

CALIFORNIA POLYTECHNIC STATE UNIVERSITY  
Civil and Environmental Engineering  
**CE 523: Transportation Planning**  
**Winter 2004**

E. C. Sullivan (04-07, 756-1166, esulliva@calpoly.edu)  
Office Hours: Tu 1-3:30, W 11:30-12:30 & 1-2:30. Also by appointment.

**Course Objectives:** To learn the theoretical concepts and applied methods of transportation planning, focusing on transportation network modeling and estimation of travel demand. The course covers theory and hands-on experience in the following areas:

- organizing and managing an analytical transportation study
- data sources for transportation planning
- developing road and transit network models
- design and conduct of travel surveys
- calibration and estimation using demand models
- computer applications in transportation planning

**Course Approach:** Motivation will be provided by focusing on a case study of a controversial local land development and infrastructure proposal, with potentially substantial travel and traffic impacts. Through the case study, you will apply data and modeling tools obtained from local transportation planning authorities.

**Organization:** In lab, students will work on the case study in groups of two, using structured computer-based exercises and common data sets. You will find it helpful to discuss what you are doing with neighboring teams and, as needed, problem-solve together. DON'T BE SHY about seeking help from other students or your instructors. That's what the lab is for.

The class schedule is attached. Some time outside of scheduled lab hours will be needed to complete assignments, including written lab reports.

**Requirements:** Evaluation will be based on a case study proposal (5%) due at the end of week #2, an interim lab report (15%), a final lab report (25%), a mid-term exam (15%), a final exam (20%), and class participation (20%) as evidenced by completing answer sheets associated with labs.

**Prerequisites:** Participants are expected to have some prior knowledge of the "rational" (4 step) transportation planning process, highway capacity concepts, and trip forecasting to the extent these materials are covered in CE 221. Basic understanding of probability and statistics and hands-on computer use are also important. Lab assignments involve much computer work, mostly running computer models and some spreadsheet manipulations. No computer programming is required.

**Required Text:** J. de Dios Ortözar and L.G. Willumsen. *Modeling Transport* (3rd Edition). John Wiley & Sons. 2001.

Also, you must obtain a copy of the *CE 523 Lecture Outlines*, available at El Corral Bookstore.

## SCHEDULE OF TOPICS

The lecture material and lab activities will both track the following approximate schedule:

Week	Readings*	Topic	Assignments
1	Ch. 1 except 1.3	Introduction; Study Design	
2	3.4	Overview of Computer Systems for Modeling and Data Manipulation; Census Data in Modeling	Study Proposal (due 5:00 Friday)
3	Ch. 10	Detailed Network Modeling (Establishing Zones, Road & Transit Networks)	
4	3.2	Traffic Assignment; Assignment of Base Trip Tables: Model Validation	
5	3.1, 3.3	Demand Data Sources; Demand Data Collection; Adjustment of Base Trip Tables	
6	Ch. 4, 13.2	Trip Generation Analysis	Interim Report (due 5:00 Friday)
7	Ch. 5	Trip Distribution Analysis	
8	Ch. 6-9	Mode Choice Analysis	
9	1.3	Evaluation of Traffic Impacts of Alternative(s)	
10	-	Wrap Up	Final Report (due 5:00 Friday)

\* Numbers refer to chapters in the textbook by Ortözar and Willumsen.

**Format of Your Interim & Final Reports:** Much of your course grade is based on written team reports. These reports will be evaluated on both technical content and the quality of organization and presentation, including English composition. The following outline is suggested:

1. Executive Summary - Succinctly identify the motivation for and content of the report, the general nature of the methodology, and the main findings and recommendations.
2. Background - Describe in moderate detail the situation and the specific questions being addressed, and other pertinent background information.
3. Approach - In one or more sections, describe in some detail the steps you followed, with emphasis on its theoretic justification.
4. Results - Present your results in well organized form, using summary tables and charts designed to make it easy for the reader to understand your findings. Detailed data sheets and voluminous outputs should not be included here, but rather placed in appendices or omitted altogether if not likely to be of interest to the reader.
5. Conclusions and Recommendations - Summarize principal conclusions, make pertinent recommendations with justification. Conclusions and recommendations should relate to questions addressed, the adequacy of methodology employed, and the need for follow-on work.
6. Appendices (as necessary), including and References and/or Bibliography.

Technical reports should be typed and include a table of contents as well as a cover page showing, at a minimum, the study title and the name(s) of the author(s). Raw data, sketches, etc. placed in appendices should generally not be retyped or redrawn; your time is better spent elsewhere.

CALIFORNIA POLYTECHNIC STATE UNIVERSITY  
Civil and Environmental Engineering  
CE 523: Transportation Planning

**ASSIGNMENT #1: REQUEST FOR PROPOSALS**

Your firm is hereby invited to submit a proposal to study the travel and traffic impacts of a major commercial development proposed to be located adjacent to the Promenade/Madonna Plaza . The proposed development also envisions the extension of Prado Road to intersect with Madonna Road, the construction of a full diamond interchange at Prado Road- U.S. 101, and perhaps suitable bus route changes. The study should estimate increased trip generation and traffic due to the proposed development, and identify possible problems due to increased local street congestion, inadequate intersection capacities, and efficiency of serving the development with public transit. Appropriate mitigation actions, including possible new roadways, traffic signals and turning lanes should be proposed and evaluated. Relevant related issues include but are not limited to the following:

- Possible changes in traffic flow patterns to and through the project and adjacent portions of the city street system and state highway (including freeway ramps).
- Possible level of service changes at key intersections (as measured by average delay) and possible mitigation measures (e.g. additional lanes, turn prohibitions).
- Changes in user costs (travel times and travel distances).
- Effects on bus routes and bus schedules.
- Effects on emergency vehicle response times.
- Implications for additional future urban and regional growth.

To be favorably considered, your proposal should be prepared according to the following outline:

- A. Title page and table of contents
- B. Statement of the problem; the study motivation and objectives. (See S.L.O. General Plan materials in Library documents room [Calif SLO C660 G4L 1992(Docs)].)
- C. Your proposed technical approach, which should describe the system of concern, the study scope, and your commitment to do the following:
  - Develop network models of the street system and the bus routes in order to estimate representative travel times before and after the proposed infrastructure changes.
  - Develop origin-destination matrices summarizing travel patterns by principal travel modes. In this, you will be able to adapt existing trip matrices available from local authorities.
  - (As needed) design and conduct a small field survey to get necessary information to supplement existing data.
  - Develop or adapt trip generation, trip distribution, mode choice, and traffic assignment models appropriate for the current study.
  - Update origin-destination matrices and traffic assignments to reflect expected land use changes and future growth.
  - Evaluate system performance with and without the proposed circulation changes, and recommend pertinent traffic mitigation measures.

Your technical approach should follow the standard sequential transportation planning process and demand analysis framework as described in Sections 1.5 and 1.6 of the class text, Ortúzar and Willumsen.

- D. A commitment to the "deliverables" to be provided during the study (technical memos, reports, etc.). (See the course schedule.)
- E. A study schedule, in horizontal bar chart form, showing the sequence, durations, and possible overlap of all tasks to be accomplished.

NOTE: Do **not** include a cost estimate or statements of personnel qualifications.

Proposals should be submitted in proper professional form, as described in texts like the following:

1. Helgeson, Donald V., Handbook for Writing Technical Proposals That Win Contracts. Prentice-Hall, Englewood, NJ. 1985. (Especially Chapter 3.) (T11 .H45 1985)
2. Whalen, Timothy, Writing and Managing Winning Technical Proposals Artech House, Boston. 1987. (Especially Chapter 8, articles 3 & 4.) (T11 .W4461)

Bidders will find useful models for the type of study which is desired in the reports *Analytical Study of the Traffic Impacts of the Proposed South Street Extension Project*, and *Traffic Impact Analysis for the Proposed Regional Center at Prado Road*. Copies of both reports are on course reserve in the Library.

**Special Note:** Proposals must not exceed five (5) single-side typewritten pages, including the schedule but excluding any cover page and table of contents. Each student in the class should prepare and submit his/her own proposal, although discussion and collaboration on content within the class is encouraged.

**DEADLINE:** Deliver your proposal to the dept. office (13-263, give to Kay) to be placed in your instructor's mailbox by the end of the business day on Friday, January 16, 2004.