <b>% Time Assigned to the Urban Planning Program</b> |
|--|---|--|--|
| Van Zandt, Shannon; Assistant Professor      | Ph.D. in Urban and Regional Planning from the University of North Carolina at Chapel Hill | PLAN 601: Introduction to Planning; PLAN 613: Planning Methods and Techniques; PLAN 656: Housing and Community; PLAN 661: Communications; PLAN 684: Professional Internship                        | 100%   |
| Wunneburger, Doug; Senior Lecturer           | Ph.D. in Forestry from Texas A&M University   | PLAN 625: GIS in Landscape and Urban Planning; PLAN 626: Advanced GIS in Landscape Architecture and Urban Planning; URSC 325: Introduction to GIS; URSC 326: Advanced GIS Urban and Regional Study | 100%   |

|   |   |  |      |
|---|---|--|------|
| Lindell, Michael;<br>Professor                          | Ph.D. in Psychology from the University of Colorado, Boulder                                | PLAN 649: Organized Disaster Response; PLAN 650: Disaster Response Planning; URSC 310: Urban Analytic Methods  | 100% |
| Peacock, Walt;<br>Professor and HRRC Director           | Ph.D. in Sociology from the University of Georgia   | URSC 641: Analytic Methods; URSC 642: Analytic Methods   | 100% |
| Brody, Sam;<br>Professor                                | Ph.D. in City and Regional Planning from the University of North Carolina at Chapel Hill    | PLAN 641: Environmental Planning Administration  | 25%  |
| Ndubisi, Forster;<br>Professor and LAUP Department Head | Ph.D. in Regional Planning and Resource Development from the University of Waterloo, Canada | LAND 200: Introduction to Landscape Architecture Practice; LAND 689: Ecological Planning; URSC 301: Introduction to Planning; URSC 485: Directed Studies | 25%  |

**APPENDIX B. LOGISTIC ASSESSMENT REPORT**



## LOGISTIC ASSESSMENT OF CAPACITY TO DELIVER CERTIFICATE IN TRANSPORTATION PLANNING BY DISTANCE

### INTRODUCTION

This report evaluates the feasibility of developing and implementing the delivery of the proposed Transportation Planning Certificate by distance (eCertificate) using the existing TAMU virtual learning platform.\* Distance education (DE) or distance learning can be defined as the field of education that focuses on teaching methods and technology with the aim of delivering teaching, often on an individual basis, to students who are not physically present in a traditional educational setting such as a classroom. It involves a process that creates and provides access to learning when the source of information and the learners are separated by time and distance, or both.

With accelerated innovations in technology and communication, distance learning is gaining popularity among individuals who are seeking flexibility in pursuing an academic program that would allow them to balance their studies, family, and work life. Distance learning allows participants to synchronously and asynchronously interact with other professionals. It sometimes requires a physical on-site presence for reasons such as taking examinations. If that occurs on a regular basis, then the process is termed as [hybrid](#) or [blended](#) learning.

### Distance learning vis-à-vis face-to-face learning

Unlike the traditional face-to-face educational delivery method, distance learning uses technology to deliver educational programs. It comprises all forms of electronically supported learning and teaching. It uses electronic applications and processes to learn. It is essentially a computer- and network-enabled transfer of skills and knowledge. Its applications and processes include web-based learning, computer-based learning, virtual classrooms, and digital collaboration.

Content is delivered via the Internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM. The Internet makes it easy for some external degree programs or courses to be offered in off-campus locations, literally anywhere around the world. Distance learning can be self-paced or instructor-led and includes media in the form of text, images, animation, and streaming video and audio. Acronyms like CBT (computer-based training), IBT (Internet-based training), and WBT (web-based training) have been used as synonyms for distance learning.

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\*This report is a synthesized and modified version of a larger report written by Shariff Mustapha, a Ph.D. student in Urban and Regional Planning, who was the research assistant for this project. The stages in program design for online courses presented in Appendix C are part of the larger report noted above.

## **Strengths and perceived weaknesses of distance education**

Distance learning courses provide flexibility and variation in delivery formats that are supported by various technologies. Some are structured so that the students can complete them at whatever time is most convenient for them, while others provide a more specific set of deadlines and opportunities to collaborate with classmates. With either option, a faculty member will provide direction as students move through the course.

The general misconception about distance learning is that online delivery does not provide as good an educational experience as delivery through traditional face-to-face formats. Such misconceptions could be attributed to factors such as software and hardware problems, facilitators' limited online teaching skills and experience, participants' study modes, and limited interpersonal interactions among class participants and between class and instructor. Moreover, most people have learned through traditional formats and are not used to or are just getting familiar with technology-enhanced learning. However, the fact is that distance learning not only allows students to learn from traditional classroom materials such as books, journals, case studies, etc., but also provides students the opportunity to interact using multimedia software and other technologies.

To make up for loss in face-to-face interactions between online participants and instructors, distance education courses may be designed to include a face-to-face component. This may be achieved, for instance, by requiring students to:

- meet on a university campus or any given location a few times or regularly during the semester;
- meet on selected weekdays or weekends in the case of condensed or executive programs; or
- meet at a regional extension center or a selected community college, school, or other location through the use of live Internet protocol (IP) videoconferencing.

Table 1 (page 9 in the text) is a comparison of different methods of educational delivery. Each delivery strategy has pedagogical ramifications as well as a set of requirements for technology. A hybrid course delivery system that blends the interpersonal dimension of traditional face-to-face instruction with online instruction seems to be the most effective way of delivering distance learning.

## **DISTANCE EDUCATION AT TEXAS A&M UNIVERSITY**

Distance education at Texas A&M is delivered and managed through two major virtual platform systems. These are the university-wide learning management platform, Blackboard Vista (formerly Web CT Vista), managed by TAMU's Instructional Technology Services (ITS), and the TTVN (Trans-Texas Videoconference Network) managed by the Texas A&M University System

that serves the thirteen university campuses, the Health Science Center, and seven research and service agencies of the Texas A&M University System (TAMUS). Both systems can be used to deliver distance education independently or combined.

## 1. TAMU ITS Virtual Platform

The TAMU ITS is responsible for maintaining, administering, and developing university-wide systems and services to support the distance education/online learning infrastructure at Texas A&M. It serves as a hub for technology-related services pertaining to online programs throughout Texas A&M University. It administers eLearning resources and empowers instructors to use best practices in higher education to enhance student learning through the use of technology. ITS manages the university-wide learning management platform, Blackboard Vista (formerly Web CT Vista), which is the primary virtual platform used for delivering distance education.

Texas A&M University offers numerous distance education graduate degrees and certificate programs using Blackboard Vista as the primary virtual platform. Examples of certificate programs include the George Bush School of Government's certificates in Advanced International Affairs, Homeland Security, and Non-Profit Management; the Certificate in Mathematics offered by the Department of Mathematics; and the Certificate in Statistics offered by the Department of Statistics. ITS supports a vast array of tools and programs for delivering distance/online education. Delivery tools vary and include QuickTime, Adobe Presenter, Podcasts, Audacity, Calibrated Peer Review, Camtasia, Snagit, and Centra Web Conferencing System. Some of the delivery tools are summarized below.

### *Delivery Tools in Distance Education*

**1. eLearning:** Powered by Blackboard Vista (formerly WebCT Vista), eLearning is the university-wide learning management system for uploading syllabi, managing grades, and teaching courses in either a hybrid format or completely online. It is a secure, enterprise-level system that features specific tools, software, and devices that include grade books, assignments, quizzes and surveys, chat rooms, discussion forums, blogs and journals, email, and content-management tools.

**2. Audacity:** Audacity is a free, cross-platform audio recorder and sound editor. It is used to record and review lectures. The outputs can be distributed as MP3 podcasts. [Media Matrix](#) and [iTunes U are additional](#) online tools distributing educational audio/visual content supported by the ITS.

**3. Blogs @ TAMU:** This is a centralized, WordPress MU-powered system that provides no-cost blogs (short for "weblogs") to Texas A&M students, faculty, and staff. Blogs are online journals.

**4. Calibrated Peer Review:** Calibrated Peer Review (CPR) is an online peer review system that enables students to submit writing assignments, review their peers' submissions, and evaluate

their own submissions based on a rubric provided by the instructor. The CPR system calibrates student grades, even as iteratively refined versions are turned in. In short, it enables students to critique their own work as well as that of their peers.

**5. Camtasia & Snagit:** TechSmith Camtasia records full-motion, onscreen actions and enables editing of the content and format, such as adding audio annotations and various types of visual callouts. The resulting screencast (video) can be saved in various formats and sizes for online delivery to students. Snagit enables the user to take screenshots of images on the computer screen, including the entire desktop, windows, regions, and even long, scrolling pages. The images can be edited, labeled, and exported for use in other applications. The [Texas A&M Software Center](#) offers both Camtasia and Snagit as a downloadable software package for Texas A&M students, faculty, and staff.

**6. Centra Web Conferencing System:** Centra is an interactive web conference application that enables any number of participants to meet over the Internet using their desktop or laptop computers. Centra enables instructors to display PowerPoint presentations, graphics, and other media for the web conference participants. It also provides interactive application sharing, interactive whiteboarding, and interactive web surveys. Saba Centra enables users to share presentations, websites, and applications; present quizzes and surveys; and use breakout rooms in a real-time web conferencing system. Centra may be used for presentations to small or large classes. It enables participants to interact with voice-over IP, video, and text. It also permits recording and archiving of presentations for later viewing. Moreover, Centra uses its own voice-over IP audio, so no telephones are required for web conference participants to hear a presentation or talk interactively. To interact verbally, most Centra participants use headset microphones connected to their desktop or laptop computers. Centra works with PC, Mac, and Linux computers. It is intended to be a personal interactive communications system that can be used in one-to-one settings, small group meetings, or large seminars or classes with any manageable number of participants, each at his or her own desktop or laptop computer. With careful planning for video projection and audio, Centra can be used in a classroom setting with a large number of participants.

**7. Impatica for PowerPoint:** Impatica converts PowerPoint files into a compressed format that is optimized for online viewing. The original PowerPoint text, graphics, transitions, and narrations can be retained and exported into slideshows. Impatica files are typically 95% smaller than native PowerPoint files and can be easily uploaded to a website or to [eLearning](#).

**8. iTunes U:** This is a no-cost content distribution system hosted by Apple that enables Texas A&M departments and student organizations to provide audio, video, and PDF files from lectures, interviews, performances, and other sources in the iTunes Store. iTunes U allows users to download publicly available multimedia content to their computers, iPods, or other portable devices.

**9. Media Matrix Audio/Visual Internet Streaming System:** Media Matrix allows the user to upload audio and video files to create customized collections of educational media for students

or other viewing audiences. Access can be limited to specific sets of people based on Net IDs. The system supports a variety of media formats and offers robust RSS (Really Simple Syndication) capabilities.

**10. Respondus & StudyMate:** Respondus enables instructors to manage exams that can be printed on paper or published online at a later date. Exams can be created offline, or existing exams can be imported from word processor files. Study Mate allows instructors to create 10 Flash-based activities and games using three simple templates. Activities can be uploaded to a website or published directly to [eLearning](#).

**11. Second Life 3D Virtual World:** Second Life is a three-dimensional (3D) virtual world teaching environment. It runs on a free application in which users interact with each other using avatars, or onscreen characters. Chat and multimedia features are also available to facilitate participation in individual and group activities.

**12. SMART Boards, Sympodiums, and AirLiner Wireless Tablets:** These are instructional devices used for creating presentations before, during, and after a class. They are installed in numerous technology-enhanced classrooms throughout campus.

**13. Wikis @ TAMU:** This is a centralized, Atlassian Confluence-powered, multiuser website system in which registered users can contextually add content or edit existing documentation. Wikis introduce a collaborative and social method for developing up-to-date information and maintaining online file repositories.

## **2. Enterprise Networking and Interactive Communications for the Texas A&M University System**

TTVN, headquartered in the city of Bryan, is the area-wide data and interactive communications network that serves 13 university campuses, the Health Science Center, and seven research and service agencies of the Texas A&M University System. The network also serves numerous affiliated colleges and universities, K-12 school districts, and state agencies throughout Texas. The core TTVN network consists of over 120 primary wide-area network sites and more than 300 videoconference sites. TTVN provides enterprise-class commodity Internet, Internet2, National LambdaRail, and Texas Intranet data services to all members of TAMUS and the extended TTVN community. It also provides videoconference scheduling and facilitation services, videoconference user and technical support, multipoint videoconference bridging, ISDN/IP gateways, live and archived webcasting, and videoconference equipment repair.

TTVN also manages the Centra interactive web conference application for the campuses and agencies of the Texas A&M University System. Centra, as noted earlier, provides interactive web conferencing for classes, seminars, and meetings. Like TTVN videoconference services, Centra is available to faculty, staff, and students at no cost per user or per event. The TTVN backbone network infrastructure is an all-IP environment. The IP environment allows TTVN staff to focus on a single type of network infrastructure for all supported services. This allows the

most cost-effective environment and the most efficient utilization of bandwidth. The TTVN network is monitored 24/7/365 with the ultimate goal of providing 99.999% reliability.

The TTVN network is part of the Lonestar Education and Research Network (LEARN). LEARN is a carrier-class optical network between Texas cities operating on 20-year leases of dark fiber optic circuits. Multiple gigabit Ethernet, 10-gigabit Ethernet, and specialized optical paths operate between Dallas, College Station, Houston, Austin, San Antonio, and back to Dallas to form the highly reliable LEARN ring architecture. LEARN is a partnership of 33 Texas higher education institutions.

TTVN and LEARN provide connectivity to the Internet2 NewNet backbone through multiple redundant gigabit Ethernet connections. These connections, in cooperation with the University of Texas System Office of Telecommunications Services (UT-OTS), serve as the Texas higher education access points to Internet2. The Internet2 network backbone also provides TTVN with international connectivity to the Texas A&M University campus in Doha, Qatar, and to Texas A&M facilities in Mexico City and Costa Rica.

The TTVN Video Operations group provides a videoconference help desk, multipoint videoconference bridging, ISDN/H.320 gateways, live and archived Windows Media webcasts, and videoconference equipment repair. Three Polycom/Accord MCG-100 multipoint control units (MCUs) and one Codian 4250 MCU that are scheduled and operated by TTVN provide highly flexible multipoint bridging and gateway videoconference services.

TTVN is managed for the Texas A&M University System by the staff of the Texas A&M University Educational Broadcast Services (EBS). EBS also operates KAMU-TV and KAMU-FM, the public television and public radio stations for College Station/Bryan, Texas. The relationship between TTVN and the co-located broadcast stations offers a unique combination of networking, videoconferencing, webcasting, web conferencing, new media, and radio/television production staff and facilities that broaden the range of TTVN services.

## **ASSESSMENT OF VIRTUAL INFRASTRUCTURE AND DELIVERY TOOLS**

Blackboard Vista and TTVN have been employed successfully in delivering distance education at TAMU. They can be used independently or combined. They work best when combined, and sites (appropriate technology classrooms) are available when needed for delivery through TTVN. Distance delivery of education courses is very effective when it blends *synchronous* (real-time) and *asynchronous* (interaction through virtual course material access) modes of delivery. The Blackboard platform has proven to be effective in delivering educational content in a fully interactive format involving both asynchronous and synchronous modes.

Asynchronous activities will include but not be limited to threaded discussions, video and audio presentations, written lectures linked to video and audio presentations, blogs and journals, document sharing, and shared online assessment. Synchronous activities include live chat and

web conferencing including video and audio interactions, small group forums, student presentations, and live assessment methodologies. Integrating TTVN as a part of the Blackboard virtual network platform greatly enhances course delivery through the synchronous mode since it provides enhanced videoconferencing network capabilities.

The effectiveness of using TTVN as the primary mode of delivery is contingent on the availability of rooms equipped with videoconferencing technology at varied locations in the state when needed, and on the availability of adequate technical support. For instance, Texas A&M University has adequate capabilities and facilities at College Station and other off-campus locations in all of the major Texas cities, including Dallas, Austin, San Antonio, and Houston. However, not all facilities may be available when needed. For example, one of the issues explored in this assessment is the feasibility of utilizing Texas Transportation Institute (TTI) regional facilities for course delivery using the TTVN. While it has adequate videoconferencing facilities throughout Texas, there is reluctance in committing the facilities for a full semester use by another system unit or department. On the other hand, an agreement can be reached with TTI to use its facilities as long as there is no conflict of interest.

Web conferencing utilizing the Centra software may have additional advantages over videoconferencing using TTVN. First of all, it is easier to implement. It takes advantage of cable and modem facilities provided by network companies such as DSL, AT&T, Verizon, etc., as well as technology tools and software provided by Texas A&M, such as Centra. Moreover, it is cheaper to use web conferencing compared to videoconferencing. The latter involves physical locations needed to set up videoconference communications. However, the quality and clarity of images delivered through TTVN is far superior to that delivered through desktop or laptop computers.

Students may find it easier and more convenient to use web conference than videoconference, as they do not have to be physically present at a given location as long as they have access to a computer and an Internet connection. For instance, TTI has videoconference facilities in northern Dallas, but even if that facility were made available to students, it would be difficult and inconvenient for students living in Fort Worth, for example, to drive to north Dallas to attend a class, unless it were an occasional event that took place once every two weeks or so.

The fact that eLearning and Blackboard can be accessed by computers as well as smart phones (new technology) negates the problem associated with geography and distance. However, another problem associated with videoconferencing is the availability of onsite stand-by technical support. This is why it is crucial to pay attention to site selection, as some of the sites may not have the support needed readily available. While there is an extensive distribution of TTVN sites across the state of Texas, including the four locations of our interest—Dallas, Austin, San Antonio, and Houston—many of these facilities are closed during the weekend, unless arrangements are made in advance to use them. Even at that, technical support may be problematic.

## **CONCLUSION**

It is prudent to conclude that Texas A&M University has well-established virtual delivery platforms, technology, tools, facilities, and technical support to deliver the proposed eCertificate in Transportation Planning. In fact, the platforms are currently used in delivering numerous distance education courses and academic programs. Additionally, training is readily available for faculty interested in delivering distance courses, including faculty teaching courses in transportation planning. This is in addition to support provided by the help desk, which offers round-the-clock services, especially for the eLearning and Blackboard platform.

**APPENDIX C. STAGES OF PROGRAM DESIGN (ECERTIFICATE PROGRAM)**

## Stages of Program Design (eCertificate Program)

**Stage 1:** Identify a program director to oversee the goals and objectives of the online certificate program. The director works with LAUP department head and the appropriate program coordinators to identify courses that align with the program goals and objectives.

**Stage 2:** Identify an instructional design specialist (IDS) to work extensively in the background to make sure the course meets the requirements for the certificate program.

The IDS works with subject matter experts (SMEs) to develop course contents. The instructional design specialist works with the content to ensure that:

- all course objectives are measured,
- all assessments align with the course objectives, and
- the content gives students enough information to meet the course objectives.

The instructional design specialist also works with the SMEs to create engagement activities and help integrate technology into the classroom (such as web conferencing, social media, flash, simulations, etc.). Upon receiving the course contents, the IDS uses various software programs to produce the content into a web accessible format. The software includes:

- PowerPoint and Camtasia to record the audio/video lectures (slide handouts are provided to students). Camtasia works in conjunction with PowerPoint. It synchronizes voice with slides. Snagit is another piece of software that comes with Camtasia. It is used for taking snap shot texts.
- Centra, a software that uses webcam features for weekly life chats between students and faculty.
- Audacity, a software used to interview guest lecturers as supplemental lecture materials.
- Dreamweaver to create course pages (Blackboard runs on html formatting for all pages).
- Photoshop and Illustrator to create graphics and illustrations that stand alone in the course or are included with the lecture slides.

**Stage 3:** Identify subject matter experts to develop courses. The SMEs can be full-time in-residence faculty or part-time adjunct faculty (meaning, as per Bush School of Government Online Certificate Programs, they are not physically on campus or not employed directly by our college). SMEs are charged with:

- Writing course objectives.
- Developing audio/video lectures.
- Creating discussion questions.
- Creating student engagement exercises.
- Creating course assignments (quizzes, essays, exams, etc.).
- Developing reading requirements that supplement the lecture materials.

**Stage 4:** Coordinate with ITS to create course templates that can then be applied to course sections. These templates can then be saved for future use to avoid regenerating them every semester. All of the certificate courses are to be formatted the same way so that they have the same look and feel, color and layout, so students going from one course to the next in the

program don't have to spend time figuring out where to locate the syllabus, course lectures, and course assignments.

**Stage 5:** Have instructional design specialist create a course blueprint template that is mostly used for creating learning modules and learning objects for online courses. Each single module should be equivalent to a week's face-to-face information the instructor would share with students.

**Stage 6:** Closer to semester start date, have IDS request that ITS create Blackboard sections. Under each course level, there could be multiple sections (in state, out of state, etc.).

**Stage 7:** Have IDS group import course contents, place materials into Blackboard, and launch the course for student use.

**Stage 8:** Upon setting up the courses, have the faculty, basically, get in the driver's seat and drive during the semester. The faculty:

- facilitate the discussion,
- work with the students,
- respond to emails, and
- give feedback to students.

**Stage 9:** Have the IDS group provide technology support for the online courses, including:

- formatting and uploading of all course materials,
- setting release dates,
- creating assignments, and
- providing technology assistance to students and faculty.

**Stage 10:** Ensure that there are four access levels to the web page (e-learning page in the case of Texas A&M):

- University level access—available to ITS personnel who are also authorized to give access to the following three groups:
  - Group level access—available to schools and colleges.
  - Course level access—available to course designers.
  - Section level access—available to students.

**Stage 11:** Have faculty provide to IDS, in advance, all deliverables, which include handouts, PowerPoints, and audio and video materials for the whole program length. It is recommended that the audio and video materials should not exceed two to three 20-minute chunks, which are more easily manageable than longer sessions.

**Stage 12:** Ensure that the graduate certificate program has a full online system with asynchronous and synchronous methods of delivery.





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