

Improving Commodity Flows with Private Sector Bill of Lading Data (BOL)

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Introduction

- Commodity flow data products, such as FHWA's Freight Analysis Framework (FAF) dataset, are helpful to planning agencies for establishing baseline analyses about important commodity movements and trade markets.
- However, the high-level nature of the data in terms of geography, commodities and modes make commodity data difficult to use in performance-based planning or priority project programming for freight infrastructure investments.
- Poor data leads to poor project identification and underwhelming results for the nation's shippers and carriers using public sector freight networks.

Objectives

- The goal is to overcome common data challenges encountered in state and local freight planning and improve freight intelligence by integrating commodity flow data and private shipping records.

Commodity Flow Data

Identifies macro level information about mode share and trade markets

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Shipping/BOL Record

Provides localized freight cost, equipment and benchmark information for key supply chains

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Integrated Data

Allows for more robust analysis of supply chains and performance-based, project level decisions for freight planning

Methodology

- The approach starts with desensitizing tens of millions of private-sourced, bill of lading shipping records and other mode-specific data. A Bill of Lading (or BOL) is a contract between a shipper and carrier.
- Commodity flow data is disaggregated to county level origins and destinations to provide detail needed for local & regional planning.
- Next the commodity data is conflated with the BOL records to integrate shipment cost, distance and equipment benchmarks.
- The integrated dataset can be further enhanced with trade data to expand import/export detail and correct weaknesses in commodity flow data for agricultural and food exports.

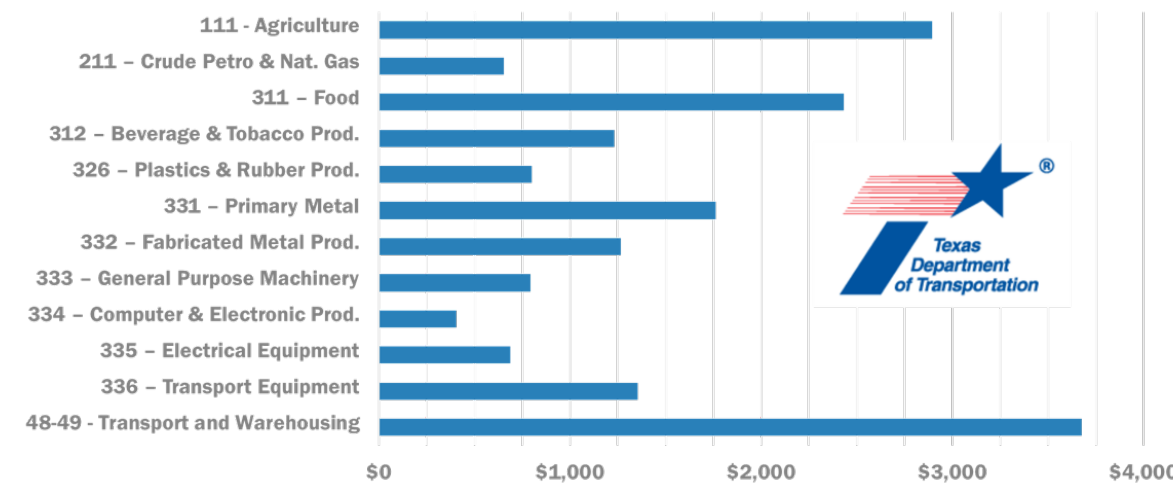
Bill of Lading Data Attributes

- Origin city, state, zip
- Destination city, state, zip
- Mode(s)
- NAICS or SIC code
- Equipment type
- Shipment weight
- Line-haul charge
- Surcharge costs
- Total transportation costs

Examples of Integrated Data Use

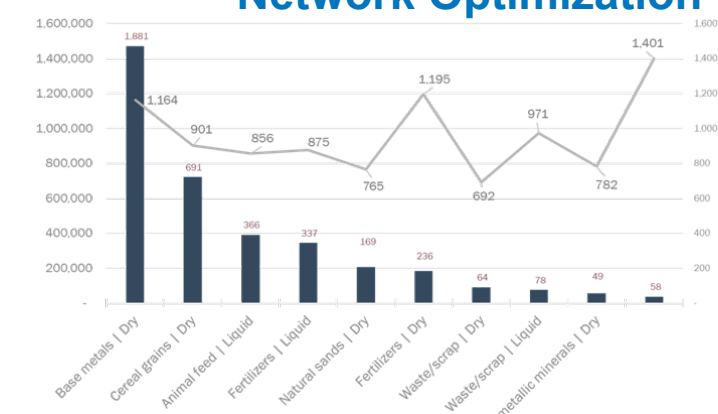
Texas Department of Transportation Statewide Freight Planning

HIGHWAY CORRIDOR TRANSPORTATION EXPENDITURES BY INDUSTRY (\$MILLIONS)



- For TxDOT, Transearch commodity flow data was enhanced with BOL data to estimate transportation costs associated with freight utilizing its major corridors.
- Analysis found highest transportation spend on the I-35 corridor with major users in waste management/ remediation, crop production and food manufacturing.

Nebraska Department of Transportation Supply Chain Network Optimization



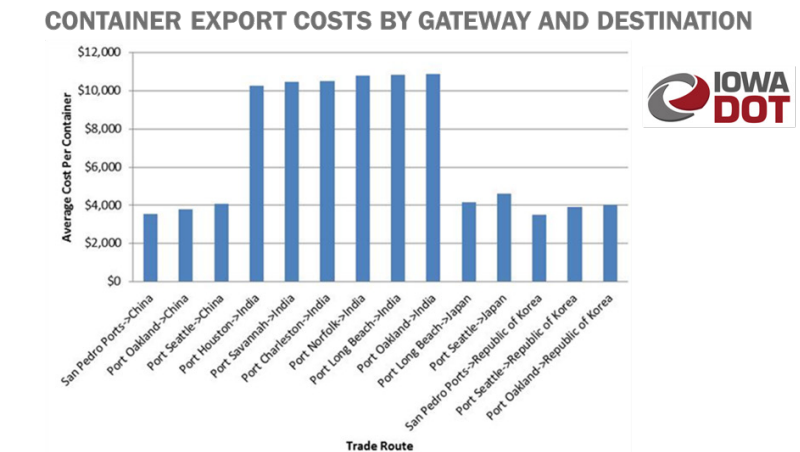
- In Nebraska, BOL records integrated with FAF-4 data were used to assess transload market opportunities.
- The bar chart shows the tonnage of dry and liquid bulk commodities currently moving by truck to and from the analysis region. The gray line shows the average length of haul for each commodity group.

Minnesota Department of Transportation I-94 Corridor Capacity Construction Project



- For MnDOT, FAF commodity flow and Streetlight GPS vehicle data was integrated with BOL data to better understand businesses that rely on the corridor and the value of commerce that flows through it.
- Analysis identified over \$1B in spend to move goods in Truckloads, Less-Than-Truckloads, and Partial Truckloads -- plus \$153.7MM to dray containers to/from the region's intermodal ramps.

Iowa Department of Transportation Freight Network Optimization



- In Iowa, BOL records integrated with FAF-4 data were used to assess intermodal market opportunities and examine supply chain resiliency.
- Using over 7 million records collected directly from private businesses, the analysis examined container shipping costs for all major gateways in the U.S.

Conclusion

- Integrating commodity flow and shipping records provides critical information needed to effectively analyze and prioritize infrastructure investments for freight fluidity.
- Average Length of Haul by Commodity, Mode and Region:** Allows planners to do time-series analysis regarding heavy haul industries, access to services or trends in last mile delivery.
- Equipment type:** Use to understand equipment needs (e.g., dry van, refrigerated van, flatbed/flat car, etc.) critical to evaluating potential facility investments.
- Modal Cost Benchmarks:** Analyze cost of various mode options for shippers in a state or region to determine value of freight investments in the transportation network.