Columbia River CROSSING

Memorandum

October 18, 2006

TO: CRC Task Force

FROM: CRC Freight Working Group

SUBJECT: **Screening of Freight Components**

The Columbia River Crossing project's Freight Working Group (FWG), which consists of representatives of the Vancouver-Portland metropolitan area's freight industry and meets regularly to provide input to the project, unanimously recommends the following regarding the remaining freight components being considered:

- Component F-1 – Freight in Managed Lanes: Drop from further consideration
- Component F-2 – Freight Bypass Lanes: Continue to consider as a project component
- Component F-5 – Freight Direct Access Ramps: Continue to consider as a project component
- Component F-6 – Enhanced Highway Design for Freight Mobility: Add as a new component to be considered

Components F-3 and F-4 (Freight Restrictions and Increased Truck Size) were previously dropped from consideration by the Task Force.

For additional information regarding Components F-1, F-2, F-5, and F-6, please refer to the following pages.

Freight Working Group Committee:

Member	Organization
Grant Armbruster	Columbia Sportswear
Steve Bates	Redmond Heavy Hauling
Bryan Bergman	Georgia Pacific
Mark Cash	G&M Trucking
Corky Collier	Columbia Corridor Association
Ken Emmons	United Road Service
Jerry Gaukroger	Boise Building Supply
Lee Johnson	Jet Delivery Systems
John Leber	Swanson Bark
Tracy Whelan	Esco Corporation

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Component F-1: Freight in Managed Lanes

Description

Freight in managed lanes could cover a range of facilities from truck-only lanes to managed lanes where vehicles pay a fee to enter the lanes when there is excess capacity. Managed lanes are typically designed for high occupancy vehicles.

Analysis of Operating Conditions

Managed lanes offer a travel time benefit to truck mobility primarily for long distance trips. For short trips, the time delay caused by weave maneuvers required to enter and exit the truck-only lane or a managed lane is often a large portion of the total travel time. Several of the region's major freight generators are accessed to and from I-5 within the Bridge Influence Area such as the Port of Vancouver, the Port of Portland, and the Columbia Corridor and would not benefit from an approximate five-mile-long truck-only lane. In addition, there is generally no net travel time benefit for trucks operating in managed lanes during the off peak, and no need to pay a fee to enter the lane.

Truck-only facilities on an interstate are generally recommended to be physically separated from general purpose traffic to reduce or eliminate the effect of trucks weaving into and out of this lane. Because of this separation, direct-access ramps to truck-only lanes are required and have limited locations. Such a configuration would substantially impact the I-5 Bridge Influence Area, which has limited right-of-way and many interchanges. The cost and environmental impacts of added infrastructure within this corridor would be considerable.

The summary below provides a comparison of conditions within the I-5 Bridge Influence Area to three criteria for truck-only lanes recommended from current research.

Truck-Only Lane Criteria Assessment for I-5 Bridge Influence Area

Criteria	Criteria met today?	Criteria met in 2020?
Truck volume exceeds 30% of the normal traffic mix.	No 125,000 daily trips on the I-5 Columbia River Bridge with at most 9% trucks including smaller single-unit trucks. Peak direction-peak period percentages tend to be lower.	No Previous analysis from the I-5 Partnership and recent I-5 Delta Park study results show truck volumes as a percentage of total traffic will not reach 30%.
Peak hour volume exceeds 1,800 vehicles per lane per hour.	Yes The I-5 Partnership work and recent Delta Park EA shows that peak period/direction volumes within the Bridge Influence Area exceed 1,800 vehicles per lane.	Yes Growing regional demand ensures this criteria will be met In the future.
Off-peak volumes exceed 1,200 vehicles per lane per hour.	Partially The Delta Park EA shows southbound I-5 afternoon volumes exceeding 1,200 vph on the I-5 Bridge. At other Bridge Influence Area locations, volumes drop below 1,200 vph. Northbound morning volumes rarely exceed 1,000 vph.	Partially Barring significant changes in regional jobs/housing balance, it is reasonable to assume these criteria, partially met today, will continue to be at least partially met in 2020.

Source: Identification and Thresholds Analysis of Truck Only Lanes, Working Paper 6.2, I-5 Columbia River Crossing Partnership: Traffic and Tolling Analysis, Prepared by David Evans and Associates, Inc. and Parisi Associates, November 2000.

Recommendation

The FWG recommends dropping Freight Component F-1 from consideration and exploring other more effective freight facilities during the design of alternatives.

Component F-2: Freight Bypass Lanes

Description

Bypass lanes can accommodate a high volume of vehicle trips around a system interchange (highway-to-highway) or around a major arterial interchange. Freight bypass lanes could also be applied to ramps, and could be used to avoid starting from a stop at ramp meters. I-5 at Barbur Boulevard is a local example.

Analysis of Operating Conditions

Freight bypass lanes are used to bypass complex interchanges and intersections, thus minimizing potential for delay due to local congestion. A bypass lane around an interchange reduces delay for through truck trips when the interchange is congested. In addition, it removes trucks from the highway mainline and from the weaving maneuvers of general purpose traffic at major interchanges.

The concept of a truck bypass lane could be applied to ramps by adding an exclusive lane for trucks. This concept can provide a travel-time advantage for trucks during congested conditions and if ramp metering is in effect. In addition, a bypass lane can eliminate trucks starting from a stop condition when entering the highway. Trucks require longer acceleration distances and if a truck enters the highway at a higher speed, it has less impact on general purpose traffic and less reduction of the effective highway capacity.

Recommendation

The FWG recommends carrying forward F-2: Truck-freight bypass lanes.

Component F-3: Freight Restrictions

This component was previously dropped by the Task Force.

Component F-4: Increased Truck Size

This component was previously dropped by the Task Force.

Component F-5: Freight Direct Access Ramps

Description

Freight direct access ramps provide access from an independent highway lane such as a truck-only lane or managed lane. However, a truck access ramp could be warranted to serve a high volume of trucks when there is not an independent highway lane. Such a ramp may or may not be for the exclusive use of trucks, but may be warranted due to the truck volume.

Analysis of Operating Conditions

Separation of trucks and passenger cars could reduce conflicts resulting from different vehicle operating characteristics. Removing trucks from high volume ramps could preserve capacity for general purpose traffic.

A truck access ramp could improve travel time reliability for trucks at locations with high truck volumes and high general purpose traffic volumes. In the Portland-Vancouver region, the location of truck access to and from I-5 is a significant design consideration in order to address the relatively large volume of trucks to and from local industrial land uses such as the Port of Portland, Port of Vancouver, and various distribution centers.

Improvements to access ramps for trucks are an opportunity for "truck-friendly" design by lengthening acceleration and merge distances, reducing grade, and reducing superelevation on curves. Truck-friendly design preserves ramp and mainline capacity for general purpose traffic. In addition, there is a safety benefit for trucks and general purpose traffic.

Recommendations

The FWG recommends revising F-5 as "Access ramps for trucks" to be more inclusive of all potential ramp facilities that benefit trucks and general purpose traffic.

Component F-6: Enhanced Highway Design for Truck Mobility

Description

Enhanced highway design for truck mobility addresses the difference in operating characteristics between trucks and general purpose traffic. Trucks are longer and heavier, require longer distances for acceleration and deceleration, are affected more significantly by steep grades, and are more limited in mobility around tight curves and on super-elevated curves. When truck speeds and mobility differ from that of general purpose traffic, they have the effect of reducing the capacity along a mainline segment and on a ramp.

Analysis of Operating Conditions

Truck needs are essentially the same as those for general purpose traffic. The differentiating issues between trucks and general purpose traffic are their operating characteristics. Adding mainline capacity provides a window of opportunity for increasing the number of hours that the highway operates in uncongested conditions, which facilitates the efficient movement of trucks. An uncongested or less congested system offers better reliability and fast travel times—both of which are important for freight. Improved safety along the corridor will also reduce the unexpected delay associated with incidents, which will also improve the reliability of the system for freight.

The benefits of truck-only facilities are limited to locations with very high volumes of trucks and single-purpose truck movements (through truck trips, direct access, etc.). The FWG recognizes that improvements to truck mobility benefit all traffic. In addition, truck-friendly highway design will result in accrued benefit to all significant truck movements within and through the Bridge Influence Area, whether or not the location warrants a truck-only facility. Examples of major improvements that could provide improved mobility for trucks are:

- Improved design of the eight interchanges in five miles
- Efficient access – truck bypass lanes and truck ramps
- An increase in the number of through lanes to at least preserve the existing hours of uncongested highway conditions
- Geometric improvements to increase capacity and reduce the crash rate – i.e., grades, ramp curves and superelevation, and merge and weave distances
- Reduction in or elimination of the number of bridge lifts

Finally, safety improvements targeted to trucks could reduce the potential for crashes with general purpose traffic and the liability for truck drivers. Truck-friendly design can integrate needed safety improvements with the highway design.

Recommendations

The FWG recommends adding freight component F-6: Enhanced design for truck mobility.