RESEARCH PROBLEM STATEMENT

DATE:	09/02/2019	PROJECT AREA:	Construction

TITLE: Update of the ARDOT Workforce Forecasting System

PROBLEM STATEMENT:

ARDOT has relied on 'The Manpower Forecasting System Formulas Program' since the 1970s to predict workforce needs at Resident Engineer's (RE) offices throughout the state. The program takes project characteristics (roadway type, contract amounts, etc.) as input to predict annual inspection staffing levels based on formulas derived from historical construction project data. The software estimates the labor required to inspect projects as they are constructed, determines when and where labor is needed, and generates reports of this information. Unfortunately, the staffing prediction formulas within the program have not been re-estimated to reflect today's workforce productivity and the Department's changing resource usage patterns. Further, from a practical standpoint, the software currently used is outdated and cannot run or be updated easily on modern PCs. Therefore, the purpose of this project is to reestimate and expand the capabilities of workforce prediction model and software. For added functionality, the proposed software will allow direct user input for items like seasonal factors and underlying workforce usage trends and enable longer-range predictions (2+ years).

OBJECTIVES:

The objectives are to: (1) update regression based formulas for workforce forecasting based on recent construction project characteristics and staffing requirements and (2) update the software platform used to analyze and predict workforce needs. The tasks associated with these objectives are to: (a) gather historical construction project records from the Construction Division, (b) estimate multiple regression formulas that incorporate recent construction project characteristics like contractor and Department methods, larger ranges of project costs, etc., (c) develop a new software to allow for data entry, report output, and integration with other ARDOT systems (AASHTOWare, etc.), and (d) test new software with Construction Division.

FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:

The research will be implemented as a software tool that takes construction project characteristics as input and outputs predictions of where, when, and how many person hours are needed for job inspections. A user-manual detailing software protocols will also be developed. An update of soon-to-be obsolete workforce forecasting system will support more accurate Project Management Plans to effectively manage the budget, schedule, and quality of major construction projects. Extending the current capabilities of the software and its' models to allow longer range predictions, changes in contractor methods, and ranges of projects contributes to the positive ROI that is expected with the project.

Estimated Project Duration: 12 **Months**

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Standing Subcommittee Ranking	Advisory Council Ranking	Statement Combined with Statement Number(s)
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