

CEE 123 Transport Systems 3: Planning & Forecasting

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Homework #2 -- The Transportation Planning Process [A S O L U T I O N]

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 SR-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.

Note: This is one possible response to illustrate the open-ended nature of the planning process. It is rather brief and not necessarily representative of a insightful, well-written response.

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 transportation system and likely problem locations.
 - a. Assume Community **Values**: Assume the community wishes to preserve its historical significance as a beach-oriented community that emphasizes the small town agricultural and fishing industries, as well as maintaining a sustainable tourist trade focused on these attributes.
 - b. Define Primary **Goals**: The community wishes to maintain quality of life for all residents; to accommodate tourist trade to maintain the local economy; maintain a sustainable community by minimizing environmental impacts.
 - c. Define Assessable **Objectives**: To reduce the impacts of increasing truck traffic in the community, including congestion, safety, infrastructure deterioration, air quality, public health, noise, and visual aesthetics, as well as impacts on the tourist trade which could hurt the local economy.
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.
 - a. **P1**: Increasing thru traffic between Miasma and Port Miasma on SR-1 includes a high proportion of tractor-trailer trucks, particularly in the peak-hours, creating excessive congestion on the City's major artery. The City views the trucks as more problematic with respect to City vision and goals than the overall increase in traffic, with particular impact on the tourist trade.
 - b. **P2**: Increasing volumes of trucks transporting agricultural products from TAZ 4 and fresh seafood from TAZ 6 to the external stations 7 and 8. Concomitant increases in congestion, accidents, and emissions now exist in local neighborhoods in the peak hours, limiting the City's sustainability objectives.
3. For your defined problems, develop **3** transportation system alternatives (A1, A2, and A3, one per team member) that have potential to address the defined problems.
 - a. **A1. Infrastructure Option**. Problem 2 can be partially addressed by increasing capacity on Mountain Boulevard, 1st Street, and 4th Street and implementing traffic calming in selected neighborhoods to "re-direct" truck traffic out of TAZ 1, 3, and 6 neighborhoods.
 - b. **A2. Demand/Pricing Option**. Developing a pricing scheme for with toll barriers at External Stations 7 and 8 where exiting thru trucks that were captured at an entrance toll barrier within a short time window are charged a thru-toll based on time-of-day, essentially re-routing peak trucks to the SR-101

option north of Miasma Beach. Variations include building truck weigh stations at External Stations, effectively delaying trucks and decreasing the current utility of the cut-through option, or implementing tolling on the SR-1 Miasma Blvd bridge.

- c. **A3. Outside-of-the-Box Options.** The agricultural industry could be changed in two ways: evolution to local consumption and farmer markets that would increase tourist traffic and decrease exports and thus trucks, or could be encouraged to move east and/or west of town with favorable tax subsidies or redevelopment incentives. Infrastructure expansion from 2000 to 2010 could be scaled back on SR-1 via a Complete Streets approach tied to community values, goals, and objective, improving utility alternate modes within the community while increasing travel times for thru-traffic. Traffic commuting from outside of Miasma Beach during peak hours could be intercepted with "park and ride" lots at External Stations 7 and 8, with free parking and bus service paired with increased parking charges in the City for non-residents.
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.
 - a. **PM 1.** Depending on the performance measure selected by the City, standard measures such as VMT, VHT, delay, and emissions would all address the evolution of total traffic, by origin, destination, mode, time-of-day, and route, as well as by resident and non-resident, and by truck or passenger car. For traffic calming options, local link counts by time of day, before and after the policy implementations, would be needed.
 - b. **PM 2.** Given the goal of maintaining the tourist trade, performance measures associated with maintaining or increasing the tourist trade would be of value, although this might require models beyond the scope of the base Miasma Beach travel forecasting model. If the reduction in trucks improves the ambience of the City, then increase tourist trade can be measured by increased hotel bookings or attendance counts at event, parks, etc.
 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.

Solution: Since the proposed design alternatives will vary significant, this sample solution does not include cost estimation or a recommendation. Selected team responses will be posted to the web site.

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.

Solution. There is no right or wrong answer so credit will be granted for any reasonable attempt to find a similar city and justify your choice.