

Traffic Sim: The final project

## CS 351

# Design of Large Programs

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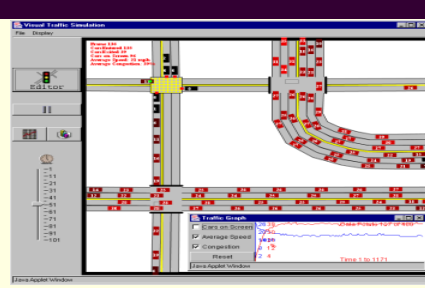
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4/5/2009

## Traffic Simulation: Albuquerque Area

### Goals:

- Learn something about *Simulations*.
- Learn something about *Designing Large Software Projects*.
- Learn something about *Programming in a Group*.
- Solve a *Real Problem* and have it *Make a Difference*.



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## Instructor's Role

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- This is a software design course, not a software engineering course.
- Therefore, I will do much of the software engineering.
- I will also serve as a technical advisor and problem solver.
- The idea of the remainder of this course is to work together to produce a large software design and implementation of value.

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## Networking

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- City planners?
- UNM Department of Civil Engineering?
- Albuquerque Journal?
- We have many engineering-hours to offer, not for money, but simply for a chance to make a difference, and to learn.



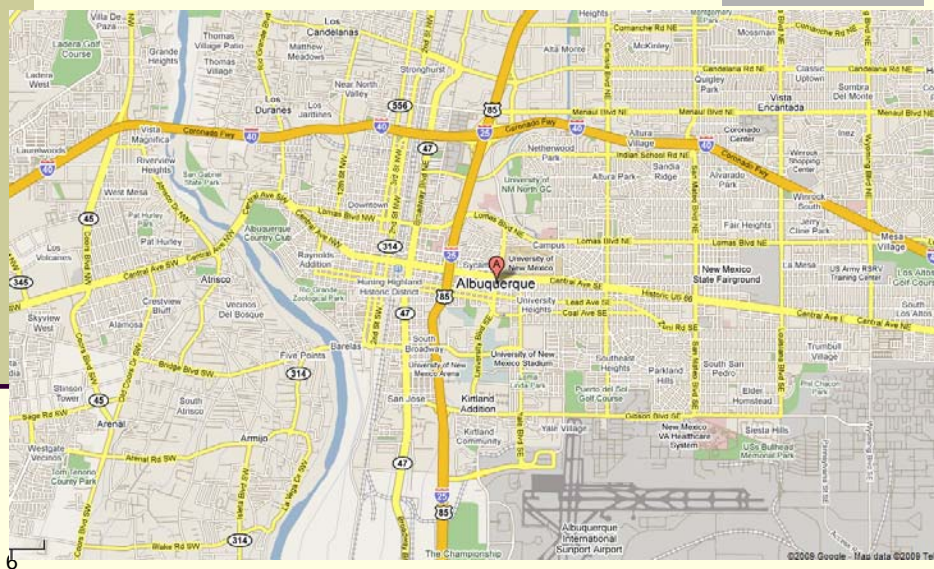
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## Responsibilities

- Weekly Status Report
  - This is a half page submitted into WebCT every Friday (starting Friday, April 3)
    - Each student must submit separately.
    - Number of hours you worked each day of the week.
    - A description of what you worked on.
    - A description of goals accomplished, and/or "road blocks".
- PowerPoint: Design and Code Peer Reviews.
  - Each of you individually or in small groups, need to schedule and present a **proposed plan** of moving forward: sub-design, sub-solution, data plan, algorithm, ...

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## The Search Space



## Jobs to get Started – ¿¿¿ Who ???

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- Contact City Planners – [Annett, T.D.](#), [Jonathan M](#)
- Contact UNM Department of Civil Engineering - [Basak](#)
- Research Existing Traffic Simulations:
  - Algorithms – [Jonathan B](#)
  - Data - [Omar](#)
  - Data Structures - [Trent](#)
  - User Interfaces - [Patrick](#)
  - Uses and Successes - [Santiago](#)

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## Suggestion #1: High Profile Accident Location

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- Pick a high fatal accident location in Albuquerque (such as the intersection of Montgomery and Wyoming). Use either intuition, a simulation, or an existing proposal to find a low cost solution for improving the safety of this location.
- Pick a location that is dangerous due to some peculiarity in business access, visibility, or some other special case that requires a site specific model.
- Create a simulation to prove that the solution is significantly safer.
- Use the simulation to demonstrate that the solution does not significantly impact the rate of traffic flow (or, even better, that it improves flow).

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## Suggestion #2: Low Profile Safety

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- Pick a low profile, under funded, neighborhood project where there is an open request for some type of additional traffic control (such as speed bumps or a traffic light).
- Create a detailed simulation of the area that demonstrates the effectiveness of a solution.
- This simulation would need to include both safety and rate of flow.
- Demonstrate an improvement in safety without significantly impacting flow.

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## Suggestion #3: Traffic Flow Anomaly

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- Pick an area of the city that has traffic flow problems caused by some special case that is unusual enough not to be included or well modeled by commercial Off-the-Shelf modeling programs.
- Model both flow and safety.
- The goal is to show improved flow without compromising safety.

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## Suggestion #4: Future Construction

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- Plug into a planned project of new construction and model its local and citywide effect on both flow and safety.
- Pick a relatively small project for which there are not already teams of professional modelers.
- The project should be big enough that the city would care about the results of a model, but not so big that the city is paying professional modelers.

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## Suggestion #5: Non-Auto or Mixed Traffic

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- Model safety and flow of some non-standard traffic items such as:
  - Dedicated Bicycle Paths,
  - Bike Lanes,
  - "Share the Road" Bike Routes,
  - Pedestrians: High Volume Road Crossings, Bridges, or Tunnels,
  - Animal crossings (deer, horses, dogs, cats, children).

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## Suggestion #6: Special Event

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- Model traffic flow, safety and parking during a high profile special event:
  - State Fair,
  - Balloon Fiesta,
  - Fourth of July Fireworks display.