

**DIVISION OF RESEARCH, INNOVATION & SYSTEM INFORMATION**  
**Research Initial Scope of Work**  
**SUBMITTAL FORM - FY 2021/22**

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I. **Project Number: P1497**

Project Title: California Transportation Improvement System (CTIPS) Database

II. **Task Number: 3975**

Task Title: California Transportation Improvement System (CTIPS) Modernization

III. **Project Problem Statement:**

The California Transportation Improvement Program System (CTIPS) is the backbone of all State and Federal Programming data that includes project prioritization schedule and funding. State and local agencies use CTIPS to program state, local and transit transportation projects. It was developed as in-house database in the mid-90s to track programming of projects for the Division of Financial Programming. After many years of use modifications and service, CTIPS database needs an upgrade to keep up with growing programming demands and technological advancements. CTIPS must be replaced with a robust system that is compliant with the Americans with Disabilities Act (ADA), web secure, flexible to accommodate additional functions and enhancements, and capable of integrating with other systems.

IV. **Objective:**

The objective of the project is to find solutions for meeting ADA compliance requirements and make the application secure on the web while finding solutions for long term replacement. This research will develop and recommend available options to address the deficiencies of the existing CTIPS and work toward the goal of replacing CTIPS that will increase organizational agility and efficiency.

V. **Task Description of Work and Expected Deliverables:**

- 1) Recommendations on making existing system ADA compliant
- 2) Recommendations for ensuring web security of the current system
- 3) Current CTIPS must be fully functional and viable while implementing upgrades
- 4) Recommendations for commercial off the shelf, custom designed or a hybrid solution for CTIPS replacement and updated user interface so that the system will be viable for all future needs and advancements of technology and policy updates.
- 5) The updated system should accommodate data flow to and from other departmental databases and systems along with options to expand to accommodate future programming needs. It should also, incorporate recommendations by the current San Jose State University CTIPS research contract.
- 6) Database model – converting process recommendation and information flow from current phase I of CTIPS research to business rules and a model/prototype
- 7) The project will devise flow of information log, storage solution, data validation rules, multiple accesses for various programs so that data can be streamlined across multiple funding programs and throughout the department.
- 8) The documentation and prototype from this research should serve as a Feasibility Study Report for the next stage of development and implementation.

VI. **Background:**

CTIPS is a programming database that was originally developed in FoxPro environment in-house by California Department of Transportation (Caltrans). Then it was converted to Oracle database and Java interface as an interim solution for upgrading. But the conversion was not a standard process and was done using Legacy Conversion, which makes it hard to implement any further changes or updates.

CTIPS needs to be modernized because it is not able to keep up with the growing demands of the Programming and technological needs despite the high cost of maintenance.

Furthermore, the current user interface of CTIPS is not compliant with the American with Disability Act (ADA) requirements and has security vulnerabilities. Efforts to make CTIPS ADA compliant were not successful due to the application framework and complex structure of the database.

VII. **Estimate of Duration:**

Up to 24 months, shorter time frame is favorable

VIII. **Related Research:** Currently, we are working with San Jose State University on a research project (phase I) to document the current processes and flow of information of the existing system along with a comprehensive survey of system needs that have been in use in Programming divisions of other State Department of Transportation along with input from other California State users of CTIPS.

IX. **Deployment Potential:**

This project is a high priority that lines up with goals and objectives of the department. The ADA compliance is mandated by legislature, which makes the priority bound by law.

The possibility of deployment for this research is inevitable.

X. Author: Muhaned Aljabiry

Date: 25 May 2021

## Research Initial Scope of Work Guidelines FY 2021/22

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### **INTRODUCTION:**

The Project Manager/Task Manager (PM/TM) who decides to advertise their FY19/20 **approved** task(s) should follow the guidelines below. The completed Initial Scope of Work Submittal Form and any back-up documents should be forwarded to Yvonne Cooks **on or before April 25, 2019.**

### **GUIDANCE ON INITIAL SCOPE OF WORK SECTIONS:**

- I. **Project Number and Title:** (Limit titles to *no more than 60 characters.*)
- II. **Task Number and Title:** (Limit titles to *no more than 60 characters.*)  
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- III. **Project Problem Statement:** (Describe the project problem statement.)
- IV. **Obj  
ective:** (Describe the overall task objective(s).)
- V. **Task Description of Work and Expected Deliverables:** (Optional section for the PM/TM to provide specifics about work requested in the proposal.)
- VI. **Background:** (A brief background statement or description of how the task relates to the project, and to departmental operations.)
- VII. **Estimate of Duration:** (Duration estimate for *this task.* Please align the schedule with the RPMD.)
- VIII. **Related Research:** (Results of PM/TM's literature review and/or Preliminary Investigation for new projects, or research results from previous tasks in this project. Also include additional research results/data and relevant literature.)
- IX. **Deployment Potential:** (Is this an incremental part of a larger research project? What stage of research is this project in now? What might be the eventual deployable product? What division/office/entity is the identified sponsor?)
- X: **Author and Date:** (Self-Explanatory)