

I. PROBLEM TITLE

Improving Traveler Information Services with Contractor Permit Apps

II. PROBLEM DESCRIPTION

One of the major causes of commute delay is lane closures or other construction events. With appropriate notification, drivers can be made aware of construction and modify commute times and routes which results in less time stuck in traffic and reduced chance of work zone accidents. However, accurate, up-to-date, construction is not always available from NDOT contractors. Even though work plans must be submitted outlining closures, the actual times of the event start and end are not always reported which results in poor traveler information.

III. OBJECTIVE

The primary goal of this project is to develop a new, simplified, web application for construction projects. The web application would incorporate construction plans into an automated notification system. The system will be able to send email and text message reminders to managers to remind them to “check-in” at the start and end of the construction event. In addition, a mobile interface will developed to provide a single-stop app to manage the notification process. The proposed system will make the reporting process as simple as possible to maximize compliance. This compliance is particularly important due to SAFETEAU-LU 1201 construction accuracy reporting requirements.

IV. CURRENT PRACTICE AND RELATED RESEARCH

Construction projects are actively managed and maintained and therefore road closure information is known well in advance. Typically, this means that NDOT construction closures are well reported. However, non-NDOT entities do not do a good job of reporting which causes problems with the timeliness of construction data. The weakest point of the process is that once the permits are issued, there is no good procedure to track compliance. The system requires a person for the contractor to contact road operations to notify of lane closure and when normal operation resumes. If the call is not placed (not properly reported), there is no way to determine when this breakdown occurs. Notification about a road closure then comes from the traveling public as they come across and unexpected delay.

When construction check-in information is available, it is an important data source for traveler information. It provides the location and times of lane closures essential for intelligent route choice. The FHWA California Division uses “event start” and “event end” calls to the TMC to gauge the accuracy of their permit information. If both start and end calls were placed, they have an accurate record, while any less is inaccurate. The ratio of accurate records to permits is used to assess the 85% accuracy of construction activities as will be mandated in November 2014 by federal SAFETEA-LU 1201 legislation.

California, Ohio, Wisconsin, and various other states have developed web-based lane closure systems (LCS) to coordinate lane closure activities across the state. The online tool provides a quick and easy way to determine lane closure policy for a given roadway based on capacity constraints at all hours of the day. The CA LCS also gives the ability to monitor lane closure progress and feed the information into the freeway performance measurement system (PeMS) for integrated real-time data management.

V. RESEARCH METHODOLOGY

The proposed research involves three main phases: 1) construction management process analysis 2) check-in web app development and 3) system test and evaluation.

To start the research, a complete review of the construction bid and management process will be reviewed. This analysis will determine what types of job information are available and make recommendations for new fields if required. In addition, the management software and database systems will be examined to determine methods for either direct interface or to export into the new web app system. The web app system will be developed to maintain a database of all planned jobs along with the start and end times. A web interface will give NDOT and contractors a simple interface to manage the job. The app will use the planned times to send email and text notifications which will require acknowledgement through a check in process (phone call or through web app). A mobile app will also be developed (Android) for push notifications and for immediate check in with the phone. Finally, the check-in web app system will be tested and evaluated by NDOT and contractors for improvements in interface and design.

VI. IMPLEMENTATION POTENTIAL

The proposed research is in Stage I/II of research deployment. This is a new idea; however, the UNLV research team has been actively developing web and mobile applications recently and has other successful projects of similar nature. The proposed research will result in a usable check-in web application for management of construction projects and lane closures. It is expected that further tests beyond this project would be conducted to ensure this product could fully integrate into the current management practice.

The only foreseeable barrier to entry would be contractor acceptance of such an app. If the contractors do not use the app it will not be effective for management. However, this same problem exists currently and the app will be designed to streamline the check-in process by utilizing familiar and convenient technology.

VII. URGENCY AND PAYOFF POTENTIAL

SAFETEA-LU 1201 Real-Time System Management Information Program established provisions and parameters for state DOTs to provide accessibility to traffic and travel condition information. Construction activities that close or reopen roadways must be reported within 10 minutes within Metropolitan Areas (20 outside). In addition, the information must be 85% accurate and available 90% of the time. In order to meet the accuracy requirement, contractors

must report their activities, which is not happening enough currently. With this new, simplified, check in procedure, the accuracy rates should increase because an automated system will ask for updates and make check-in simple to perform.

This project can become a critical component for SAFETEA-LU 1201 compliance. It should be pursued this funding cycle because of the November 2014 deadline for program establishment for Interstate highways and the November 2016 deadline for metropolitan area routes of significance.

This problem statement addresses the following NDOT FFY 2015 Expert Task Groups:

- Expert Task Group on “Better Project Delivery”
- Expert Task Group on “Transformative Transportation Technologies”

This work can potentially change the manner in which NDOT does business by leveraging new mobile technology to develop apps to improve program management.

VIII. ESTIMATED BUDGET

\$100,000

IX. DATE AND SUBMITTED BY

May 23, 2014

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X. NDOT CHAMPION, COORDINATION, AND INVOLVEMENT

The NDOT champion for this proposal is:

- Michael H. Yates, PE, Traffic Engineer – District I, (702) 385-6535

This project would likely benefit NDOT Operations through Construction, Engineering Project Management, and Planning Traffic Information System.



Brendan Morris <brendan.morris@gmail.com>

ndot research problem statement idea for construction

Yates, Michael H <MYates@dot.state.nv.us>

Thu, May 15, 2014 at 12:48 PM

To: Brendan Morris <brendan.morris@unlv.edu>

Brendan, I am out of the office until After Memorial Day, but if there were a way to simplify the process for contractors to notify the department of lane closures, for permits it could definitely benefit the department. Let me know what I can do to help.

Michael H. Yates, PE
Traffic Engineer - District I
Nevada Department of Transportation
(702) 385-6535
zero logo email signature
Always Buckle Up, Don't Drive Impaired
Focus on the road, Stop on Red
Be pedestrian safe

On May 15, 2014, at 12:03 PM, "Brendan Morris" <brendan.morris@unlv.edu> wrote:

Hi Mike,

I'm a professor in electrical engineering at UNLV and we met earlier in the year when I attended the RSMIP kickoff meeting help in January at FAST.

You may be aware of the call for NDOT research problem statements for the 2015 year and I had an idea based on some issues you mentioned regarding traveler information and construction. I believe that you said there was a problem with non-NDOT entities not doing a good job of reporting when they are working and lane closures and such. I had an idea for an NDOT construction web-app that you could have these entities use as part of the contract process. The app would ask for information necessary from the planning perspective but also would have a way to verify the project. E.g. have a text message or email go out to the contractor to confirm status. The idea would be to develop a very simple app that contractors would actual use for reporting because it only requires a "check-in".

I was wondering if something like these might be of interest to you? We would develop the app here at UNLV and design it with your guidance based on reporting requirements. If desired we could host the information, but my hope would be to integrate this automatically into your current workflow and systems (databases etc.).

I plan to write up a few problem statements so I would appreciate your support. I would be happy to talk more about your groups needs and this project at your convenience. (The deadline is Friday May 23 next week). Best.

Brendan
702-774-1480

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