



Ergonomics Case Study Washington State Ferry Signature Pads

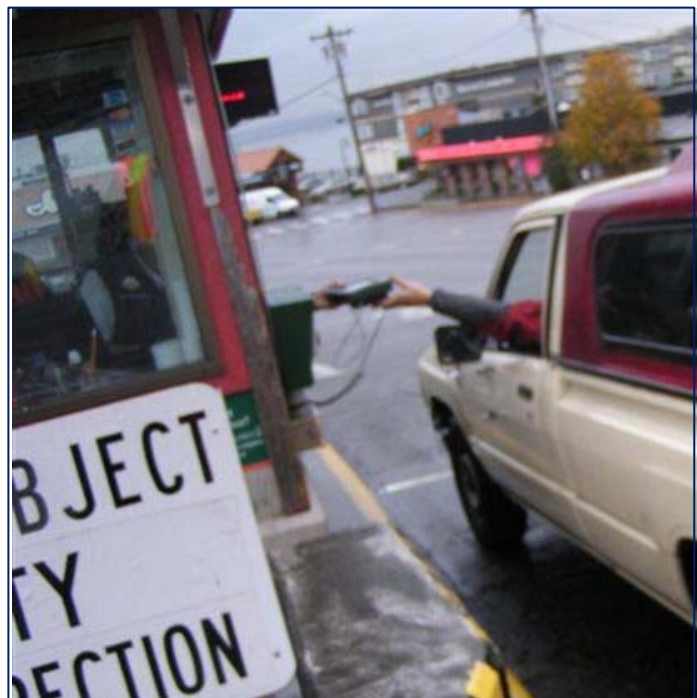
Background

Workers from Washington State Ferries (WSF), contacted L&I for help with the Toll Booths at the ferry terminals. Some Ticket Sellers experienced discomfort when handing an electronic signature pad out the toll booth window to motorists. The L&I ergonomist focused her assessment on the use of the signature pad, while an ergonomist from Washington State Department of Transportation (WSDOT), Dr. Ed Stevens, Jr. looked at the bigger picture, including the signature pad, toll booth design, and set up of computers and other equipment.

Issues Found

Ticket Sellers handed the signature pad to car and truck drivers hundreds of times a day. Although fairly lightweight (28 ounces), the signature pad was held in a pinch grasp at a full arm's length. Reaching, bending and twisting to fit through the narrow window of the toll booth added to the stress on the Ticket Sellers' hands, shoulders, and backs.

Dr. Stevens' study found other issues that added to the awkward reaching and postures. The layout of equipment was not the same from one toll booth to the next. Also, an automated system meant to read customers' cards without Ticket Seller assistance wasn't used much by customers.



Recommendations

Several solutions were proposed by both ergonomists. These included:

- Consider getting rid of the signature pad.
- Mount the signature pad outside the toll booth windows so only the customers handle it.
- Explore other systems, like the Good-To-Go electronic tolling system on the Tacoma Narrows Bridge. This would create consistency across WSDOT systems.
- Figure out why customers don't use the automated card reader system and correct it.

Dr. Stevens' toll booth recommendations included:

- Make all window openings 30 inches wide to accommodate a large male's shoulders with room for movement.
- Install shades to help reduce glare.
- Work closely with Ticket Sellers to design an "optimal" workstation within the booths.

Implementation

Rather than eliminate the signature pad completely, WSF changed the requirements of its use in August of 2008. The signature pad only had to be used when the fee was more than \$100 or the customer used a debit card.

Follow-up

Sample data taken both before and after WSF made the change in their process showed dramatic drops in the amount of use of the signature pad. Prior to the change, workers handed the signature pad out the window an average of 10,645 times every day system wide. After the change in August, 2008, the signature pad was handled an average of only 177 times per day system wide. This is more than a 98% decrease in its use.

Ticket Sellers expressed their pleasure at the reduction in signature pad use:

- "I'm thankful that I don't have to use it anymore."
- "We use less paper and it's faster."
- "Now that I only use it once or twice a day, I have less discomfort in my shoulder and arm."

Thanks to Manny Perez, WSF Fleet Safety Coordinator, for implementation and follow-up data, and Dr. Ed Stevens for ergonomics study findings.