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Caltrans Division of Research, Innovation and System Information

Research Results

Transportation Safety and Mobility

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Project Title:
California Traffic Management Laboratories (CTMLabs) Testbed Program

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Traffic Management Center (TMC) Training Simulator Upgrade and Support

The work of this project consisted of upgrading the TMC Training Simulator equipment and installing it at Cal Poly University at San Luis Obispo, where the training sessions took place.

WHAT WAS THE NEED?

The facility and equipment at the University of California at Irvine (UCI) that composed The California Department of Transportation (Caltrans) Traffic Management Center (TMC) training simulator has become obsolescent and no longer functional. The training simulator had been used by The Caltrans TMC Academy to train operators to work in district TMCs. However, the TMC Academy had been unable to offer any training sessions for two years due to the lack of a functioning facility. More trained operators were required to staff district TMCs, so they could continue to operate.

The growing problem of traffic congestion in California required continued efforts by Caltrans and the California Highway Patrol (CHP) to manage the statewide transportation system in order to minimize congestion and provide the safe and efficient movement of people, goods and services. With diminishing space, building new highways is costly, and in many places, no longer feasible. The need for more sophisticated transportation management of the existing infrastructure was, and remains, essential. The TMC is the backbone of the Traffic Management System, which is designed to efficiently manage existing infrastructure and mobilize assets and field personnel.

WHAT WAS OUR GOAL?

The goal of this project was to create an up to date functional TMC Training Simulation System at Cal Poly University in San Luis Obispo (SLO) equipped with the tools necessary to teach prospective operators the requisite skills to perform effectively and efficiently. The centralized training facility served the broader

goal to standardize systems, operations, and facilities to ensure cost effectiveness, uniform statewide functionality and economics of scale. This supported the even broader goal to actively manage the statewide transportation system to minimize congestion and provide for the safe and efficient movement of people, goods and services.

WHAT DID WE DO?

The work of this project consisted of upgrading the TMC Training Simulator equipment and installing it at Cal Poly, where the training sessions took place. Key elements were to update and maintain the TMC Simulator, ensuring that all systems were operational and to add necessary features such as an incident board on the TMC floor and additional video and audio monitoring capabilities.

The newly developed simulated CHP VisiCAD was tested by traffic management personnel for realism and operational accuracy. Required improvements were documented and changes were made. The automated script builder tool, which allowed TMC simulation scripts representing various scenarios to be written in an automated fashion, was designed and implemented. The Transportation Management Center Activity Logging System (TMCAL), which provided incident logging capability to TMC simulation trainees, was integrated into the TMC simulator. Four TMC academy courses were delivered at Cal Poly using the newly installed and refurbished TMC simulator.

The work plan for the project included the following principal activities:

1. Maintain and Update TMC Simulator Facility and Equipment at its new installation in the Advanced Technology Laboratory at Cal Poly. This work included maintaining existing software and equipment and installation of new equipment and accoutrements.
2. Update the CHP CAD Simulator. This work required changes to the CHP VisiCAD simulator, which were designed, implemented, tested and documented.
3. Develop the automated script-builder tool. This work required changes to the Script-Builder software, which were designed, implemented, tested and documented.
4. Integrate TMCAL into TMC Simulator. TMCAL was installed in the TMC Simulator, tested and documented.
5. Support TMC Academy Training. Cal Poly researchers supported four one-week TMC Academy courses during this task. TMC Academies ran from Monday afternoon through Friday morning. Support for TMC Academies included printing training materials, organizing classrooms and amenities at the TMC simulator, being present to support student needs, and running TMC simulations during the last two days of each academy.

WHAT WAS THE OUTCOME?

The TMC Simulator equipment was transported from UCI to Cal Poly and installed in the Advanced Technology Laboratory there. Several hardware upgrades were installed, including new video wall monitors, student workstations, a closed-circuit telephone system, video servers, a sound system and instructor work stations. System software was further developed, including the CHP CAD simulator and the automated script builder. The TMCAL software was integrated into the CAD simulator. A separate student classroom was configured, painted and furnished. Four one-week classes, including TMC Simulator training sessions, were taught to Caltrans TMC operators from across the state by Caltrans training personnel. The Cal Poly researchers worked closely with the trainers and provided technical and logistical support before and during the classes.

WHAT IS THE BENEFIT?

The TMC is the nerve center of the state's regional transportation management system. It is where data from the transportation network is collected

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and processed to produce information used by operators to monitor the system and initiate control strategies to effect improvements in operation. The TMC is where Caltrans and CHP coordinate their responses to transportation situations and communicate transportation related information to the media and the motoring public.

When operated properly, TMCs are capable of actively managing the transportation system to reduce congestion and provide for the safe and efficient movement of people, goods and services. TMCs can contribute to conserving energy and improving air quality. By enhancing the movement of goods, they give California businesses a competitive edge by adding value to their products and services.

LEARN MORE

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IMAGE

Image 1: Traffic Management Center (TMC) Training Simulator facility as installed at University of California Irvine (UCI).