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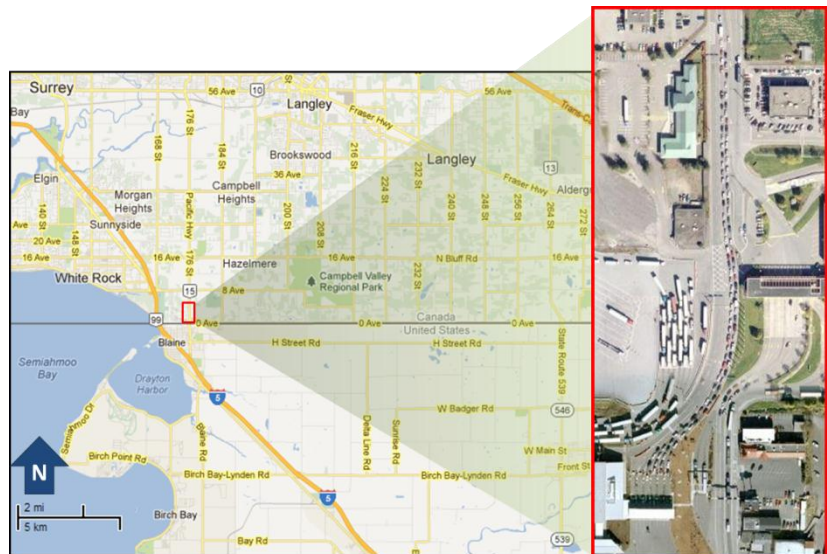
## Pacific Highway Southbound Passenger Lanes-to-booths Traffic Flow Improvements

### Overview

Border approach traffic lanes at this location unevenly distribute traffic volume to inspection booths. This generates additional congestion and creates a discrepancy between published border wait times and individual driver experiences. This project will develop traffic management strategies and improvement alternatives to optimally direct current traffic volumes to the corresponding open-booth capacity.

### Location

This project focuses on the southern terminus of BC Highway 15 in Surrey, British Columbia and its connection the Pacific Highway U.S. border inspection station in Blaine, Washington. The map graphic below illustrates the location and an aerial view of the current vehicle approach to primary inspection booths. This project is limited to *passenger* vehicle approaches. Commercial vehicles have a separate and recently improved border-approach configuration.



### Why this project is needed

The uneven distribution of traffic to available inspection booths mentioned above creates inefficiency of traffic movement and distortions to traveler information and system performance measurement. These impacts have costs.

At this location, two general purpose (GP) lanes and a third, dedicated NEXUS lane bring cars to the U.S. inspection station where the auto plaza widens to accommodate access to six primary-inspection booths (at least one of these being dedicated to NEXUS traffic). The flow of traffic under current infrastructure and lane geometry conditions is such that cars approaching in the easternmost of the two Highway 15 GP lanes end up having access to only the one, easternmost booth. Cars approaching in the western GP lane enjoy a more typical distribution to multiple service channels and thus, very often have a significantly shorter wait time at the border.

The problems this situation causes include the following.

- When drivers notice that other lanes are moving noticeably faster, many will start to change lanes and introduce friction that slows the flow, takes up needed space, and contributes to periodic conflicts.
- Border wait time systems at this crossing (as with most all crossings where such systems are installed) calculate values for the average of vehicles currently moving through the system. Recent system validation studies conducted by the B.C. Ministry of Transportation (BC MoT) showed that while the *average* values are accurate, wait times experienced by *individual* vehicles were often (during high volume conditions) either well below or well above the times posted in variable message signs (system average estimates). These observations match well with the uneven flows described previously. This widespread, ongoing mismatch between individuals' experience and the times that those same motorists have seen on the message-signs as they arrived at the border, generates mistrust in the information and thus reduces the likelihood that drivers will choose a different crossing route based on the information. One of the primary benefits the wait-time systems were developed to deliver was optimized distribution of traffic demand

between proximate crossing routes. If drivers don't believe the information is accurate, the value of the investments is greatly reduced.

- Especially following the adoption, by the United States and Canada of the Beyond the Border Vision and Action Plan (BtB), wait-time systems at high-volume ports of entry have been highlighted for their importance to supporting operational efficiency but also as an important source of quantitative feedback on system performance. While a sufficiently accurate measure of the average wait time experienced by the population of vehicles moving through a crossing is a legitimate and useful measure, alongside the assessment of lane-to-booth vehicle flow we have for southbound Pacific Highway, the average values mask the unequal performance being experienced by a large share of individual travelers – performance which is well below potential.

## Results

- Consultations with owners and managers of involved infrastructure (BC MoT, WSDOT, US CBP) to scope specific geography of improvement designs and options. At this location, duty free stores also have an interest in
- Assessment of dynamic elements that would need to be accounted for including the variable number of booths that would be open, dynamic opening (reassignment) of more than one NEXUS booth, and the possibility of metered flow from a location north of the inspection plaza.
- Delivery of a channelization improvement (possibly inclusive of lane metering) that will evenly distribute cars to inspection capacity. This will be measurable and evidenced by wait-times for cars in both GP lanes being equalized. The resulting improvement should also complement CBP active-booth management strategies.
- Evaluation of effectiveness: before and after data collection and assessment. This could likely be done with lane-based loop data (not requiring a field deployment).

## Application to other IMTC projects

Improving vehicle flow at this location will complement and be coordinated with the planning and delivery of other needed improvements on the IMTC Project List.

- **Near-term Predictions of Significant Changes in Cross-border Traffic.** A critical input to this project is accurate assessment of current conditions (wait times and arrival rates) as well as the capability for operations to change quickly in response to predicted conditions changes.
- **NEXUS Expansion—Measuring Effectiveness.** Channelization improvements will improve NEXUS at Pacific Highway by reducing lane blockages by non-NEXUS vehicles and by improving the ability to shift between one-booth and two-booth NEXUS operations.
- **ATIS Assessment & Calibration.** The effectiveness of the ATIS (border wait time) systems depends on drivers' trust in the information as much as it depends on technology. These projects will complement each other. Driver interviews done under the Assessment & Calibration project can be a basis for estimating the benefits of bringing average wait-time measures in line with individual drivers' wait-time experiences.
- **Pacific Highway Northbound Active Lane Management.** While the traffic management issues at northbound Pacific Highway are somewhat different, there might well be opportunities to employ similar methods to actively change lane status and optimize traffic flow on final approach to open booths.

## Estimated project Schedule

Completion of this project, from designing alternatives to, is estimated to take less than one year.

## Cost

This estimated cost of this project is to be determined. A low cost estimate for improved striping and additional delineation is \$100,000. A higher cost estimate for a sign based active metering system is \$900,000.

This project is not currently funded.

## Administration, funding, and partnerships

Coordination of agency consultation and inputs on design would be done by WCOG through the IMTC Program. Designs would be jointly approved, at a minimum, by BC MoT, US CBP, and WSDOT. Implementation and/or construction will be handled by the jurisdictions that own the underlying right-of-way.