Design & Build Chicago Scale Model for Dynamic Disaster Simulation
The Chicago fire department is the nation’s leading fire department in term of disaster preparedness and event forecasting.

They need very understandable means to communicate and decipher a complex system of multiple emergency services and protocols that occur simultaneously during a disaster.

Chicago mass transit falls short in evacuation planning, federal report says:

Recommends upgrades to move elderly and disabled in emergency

Project Objectives

- To Map in Three Dimensions the Highest Density City Areas

- To develop a training tool for Chicago Fire Department use
  - Familiarizing Fire Department Personnel with Target Area
  - Identifying Problematic Scenarios
  - Illustrating a Vast Array of Potential Disasters
  - Simulating Disaster Response in Real-Time

- To be used for other studies:
  - Wind Tunnel Testing
  - Environmental Impact Testing & Show Case
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Team Organization

Introduction
Scale Model
Manufacture
Dynamic Projection
Demonstration
Questions

**Milling**
- Team Leader – Chance Lebron
- 4 ARCH
  - 1 CAEE

**Modeling**
- Team Leader – Andrew Seo
- 1 CAEE
  - 2 MMAE

**Projection**
- Team Leader – Matt Claxton
- 3 MMAE
  - 1 SS
  - 1 ECE
Methodology

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Milling
- Produce Models
- Complete Original Model

Modeling
- Experiment
- Evaluate Efficiency Process

Projection
- Test Model
- Integration into Complete Model
Building the scale model

• Completion of the model, including wrapping up the milling process on the CNC machine, sandblasting all buildings, bonding buildings and proper labeling and placement of buildings, base manufacture, composing street system.
Description of Scale Model

- Base
- Street System
- Building
- City Blocks
Research

• Explored the various types of acrylic bonding methods and finalize a strategy

• Research different materials to prepare a molding cast, in order to meet temperature requirements, be cost effective and gain ease of manipulation.
Tests

• Experimented different forms of molding making and provided small samples.

• Selective Laser Sintering process: utilizes powdered nylon or metal to create 3-D molds
Integration of LEDs and Projector Building System

Controlled by one main computer

Street System
LED Control

Controller

Program Code

LEDs

Wireless Communication

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Missile Attack Scenario

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Video or Picture
Questions?

Thanks!

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