

MEMORANDUM OF UNDERSTANDING

between

Faculty of Engineering of the University of Pisa - Pisa, Italy

and

**Civil, Construction and Environmental Engineering Department
College of Engineering - Iowa State University of Science and Technology
Ames, Iowa, U.S.A.**

1° RAPPORTO VISITA - anno 2009 1st TRIP REPORT - year 2009

– 17th April, 2009 –



Nell'ambito dell'accordo internazionale siglato col Memorandum of Understanding tra l'Università di Pisa e la Iowa State University (Allegato 1) nel mesedi Aprile del corrente anno si sono svolte le seguenti attività:

- 1) Il Prof. Souleyrette ha organizzato la visita del Prof. Pratelli presso la Iowa State University nel periodo 4-9 aprile 2009. Il Prof. Souleyrette ha lavorato in collaborazione con l'ing. Tim Simodynes dello Iowa Department of Transportation per organizzare un workshop allo Iowa Department of Transportation, con circa una trentina di partecipanti tra ingegneri del traffico e progettisti di strade, specialisti di ambiente e paesaggio ed esperti di sicurezza stradale. Il Prof. Souleyrette ha anche organizzato un seminario del Prof. Pratelli da tenersi alla Transportation Students Association of Iowa State University, così come delle lezioni per gli studenti dei corsi di Highway Design, CE 453 (Dr. Tom Stout) e di Highway Safety, CE 552 (Prof. Souleyrette). Il Prof. Souleyrette ha inoltre provveduto alla sistemazione in albergo ed agli spostamenti del Prof. Pratelli.
- 2) Il Prof. Pratelli ha preparato tre presentazioni ed altrettanti poster per il workshop, il seminario e le due lezioni di cui sopra tenute ad Ames. Le presentazioni del Prof. Pratelli hanno avuto per titolo:
 - a. "MODERN ROUNDABOUTS: introduction and perspectives from practice" (workshop venue at the Iowa DOT);
 - b. "DESIGN OF MODERN ROUNDABOUTS IN URBAN TRAFFIC SYSTEMS" (lecture in class of Highway Design, CE 453 - Dr. Tom Stout);
 - c. "IMPROVING ROAD SAFETY AND OPERATIONS OF URBAN ARTERIALS: The study-case of Viale Ariosto in Sesto Fiorentino, Florence (Italy)" (lecture in class of Highway Safety, CE 552– Prof. Reginald Souleyrette).

Mentre i tre poster presentati e discussi nel workshop presso la Transportation Students Association of Iowa State University avevano i seguenti titoli:

- a) "EFFICIENT ARTERIAL MOVEMENT ARRANGEMENTS TO REMOVE A MULTIPHASED SIGNAL IN LUCCA (Tuscany, Italy)";
- b) "MODERN ROUNDABOUTS AND HISTORICAL TOWNS: THE AREA OF PORTA S.ANNA IN LUCCA (Italy)";
- c) "THE ROUNDABOUTS OF ARTS IN PIETRASANTA".

3) Visita ad Ames:

- Il prof. Pratelli arriva ad Ames il 4 di aprile, dopo che il Prof. Souleyrette è andato a prenderlo all'aeroporto di Des Moines, e si sistema al Montebello B&B. Il proprietario, Jaime Reyes, è un ingegnere in pensione dello Iowa DOT e ciò è interessante per scambi di pareri e notizie pratiche.
- Per domenica 5 aprile il Prof. Souleyrette aveva programmato una visita a Minneapolis al Minneapolis/St. Paul Minnesota metro traffic control operations center RTMC con la partecipazione di Brad Estochen e Jim Kranig del Minnesota Department of Transportation. Il programma prevedeva inoltre l'incontro col Prof. Tom Maze. Sfortunatamente, tutto ciò non si è potuto svolgere a causa di una tempesta di neve che ha investito lo Iowa ed è durata per l'intera giornata. Il Prof. Pratelli ha potuto comunque percorrere in auto alcuni tratti della rete autostradale, apprezzandone le soluzioni funzionali.
- *Lunedì 6 aprile.* Il Prof. Pratelli ha tenuto un workshop allo Iowa Dept. of Transportation di fronte ad un gruppo di ingegneri del traffico, progettisti di strade ed esperti di sicurezza stradale. Essi hanno apprezzato molto la trattazione e le spiegazioni date sulle rotatorie sulla base dell'esperienza del Professor Pratelli in Italia ed in Europa. In particolare, sono risultati interessanti le perti dedicate alle rotatorie concepite come parte del sistema traffico, oltre alla percezione delle rotatorie da parte dei conducenti non ancora abituati ad esse.
- Il Prof. Pratelli ha tenuto una lezione sulle politiche dei trasporti degli Stati Membri della Comunità Europea agli studenti del corso di European Politics della Prof.ssa Ellen Pirro. Alla lezione è seguita una vivace ed interessante discussione con i 30 studenti presenti in aula.
- Professor Pratelli conclude la giornata con una una cena informale con conferenza agli studenti della Iowa State Transportation Students Association. Partecipano 15-20 laureandi e laureate di primo livello ed altri membri della Facoltà, tra cui la Professoressa Nadia Gkritza ed il Professor Ed Kannel. Tema della conferenza è la presentazione e la discussione dei poster sul progetto, la sicurezza e l'arredo delle rotatorie.
- *Martedì 7 aprile.* Il Professor Souleyrette ha accompagnato il Prof. Pratelli in una visita dello Iowa State Campus. Il prof. Pratelli è stato così presentato al Direttore del Dipartimento CCEE Prof. James Alleman ed al Preside del College of Engineering, Prof. James Bernard. Il Preside Bernard è un esperto di dinamica dei veicoli ed ha avuto una interessante discussion ecol Prof. Pratelli sul nuovo Scooter a tre ruote MP3 prodotto dalla Piaggio.
- Professor Pratelli ha incontrato gli studenti del gruppo di studio "Mid-west simulation" guidato dalla Professoressa e che fanno parte dell'Italian team. Questi studenti devono sviluppare delle esercitazioni su argomenti di studio in certe aree del mondo che interessano la politica statunitense. Il Professor Pratelli ha parlato con loro e ha avuto una interessante discussione sugli indirizzi delle politiche Comunitarie nel settore dei trasporti.
- *Mercoledì 8 aprile.* Il Professor Pratelli ha tenuto una sulle rotatorie agli studenti del corso di Highway Design (CE453) del Dr. Tom Stout. Nel corso della lezione sono stati spiegati aspetti di progettazione, capacità e di compatibilità ambientale delle rotatorie. Alla lezione hanno partecipato circa 50 studenti del IV anno (laurea specialistica) di ingegneria civile.
- Nel primo pomeriggio si è lavorato ad una pubblicazione congiunta sulla sicurezza delle rotatorie.
- A seguire, il Professor Pratelli ha tenuto una lezione di 3 ore sulle rotatorie agli studenti del corso di Highway Safety (CE552) del Prof. Reg Souleyrette. È stato presentato, come caso esempio, un dei progetti realizzati dal Prof. Pratelli per la ristrutturazione viaria di una arteria urbana, ovvero il Viale Ariosto a Sesto F.no. Erano presenti 4 studenti della specialistica (IV anno) e 7 studenti della triennale (MS students) di ingegneria civile.
- Per cena, il Professor Pratelli è stato invitato a casa del Professor Shashi Nambisan, Direttore del CTRE, e dove ha potuto conoscere il Professor Satya Kalidindi dell'Indian Institute of Technology di

Madras. La cena è stata una importante occasione per discutere delle possibilità offerte dallo sviluppo di accordi internazionali tra università e gruppi di ricerca.

- *Giovedì 9 aprile.* Pratelli e Souleyrette hanno lavorato alla programmazione delle loro future attività, tra cui:
 - i. la possibilità di tradurre in inglese il libro del Prof. Pratelli sull'Ingegneria dei Sistemi di Trasporto, ovviamente ampliandolo con ulteriori capitoli. Per questi ultimi si pensa ai sistemi GIS, alla logistica, ad elementi di file d'attesa, oltre ad una appendice sul metodo della *simulated annealing*; abbiamo anche intenzione di migliorare il capitolo sulla matrice OD stima aggiungendo una sezione relativa alle intersezioni, utilizzando i metodi NCHRP Rep. n.255 e quello "euristico 2001" di Pratelli, con un esempio numerico. Il prof. Souleyrette produrrà a sua volta un altro esempio numerico.
 - ii. la possibilità di sviluppare un nuovo modello di domanda di trasporto basato su un approccio multistep che comprenda la random utility maximization, la prospect theory ed il comportamento puramente casuale;
 - iii. la messa a punto le linee principali della presentazione della loro memoria alla International Conference Urban Transport 2009 del giugno prossimo a Bologna.
- *Venerdì 9 aprile.* Il Prof. Pratelli è stato accompagnato dal Prof. Souleyrette all'Aeroporto di Des Moines da dove è ripartito per Pisa, passando prima per New York.



In the spirit of the MOU signed by Iowa State University and the University of Pisa (see Attachment 1), the following activity in research and teaching has taken place:

- 1) Prof. Souleyrette arranged for hosting Professor Pratelli in Iowa April 4-9, 2009. Prof. Souleyrette worked with Engineer Tim Simodynes of the Iowa Department of Transportation to arrange a workshop venue at the Iowa DOT, with approximately 30 design, landscape and highway safety engineers. Prof. Souleyrette also arranged for a presentation of Prof. Pratelli to the Transportation Students Association of Iowa State University, as well as guest lectures in classes of Highway Design, CE 453 (Dr. Tom Stout), and Prof. Souleyrette's Highway Safety class, CE 552. It was Prof. Souleyrette's pleasure to also arrange for local accommodations, entertainment and transportation for Prof. Pratelli.
- 2) Professor Pratelli prepared three presentations and three posters for the workshops and lectures in Ames. The titles of Professor Pratelli's presentations are:
 - a. "MODERN ROUNDABOUTS: INTRODUCTION AND PERSPECTIVES FROM PRACTICE" (workshop venue at the Iowa DOT);
 - b. "DESIGN OF MODERN ROUNDABOUTS IN URBAN TRAFFIC SYSTEMS" (lecture in class of Highway Design, CE 453 - Dr. Tom Stout);
 - c. "IMPROVING ROAD SAFETY AND OPERATIONS OF URBAN ARTERIALS: THE STUDY-CASE OF VIALE ARIOSTO IN SESTO FIORENTINO, FLORENCE (ITALY)" (lecture in class of Highway Safety, CE 552– Prof. Reginald Souleyrette).

While the titles of the posters are:

- a. "EFFICIENT ARTERIAL MOVEMENT ARRANGEMENTS TO REMOVE A MULTIPHASED SIGNAL IN LUCCA (Tuscany, Italy)";
 - b. "MODERN ROUNDABOUTS AND HISTORICAL TOWNS: THE AREA OF PORTA S.ANNA IN LUCCA (Italy)";
 - c. "THE ROUNDABOUTS OF ARTS IN PIETRASANTA".
- 3) Visit to Ames, April 2009:
 - Professor Pratelli first arrived in Ames on Saturday April 4. Professor Souleyrette picked up Professor Pratelli at the Des Moines International airport. Prof. Souleyrette introduced Professor Pratelli to Jaime and Daphne Reyes, innkeepers and host of Professor Pratelli at the Montebello

B&B in Ames. Mr. Reyes is retired safety engineer from the Iowa DOT, and this provided Prof. Pratelli with a unique accommodation experience.

- Professor Souleyrette arranged for a Sunday visit to the Minneapolis/St. Paul Minnesota metro traffic control operations center RTMC with Brad Estochen and Jim Kranig of the Minnesota Department of Transportation. He also arranged for a visit to the home of Professor and Mrs. Tom Maze in St. Paul. Unfortunately, a late season blizzard forced Professors Souleyrette and Pratelli to turn back and abort the trip. It turned out the Interstate had to be shut down due to many crashes later that morning in any case. Professor Pratelli enjoyed the experience of driving through a blizzard on an American Interstate and made many comments about highway geometry in the US.
- On Monday, Professor Pratelli gave a workshop to a group of design, traffic and safety engineers at the Iowa Dept. of Transportation. They enjoyed hearing about roundabouts as part of the overall transportation system, Professor Pratelli's experience in Italy and in Europe, and especially issues faced by organizations and the public when they are not accustomed to roundabouts.
- Professor Pratelli gave an impromptu guest lecture to Professor Ellen Pirro's European Politics class, covering logistics and international relations in the European Community. The lecture to over 30 students was well received and accompanied by a lively discussion.
- Professor Pratelli gave an after dinner presentation to the Iowa State Transportation Students Association. Approximately 15-20 undergraduate and graduate students and some faculty members were in attendance, including Professor Nadia Gkritza and Professor Ed Kannel. The topic was on the aesthetics design of roundabouts.
- On Tuesday, Professor Souleyrette gave a tour of the Iowa State Campus to Professor Pratelli.
- Introductory meetings were held with Chair of CCEE James Alleman and Dean of the College of Engineering, James Bernard. Dean Bernard is an expert on vehicle dynamics and was particularly interested in Professor Pratelli's new Piaggio MP3 3-wheeled scooter.
- Professor Pratelli met with Professor Pirro's "Mid-west simulation" bound students who compose the Italian team. These students write/create directives in certain areas that are consistent with national objectives. While agriculture is emphasized, the topics are general. The students asked about current feeling about the EU in Italy, groups which favor or oppose the EU, the major goals of Italy within the EU, and areas where Italy is opposing the EU's activities/directives/possible programs e/g/ the single license or the current safety objectives. Professor Pratelli was asked what he would put on the EU agenda if he could, specifically about transportation.
- On Wednesday, Professor Pratelli had breakfast at the Montebello with Prof Shashi Nambisan (Director, inTrans (formerly CTRE)) and Prof Satya Kalidindi (visiting prof from IIT Madras).
- Professor Pratelli gave a guest lecture on roundabouts to the CE453 Highway Design class (Dr. Tom Stout). The focus was on design/capacity/traffic/environmental issues. The class consisted of about 50 senior (4th year) undergraduate civil engineering students.
- An afternoon session was spent discussing papers on highway safety.
- Professor Pratelli provided a 3 hour guest lecture on roundabouts to the CE552 Highway Safety class (Prof. Reg Souleyrette). Focus was on safety issues and corridor redesign. The class had 4 senior (4th year) undergraduate civil engineering students and 7 graduate (MS) students.
- Professor Pratelli enjoyed a dinner at the home of Professor and Mrs. Nambisan and home cooked Indian specialties. Professor Kalidindi was also in attendance. This provided an opportunity to discuss the benefits of international university cooperation.
- On Thursday, Professors Pratelli and Souleyrette worked on planning for a revised edition (in English) of Professor Pratelli's textbook on Transportation Networks and Systems as well as ideas for papers.
 - i. For the book, we propose translation into English and the addition of several new chapters, possibly including GIS, logistics, queuing, and an appendix on the simulated annealing method. We also intend to improve the chapter on OD matrix estimation by adding a section related to intersections, using NCHRP report 255 and Professor Pratelli's "heuristic for o/d roundabout matrix" tutorial with a numerical example. Professor Souleyrette will also provide an example.

- ii. For a paper, we propose to investigate simultaneous application of heterogeneous assignment methods, possibly to include random utility maximization, prospect theory, stochastic, deterministic, and random methods. As not all transportation system users have the same objective functions, it seems logical not to try and model them as if they did. Further work across modes, or specific to modes is a possible extension.
 - iii. We also plan to prepare a presentation for our paper that will be presented by Prof Pratelli in Bologna in June 2009.
- After an American Italian meal and coffee, Prof Souleyrette dropped Prof Pratelli at a Des Moines airport hotel in preparation for his return to Pisa via a stop in New York.

. . . - + * ° * + - . . .

Professor Reginald Souleyrette

Prof. Ing. Antonio Pratelli

MEMORANDUM OF UNDERSTANDING
between
Faculty of Engineering of the University of Pisa
Pisa, Italy
and
Civil, Construction and Environmental Engineering Department
College of Engineering
Iowa State University of Science and Technology
Ames, Iowa, U.S.A.

This Memorandum of Understanding between the Faculty of Engineering of the University of Pisa, Pisa, Italy and the Civil, Construction and Environmental Engineering Department, College of Engineering, Iowa State University, Ames, Iowa, USA, signifies mutual interest in the development of joint educational and research projects. Where financially feasible and consistent with the policies of the Board of Regents of the State of Iowa, and all other governing legislation, the parties agree to pursue mutual interest in the following types of activities:

- *Long-term and short-term exchanges of faculty and staff:* Sabbaticals, faculty improvement leaves, visiting professorships, research collaboration, and other activities in areas of mutual interest and expertise are contemplated.
- *Programs relating to research, teaching, and/or outreach:* These programs may encompass any discipline to the extent that suitable counterparts exist at the other institution.
- *Exchange of students at the graduate level:* Students who meet regular admissions requirements of the host institution may be admitted to academic programs. The term(s) of attendance and course of study will be determined individually for each student by the two institutions.

Prior to finalizing individual visits, projects, or exchanges, representatives at both institutions shall prepare any appropriate plans (program or financial) and secure approvals from the appropriate university administrative officers, including the department head and the Dean at the College of Engineering at Iowa State University and the Dean of the Faculty of Engineering at the University of Pisa. It is understood that neither party assumes any financial obligation as a result of this Memorandum of Understanding, but that financial arrangements will be negotiated separately as needed and will depend upon the availability of funds.

The signatures of the institutional representatives affixed below signify the interest of both parties in promoting mutual friendship and cooperation. This understanding will remain in effect until one party notifies the other of its wish to terminate the agreement.

Iowa State University

University of Pisa

Elizabeth Hoffman 7/12/07
 Professor Elizabeth Hoffman Date
 Executive Vice President and Provost

Mark J. Kushner 7/11/07
 Professor Mark J. Kushner Date
 Dean of Engineering
 College of Engineering

James J. Alleman 7/3/07
 Professor James Alleman Date
 Chair, Civil, Construction & Environmental Engineering Dept.

Reginald Souleyrette 02/01/07
 Professor Reginald Souleyrette Date
 Civil, Construction & Environmental Engineering Dept.

Julia Apple-Smith 7-9-07
 Julia Apple-Smith Date
 Director, Engineering International Programs

Marco Pasquali
 Professor Marco Pasquali Date
 Rector

Emilio Vitale
 Prof. Emilio Vitale Date
 Dean of Faculty of Engineering

Massimo Dringoli
 Prof. Massimo Dringoli Date
 Director, Civil Engineering Dept.

Antonio Pratelli 20.05.07
 Prof. Antonio Pratelli Date
 Civil Engineering Department

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

College of Engineering
Department of Civil, Construction
and Environmental Engineering
Ames, Iowa 50011-3232
Phone 515 294-3892
FAX 515 294-8216

July 18, 2008

Prof. Ing. Antonio PRATELLI
Dipartimento di Ingegneria Civile "Vie e Trasporti"
Facoltà di Ingegneria – Università di Pisa
Via Diotisalvi, 2 – 56126 PISA

Re: Visiting Professor Invitation

Dear Professor Prатели:

In my capacity as Gerald and Audrey Olson Professor of Civil Engineering and Associate Director of the Center for Transportation Research and Education, I am pleased to invite you to Iowa State University to visit our faculty and meet with our research staff.

During your visit, I invite you to give a short course on "Roundabout design and practice in Europe" to my students and other interested faculty and staff, as well as interested staff from the Iowa Department of Engineering. I have also invited Dr. Gene Russell of Kansas State University to meet with you and attend your workshop. While you are in Iowa, I also invite you to make guest lectures to our regular semester classes in highway design (Dr. Tom Stout) and transportation engineering (Dr. Nadia Gkritza).

This invitation as visiting professor is pursuant to the existing Memorandum of Understanding between the Faculty of Engineering of the University of Pisa and the Civil, Construction and Environmental Engineering Department, College of Engineering, Iowa State University. As you are aware, the MOU signifies mutual interest in the development of joint educational and research projects. As we have discussed, your visit will be for the period from August 31, to September 6, 2008. All local travel, food and hotel expenses in Ames will be charged to my sources of funds.

Sincerely yours,



Reginald R. Souleyrette, PhD, PE
Gerald and Audrey Olson Professor and Associate Chair

Cc: James E. Alleman, Chair, Civil, Construction and Environmental Engineering
Mark J. Kushner, Dean, College of Engineering
Julia Apple-Smith, Director, College of Engineering International Programs
Shashi Nambisan, Professor and Director of CTRE
Sandra Q. Larson, Director of Research, Iowa Department of Transportation
Tim Simodynes, Office of Traffic and Safety, Iowa Department of Transportation
Tom Stout, Lecturer in Civil Engineering
Nadia Gkritza, Assistant Professor of Civil Engineering
Shauna Hallmark, Associate Professor of Civil Engineering
Tom Maze, Professor of Civil Engineering
Gene Russell, Professor of Civil Engineering, Kansas State University
Hillary Isebrands, Candidate in Philosophy, Iowa State University

Transportation Student Association



General Meeting

Presenter:

Professor Antonio Pratelli



University of Pisa



Subject: Roundabouts

Monday, April 6th, 2009

Room 178 Town Engineering

Food at 6:00pm

Speaker at 6:30pm