

CEE 123 Transport Systems 3: Planning & Forecasting

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Homework #2 -- The Transportation Planning Process [Due: Friday, 15 April 2022 @ 12 noon PDT]

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 attendant 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.
2. 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 City. 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 rough **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 similar 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

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 **Transportation** and **Activity** 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
4	0	0	0	0	0	1400	150	200	1750	2.83
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 population EBAS = basic employment
 LABF = labor force (by residence) ERET = retail employment
 CARS = total cars in zone EOTH = 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