

# Quantifying Emission Reduction, Queue Reduction, and Delay Reduction Benefits from the Nogales Unified Cargo Processing Facility

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**Executive Summary**



## Executive Summary

The purpose of this analysis was to calculate the emissions reductions benefits of the Unified Cargo Processing (UCP) program, jointly operated by U.S. Customs and Border Protection (USCBP)-Mexican Aduanas/SAT and which was piloted at the Nogales-Mariposa Land Port of Entry beginning in 2016.

To accomplish this, the research team conducted surveys of 432 commercial vehicle drivers at the Nogales-Mariposa Port of Entry in March, April and May 2018. Survey data was used to develop an analysis using approaches for ports of entry developed for the U.S. Federal Highway Administration (FHWA) and the U.S. – Mexico Joint Working Committee on Transportation (JWC template). That process utilizes queue models to study each process at the POE, along with estimated demand for each crossing program, to estimate how much delay and queueing commercial vehicles experience as they cross the border. The resulting estimates of vehicle activity were then coupled with emission rates from the United States Environmental Protection Agency (USEPA) MOVES model to estimate an emissions inventory, with and without Unified Cargo Processing.

This analysis finds that the UCP and Free and Secure Trade (FAST) programs substantially reduce queue lengths and crossing times to deliver an approximately 85% reduction in emissions (CO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>) associated with queueing and cargo inspection delays for northbound commercial traffic at the Nogales-Mariposa LPOE.

Queueing, delay and emissions from non-UCP NB commercial vehicles are reduced by the UCP program because these performance measures have an exponential relationship to traffic volumes at overcapacity inspections.

The Aduanas primary booths and cargo inspection area are the largest bottlenecks in the Mariposa LPOE complex. UCP program benefits are primarily attributable to the UCP commercial traffic bypassing the Aduanas facility. The capacity that those bypassing vehicles free up at the Aduanas primary booths and cargo dock then reduces the queueing and delay experienced by the remaining commercial vehicles.

The CBP primary lanes and non-intrusive inspection (NII) area do not have enough capacity to process peak-hour demand. Queues and delays for these inspections would be reduced, but not eliminated, if the facility were fully staffed. In contrast, the CBP cargo dock has ample capacity for the current volume of commercial vehicles.

The proportion of class 8 trucks relative to class 7 trucks is noticeably higher than what has been observed at commercial LPOEs in California (unpublished work at Calexico East and Otay Mesa), where in-use truck rules make Class 7 trucks more practical for many applications. This is consistent with having a larger proportion of long-haul rather than drayage traffic using the Mariposa LPOE.

U.S.-Mexico land ports of entry all exhibit unique characteristics in terms of layout, traffic flow and other aspects. For policy considerations, the emission reductions resulting from the UCP and FAST programs at the Nogales-Mariposa Port of Entry are only transferable to other LPOEs where similar bottleneck relief could be achieved.