

2016 UDOT RESEARCH PROBLEM STATEMENT

*** Problem statement deadline is March 14, 2016. Submit statements to Tom Hales at tahales@utah.gov. ***

Title: Understanding Transit Ridership: Using regression analysis to generate ridership forecasts for better performance measurement of transit agencies. **No. (office use):** 16.06.04

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UDOT Champion (suggested):

Select One Subject Area

<input type="checkbox"/> Materials/Pavements	<input type="checkbox"/> Maintenance	<input type="checkbox"/> Traffic Mgmt/Safety
<input type="checkbox"/> Preconstruction	<input type="checkbox"/> Planning	<input checked="" type="checkbox"/> Public Transportation

1. Describe the problem to be addressed.

Ridership is the most ubiquitous performance metric for transit agencies around the country. Many agencies set annual goals for ridership, against which they are measured in the coming year. There is one major issue with this approach: ridership goals usually come from relatively arbitrary estimates, often looking at recent trends with little consideration of the factors actually impacting ridership. A robust methodology has yet to be established which can generate reasonable ridership forecasts using scientific analysis of the variables which influence that measure.

2. Explain why this research is important.

The Salt Lake City region is unique in many ways from other areas which have previously been examined. Much of the existing research focuses on major metropolitan areas where transit systems and populations have been relatively stable. The Salt Lake City region has experienced rapid population growth in recent years, as well as significant improvements to its transit system. This allows for the exploration of new variables which have not been examined in past research efforts. These new factors may provide a more specific understanding of local circumstances that diverge from traditional patterns demonstrated by other regions. Also, the examination of a less prominent metropolitan area can determine the generalizability of previously published relationships between well-established factors and transit ridership.

3. List the research objective(s):

1. This study hopes to expose the generalizability of previously published relationships (elasticities) of factors affecting transit ridership, while also identifying new factors that have yet to be examined.
2. Develop a methodology for utilizing elasticities from regression analysis to create improved, informed transit ridership forecasts.

4. List the major tasks:

1. Conduct a comprehensive literature review of the factors affecting transit ridership.
2. Improve and refine multivariate regression models.
3. Create a ridership forecasting tool from model-derived elasticities for use of transit agencies.
4. Conduct workshops with the Utah Transit Authority (UTA) to facilitate model adjustment and future use of the forecasting tool.

5. List the expected results:

1. Given the unique economic, cultural and demographic qualities of the region, some of the previously identified relationships will certainly be different than what has been discussed in the literature. Initial model results have, indeed, shown this to be true.
2. Models continue to improve and will describe more thoroughly parsed relationships with improved explanatory power. Current models explain almost 85% of variation in ridership.

6. Describe how this research will be implemented.

Implementation is one of the most promising aspects of this research. Ridership is one of the core goals of UTA, and is the standard performance metric for this industry. Preliminary research was used to forecast 2016 ridership, and a goal was set by the UTA board of trustees based on the forecast generated by our model. When the model is improved, new elasticities will help to

create even more accurate forecasts. A tool will be created that makes the process more accessible to agency staff. This tool can be used regularly to refine forecasts and improve performance measurement.

7. Requested from UDOT: \$10,000 (UTA)

Other/Matching Funds: \$5000 (WFRC)

Total Cost: \$15,000

(or UTA for Public Transportation)

8. Outline the proposed schedule, including start and major event dates.

May 1 - Project start

May 1 to June 1 - Literature review

June 15 to July 15 - Data acquisition, model refinement, final model construction and diagnostics

July 15 to August 15 - Report and peer reviewed article writing

August 15 to September 1 - Workshops and presentations

September 1 - Project completed