Transportation Engineering

CEE 362
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ABOUT MYSELF

http://unr.edu/homepage/zongt/
SYLLABUS

GRADING

- Grading:
  - Midterm Exam: 1  20%
  - Final Exam: 1  30%
  - Quizzes: 2  15%
  - Homework: infinite  20%
  - Project: 1  10%
  - Class Attendance: 5%

  Total  100%
WHAT IS TRANSPORTATION ENGINEERING

- **Approach** - application of technology and scientific principles
- **Scope** - planning, functional design, operations, and maintenance of facilities
- **Objective**
  - movement of people and goods
  - safe, rapid, comfortable, convenient, economical, and environmentally compatible
TRANSPORTATION ENGINEERING (cont.)

- Multi-modal: highway, rail, air, water ....
Transportation Modes

- Dollars Involved
- Pass. Miles
- Ton Miles
- Freight Revenue

Legend:
- Highway
- Railroad
- Water
- Air
- Transit
- Pipeline
Features of Mode

- **Highway**: Short to medium range of travel; door-to-door delivery
- **Air**: Long distance; faster; higher cost
- **Rail**: Long distance freight; low cost
- **Water**: Long distance (overseas); low cost; slow
- **Pipe**: Oil; gas
Highways

- Dominant mode in US

- Size
  - 46,675 miles of Interstate
  - 114,505 miles in National Highway System
  - 3,951,909 miles of other systems

- Carries
  - 20-25% of freight
  - 85-90% intercity travel
  - 90%+ intracity travel
Urban Transit

- Directional route-miles serviced (1998)
  - Bus: 157,823
  - Trolley Bus: 424
  - Commuter rail: 5,172
  - Heavy rail: 1,527
  - Light Rail: 676
Institutional Structure

- **Federal Level:** US DOT, FHWA
- **State Level:** State DOT
  - **Local Level:** MPO, RTC, City, County
    - Private level: carriers, transit agencies, toll contracts
DISCIPLINES IN TRANSPORTATION

Highway Transportation Engineering

Traffic Engineering
- Planning
- Operation
- Design

Pavement Materials
TRAFFIC IMPACT ANALYSIS

- Site Development
- Traffic Generation
- Area of Impact
- Operational Analysis
- Mitigation Measures
- Submit for Approval

Planning → Operations → Design
TOPICS IN TRAFFIC ENGINEERING

Planning
  How much traffic will be generated? Where will the traffic come and go? How wide the roads should be? What modes should be provided?

Operations
  Analyses: Capacity, delay, travel time, speed
  Management: Signs, signals, markings

Design
  Geometrics: Cross sections, Curve radius, grades, environmental impacts, hydraulic
Why Transportation Engineering

- Among the top 10 most secure jobs
- Interdisciplinary
- Interaction with people
- Professional meetings (parties)
Employment

- Public sectors
  - State DOT
  - City, County, Metro
- Consulting firms
Professional Organizations

- Institute of Transportation Engineers (ITE)
  - http://www.ite.org/
- Transportation Research Board (TRB)
  - http://gulliver.trb.org/
- ITS America
  - http://www.itsa.org/
- Women’s Transportation Seminar (WTS)
  - http://www.wtsnational.org/
- ASCE
Assignment #1

- Prepare a brief resume of yourself and send it to me (electronically) by the end of this week.

- Schedule an appointment with me within the next two weeks (2~3 people in a group)
Questions?