

# Modeling Methodology and Simulation of Port-of-Entry Systems

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## Problem Statement

CBP-OFO needs decision support tools for Port-of-Entry (POE) planning for both optimizing operations and for long-term evolution. To this end, it needs flexible and high-fidelity simulation models that compute POE performance metrics, primarily waiting time statistics.

## Project beneficiaries and end users

CBP-OFO Analysts, port-of-entry directors, drivers crossing POEs.

## Gains desired

Creation of a simulation tool and detailed POE models that allow flexible experimentation with POE configurations aiming to decrease POE driver waiting times and increase inspection personnel utilization.

## Pains at present

Inability to flexibly gauge the impact of impending congestion due to traffic surges or disruptions, and experiment flexibly with mitigations.

## Project products & services

- Suite of detailed POE simulation models, dubbed Port-of-Entry Simulation System (POESS)
- Accompanying documentation consisting of user guide and technical reports for each POE modeled

## GAINS created

- Short term (evaluated by end-user satisfaction survey): ability to flexibly gauge the impact of impending congestion and experiment with mitigations, and better schedule inspection personnel
- Long term (evaluated by field measurements): shorter average waiting times and increased inspection personnel utilization

## PAINS alleviated

- Long average waiting times of drivers at POEs
- Inefficient inspection personnel utilization



## Key Accomplishments

- Developed a modeling and simulation methodology for POESS, documented in a technical report
- Completed a POESS simulation model of the Bridge of the Americas (BOTA) POE in El Paso, Texas, and its accompanying user guide and technical reports
- Validated the BOTA model and delivered it to our end-user analyst group at CBP-OFO
- Conducted a usability survey of end users yielding overall end-user satisfaction rate of 83.3%, well over the requisite minimum of 75%

## Next Steps

- Modeling the Peace Arch POE in Blaine, Washington (in progress)
- Modeling the Calexico East POE in Calexico, California