

CE 88 Midterm**Transportation Policy – Decision Support**

In this midterm we will work on providing quantitative estimates in support of transportation policy decision making. We will compute an expected impact of reducing transit fares (or providing a subsidy towards transit use) for a given region.

The regional government is interested in improving traffic and reducing the total vehicle-miles-traveled (VMT) in the area. They consider reducing the transit ride fares, expecting that it will make transit choice more attractive and shift a share of population from driving to transit.



Our goal is to estimate the impact of the introduced measures and to provide recommendations based on the analysis of the collected data.

Data. We will use the **modechoice.csv** dataset from Minilab 6 and 7. Consider only trips where both `drive_alone` and `walk_transit_walk` are available, and of these trips, consider only trips where the selected travel mode is either `drive_alone` or `walk_transit_walk`.

We will further assume that the dataset is fully representative the whole population of the region, and that the estimates computed for the subset defined above hold true for the whole region.

Problem 1: For the subset of trips described above, find the percent of trips where travel mode is drive alone and calculate the total vehicle miles traveled (VMT) for all of the `drive_alone` trips. Make sure to clearly provide your answer, `VMT_before`.

Problem 2: The government is considering a fare reduction that will make the `walk_transit_walk` option \$1.0 cheaper for all trips. An estimated value of time for the population in the area is \$20/h. If we assume that a kNN with 10 nearest neighbors is a good model to predict the travel mode choice, what is the expected drive alone VMT with the fare reduction enacted? Provide a new value for vehicle-miles-travelled, `VMT_after`.

Problem 3: Estimate the relative change in VMT before and after, in percent. Discuss the potential effect on the expected mode choice by the reduced amount of traffic, alleviated congestion and travel delays. What would be your next steps in improving the accuracy of the forecast?

Your submission must contain a pdf with your answers clearly marked, as well as the code in support of your estimates.

Good luck!