CEE 123 Transport Systems 3: Planning & Forecasting

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Homework #2 -- The Transportation Planning Process [Due: Monday, 15 April 2024]

Problem 1. Team Project (30 points)

Miasma Beach, a seaside town with a population of 15,500, completed a study that identified a range of existing and projected transportation problems. The City Council prioritized one problem; the increasing \volumes of truck traffic in the community. There are two primary sources of truck traffic:

- 1. trucks transporting agricultural products from TAZ 4 and fresh seafood from TAZ 6 to points north and south of the city;
- 2. pass-through trucks traveling between Miasma and Port Miasma on State Route 1.

The City is not concerned with the relatively small number of local freight and service vehicles. They are only concerned with the increasing number of large trucks and the attendent problems such as congestion, safety, infrastructure deterioration, air quality, and public health, as well as noise and visual aesthetics. The City has requested a preliminary scoping of potential alternatives. Working with your lab team, apply the Transportation Planning Process and complete the following tasks:

- 1. **Assume** and **describe** some basic community values and, based on these values, prepare a **set** of (a) broad goals and (b) specific objectives for the City. Include a brief summary of land use, demographics, and socio-economic characteristics of the community, as well as a description of the current transportation system and likely problem locations.
- Identify 2 or more truck-related transportation problems (label P1, P2, etc.) within the city. Suggest
 potential gaps between community objectives and actual system performance.
- 3. For your defined problems, develop 3 transportation system alternatives (A1, A2, and A3) that have potential to address the defined problems. At least one of these alternatives (A1) must address identified problems from an infrastructure (supply) perspective. A second alternative (A2) must address the identified problems from a demand perspective. For the third alternative, propose a "thinking outside the box" perspective that addresses the activity system. Think broadly when proposing alternatives: both conventional or innovative options are welcome, as long as each is scaled appropriately to the size of the Ciy. Each defined alternative must include a full description, including relevant system characteristics. Each alternative must be consistent with the values, goals, objectives, and defined problems for this city of 15,500 residents. Note: your grade will be based on your creativity so do not share your ideas with other teams!
- 4. While you will not actually analyze these alternatives, develop 2 or 3 quantifiable performance measures (Measures of Effectiveness, or MOEs) that can be used to assess impacts. The measures can relate to level-of-service (e.g., average travel time), environmental quality (level of emissions), or other impacts. These MOEs must relate directly to the proposed alternatives, problems, and objectives.
- 5. Develop <u>rough</u> cost estimates for each alternative. Search the web for cost information or use your judgement to estimate appropriate values. You should consider capital and annual operating costs. Include an estimate of total cost (Net Present Value) or total annual average cost.
- 6. Express your team's *a priori* expectations of **overall effectiveness** for each alternative and compare to the total cost estimate. Using these results, **recommend** a single alternative.

Your opinion is probably based on very little real-world experience. First, read the background information on Miasma Beach (on the website's Project page). Next, search the web for supporting information or simply come to some general agreement with your teammates. There's no "right" answer; this is a thinking exercise that you will re-visit at the end of the course. Throughout the course, we'll present and discuss methods and models to formally estimate and evaluate the performance of system alternatives. You will apply this process again in your lab report.

Problem 2. Team Project (10 points)

Miasma Beach is a fictional community that is loosely based on real seaside cities. Find a west coast, seaside community with similar population, land area, and/or other characteristics simlar to those for Miasma Beach. Review material available on-line to find out more about a community of this size and nature. Please use this

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exercise as a means to scale the issues that you will be discussing for Miasma Beach. Some potential communities include Grover Beach, Half Moon Bay, Laguna Beach, Malibu, Morro Bay, Seal Beach, and Solana Beach. **Summarize** your findings relative to the **T**ransportation and **A**ctivity system information provided for Miasma Beach. This "Sister City" information may prove useful throughout the quarter.

Table 2. 2022 Miasma Beach Demographic Data ZONE POP LABF CARS HINC HH EBAS ERET EOTH ETOT AREA _____ 1 3000 1100 900 29850 700 400 150 1000 1550 1.56 2 1550 1300 600 44850 800 300 225 1300 1825 2.53 3 3500 1200 2500 83100 1000 0 350 250 600 3.10 0 0 0 0 0 1400 150 200 1750 2.83 4 5 2450 1400 2000 49500 950 0 100 50 150 1.27 6 5000 1800 2250 57000 1550 0 425 500 925 3.09 _____ Tot 15500 6800 8250 5000 2100 1400 3300 6800 14.38 Mean 2583 1133 1375 55050 833 350 233 550 1133 2.40 _____ Note: Weighted mean used for income _____ POP = zone populationEBAS = basic employmentLABF = labor force (by residence)ERET = retail employmentCARS = total cars in zoneEOTH = other employment HINC = median zone household income ETOT = total zone employment HH = number of households in zone Area = zone area (sq.mi.) Note: basic employment includes agricultural and industrial

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