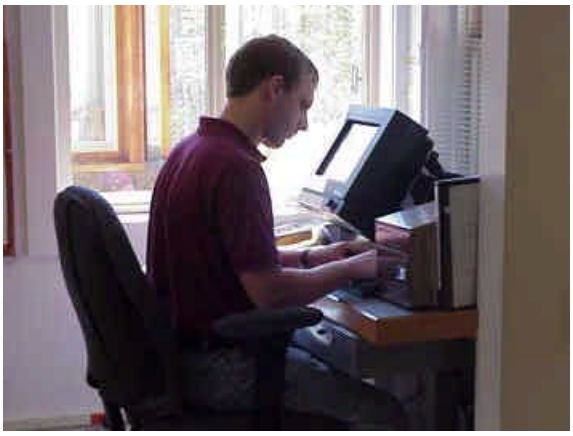
Tolltex Touch Screen Toll Collection System

During June 2002, Tolltex installed a revised toll collection system at the Whittier Access Tunnel in Alaska. The State of Alaska expanded the number of vehicle classes and payment types to further support the users of the tunnel.

This expansion required a redesign of the collector's toll terminal interface as well as the database and real time monitoring software. Previously the collectors used stainless steel terminals equipped with buttons corresponding to the original vehicle classes and payment types. Using touch screens allowed for the new functions to be implemented and supported future expansion. The major components of the system are described below.



Touch Terminals - The touch screens provided were rugged die-cast units with a 10.4 inch color screen. A custom mount assembly was designed to allow the collectors to easily adjust the unit for efficient use and viewing.

A bar code reader in each booth is used to scan ticket books as they're sold and tickets that are redeemed as payment of the toll.

Each lane includes a Receipt Printer fabricated of stainless steel and linked to the lane controller via serial RS-422 communications.

To support the additional vehicle classes and to support the sale and processing of coupons, the plaza database system was completely re-designed The database contained two years of previous transactions that were created before the change was made in 2002. A special utility program was developed to reformat the old transactions into the new format.

A bar code reader was also added to the plaza computer system (PCS) to support management of the new discounted coupons and passes.

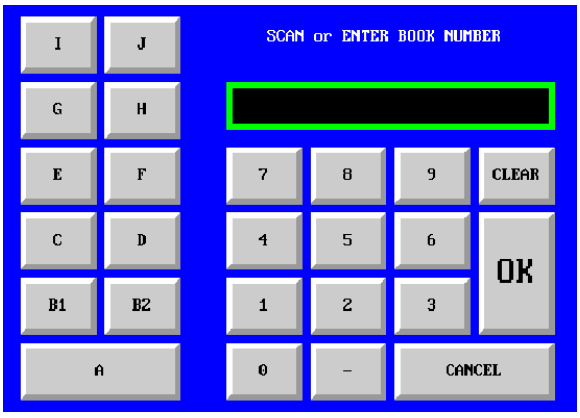
Touching the "Panic" target sounds an alarm in the plaza building as an alarm. Other targets are used to indicate the payment type (Cash, coupon, check, credit card).

Tolltex worked with the State of Alaska's operational staff and designed touch screens that met the unique operational requirements of the facility.

Each rectangle on the screen shown here is a "touch target" that when touched, causes the operation to be performed.

For example, touching "Class A" sets the vehicle classification to a 2-axle vehicle. Touching "Receipt" causes a receipt to be printed.

The green color border around the "Lane Open" target indicates that the lane is open. If the lane was closed, that target would read "Lane Closed" and the border would be red. The areas with the yellow text display messages. For example, the top left area indicates that collector ID 0002 has opened the lane. Other areas display the toll amount due and the current date/time.



Discounted coupon books and special 6-month passes are sold in the lanes. New screens were developed to record each sale.

When sold, the bar code on each coupon book or pass are scanned by the collectors using an industrial handheld scanner. Once scanned, coupons in the book or the pass are accepted as payment. If a book or pass had not been sold, the system does not allow the coupons from the book or a pass as payment. Each individual coupon and pass is tracked by a unique bar code number. Once a coupon is redeemed for payment, it cannot be used again. Passes have an expiration date which is checked before the pass is accepted as payment of the toll.

If a bar code is unreadable, coupon/pass numbers can be entered manually by using the graphic keypad screen on the touch terminal.

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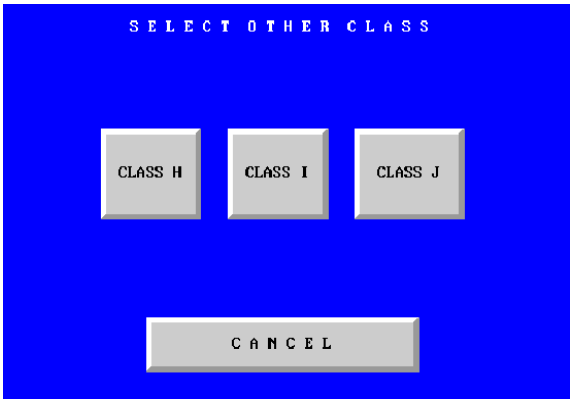
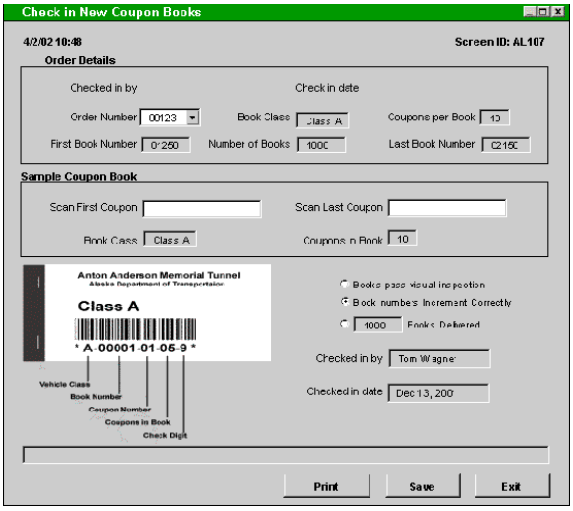
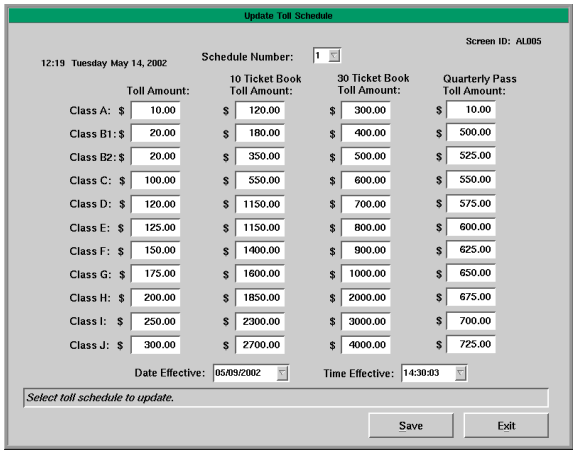


A goal of this system expansion was to allow for future growth. Additional vehicle classes were added in the event that operational requirements change.

By touching the "Other Classes" target on the main classification screen, a sub-screen is displayed allowing the collector to select additional classes. The database, toll schedule, and all reports were designed to include these additional classes in the event they are ever used.



The plaza computer system was also modified to support the new functions. A complete coupon book/pass database with new screens and reports was developed. This portion of the system supported the manual procedures that included; ordering books/passes, generating the bar code numbers that were given to the printing service, checking in books/passes once they were received from the printer, assigning books/passes to collector's for sale, and returning any unsold books back into stock. It was also possible to change the status of a book/pass to lost/stolen to handle those cases. The result was a compete coupon/pass management system.



It was necessary to completely redesign the toll schedule to support the additional vehicle classes and payment types.

The use of discount coupon books and passes required special toll amounts to be associated with each of the vehicle classes that are authorized to use coupons and/or passes.

Fields on the toll schedule screen allow a new schedule to be put into effect automatically on a certain date/time.

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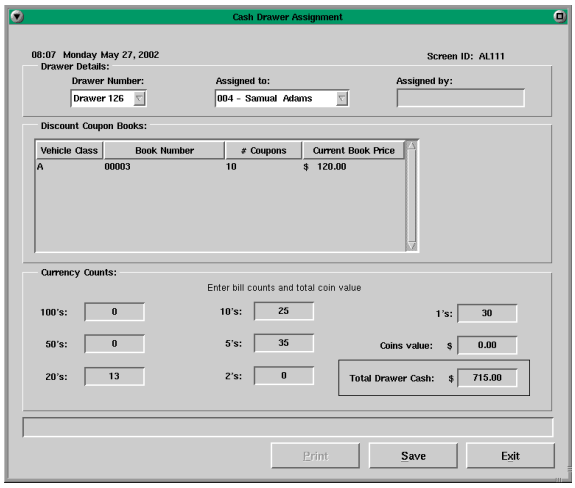
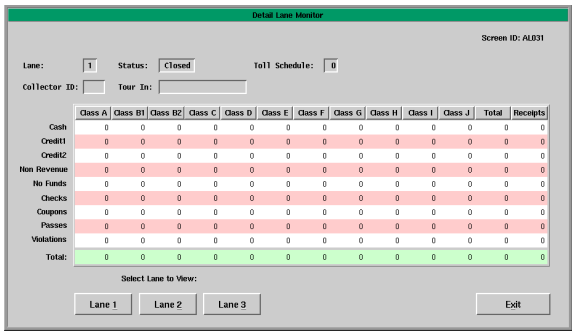


Methods of managing the collector's cash drawer also had to be revised. Selling and redeeming coupon books and passes required tracking of each book/pass given to the collector's for sale, and each coupon received for payment. The change fund assigned to each collector is also managed according to the cash drawer given to each collector.

Coupon books and passes given to the collector for sale in the booth are first scanned and associated with the cash drawer assigned to the collector. This ensures that at all times, each book and pass is accounted for by the system.



Real time monitoring of all operations occurring in the lane allows supervisors to control and manage the facility. Counts of vehicles processed in each lane as well as the status of each lane are displayed in real time as events occur. This allows supervisory staff to have full control of the operation.

All devices in the lane including the touch screen toll terminals, bar code readers, and receipt printers are connected to the lane controller located in the plaza building. The lane controller connects to the plaza computer system via a 100BaseT LAN.

The controller features a 266HHz processor, 256 MB RAM, 9.1 GB hard disk, 16 port serial multiplexer, and the necessary support for the digital input and output devices located in the lanes.

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