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Executive Summary

Emissions Costs of Different Modes of Transportation in the San Juan Metropolitan Area

by

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Introduction

The problem that will be studied is based on the traffic congestion that the San Juan Metropolitan area is suffering at this moment. This has become a high priority to the government to be resolved. An associated problem to this is the generation of pollutants in the emissions that cars, buses and other modes of transportation create. The different modes of transportation generate different amounts of emissions and these emissions would vary accordingly to the amount of passenger they can move from one point to another. These emissions cause indirect costs that society has to pay either directly or indirectly.

The cost of these emissions varies between the different modes of transportation. Some of this costs are related to aesthetics, health, fuel use and air quality to mention a couple. The aesthesis factor is the opacity of the air and how buildings become darker over time by the accumulation of particles on them. The health cost is how these emissions increases the chances of asthma attacks, respiratory diseases and known diseases that are related to some chemical compounds that are emitted by the different modes of transportation. The fuel cost is the related to the fuel consumption by cars in the traffic congestion, this could increase the cost of fuel because the cars are consuming fuel but they are not moving and therefore a higher demand of fuel is required by the users of cars. The air quality costs are the costs that could come by fines imposed by E.P.A. for not meeting air quality standards.

Objectives

The objectives of this research are:

- To evaluate the emissions of different modes of transportation
- To evaluate the costs to society of these emissions To establish a methodology of design for new transportation projects taking into account the emissions that will be released during its use. To provide another marketing tool for the Tren Urbano by showing the possible benefits of its use in terms of money so the society can really see how they may benefit from the use of the Tren Urbano.

Work done this semester

During this first semester the first data needed for the project was obtained. This consisted on a transit study of the U.P.R. Río Piedras Campus. The study was made in order to measure the transit that the campus itself produces. This transit is needed to estimate the emissions produced by the transit in that area and then estimate the external costs it imposes to society. Another reason for the study of this area is that the Tren Urbano alignment goes thru it. The flows of transit obtained will then be used to simulate the effect of different modes of transportation on those flows. This will give us the bases to develop the methodology for estimating the costs of the emissions produced by the different modes to be studied.

The most important findings of the transit study are:

- Approximately 140,000 cars enter and exit the campus from Monday to Thursday.
- Traffic on Fridays is less than on the rest of the week.
- The highest level of traffic entering the campus is from 7:15 a.m. to 8:30 a.m.
- The highest level of traffic exiting the campus is from 4:45 p.m. to 5:00 p.m.
- Almost 50% of the traffic enters thru the Barbosa Ave.
- The Sociales and Ciencias Naturales entrances are mostly used to enter the campus from 6:00 a.m. to 9:00 a.m.

These findings will help us to better estimate the effects of the emissions and the effects of the proposed modes of transportation. For the effects of the emissions is very important to know at what time of the day they are being produced because the effects are different on the environment depending at what time they are being emitted.

As for future work the flows of the De Diego Highway will be obtained from the Highway Authority. The effects of the different modes of transportation on the current flows will be determined. Finally the external costs of the emissions will be estimated and the methodology of doing so will be established.