Developing a Performance Measurement Approach to Benefit/Cost Freight Project Prioritization
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Benefits of Network Improvement

Global Gateways:
• Time into and out of major terminals
• Reliable Connections to time sensitive intermodal Connectors
• Corridor Access

Urban Goods Movement:
• Just-In-Time Deliveries
• Window of Reliability
• Reduced Congestion reduces, idle time and emissions

Rural Economies:
• Seasonal Road Closure Disruptions
• Connecting Critical Agricultural Facilities to the Freight Network
• Efficient access to intermodal Facilities

As stakeholder discussions evolved, it became clear that despite different expressions between technical teams, the common factor was the amount of time spent on the network and the ability to reliably estimate that time.

Summary of Truck Freight Direct Benefit and Economic Impact Methodology Process

INPUTS

Project Specific Data Inputs (e.g. amount of capacity needed)

MODEL FRAMEWORKS

Section 1: Modelling Freight Transportation Related Benefits
* Travel Demand

Section 2: Modelling Economic Impacts Methodology
* Employment
* Input/Output

Outputs

Benefits from:
* Travel Time Savings
* Operating Cost Savings
* Emissions

Outputs

Employment Changes
Regional Economic Output

Infusing GPS Based Reliability Measures: The Bimodal Method

Since 2008, approximately 3% of trucks travelling in Washington State have been recording GPS based probe data for use by WSDOT to evaluate truck reliability performance and identify freight bottlenecks.

Example of the GPS Truck Data

Spot speed data collected on roadway segments enables the research team and WSDOT colleagues to identify the reliability condition of segments as:

(1) Reliably Fast (2) Reliably Slow (3) Unreliable

The approach defines the travel condition as unreliable if:

\[ |\bar{u}_1 - \bar{u}_2| \geq |\bar{u}_1 + \sigma_1| + \sigma_2 \]

Difference between the means is greater than the sum of standard deviations,

\[ \alpha \geq 0.2 \]

At least 20% of the traffic is attributable to the congested distribution function,

\[ \bar{u}_1 \leq 0.75 + V_f \]

The congested mean speed is less than 75% of free-flow speed,

otherwise it is viewed as reliable. Performance deemed reliable is subdivided into reliably fast and reliably slow depending on the average speed. If traffic along the segment is defined as reliable and , then the traffic is reliably slow, otherwise it is reliably fast.

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