

2019 UDOT RESEARCH PROBLEM STATEMENT

*** Problem statement deadline is Feb. 6, 2019. Submit statements to UTRAC@utah.gov. ***

Title: Assessing How Proposed Construction Projects Contribute to UDOT's Optimize Mobility Goal **No. (Office Use):** 19.06.03

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Select **ONE** Subject Area Materials/Pavements Maintenance Traffic Mgmt/Safety Structures/Geotech
 Planning Perf Mgmt/Data Analytics Public Transportation Other

1. Describe the problem to be addressed:

UDOT's three key strategic goals are: Zero Fatalities; Preserve Infrastructure; and Optimize Mobility. Of these, the Optimize Mobility goal presents particular challenges when determining which projects contribute more or less to achieving this goal. Underpinning the Optimize Mobility goal are four performance measures: Reliability, Snow and Ice Removal, Mode Split, and Delay. This research proposes to establish methods to forecast how a project will affect each of these performance measures once built.

UDOT does not currently have a repeatable process, drawing on existing data resources, that Project Managers can use to evaluate the extent to which any project optimizes mobility. Lacking a repeatable process, the determination of how projects optimize mobility is largely subjective. As a result, the priority placed on projects may be skewed based on the qualitative judgements of UDOT PMs.

It is essential that any quantitative process that is developed for this purpose be easy to use and leverage data that is already assembled through the project concept and/or design phases. UDOT's Project Wise database may provide a ready data source for this purpose. In addition, UDOT's Performance Management division is currently developing a project database from historical data that can be leveraged for this proposed research.

This research seeks to develop a tool, accessible to all UDOT PMs, for quantitatively evaluating the projected impact any UDOT project will have on the Optimize Mobility goal. Successful completion of this research will deliver a tool, used by UDOT Region PMs, that will help UDOT make more cost effective investment decisions.

2. Write the project objective (25 words or less):

The objective of this project is to develop a an easy-to-use tool that draws upon existing data resources, to be used by UDOT Project Managers to evaluate how a proposed construction project will advance UDOT's Optimize Mobility goal.

3. Explain why this research is important:

(In response, consider addressing specific UDOT goals, applicability in Utah or other states, etc.)

1. There currently is no department-wide process that provides a quantitative evaluation of a proposed project with regard to its contribution to optimizing mobility. This research proposes to develop a tool that standardizes this analysis.
2. There are currently databases, such as Project Wise, PDBS, and MasterWorks, which contain valuable data on projects including highway capacity improvements, estimated future traffic, and specific design elements that can be reviewed for their application in an Optimize Mobility model.
3. UDOT is currently updating its Project Prioritization process (initiated by Planning). The proposed research will be a parallel effort focused on one element of project performance – its impact on mobility. The timing of this research will be beneficial to the prioritization update and will likewise seek to benefit from that ongoing work.

4. List the major tasks:

1. Stakeholder meetings: assemble a group of stakeholders from UDOT Performance Management, Planning and Project Development to advise the research. A total of three meetings is envisioned: 1) kick off; 2) presentation of analytical approaches and potential data inputs; and 3) presentation of findings; presentation of final tool.
2. Literature review, review of analytical methods: Review the most recent methods used in evaluating project impacts on mobility. This will include a literature review and outreach to five State DOTs that have developed methods for this purpose. The goal of Task 2 is to identify up to three analytical approaches that UDOT can consider for the Optimize Mobility tool.
3. Outreach – the project team will reach out to five State DOTs that have developed methods determined to be relevant to the research. The project team will also meet with up to 5 UDOT Region PMs to obtain their input on the tools, and their suggestions for tools and data that most directly drive mobility.
4. Review data sources: following the review of analytical methods and DOT/UDOT PM outreach, the research team will review the data sources currently assembled through normal project development, including the Project Wise database, data being assembled by UDOT’s Prioritization update, and from other internal initiatives that are currently being conducted by the Performance Management division.
5. Develop beta model: based on the findings from Tasks 2-4, the project team will develop a beta model for estimating mobility impacts. The beta model will be designed with two important criteria in mind: 1) the model must be easy to use, and leverage existing UDOT software; and, 2) the model must draw on data sources that are already assembled through the project development process or otherwise could be easily assembled with minimal process changes.
6. Model beta testing: the project team will meet individually with UDOT PMs to demo the model and obtain their feedback on model improvements with a focus on usability.
7. Final model delivery with 2-3 page User Guide.

5. List the expected deliverables (reports, manual, specification, design method, training, etc.):

- 1.Task 2 technical memorandum summarizing recent relevant research.
- 2.Task 3 technical memorandum summarizing DOT and UDOT PM outreach.
- 3.Task 4/5 technical memorandum summarizing relevant data sources and the development of the beta model.
4. Final Optimize Mobility tool and User Guide (2-3 pages)

**6. Describe how the research results will be implemented:
(In response, consider addressing UDOT leader support, process or standard improvement, etc.)**

The research will result in the creation of a simple tool that generates an quantitative estimate of how a proposed construction project will further UDOT’s Optimize Mobility tool. It is envisioned that UDOT PMs will be the primary users of this tool. UDOT PMs will import data into the tool from data sources that are already assembled through project development. A simple Optimize Mobility score will be produced and entered into a project update form that is already a part of the existing process.

7. Requested from UDOT: \$50,000	Other/Matching Funds: \$25,000	Total
Cost: \$75,000		
(or UTA for Public Transportation)		

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

The schedule assumes a July 2019 start date and a 12- month research plan, with final report delivery in March-May 2020.

Task 1: Stakeholder Meeting #1; Literature Review and Review of Analytical Methods – two months (August-September 2019).

Task 2: Literature Review (August-September 2019)

Task 3: DOT and UDOT PM Outreach (September-November 2019)

Task 3: Review Data Sources; Stakeholder Meeting #2 (November-February 2020)

Task 4: Development of Beta Model (February-March 2020)

Task 5: Beta Testing (March-May 2020)

Task 6: Stakeholder Meeting #3; Final Model and User Guide (June-July 2020)