Department of Civil and Environmental Engineering Annual Report 2007 – 2008

Prepared by
Tahar El-Korchi
August, 2008

Michael Richard – Presenting the Valedictorian Address “A Bridge to Anywhere” Commencement 2008
Dear Colleagues:

The CEE Department is proud to summarize its accomplishments for the year 2007-2008.

- Our enrollment continues to grow and our graduating class of 75 students receiving B.S. degrees in civil and environmental engineering is the highest its been in 10 years. We also graduated 23 M.S. students and 1 Ph. D. student.

- We completed 32 MQPs involving 84 students.

- Our funded research is continuing to grow with approximately $400K in new funding and active grants of over $1.2M. New proposals submitted exceeded $2.8M which is $1.2M over last year.

- Our scholarly output is increasing; the faculty published over 33 articles including two textbooks.

- We hired a new faculty in the Geo-mechanics and Geo-materials area.

- We completed lab renovations and started facilities improvements in other areas of Kaven Hall.

- We are preparing and look forward to the ABET accreditation site visit this fall.

- We are engaged with the development office to enhance our networking capabilities, seek opportunities and raise funds for current and new initiatives that support our academic mission.

We look forward to another great year as we grow our enrollment, our scholarship and introduce new program initiatives and improve our physical facilities.

Respectfully submitted,

Tahar El-Korchi
Professor and Interim Head
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## UNDERGRADUATE PROGRAM

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- Enrollment and Degrees
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## Outcomes Assessment & Program Improvement

- Modification of the MQP evaluation form
- Adoption of New and Experimental Courses
  - CE 203X Software Applications in Civil Engineering
  - ES 2800 Environmental Impacts of Engineering Decisions
  - CE4600 Hazardous and Industrial Waste Management
- CEE Curriculum Reform

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- BS/MS Recruitment Program
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- Senior Welcome and Information Session

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## GRADUATE PROGRAM

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- Degrees Awarded
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HIGHLIGHTS

- The department was very active in preparing for the upcoming ABET visit during the Fall 2008. Part of the process involves completing a self-study report that outlines the outcomes assessment process, and details the continuous improvement of the CEE educational program.

- The department would like to thank Professor Fredrick Hart for his service to the CEE Department. Dr Hart served as Department Head for 12 years. During his tenure, the CEE department has experienced growth in its student body, funded research and laboratory renovations. We wish Dr Hart continued success as he returns from his sabbatical leave next year.

- Dr Mingjiang Tao joined the CEE Department in 2007. Dr. Tao’s research interest focuses on Geotechnical and Pavement engineering, and characterizing geo-materials through laboratory and field testing procedures. He teaches courses in Geology, Foundation Engineering, Geomechanics and Pavement Engineering. The department welcomes the addition of Dr Tao who obtained his Ph.D. from Casewestern Reserve University and worked for four years with the Louisiana Transportation Research Center prior to joining WPI.

- Lab renovations for the new impact mechanics lab, geotechnical and water resources lab were completed this year (Figure 1). The impact mechanics lab will host two large drop towers, one mini drop tower, two electro-mechanical testing machines and the future impact sled for vehicle impact and road side barrier studies. This lab will support Professor Ray’s research and teaching activities. A computer lab that hosts 6 computer servers is also housed in the impact lab. The renovated geotechnical lab and the water resources lab will be used for undergraduate laboratory teaching and projects. This should support Profs Mathisen, Tao and Mallick’s teaching and research activities. In addition, a common project and student activities area will be used for MQP projects and student activities such as the concrete canoe construction, steel bridge, and precast concrete beam contests sponsored by the ASCE student chapter.

Figure 1. The newly renovated Impact Testing and Transportation Safety Laboratory
- Additional renovations are underway for the main CEE department office, the student lounge, graduate student offices and two faculty offices. The goal is to improve the working environment and provide better services for students, faculty and staff.

- The Environmental Engineering Program is growing steadily. Current enrollment is approximately twenty students. The program director is Professor Jeannine Plummer of the CEE Department. Approximately 80% of the course offerings and MQP advising are provided by the CEE faculty and CEE Department.

- This year the CEE Department in collaboration with the Career Development Center (CDC) produced and distributed a resume booklet of the CEE senior class. About 85% of the 2008 CEE graduating class chose to submit their resumes for inclusion in the booklet. About eighty civil engineering companies received the booklet. This is the fifth consecutive year that the resume booklet has been produced and distributed.

- This year for the first time, the CEE Department in collaboration with the Career Development Center (CDC), hosted a pizza lunch information session for all seniors on September 18th. The purpose was to remind them of the MQP capstone design requirement (and to satisfy ABET requirements), CDC services and sponsored events such as the career fair, job search, graduate school, etc. Additional information on graduate studies at WPI was also offered.

- This year for the first time, the CEE Department embarked on a program to promote the BS/MS program to CEE Juniors.

- The faculty published 33 publications including textbooks, book chapters, journal articles and proceeding articles. A full list of publications is presented in Appendix. The two textbooks published this past year are:

Currently 5 faculty have authored or co-authored textbooks (Figure 2) including: Professors Pietroforte, Fitzgerald, Bergendahl, Mallick and El-Korchi.

<table>
<thead>
<tr>
<th>Pietroforte</th>
<th>Mallick and El-Korchi</th>
<th>Bergendahl</th>
<th>Fitzgerald</th>
</tr>
</thead>
</table>

Figure 2. Textbooks written by CEE faculty
• CEE faculty continue their support for the global studies program. The following faculty participated in the program.
  o Professor Ray - London C08
  o Professor Salazar – London D07, Melbourne D08
  o Professor El-Korchi – Costa Rica E2007, Morocco A2007, Morocco A2008, Director Morocco Project Center
  o Professor Hart – Edmonton Project Center Director 2008

• A video podcast was taped to showcase the department engaged in their educational activities.

UNDERGRADUATE PROGRAM

Enrollment and Degrees

Bachelor of Science in Civil Engineering was awarded May 17, 2008 to 68 students and a total of 75 graduating seniors for the year. This is the largest graduating class in the past ten years. Table 2 shows the continuing upward trend over the last ten years. This trend should continue based on renewed interest in infrastructure rehabilitation, sustainable development, green construction, and environmental sustainability. Table 3 shows enrollment numbers per class. It should be noted that our sophomore level classes for the last three years have been around 68-73 students. Traditionally, some of the non-declared majors have migrated into civil engineering.

The incoming class for Fall 2009 has **50 declared CE Major (this is 20 students larger than last year)**. We have a diverse incoming class with 35% of the students from outside of the New England area and international students from Jamaica, Pakistan, Tajikistan, Vietnam, and Peru.

Table 2. Historical Data For Degrees Granted in CEE (10 yrs)

<table>
<thead>
<tr>
<th>Degree</th>
<th>97-98</th>
<th>98-99</th>
<th>99-00</th>
<th>00-01</th>
<th>01-02</th>
<th>02-03</th>
<th>03-04</th>
<th>04-05</th>
<th>05-06</th>
<th>06-07</th>
<th>07-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS</td>
<td>74</td>
<td>51</td>
<td>52</td>
<td>40</td>
<td>44</td>
<td>38</td>
<td>41</td>
<td>45</td>
<td>63</td>
<td>56</td>
<td>75</td>
</tr>
<tr>
<td>MS</td>
<td>16</td>
<td>22</td>
<td>17</td>
<td>14</td>
<td>14</td>
<td>11</td>
<td>11</td>
<td>9</td>
<td>20</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3. CEE Enrollments for AY08

<table>
<thead>
<tr>
<th>Year</th>
<th>Freshmen</th>
<th>Sophomore</th>
<th>Junior</th>
<th>Senior</th>
<th>Total</th>
<th>Faculty</th>
<th>Ratio</th>
<th>BS Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>30</td>
<td>53</td>
<td>54</td>
<td>77</td>
<td>214</td>
<td>13</td>
<td>16.5</td>
<td>75</td>
</tr>
</tbody>
</table>
Projects

Project Presentation Day (PPD) for Academic Year 07-08 (AY 08) was held on Tuesday, April 18, 2008. A total of 25 presentations took place in Kaven Hall. This was the largest PPD in over five years. A total of 32 projects included 84 students with the majority completing a BS in Civil Engineering in AY08. A complete list of presenters is shown in the appendix.

Student Scholarships & Awards

The following awards were granted to meritorious CEE students as shown in Table 4.

Table 4. Awards Granted to CEE Students

<table>
<thead>
<tr>
<th>Award Name</th>
<th>Recipient</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Holt Memorial Award</td>
<td>Katharine Woodman</td>
<td>This award is presented to a civil engineering senior who has consistently earned academic honors and who shows excellent promise for success.</td>
</tr>
<tr>
<td>Salisbury Prize</td>
<td>Katherine Woodman</td>
<td>The Salisbury Prizes are to be awarded to highly meritorious members of the graduating class of Worcester Polytechnic Institute who have faithfully, industriously, and with distinguished attainment completed all requirements for the B.S. degree.</td>
</tr>
<tr>
<td>Carl F Meyer Improvement Award in Civil Engineering</td>
<td>Laura Rockett</td>
<td>Established by Professor Emeritus Meyer, this award is presented to the civil engineering senior who has demonstrated the most improvement in academic and professional attitude since entering the department.</td>
</tr>
<tr>
<td>CMAA Scholarship Award – Anthony Petrocchi ’09</td>
<td>Construction Management Association of America (CMAA) New England Region scholarship award of $2000 given to a highly qualified senior majoring in CEE.</td>
<td></td>
</tr>
<tr>
<td>Frank D DeFalco Award – Joseph Krasinskas</td>
<td>WPI undergraduate Civil Engineering student who has completed two and one half years towards a B.S., interested in career constructed facilities and a member of ASCE student chapter.</td>
<td></td>
</tr>
</tbody>
</table>
| Two Towers Prize Nominee - Krista Dietz                      | In keeping with the original purposes of the founders of the College, John Boynton and Ichabod Washburn, the Two Towers Prize is awarded to the student who, through general academic competence, campus leadership, regular course work, and special work in research and projects, best exemplifies a combined proficiency in the theoretical and practical which is at the heart of the WPI educational
tradition. This prize was given by Mildred M. Tyneson Petrie, the author of Two Towers, the centennial history of WPI.

Marietta E. Anderson Award – Krista Dietz, Established by Arvid E. Anderson ’20 in memory of his wife, this award is presented to the most outstanding first-year, sophomore, or junior woman student who not only has a superior academic record, but also has been a work-study student, a volunteer for college-sponsored activities, and participated in recognized extracurricular activities.

Salisbury Prize- Paul Moran & Katherine Woodman
*The Salisbury Prizes are to be awarded to highly meritorious members of the graduating class of Worcester Polytechnic Institute who have faithfully, industriously, and with distinguished attainment completed all requirements for the B.S. degree.*

(Photo: Professor Mathisen and Paul Moran)

Ellen Knott Award –

Andrea Hevey & Tiffany Luftkin

Gertrude R. Rugg Award - Linnea Palmer Paton, (is a Double Major 1st Environmental Policy & Develop 2nd CEE, Civil Engineering Class of ’11)
*This award, honoring WPI's late Registrar, is given to one or more outstanding first-year women students preparing for a career in engineering and science who have played a significant role at WPI.*

(Photo: Professor Plummer (Right) and Linnea Palmer Paton)
Outcomes Assessment & Program Improvement

In addition to completing a self-study report and preparing for the ABET visit next fall. The department has made the following program enhancements.

- Modification of the MQP evaluation form.
- Adoption of a New Experimental Course – CE 203X Software Applications in Civil Engineering
- Adoption of a New Course – ES 2800 Environmental Impacts of Engineering Decisions
- Adoption of a New Course – CE4600 Hazardous and Industrial Waste Management
- CEE Curriculum Reform
- MQPs in a Global Setting

As a reminder, the CEE PEOs and PMOs are presented below Table 5 and Table 6.

<table>
<thead>
<tr>
<th>Table 5. CEE Program Educational Objectives</th>
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<tbody>
<tr>
<td>1. A graduate should be able to apply the fundamental principles of mathematics, science, and civil and environmental engineering to analyze and design a component, process or system.</td>
</tr>
<tr>
<td>2. A graduate should have the interpersonal and communication skills, an understanding of ethical responsibility, and a professional attitude necessary for a successful engineering career.</td>
</tr>
<tr>
<td>3. A graduate should have the ability to engage in life-long learning.</td>
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<td>4. A graduate should have an appreciation for the interrelationships among basic knowledge, technology, and society.</td>
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Table 6. CEE Department Program Measured Outcomes

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<tbody>
<tr>
<td>1</td>
<td>Preparation for engineering practice, including the technical, professional, and ethical components.</td>
</tr>
<tr>
<td>2</td>
<td>Preparation for the future changes in civil engineering.</td>
</tr>
<tr>
<td>3</td>
<td>A solid understanding of the basic principles of civil engineering.</td>
</tr>
<tr>
<td>4</td>
<td>An understanding of appropriate scientific concepts, and an ability to apply them to civil engineering.</td>
</tr>
<tr>
<td>5</td>
<td>An understanding of the engineering design process and an ability to perform engineering design, which includes the multidisciplinary aspects of the engineering design process, the need for collaboration and communications skills, plus the importance of cost and time management.</td>
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<tr>
<td>6</td>
<td>Demonstration of ability to setup experiments, gather and analyze data, and apply the data to practical engineering problems.</td>
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<tr>
<td>7</td>
<td>Demonstration of in-depth understanding of at least one specialty within civil engineering.</td>
</tr>
<tr>
<td>8</td>
<td>Understanding of options for careers and further education, and the educational preparation necessary to pursue those options.</td>
</tr>
<tr>
<td>9</td>
<td>An ability to learn independently.</td>
</tr>
<tr>
<td>10</td>
<td>The broad education envisioned by the WPI Plan, and described by the Goal and Mission of WPI.</td>
</tr>
<tr>
<td>11</td>
<td>An understanding of civil engineering profession in a societal and global context.</td>
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MQP Form Revisions:

The last CEE MQP review was conducted in 2006. This past year, the MQP evaluation process and evaluation criteria were re-evaluated. Based on numerous discussions and a critical review the CEE faculty made the following changes to enhance the MQP assessment process, goals and expectations:

1. To make the evaluation process more rational, the scale in the MQP Review form (in Part IV) is proposed to be changed from 0-5 to 0-3, corresponding to not-relevant (0), nonexistent or inadequate (1), satisfactory (2), excellent (3), respectively.

2. A criterion for visual communication is proposed to be added in Part IV, as follows: Visual Communication: to be satisfied by the use of appropriate graphics to support text with a scale of 0-3. The use of tables, charts, images and drawings, as appropriate, will be used to assess this trait.

3. A criterion for using “CEE department specific current and state-of-the-art technological software/tools” is proposed to be added in Part IV (with a scale of 0-3). The technologies pertaining to this criterion will be different for different sub-disciplines. Based on a survey of CEE department advisory board members and the CEE faculty at WPI, a number of software/equipment/tools have been identified (note that, by no means, the list is exhaustive).
Software: AutoCAD, EQUIS, FAA Pavement Design Software, AUTOPLANT, FLUENT, Primavera, Expedition, Prolog, Mouse, Land Desk, Timberline, WaterCAD, Bentley, MWSOFT, Stone, Infoworks, Introduction to finite element programs, SewerCAD, Modflow, MathCad, Mathematica, LabView, software currently much used in the industry, such as GIS applications or Building Information Models, that integrate discrete information about and data of natural and built environment.

Tools/techniques:

Structures, Soils/Materials, Transportation: Equipment for materials testing (for example, concrete and steel), stress & strain measurement; Basic geotechnical lab testing equipment, Health & Safety personal protective equipment for confined entry, breathing zone monitoring, respirators, self-contained breathing apparatus (SCBA), noise monitoring, OSHA, ASTM and AASHTO standards where appropriate; soil gradation, compaction curves, proctor results, liquid/plastic limits, CBR (in-place and lab), pavement design testing (voids, asphalt content, compaction);

Environmental: pH, spectrophotometer, DO, jar testing, turbidity, some basics of gas chromatography and atomic adsorption.

4. A criterion for using “Non-CEE department specific current and state-of-the-art technological software/tools” is proposed to be added in Part IV (with a scale of 0-3). This criterion will assess the use of commonly used state of the art spreadsheets, statistical analysis, word processing and presentation software.

5. Realizing that, to promote high levels of performance with CEE-department specific current and state-of-the-art technological software/tools in the MQP, students should have the background knowledge in the respective software/tools before they begin their MQP, the CEE Department is starting the process of integrating a suite of software applications in their curriculum. (Some of this software was used in individual courses at the discretion of the instructor. Now we are formalizing the integration process). These include AutoCAD, Revit, Civil 3D, GoogleEarth, Primavera, ArcGIS, in addition to spreadsheet applications and presentation software (i.e. PowerPoint)

Discussions have considered including software applications within the following courses:

- CE1030- introduction to civil engineering & computer fundamentals (Civil 3D, AutoCAD, Revit) and (Spreadsheets, PowerPoint)
- CE3030 – Fundamentals of Civil Engineering AutoCAD (AutoCAD Design and Engineering Application, Revit, Civil 3D)
- CE3050 – Transportation Engineering (Civil 3D, GoogleEarth, GIS)
- CE 3020 - Project management (Primavera, Revit)
- CE 4061 – Hydrology – (ArcGIS)

Adoption of a New Experimental Course – CE 203X Software Applications in Civil Engineering
The CEE Department currently offers a course (CE3030) - *Fundamentals of Civil Engineering AutoCAD* with applications in civil engineering. Based on feedback from industry and our advisory board, there is a need to re-align our software course offerings with the needs and common practices in industry. The construction industry is in the early stages of a historic shift in the way that the design-build process of buildings and infrastructure projects are conducted. This is due to the advent of powerful parametric 3D object oriented software. With this technology, fundamental information needed for the coordination of a project’s design, construction and operation is captured in digital models at the time design objects are created. The advantages that are offered by this software to the industry provide strong premises to overcome the fragmented nature of the industry. As a result the industry is likely to see new emerging processes that replace the traditional separation of design, construction and facilities management.

In the coming year (Term A08), the CEE department will be offering a new experimental course, CE203X *Software Applications in Civil Engineering*. This course introduces Civil Engineering students to fundamental software applications in civil engineering. The course covers the principles of basic 3D software environments, object creation and manipulation, assemblies of objects, surface and terrain modeling, building modeling, geographic and building information databases. Emphasis is given to the adaptability of this software to changes in design and to the production of graphic design documentation. Application software such as AutoCAD, Civil 3D, Autodesk Revit will be used in this course.

Once this course has been tested and refined, the CEE department plans to replace the current CE3030 with the new software applications course, CE203X. In addition, other courses will be able to utilize this suite of software applications without consuming part of their 7 week term to teach some of the common startup modules. For example, CE3050-Introduction to Transportation Systems, uses AutoDesk Civil 3D for project work, CE3020 uses Autodesk Revit.

**Adoption of a New Course – ES 2800 Environmental Impacts of Engineering Decisions**

Based on feedback from Alumni and the CEE Advisory Board and demand from our students to offer more courses related to sustainability and “green engineering”, the CEE department has introduced a new course ES 2800 *Environmental Impacts of Engineering Decisions*. This course will introduce students to concepts that will make them aware of the ramifications of their engineering decisions, and is intended for engineering students of all disciplines. Specific topics the course will cover include: environmental issues, waste minimization, energy conservation, water conservation and reuse, regulations (OSHA, TSCA, RCRA, etc.), lifecycle assessment, risk assessment, sustainability, design for the environment, and environmental impact statements. Energy and mass balances will be applied to activities that impact the environment. This course was offered as an experimental course for 1 year.

**Adoption of a New Course – CE4600 Hazardous and Industrial Waste Management**

Based on feedback from Industry, Alumni and the CEE Advisory Board and a survey of other engineering schools and programs with environmental engineering, the CEE department has introduced a new course CE4600, *Hazardous and Industrial Waste Management*. This course will cover concepts and techniques for handling hazardous and industrial wastes. Regulations governing hazardous waste, water & soil remediation concepts, and the fundamentals of waste treatment processes will be discussed. Material in this course is not covered in any other undergraduate course at WPI. This course was offered
as an experimental course for 1 year.

**CEE Curriculum Reform**

The CEE Department was awarded an NSF grant (EEC-0431844) under the leadership of Professor Fred Hart (two years ago), to initiate a curriculum reform study. The objective of this project was to develop an implementation plan for curriculum reform that will

i) address needs of a more diverse student body;
ii) adopt sound pedagogical principles while implementing IT technologies for teaching engineering practices to accommodate changing learning styles for our current incoming students, appropriately called “digital natives”
iii) develop a CEE curriculum that addresses the aspirations of women and underrepresented minorities and;
iv) adopt curriculum reform based on WPI’s project based education with a global setting.

The plan recommends a total transformation of the delivery method using technology, speed and randomness in content delivery (based on current student’s learning styles), studio style teaching, and hands on discovery. A large number of the global projects currently conducted in WPI’s 24 global centers around the world have a Civil and Environmental Engineering theme. These projects would be ideal in their integration within CEE courses and projects. The final report has the detailed road map for curriculum reform, physical infrastructure transformation and associated cost and resources necessary for implementation.

**MQPs in a Global Setting**

Interlinking project topics with classroom experience is seen to be beneficial in a number of areas including:

- Helping students develop an improved understanding of course material.
- Introducing new technologies and capabilities for self-learning.
- Providing numerous opportunities for developing closer collaborations with the professional community.
- Supporting community service.
- Adopting sound pedagogical principles,
- Introducing emerging technologies related to civil engineering practice and research
- Providing a strategy that is sustainable and will foster future changes.
- Providing a manageable approach for linking fundamentals with advanced applications

Two projects were completed in 2006 in TCI
This past year, two project centers were being formalized, one in Edmonton, Alberta (Canada) and the other in Panama: Professor Hart established the Edmonton project center during his sabbatical year working for Stantec, Inc. and engineering services company. During B-term 2008, two projects will be conducted on site in Edmonton.

A second project center is currently being established in Panama. Professors Plummer and El-Korchi are organizing this effort with the assistance of the development office.

**Student Activities**

**Senior Banquet**

Members of the CEE Senior Class celebrated their academic achievements and upcoming graduation at the annual Senior Banquet held on April 24, 2008 at the Higgins House (Figure 3). Phil Holberton of The Holberton Group delivered the banquet speech, which focused on practicing and promoting leadership. Phil outlined the characteristics and practices of a successful leader in practical and humorous way. His keynote address provided living examples of leadership and challenged the audience to rise to a higher level of achievement. The senior class also prepared a skit in which members of the CEE faculty were portrayed as players on TV’s famous Jeopardy Game.

![Figure 3. Group photo during the senior banquet April 2008](image)

**BS/MS Recruitment Program**

The CEE Department, under the leadership of Professor Bergendahl started a campaign to promote the BS/MS program in CEE. This is modeled after the ME Department successful model. This started with an information session in March and targeted emails to qualified candidates. We will continue to target qualified candidates and inform them of the benefits of graduating with a MS degree and the good value in completing a graduate degree in five years. The objective is to increase graduate student enrollment and increase the number of students that complete a MS thesis option.

**Senior Resume Booklet**

This year the CEE Department in collaboration with the Career Development Center (CDC) produced and distributed a resume booklet of the CEE senior class. About 85% of the 2008 CEE graduating class chose to submit their resumes for inclusion in the booklet. About eighty civil engineering companies...
received the booklet. This is the fifth consecutive year that the resume booklet has been produced and distributed. Graduate students were also invited to participate this year.

**Senior Welcome and Information Session**

This year for the first time, the CEE Department in collaboration with the Career Development Center (CDC), hosted a pizza lunch information session for all seniors on September 18th. The purpose was to remind them of the MQP capstone design requirement (and to satisfy ABET requirements), FE Exam, CDC services and sponsored events such as the career fair, job search, graduate school, etc. Additional information on graduate studies at WPI was also offered.

**CEE Student Society Chapters**

**ASCE – American Society of Civil Engineers – Report submitted to CEE Department**

1. Officers for the academic year 2007-2008:

   President: Tracy Golinveaux  
   Vice President: Meghan Woods  
   Secretary: Eric Koethe  
   Treasurer: Nicole Maglione

Of the group, Eric was the only senior. Tracy, Meghan and Nicole were juniors.

- On November 5th, the Chapter hosted a presentation by Judith Nitsch and Jen LeBlanc from Nitsch Engineering. The following is the students’ description of the event:

"As a speaker this year the ASCE WPI chapter was able to get WPI alum Judy Nitsch to visit our school as a speaker. She is CEO of Nitsch Engineering a company which specializes in Site Development. She explained all the work which her company does as well tips for finding a job and ways to act professionally. The session was very interactive with prizes given out based on knowledge of the students. The presentation was well attended by ASCE members and was very successful. Another draw was the food which was provided to attendees."

- Fund raisers, including the Donut sale, were held in order to fund a new initiative in hosting study breaks. This program is outlined below:

"The ASCE WPI chapter launched a CE study session program this year; this is planned to be a quarterly event. Held in the lounge of our CE building this event is hosted by our chapter for all CE students. Finals are a very stressful time for many students, and in order to alleviate this stress we decided to host a CE study break. This event consisted of the chapter buying snacks and other consumables and inviting CE majors to eat and recharge during their hard studying. As a secondary objective we provide a place for CE students to congregate so that they can study together. Finally we hope this will be a great publicity event for the chapter, hopefully generating interest, encouraging people to join the ASCE. The event was well attended and we consider it a success."

- In past years, the student chapter has competed against other New England-area chapters in the annual steel beam and concrete canoe competitions. This year they investigated the "Big Beam"
design contest. The contest is sponsored by the Precast Concrete Institute (PCI) and supported by PCI producer members. It involves students in the design, construction, and testing of a concrete beam. The students were working with Unistress Corp. of Pittsfield, MA as their supporting PCI producer member. Here is their description of their activity:

"The WPI Chapter of the ASCE is attempting as a special project the Prestressed Concrete Institutes Big Beam Contest. This Contest involves the design in fabrication of an 18 foot long prestressed concrete beam. The beam is then subjected to a number of slated tests in which its performance is judged. There are stringent specifications which must be adhered too in both design construction and testing. Prizes are given to the Beams which are evaluated to have the most predictable stress resistant and failure. A team of approximately 8 WPI students are working towards entering a beam design in the contest with the help of supplier Unistress and we have high hopes for our team’s success."

- Currently, Tracy has been compiling summer internship information from CEE students. She plans to pull the information together to make it available to other students so that they can start to plan for positions for next summer during the academic year. (The completed brochure is provided in the Appendix)

Faculty Advisor: Prof. Leonard Albano

**Association of General Contractors Student Chapter**

The AGC student chapter has sponsored a number of professional speakers during this past year.

Faculty Advisor: Prof. Guillermo Salazar

**Chi Epsilon – Honor Society of Civil Engineers – Report submitted to CEE Department:**

- The 2007-2008 school year has been a successful year for the Worcester Polytechnic Institute Chapter of Chi Epsilon. On top of several new activities, we inducted seven new members in our fall initiation and eight new members in our spring initiation to bring our total chapter size to 28 active members. The officers for the second half of the year were Amanda Ruksznis, president; Jen Gilbert, secretary; Mary Kate Toomey, treasurer; Mike Richard, historian. Katie Nehmer was acting president for the first half of the year. Our newly elected officers for the 2008-2009 school year are Anthony Petrocchi, president; Justine Ziobron, vice president; Meghan Woods, secretary; Jen Himottu, treasurer and Nicole Maglione, historian.

- This year’s activities included assistance with the CEE open houses for prospective students, an open forum night, a chi epsilon academic advising initiative, and participation in the Chi Epsilon National Conclave. Chi Epsilon members assisted CEE Faculty with presentations for prospective students and their parents during a number of WPI “A Closer Look” events throughout the year. For these events, the students described their backgrounds and interests, and also helped answer questions.

- The open forum night was planned to provide an opportunity for all students in the civil engineering department to come and share their thoughts, opinions, praise and suggestions for the civil department. Pizza and drinks were served at the event. A summary report was then
prepared and presented to the department head, **Professor Tahar El-Korchi**, who then forwarded it on to the faculty. Changes and improvements are being considered and discussed.

- The academic advising initiative was also successful. Senior members of Chi Epsilon provided information and assistance to help students who had questions on academic planning. The Chi Epsilon members coordinated with the faculty to ensure the information and assistance was appropriate and accurate.

- This year, the Chi Epsilon National Conclave was held at the Stevens Institute of Technology in Hoboken, NJ. Jen Gilbert and Anthony Petrocchi attended the event, participating in a variety of activities while they were at the Conclave.

Faculty Advisor: Prof. Paul Mathisen

**GRADUATE PROGRAM**

**Degrees Awarded**

The CEE department awarded 23 MS and 1 Ph.D. degrees in 2008. The distribution of degrees per area is shown in Table 7.

<table>
<thead>
<tr>
<th>Area</th>
<th>Degree</th>
<th>Number of Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental</td>
<td>M.S.</td>
<td>10</td>
</tr>
<tr>
<td>Structural</td>
<td>M.S.</td>
<td>7</td>
</tr>
<tr>
<td>CPM/ ECM</td>
<td>M.S.</td>
<td>3</td>
</tr>
<tr>
<td>Highway/ GeoTech</td>
<td>M.S.</td>
<td>3</td>
</tr>
<tr>
<td>Impact Mechanics</td>
<td>Ph.D.</td>
<td>1</td>
</tr>
</tbody>
</table>

**Student Population**

The graduate student population has been holding steady over the past ten years (Table 8). The number of students enrolled in graduate courses has been increasing steadily over the last five years (Table 9).

<table>
<thead>
<tr>
<th>Category</th>
<th>97-98</th>
<th>98-99</th>
<th>99-00</th>
<th>00-01</th>
<th>01-02</th>
<th>02-03</th>
<th>03-04</th>
<th>04-05</th>
<th>05-06</th>
<th>06-07</th>
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<td>27</td>
<td>23</td>
<td>19</td>
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<td>17</td>
<td>21</td>
<td>19</td>
<td>26</td>
<td>25</td>
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<tr>
<td>Part Time</td>
<td>29</td>
<td>11</td>
<td>32</td>
<td>20</td>
<td>32</td>
<td>33</td>
<td>35</td>
<td>27</td>
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<td>Total</td>
<td>57</td>
<td>39</td>
<td>59</td>
<td>43</td>
<td>51</td>
<td>50</td>
<td>52</td>
<td>48</td>
<td>54</td>
<td>54</td>
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</tbody>
</table>
ADLN Program in ENV. ENG.

The ADLN program in Environmental Engineering continues to be successful in attracting new students through the ADLN program (Table 10). The ADLN program has been growing steadily and has generated over 1.2 million dollars since it started.

### Table 9. – Graduate Student Enrollments Trend

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Spring</td>
<td>52 59</td>
<td>116 113</td>
<td>98 124</td>
<td>120 73</td>
<td>103 120</td>
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<tr>
<td>courses</td>
<td>9 10</td>
<td>11 10</td>
<td>6 9</td>
<td>8 9</td>
<td>8 9</td>
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</tbody>
</table>

### Table 10. – Graduate Student Enrollments Trend in ADLN Courses

<table>
<thead>
<tr>
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<tr>
<td>Fall Spring</td>
<td>22 29</td>
<td>25 24</td>
<td>23 30</td>
<td>44 41</td>
<td>29 33</td>
</tr>
<tr>
<td>courses</td>
<td>2 2</td>
<td>2 2</td>
<td>2 2</td>
<td>2 2</td>
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### Table 11. – Revenue Generation Through the ADLN Program

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<tr>
<th>Semester</th>
<th>Revenue ($)</th>
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<tr>
<td>Spring 08</td>
<td>106,284.00</td>
</tr>
<tr>
<td>Fall 07</td>
<td>95,344.00</td>
</tr>
<tr>
<td>Spring 07</td>
<td>122,632.00</td>
</tr>
<tr>
<td>Fall 06</td>
<td>134,596.00</td>
</tr>
<tr>
<td>Spring 06</td>
<td>87,516.00</td>
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<tr>
<td>Fall 05</td>
<td>70,576.00</td>
</tr>
<tr>
<td>Spring 05</td>
<td>52,476.00</td>
</tr>
<tr>
<td>Fall 04</td>
<td>67,276.00</td>
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<tr>
<td></td>
<td></td>
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<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Spring 04</td>
<td>72,072.00</td>
</tr>
<tr>
<td>Fall 03</td>
<td>56,632.00</td>
</tr>
<tr>
<td>Spring 03</td>
<td>59,700.00</td>
</tr>
<tr>
<td>Fall 02</td>
<td>40,596.00</td>
</tr>
<tr>
<td>Spring 02</td>
<td>69,936.00</td>
</tr>
<tr>
<td>Fall 01</td>
<td>54,144.00</td>
</tr>
<tr>
<td>Spring 01</td>
<td>63,268.00</td>
</tr>
<tr>
<td>Fall 00</td>
<td>59,048.00</td>
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<tr>
<td>Total</td>
<td>$ 1,212,096.00</td>
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</table>

M.S. and Ph.D. Theses

A total of eight M.S. and Ph. D. theses were complete this past year. A complete list is provided in Table 12.

Table 12. – Completed MS/Ph.D. Theses in 2008

<table>
<thead>
<tr>
<th>Name</th>
<th>Thesis/Dissertation Title</th>
<th>Degree</th>
<th>Academic Advisor</th>
<th>Graduation Date</th>
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<tbody>
<tr>
<td>Name</td>
<td>Title</td>
<td>Degree</td>
<td>Advisor</td>
<td>Date</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------------------------------------------</td>
<td>---------</td>
<td>---------------</td>
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<tr>
<td>Prokop, Todd</td>
<td><em>Inactivation of E. coli in a Flow-through Sonication System</em></td>
<td>M.S. in Env. Eng.</td>
<td>Prof. Plummer</td>
<td>May 2008</td>
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<tr>
<td>Silvestri, Chiara</td>
<td><em>Development and Validation of a Knee-Thigh-Hip LSDYNA Model of a 50th Percentile Male</em></td>
<td>Ph.D. in CE</td>
<td>Prof. Ray</td>
<td>May 2008</td>
</tr>
</tbody>
</table>

**Nominations and Awards**

**Christine Conron** (M.S., CE, ’08) has been invited to lecture at AutoDesk University (AU) after her proposal entitled “Incorporation of AutoCAD Civil 3D & Revit into Higher Education” was accepted for a 90-minute lecture-style presentation at the Annual Conference in Las Vegas, NV. Conron’s lecture will focus on Civil engineering as an interdisciplinary industry with projects that require changes throughout design and construction. These changes generally have financial and schedule ramifications and classroom instruction is typically simplified due to time and other constraints thus discouraging educators from addressing the impacts of change. The introduction of object-oriented software early in the curriculum provides students and instructors a powerful tool to assist them with the dynamic nature of design in their education and apply
it throughout their college career. Dynamic civil modeling software, such as Civil 3D and parametric software such as Revit allow instructors to focus on teaching the concepts while equipping students with powerful tools to visually communicate their designs. In her session, Conron will explain how Worcester Polytechnic Institute is incorporating these tools into the curriculum to help students gain a better understanding of engineering concepts such as highway design, site design, and building construction.

The conference attracts more than 10,000 people annually and the organizers received more than 1400 submissions from nearly 700 individual presenters. [http://www.wtsinternational.org/default.aspx](http://www.wtsinternational.org/default.aspx)

**Chiara Silvestri** (Ph.D, CE, ’08) was nominated for the Ann Koby Legacy Scholarship by the Women in Transportation (WTS) Boston Chapter. Each year, the President’s Legacy Scholarship provides a $3,000 scholarship to a young woman pursuing a career in transportation.
FACULTY & STAFF

Tenured/Tenure Track Faculty

- Leonard D. Albano, Associate Professor, Ph.D. MIT, 1992. Structural Engineering
- John Bergendahl, Associate Professor, Ph.D., UCONN, 1999. Environmental Engineering
- Tahar El-Korchi, Professor, Ph.D University of New Hampshire, 1986, Structural, Transportation
- Frederick L. Hart, Professor of Civil & Environmental Engineering, Ph.D UCONN, 1974, Environmental Engineering
- P. Jayachandran, Associate Professor, Ph.D University of Wisconsin, 1975, Structures
- Paul P. Mathisen, Associate Professor, Ph.D MIT, 1993, Environmental Engineering
- Rajib Mallick, Associate Professor, Ph.D. Auburn University, 1997, Transportation, Asphalt Technologies
- James C. O’Shaughnessy, Professor, Ph.D Penn State, 1973, Environmental Engineering
- Roberto Pietroforte, Associate Professor, Ph.D MIT, 1992, Construction Project Management, Architecture
- Jeanine D. Plummer, Associate Professor, Ph.D UMASS, 1999, Environmental Engineering
- Malcolm Ray, Ralph H. White Family Distinguished Professor, Ph.D. Vanderbilt University, 1992, Transportation, Impact Mechanics
- Guillermo F. Salazar, Associate Professor, Ph.D MIT, 1983, Construction Project Management
- Mingjiang Tao, Assistant Professor, Case Western Reserve University, 2003, Geotechnical Engineering

Adjuncts - Undergraduate Program

- Jack Hall
- Leffie Malloy
- Suzanne LePage
- Mary Ellen Blunt
- Frank DeFalco
- Declan De Paor

Adjuncts - Graduate Program

- Brian O’Rourke
- Donald Wise
- Timothy Vadney
- William Kearney

Changes in the Faculty

Dr. Mingjiang Tao, Assistant Professor –

Prof. Tao joined the Faculty in August 2008 after an extensive search that brought interest from 65 individuals from around the globe. Dr. Mingjiang Tao joins WPI after working as a Research Associate at Louisiana Transportation Research Center. Dr. Tao’s research interest focuses on Geotechnical/Pavement engineering, especially in characterizing geo-materials through laboratory and field testing procedures, understanding the behavior of geo-materials from different perspectives and at
multi-scales, and modeling geo-material response under mechanical and environmental loading via various numerical techniques.

Education:

B.S. Civil/Hydraulic Engineering, Fuzhou University, P. R. China–1997

M.S. Geotechnical Engineering, Tongji University, P. R. China–2000

Ph.D. Geotechnical Engineering, Case Western Reserve University, Cleveland–2003

Visiting Faculty

Dr. Ali Atahan joined the CEE department in August of 2007 as a visiting research associate. He is collaborating with Prof. Malcolm Ray. Dr Atahan is an Associate Professor of Civil Engineering at Mustafa Kemal University, Hatay, Turkey.

Dr. Ali O. ATAHAN, received his Ph.D. degree from Texas A&M University in 2000. He promoted to Associate Professor degree in 2004. His research areas are: design and analysis of roadside safety hardware using highly sophisticated state-of-the-art finite element program LS-DYNA, structural evaluation of impact-contact problems and vehicle crashworthiness. Dr. Atahan has more than 30 research papers published in scholarly journals, conference proceedings and research reports. Since August 2007, Dr. Atahan has been working with Dr. Malcolm Ray at WPI on impact mechanics and computational simulation topics, such as knee-thigh-hip modeling and simulation, impact analysis of bridge rail retrofit, NCHRP Project 22-24 “Development of Verification and Validation Procedures for Computer Simulation use in Roadside Safety Applications” and cable barrier applications in Massachusetts. Based on his collaboration with Malcolm Ray, he has co-authored one journal paper and a conference proceeding.

Staff

Lajoie, Agata Admin Sec IV
Wychorski, Frances Admin Assistant VI
Daigneault, Dean Principal Lab Machinist
Pellegrino, Donald Lab Manager III

Don Pellegrino was promoted to Lab Manager III in July 2007 After 5 years of dedicated service to the Faculty and students in CEE, Mr. Pellegrino was promoted in recognition and support of his contribution to the education of future civil engineers.

SCHOLARSHIP & EXTERNAL SUPPORT
Publications

The CEE faculty published a total of 33 scholarly works, including papers, book chapters and textbooks. A complete list of publications is presented in the APPENDIX.

Sponsored Research

The CEE faculty secured $488,000 in new funding in the past year. This increases the current active grant total to over $1.2M for continued research in areas of public health and safety, road side safety system improvement, impact analysis, pavement analysis and wastewater treatment. Sponsored research has been received from institutions such as: National Science Foundation, National Highway and Traffic Safety Association, State of Maine Department of Transportation and National Institute of Health.

Proposals

The CEE faculty have submitted proposals totaling $2.8M this year. This is an increase of $1.2M over last year. A complete list of proposals is presented in APPENDIX.

Gift To CEE Department

Alumni contributed a total of $30,425.00 directly to the CEE Department. Additionally, there are several scholarships available for continued support of undergraduate studies. Scholarships include a gift of $50,000 from the George and Alice Rich Scholarship endowed fund, as well as the Judy Nitsch’s President’s Circle Scholarship. Funds are distributed through the Financial Aid Office to qualified CEE majors

RENOVATIONS

Laboratory renovations for the new impact mechanics lab, geotechnical and water resources lab were completed this year (Figure 4 and Figure 5).

The impact mechanics lab will host two large drop towers, one mini drop tower, two electro-mechanical testing machines and the future impact sled for vehicle impact and road side barrier studies. A computer lab that hosts 6 computer servers is also housed in the impact lab. This lab will support Professor Ray’s research activities.

The renovated geo-water resources lab will be used for undergraduate laboratory teaching, projects and research. The water-resources lab will support Professor Mathisen’s teaching and research activities. The Geo Lab will support teaching and research activities and will support some of Professor Tao’s activities.

In addition, a common project and student activities area will be used for MQP projects and student activities such as the concrete canoe construction, steel bridge, and precast concrete beam contests sponsored by the ASCE student chapter
Kaven Hall Renovations

Additional renovations are underway this summer. The CEE Department front office will be renovated to open up the space and enhance delivery of services. The student lounge will be repainted and new furniture will be installed along with personal mailboxes. The graduate student office will be repainted and new cubicals will be installed. Wireless internet will be provided. The TA inner room will be converted to a TA conference room for TA office hours.
FUTURE PLANS

The future for the CEE Department looks promising. Our undergraduate enrollment looks strong. The incoming freshman class is 20 students larger than in the past few years. Our sophomore level course population over the past three years has been averaging 70 students. We completed 32 MQPs involving 84 students last year. We expect this trend to continue as national and global interest focuses on solving problems related to sustainable development, infrastructure decay, renewable energy, resource conservation, low energy water and waste-water treatment, etc.

New Faculty Hire Requested

A new tenure track faculty position has been requested to meet the student growth in the CEE department. The new position will be in the constructed facilities and built environment area. This is in response to course and project needs in this area. The new hire should promote interdisciplinary scholarship in the structural-sustainable construction-built infrastructure area.

ABET Visit

The department looks forward to a successful ABET visitation this fall. This will involve preparing all course workbooks, reports and supporting documentation. In addition, a response to the ABET visitor’s exit report will also be required by the end of the year.

Facilities and Equipment Upgrade

Upgrades to the main office, student lounge, graduate student offices, and two faculty offices will be completed this fall. This should enhance the working space in Kaven Hall and make it a more inviting environment for our students and visitors.

A total upgrade of Kaven Hall is most desirable. A proposal to upgrade Kaven Hall was developed in 2005. The department is working with the development office and the advisory board on a strategic plan to achieve this. However, in the meantime, smaller scale renovations to faculty offices, computer labs and classrooms are needed. Room KH203 (currently a dated graduate computer lab) should be renovated to a studio style computer lab with meeting areas for small groups. Class rooms such as KH115 and KH204 need computer projection equipment.

The newly renovated geo-water lab will require upgrades in testing equipment. Additional testing equipment in the structures laboratory will require software upgrades.

Increase Funded Research and Revenue Generation

The department’s proposal output has increase by $1.2 million over last year. This is due to faculty seeking interdisciplinary and various partnering opportunities within and outside WPI. The challenge for the department and faculty, is to increase the number of fundable opportunities.

Revenue generation through the ADLN program has been a successful model for the department. Unfortunately, there is more competition in the ADLN space, and the department in collaboration with
corporate development, will need to enhance marketing strategies and corporate partnering to grow the program.

Adopting the ADLN model to other graduate programs such as the construction management area, or transportation is being explored.

Increasing funded undergraduate projects is a goal of the department. The department will need to increase its networking contacts through the advisory board, alumni, and

Increase fulltime graduate student enrollment and thesis participation. This is currently being done through promoting the BS/MS program, increasing the number of funded RAs and promoting current and new programs.
LIST OF APPENDICES

I - PUBLICATIONS
II – GRANTS
III - PROPOSALS
IV - FACULTY CONTRIBUTIONS
V - ADVISORY BOARD
VI - MQP PRESENTATIONS
APPENDIX I - PUBLICATIONS


Technology, Vol. 1, No. 2, pp. 72–75.


<table>
<thead>
<tr>
<th>Faculty</th>
<th>Co-PI</th>
<th>Grant</th>
<th>Start/End</th>
<th>Title</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bergendahl, J</td>
<td>Co-PI - Thompson, R (CHE)</td>
<td>NIH/Triton Systems</td>
<td>August 2006 - June 2008</td>
<td>The Removal of Disinfection Byproducts from Water</td>
<td>135,200.00</td>
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<td>Mallick, R</td>
<td></td>
<td>Maine DOT</td>
<td>April 2003 - July 2008</td>
<td>Development of Mix Design for 15 Foamed Asphalt Full Depth Reclamation Projects in Maine</td>
<td>49,173.00</td>
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<td></td>
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<td>Maine DOT</td>
<td>June 2005 - July 2008</td>
<td>Analysis of Pavement Response Data and Use of Nondestructive Testing for Improving Pavement Design and Adoption of Mechanistic-Empirical Pavement Design Procedure Using the Gilford Route 15 Instrumented Pavement Test Section</td>
<td>26,358.00</td>
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<td>Mallick, R</td>
<td>Tao, M</td>
<td>Maine DOT Sub</td>
<td>March 2008 - February 2010</td>
<td>A Study on Warm Mix Asphalt Pavement w/Recycled Asphalt Pavement: Lab Study &amp; Field Evaluation</td>
<td>88,372.00</td>
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<td>Plummer, J</td>
<td>Mallick, R</td>
<td>NSF</td>
<td>May 2004 - July 2008</td>
<td>REU Site</td>
<td>209,964.00</td>
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<td>Plummer, J</td>
<td>Harris Accoustics</td>
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<td>June 2007 - July 2008</td>
<td>Development of Acoustic Cavitation</td>
<td>10,125.00</td>
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<td>Establishment of a Center for Human Impact Protection Systems</td>
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<td>August 2000 - July 2008</td>
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<td>Amer Traffic Safety Assoc</td>
<td>September 2002 - July 2008</td>
<td>Guardrail Installation Level II</td>
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<td>Prime Sponsor</td>
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<tr>
<td>Sep-07</td>
<td>Mallick, R</td>
<td>Tao</td>
<td>REU: Motivating Talented Students, Women &amp; Underrepresented Minorities Through Summer Research Experiences in Transportation Engineering</td>
<td>NSF</td>
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<td>Sep-07</td>
<td>Plummer, J</td>
<td></td>
<td>Use of Synergistic Cavitation for Portable Wastewater Treatment Systems</td>
<td>Harris Acoustic Products Corp</td>
<td>Navy</td>
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<td>Sep-07</td>
<td>Ray, M</td>
<td></td>
<td>Development of Guidance for the Selection, Use and Maintenance of Cable Barrier Systems</td>
<td>Texas A &amp; M University</td>
<td>National Cooperative Highway Research Program</td>
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<td>Nov-07</td>
<td>Mallick, R</td>
<td>Warm Mix Asphalt Pavement (WMA) with Recycled Asphalt Prevention (RAP): Laboratory and Testing Study</td>
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<td>Nov-07</td>
<td>Tao, M.</td>
<td>Develop an Effective Modeling Procedure for Incorporating Particle Breakage of Granular Materials.</td>
<td>ACS</td>
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<td>Dec-07</td>
<td>Mallick, R</td>
<td>In-Place Response Mechanisms of Recycled Layers Due to Temperature and Moisture Variations</td>
<td>Univ. of New Hampshire</td>
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<td>Feb-08</td>
<td>Mallick, R</td>
<td>Warm Mix Asphalt Pavement (WMA) with Recycled Asphalt Pavement (RAP) Laboratory Testing and Field Study - Evaluation of Warm Mix Asphalt Recycled RAP vs Plant Mix Recycled Asphalt Pavement (PMRAP) Mixes</td>
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<td>Feb-08</td>
<td>Plummer, J</td>
<td>TT Virus: A Potential Indicator of Human Enteric Viruses in Source and Drinking Waters</td>
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<td>Electrokinetically Driven Flows through Swelling Clays</td>
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<td>Tao, M.</td>
<td>Developing a Combined Dynamic Cone Penetrometer-Time Domain Reflectometry for</td>
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<td>Mar-08</td>
<td>Tao, M.</td>
<td>An In-Depth Investigation of Molecular Level Interaction of Virgin and Aged Asphalt Binder with Thixotropic Wax (and Zeolite) for Maximization of Asphalt Material Recycling</td>
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<td>Apr-08</td>
<td>Plummer, J.</td>
<td>Improved Pathogen Risk Assessment Using Indicator Data &amp; Source Characteristics</td>
<td>University of Wisconsin Madison, DOA</td>
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<td>Apr-08</td>
<td>Plummer, J.</td>
<td>TT Virus: An Improved Indicator for Viral Pathogens in Source &amp; Drinking Waters</td>
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<td>May-08</td>
<td>Atahan, A</td>
<td>Development of Frontal Underride Guard for Heavy Trucks</td>
<td>Penn State Applied Research Lab, Metalsa S. De RL</td>
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<td>Mathisen, P.</td>
<td>Assessment of Nutrient Loads &amp; BMP Alternatives for Pepperell Pond</td>
<td>Nashua River Watershed Assoc, Mass DEP</td>
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<td>CCLI: Development of an Undergraduate course on Nondestructive Testing &amp; Evaluation of Civil Engineering Infrastructure</td>
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<td>Mallick, R.</td>
<td>Roadway Power Systems</td>
<td>Novotech, Inc NSF</td>
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APPENDIX IV - FACULTY CONTRIBUTIONS

Salazar:
• Chair of Academic Subcommittee, AGC BIMForum, 2007-2008 (www.bimforum.org)
• Chair of Education Program DBIA New England Region, 2007-2008
• Member of the Board of Directors AGC- Massachusetts, Fall 07, Spring 08
• Construction Project Management Program (CPM) Coordinator.
• WPI-DBIA Student Chapter, Faculty Advisor, with Prof. L. Albano. Spring07, Fall07, Spring08
• WPI-AGC Student Chapter, Faculty Advisor. Spring ’07, Fall ’07, Spring 08
• WPI-Christian Bible Fellowship, Faculty Advisor, Spring ’07, Fall ’07, Spring 08
• WPI-SHPE Student Chapter, Faculty Advisor, Spring ’07, Fall ’07, Spring 08
• Department Curriculum Assessment Committee, Fall 07, Spring 08
• WPI Committee on Advising and Student Life, Fall 07, Spring 08
• WPI Committee on Faculty Review Committee 07-08
• Member of the new WPI Residential Hall Planning Committee, Spring 07, Fall 07, Spring 08
• Member of the American Society of Civil Engineers:
  • Construction Research Council
  • Technical Council on Computing Information Technology
    o Education Committee (chair)
    o Intelligent Systems Committee
• Member of the:
  • Construction Industry Institute (Academic Member)
  • Society of Value Engineering
• Design Build Institute of America
  o Professional Designation Board member
  o Education and Research Committee
  o New England Region Education Committee (chair)
  o New England Region Webmaster
• Academic Subcommittee, AGC BIMForum (chair)
• Chair of Academic Subcommittee, AGC BIMForum, 2007-2008 (www.bimforum.org)
• Chair of Education Program DBIA New England Region, 2007-2008
• Member of the Board of Directors AGC- Massachusetts, Fall 07, Spring 08

Albano:
• WPI Selection Committee, Trustees Award for Outstanding Teaching.
• Search Committee, Director of Library Services.
• Faculty Advisor, ASCE Student Chapter.
• Curriculum Assessment Committee.

**Hart:**

• Sabbatical leave with Stantec Corp. Developed Continuing Educational Program for Stantec.
• Developed the MQP project center, sponsored by Stantec corporation. Two MQPs to be completed in Edmonton Alberta.

**Bergendahl:**

• Member, WPI’s Committee on Graduate Studies and Research, Fall 2007 – present.
• American Institute of Chemical Engineers, Environmental Division Programming Board, Technical Section Chair, Water
• CEE graduate studies coordinator

**Plummer:**

• Director, B.S. Program in Environmental Engineering, Worcester Polytechnic Institute
• Chair, Student Activities Committee of NEWWA (2007 – present)
• Chairman’s Award Committee (2007 – 2008)
• Chairman’s Award Committee (2007 – 2008)
• Committee on Tenure and Academic Freedom (2006 – 2007)

**Pietroforte:**

• *Visiting Professor*, “Business economics and organization”, Semester course, Department of Civil Engineering, Polytechnic of Bari (Italy), March-June, 2007.
• *Visiting Professor*, “An introduction to Advanced Project Management in the USA”, 9-hour Ph.D. seminar, Department of Civil Engineering, Polytechnic of Bari (Italy), May 16-17, 2007.
• *Invited Lecturer*, “The interfacing of design and construction: the case of Simmons Hall at MIT, School of Architecture, University of Palermo (Italy), April 20, 2007.
• *Cavaliere Ufficiale della Repubblica* (Officer Knight of the Republic of Italy). Rank to be bestowed on June 2008.
• ABET Alumni Survey Coordinator
• Kaven Hall Renovations Consultant.

**Ray:**
Chairman. Core Committee for Restoring the Lake Anasagunticook Dam, Joint Committee of the Town of Canton, Town of Hartford, Canton Water District, Lake Anasagunticook Lake Association and Millpond Association, Canton, Maine.

Tao:
Dept. faculty meeting secretary

Mallick:
- Curriculum Assessment Committee-ABET.
- MQP Assessment Criteria Development

El-Korchi:
- Expert Technical Group – TRB : LTPP Data Collection and Management
- Secretary – TRB Committee A2B06.
- Innovation at WPI – Workshop with Curt Carlson
- 

Mathisen:
- WPI CAO
- Chi Epsilon faculty advisor
- Freshmen Outreach Committee
- Open House Coordinator
- Steering Committee EVE Program
- Green Roof Water Quality Monitoring for New Residential Hall-WPI
# APPENDIX V - ADVISORY BOARD

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Title</th>
<th>Company/Institution</th>
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<tr>
<td>Allen</td>
<td>Richard</td>
<td>Member</td>
<td>Stantec, Inc.</td>
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<tr>
<td>Beverly</td>
<td>Bruce</td>
<td>Member</td>
<td>Haley &amp; Aldrich, Inc.</td>
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<td>Callahan</td>
<td>William</td>
<td>Emeritus</td>
<td>Jacobs Edwards &amp; Kelcey, Inc.</td>
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<td>Dawes Jr</td>
<td>Edmund</td>
<td>Resigned</td>
<td>WPI</td>
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<tr>
<td>El-Korchi</td>
<td>Tahar</td>
<td>Ex-Officio</td>
<td>University of Vermont</td>
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<td>Grasso</td>
<td>Domenico</td>
<td>Member</td>
<td>Harvey &amp; Tracy Associates, Inc</td>
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<td>Harvey</td>
<td>Francis</td>
<td>Emeritus</td>
<td>Metcalf &amp; Eddy Inc</td>
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<td>Johnson</td>
<td>Steven</td>
<td>Member</td>
<td>GZA GeoEnvironmental, Inc.</td>
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<td>Kwiatkowski</td>
<td>Terese</td>
<td>Member</td>
<td>Stone &amp; Webster, Inc</td>
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<td>Lucks</td>
<td>Stanley</td>
<td>Member</td>
<td>F W Madigan Company Inc</td>
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<td>Francis</td>
<td>Member</td>
<td>O'Connell Development Group Inc</td>
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<td>Francesca</td>
<td>Member</td>
<td>Executive Construction, Inc.</td>
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<td>Maquire</td>
<td>Daniel</td>
<td>Emeritus</td>
<td>Harvard University</td>
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<td>McDonough</td>
<td>Maureen</td>
<td>Emeritus</td>
<td>Cutler Associates, Inc</td>
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<td>Frederic</td>
<td>Emeritus</td>
<td>Saudconsult</td>
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<td>Shawaf</td>
<td>Tarek</td>
<td>Emeritus</td>
<td>Siemens</td>
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<td>Sorgini</td>
<td>Lisa</td>
<td>Member</td>
<td>Camp Dresser &amp; McKee Inc</td>
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<td>Tunnicliffe</td>
<td>Peter</td>
<td>Chair</td>
<td>Senior VP</td>
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<tr>
<td>Wild</td>
<td>Philip</td>
<td>Emeritus</td>
<td>Consultant</td>
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APPENDIX VI – MQP PRESENTATIONS

Lake Anasagunticook Dam Restoration

Celeste Fay & William Fay
Advisor: P. Mathisen
Co-advisor: M. Ray & M. Tao

Water Quality Improvement for Pepperell Pond

Jonathan Carelli, Christopher Luppino,
Daniel LaFrance & Kristen Ostermann
Advisor: P. Mathisen

Wastewater Effluent Disposal Alternatives for Mashpee MA

Allison Vasallo, Paul Moran & Alexander Dismore
Advisor: P. Mathisen

Bench Scale Wastewater Treatment System

Nicholas Erickson, John Kanis,
Jason Mello & Nicholas Wilbur
Advisor: J. Bergendahl
Manganese Sequestration in Drinking Water with Polyphosphate

Jessica Coelho, Aaron Ting & Katrina Kucher

Advisor: J. Bergendahl

Removal of Lead from Water Using Ionic Liquid

Rachel Patenaude, Arly Dungca & Andrea Hevey

Advisor: J. Bergendahl

Adaptive Reuse Plan for the Worcester County Courthouse

Courtney Rheault, Chelsea Bierkan & Katherine Woodman

Advisor: L. Albano

Design of a Graduate Housing Complex at Gateway Park Future Laboratory Facilities

Mary Kate Toomey, Michael Richard & Joseph Frascotti

Advisor: L. Albano
Redesigning Stoddard Residence Hall

Amanda Ruksznis & Cameron Dunaj

Advisor: L. Albano

Residence Hall Construction

Michael Belsky, Matthew Desjardin & Hallie Schiess

Advisor: L. Albano

Structural and Fire Analysis of the Wachusett Building

Adam Tracy, Kathleen Nehmer & Mathew Fuhrmeister

Advisor: L. Albano

Industrial Building Design

Patrick Kelly

Advisor: J. Jayachandran

Sponsor: Millyard Industrial Properties
Design of Sackett Harbor Bridge

Adam Duczynski, Natalie Velazquez & Christopher O’Hara

Advisor: T. El-Korchi

Sackett Harbor Bridge

Tiffany Lufkin, Kevin Barker & Roderick Taylor

Advisor: T. El-Korchi

Design of New Residence Hall

Kenneth Dawe, Kyle Kappmeyer & Eric Koethe

Advisor: T. El-Korchi

Hilti Anchor Study

Keith Coleman & Cory Figliolini

Advisor: T. El-Korchi
Energy from Asphalt Pavement

Laura Rockett

Advisor: R. Mallick

Pavement Analysis and Design

Ryan Trunko, Jennifer Gilbert & Derek Caldwell

Advisor: R. Mallick

Stantec Office Sustainability Assessment Tool

Cheryl Kocsis

Advisor: F. Hart

Sponsor: Stantec

Residence Hall Structural Design & Construction

Jacob Forsaith, Brandon Finzel & Michael Ball

Advisor: G. Salazar

Co-Advisor: L. Albano
New Residence Hall Design and Construction

Christopher Andrews, Ryan Bourque, Jacob Russell & Lee Pappas

Advisor: G. Salazar
Co-Advisor: P. Jayachandran & M. Tao

New Residence Hall Design Construction and BIM Modeling

James Bellofato, Kyle Forward, Matthew Frasier & Michael Wood

Advisor: G. Salazar
Co-Advisor: P. Jayachandran

UMass Advanced Center for Clinical Education and Science Design

John Hehir, Orry Cummings, Nicholas Ambrosino & Michael Chachakis

Advisor: G. Salazar
Co-Advisor: P. Jayachandran
Sponsor: Consigli
Union Station Parking Garage LEED’s Analysis

Mark Filomeno, Jamie Levensler
Eric Grygorcewicz & Seth Baker

Advisor: G. Salazar
Co-Advisor: P. Jayachandran