



SOLARIS Breaks New Ground in Tech Transfer with TranSync Tool

The University Transportation Center at the University of Nevada, Reno (UNR) has developed a technology transfer tool that is having a significant impact in the area of signal synchronization, both in the field and in the classroom.

UNR's SOLARIS (Safety and Operations of Large-Area Rural/Urban Intermodal Systems) center has jointly developed the TranSync tool, in collaboration with Trans-Intelligence LLC. Built on an idea similar to the earlier SMRT (Signal Timing Management and Re-timing Tool), TranSync has evolved into a complete suite for traffic signal timing management, optimization, diagnosis, and evaluation that is expected to significantly improve arterial traffic flows and reduce urban congestion.

Because it assists students in developing optimized traffic signal timing plans and evaluating their performance in the field, the tool is now being used in class projects aimed at improving signalized arterials. "The analysis tool is very useful in teaching and research," said Professor Alex Skabardonis. "It provides the means to understand signal operations, especially signal coordination, and the evaluation of the performance of signal control algorithms."

The tool has improved the learning process for students who are able to witness common traffic signal control problems and apply them to the real world, according to Zong Tian, Ph.D. who is the key developer at SOLARIS. Andrew Jayankura and Dongmei Lin, who recently graduated from UNR, agree. The transition from academic research to actual application highlights the diversity of the tool in research and education, especially for Jayankura, who was significantly involved in signal timing projects for the City of Reno based on his knowledge of TranSync gained from his studies. Likewise, Lin believes that TranSync has been a very



Traffic signal engineers from Caltrans District 11 in San Diego in a TranSync training session. Pictured from left to right: Sheri Babaki, Sonya Ellyazidi, Alicia Humphries.

Zong Tian, UNR/SOLARIS

efficient tool in helping her to learn signal timing skills and conduct signal re-timing projects, especially when troubleshooting signal problems and optimizing corridor signals.

In addition, expertise with TranSync has contributed to Jayankura's and Lin's success in gaining employment after graduation. Jayankura recently joined the Regional Transportation Commission of Washoe County as a project manager responsible for the regional signal timing work. Lin is now employed by DKS and Associates in Portland, OR.

TranSync's ability to capture real-time space diagrams in the field has also contributed to more effective engineering, according to Patrick Marnell, senior engineer at Kittleson and Associates. "When field tuning offsets, I no longer ask myself [if] that was an early return to green. I know for sure if it was or wasn't," he said. Even more, TranSync has also proven to be a very effective tool for workplace training in signal coordination principles. "I have spent countless hours explaining time-space diagrams to young staff



Professor Alex Skabardonis of UC Berkeley uses TranSync for a design project on arterial timing for a capstone class.

members,” said Marnell. “The ability to have someone ride in a car and see the vehicle trajectory plotted as they travel down a corridor creates a deeper understanding of how the time-space diagram works.”

Aside from private firms utilizing the tool, Dr. Tian has conducted training and demo projects for several federal and state agencies, including four districts in

Caltrans, Oregon DOT, Arizona DOT, City of Tucson, and City of San Diego. Yao-Jan Wu, Ph.D., Assistant Professor at the University of Arizona who attended the field demo for the City of Tucson, said “It is an excellent tool for not only solving practical signal timing problems but also in helping our students understand traffic signal timing principles. The interface is very intuitive. The visualization component of this tool is very easy to understand.” Wu has been working closely with Tucson engineers to promote advanced technologies in improving regional signal timing and coordination. He is now using the tool in teaching a technical traffic engineering elective class for both senior and graduate students.

Similarly, Sonya Ellyazidi, a traffic signal engineer at Caltrans District 11 in San Diego, experienced the tool firsthand at a field demo and found that it provided an additional tool for double checking timing solutions, particularly when combined with other tools. Though it is expected that some of those agencies will also adopt the tool, Caltrans has officially implemented TranSync as their major signal timing software after conducting an experiment using some of the suggested optimization plans with Dr. Tian.

About This Project

Development of the TranSync tool is a collaboration between SOLARIS and Trans-Intelligence LLC. guided by Zong Tian, Director of the Center for Advanced Transportation Education and Research (CATER) and SOLARIS. For additional information, please contact us at zongt@unr.edu or 775-784-1232.



This newsletter highlights some recent accomplishments and products from one University Transportation Center (UTC). The views presented are those of the authors and not necessarily the views of the Office of the Assistant Secretary for Research and Technology or the U.S. Department of Transportation.

