

NYMTC September 11th Memorial Program: Internship Work Program

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Agency: Port Authority of New York and New Jersey

Project Title: Regional Airport Ground Access Modeling

Program Description

My internship over the course of 2011-2012 took place within the office of Planning and Regional Development, working on PANYNJ's contribution to the LaGuardia Airport Access Alternatives Analysis study. This contribution was developing a model of ground access mode choice and airport choice to gain a clearer picture of ridership analysis and travel times as they may change given different alternatives. The focus of my work was on supporting this model development effort, and on enhancing and extending the results into a standing tool that has ongoing utility for airport access planning in the region.

I began my internship with a review of literature for data sources for the model development effort. This began before the consultant team began working on the model more fully, and was a precursor to work they performed regarding modeling both airport and ground access choice. The literature review covered studies with a broad range of goals – some very similar (employing similar datasets and/or looking at airports in the NY region), while others sought to compare and rate airports globally (rather than as a discrete choice amongst local options). Regardless, several factors repeatedly came up that make an airport more attractive. Some of these include: number of destinations served, number/timing of flight options, airfare, and domestic/international service. Ground access was also of critical importance – while the larger modeling effort focused on looking at this as its own model (or part of a nested model with airport choice), my effort simplified this aspect to a factor within the airport choice model itself.

After the literature review, I began analyzing existing passenger survey data from a 2005 Federal Aviation Administration airport study regarding Regional Air Service Demand – for not only the Port Authority airports, but other smaller airports in the surrounding region. Additional data provided by PANYNJ's Aviation Department provided more information on airport employees, as well as the number and nature of flights departing from each airport.

These datasets also provided the basis to begin estimation of an airport choice model. Using the passenger survey data, and knowing certain characteristics about them (where they live, where they flew to, what airports they chose, etc.), I began an iterative process of determining how significant (or insignificant) certain factors are to a passenger's airport choice. The model estimation software – a freeware program named BIOGEME – required an iterative process: calculations were performed to re-aggregate or re-scale the data in hopes of a better fit, while equations to model the alternatives and choices made were modified to include or exclude various factors. While some of my work was

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independent of the larger modeling effort, some key aspects crossed over between our two efforts, including the concept of regionally aggregating datasets in order to find a better fit of data.

After completing my work on the airport choice model, I began working in TransCAD and the New York Best Practice Model (2nd Generation). Once six potential Select Bus Service route alignments were decided upon, I mapped these alternatives into the BPM, and coded stop locations and run times along each route as well (as estimated by NYC Transit). In the process of refining and finalizing these alignments, I created accompanying maps and diagrams in TransCAD, and thus facilitating the process of identifying and addressing any changes that needed to occur.

Each of these developed routes corresponded to a different scenario run in TransCAD. They were then compared to the “No-Build” scenario – that is, the transit network as it exists today. The model outputs provided the access times to and from different portions of the greater New York region, where our emphasis was on access times to LaGuardia. I learned how to process the output matrices for access times by different modes (Walk to Transit, Drive to Transit, Walk to Commuter Rail and Drive to Commuter Rail) into tables that could be joined to maps of the region, and used to better communicate access times and their relative changes between the various scenarios.

In addition to this work within TransCAD and the NYBPM, the last few months of my internship also consisted of further expansion and development of modeling data. After PANYNJ’s consultant team finished portions of the model preparation for LaGuardia, I was able to shift my focus to expansion of that data to the other Port Authority airports – Newark Liberty, John F. Kennedy, and Stewart. With an emphasis in the current modeling effort on how employees travel to LaGuardia, data was gathered from the 2000 Census Transportation Planning Package (CTPP) to gather relevant socio-economic characteristics that might determine mode choice, such as income, vehicle ownership, and number of workers per household. Available data from the Port Authority yielded a simple dataset of LaGuardia employees that contained only geographic information. Thus, once these CTPP characteristics were aggregated for areas surrounding the airport, they were applied to the employee dataset to synthesize a fuller dataset that could be used to model airport choice. In speaking with the consultant team, I gained a fuller understanding of how they undertook this approach for LaGuardia, underwent similar methodology for the other PA airports, and documented it (as well as any deviations) for future use.

More detailed information on the work that I performed can be found in the interim reports that I submitted during the course of the program and my final presentation (scheduled for September 19, 2012).