

Golden times

Leanne Keeble talked to Charlie Mitchell, senior vice-president, TRMI Systems Integration, about the company's Systems Integration and Open Design Approach

Tell us more about TRMI's role in the Golden Gate Bridge project: how were you awarded this contract and what exactly did you do?

TRMI is the prime contractor. We were responsible for designing and developing the complete FasTrak Automatic Vehicle Identification ETC system. Part of the selection was based on our 'Open Design' approach, which deliberately makes it simple for a toll agency to take over software maintenance, including enhancements, if they choose. TRMI's liberal licensing policies, together with simplicity, modularity, and highly detailed documentation, give clients the ability to modify the system themselves, or to hire a different integrator to extend the system.

When did work begin and when was it completed?

We started the work back in August 2006 and it is scheduled to open in the second quarter of 2007.

Do you have any facts/figures/statistics that demonstrate the success of your work?

A key method used to ensure simple, modular design is the use of Test Driven Development (TDD). TDD, despite the word test in the name, is primarily a design methodology. It requires



Figure 1: Daily reconciliation



Figure 2: Lane monitoring



Figure 3: Report generation

tests to be designed before the code is developed, which naturally leads to code being created in smaller, less tightly coupled pieces. This code is easy to understand and work with. The automated test aspect is an added bonus, acting as a constant safety net during development.

To date, several hundred automated tests have been developed for the Golden Gate Bridge project. Three complete automated build, test, deploy cycles run automatically each night, providing tens of thousands of regression tests over the course of the project.

What's next for TRMI in terms of ETC projects that are you working on?

We have recently been awarded a contract to provide E-Zpass ETC to the Chesapeake Bay Bridge and Tunnel system. The Bridge-Tunnel project is a four-lane 20-mile-long vehicular toll crossing of the lower Chesapeake Bay. The same Guardian Toll Collection Software Suite will be

customized using the same TDD methods currently being employed with San Francisco's Golden Gate Bridge project. The three screen shots are from the current development of the ETC application for the Golden Gate Bridge. The screen in Figure 1 displays the business practice of the Golden Gate Bridge when they close out a work shift. The design and layout make it easy for auditors to know what to work on next. The screen shown in Figure 2 can be configured to show any number of transactions for any number of lanes, using more than 30 different transaction fields.

Using Crystal Reports (Figure 3), this enables the Golden Gate Bridge to select a specific type of report, input parameters, and then view and print the report in three different formats, including MS Word, Excel or PDF. The reports are dynamically populated from an Oracle database, and no software changes are required to add a new report to the list. ■

