A Critical Review and Integration of GIS-Based Spatial Databases for Multi-Commodity and Multi-Mode Freight Movement Modeling and Security Analysis in the USA

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Transportation Security

- Increasingly a topic of interest for policy-makers, transportation planners, importers, and exporters
- Multiple disciplines, datasets, software programs, and transportation networks are essential for an effective freight movement analysis
Freight Data

The problem with data is...

Please stop every 1 mile for commodity weight, shipment value, fuel consumption, and speed data collection

New FHWA Data Collection Methods

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Public Trade Data

- Trade Stat Express
- Commodity Flow Survey
- Freight Analysis Framework 2002
- International Trade Administration
- Maritime Administration
- US Census Foreign Trade Statistics
Private Trade Data

- PIERS
- Global Insight
- WISERTrade
- USA Trade Online
Transportation Networks

- North American Transportation Atlas Database
- Oakridge National Laboratories
## Public and Private Freight Databases

<table>
<thead>
<tr>
<th>Database</th>
<th>Commodity</th>
<th>Geographic Detail</th>
<th>Status</th>
<th>Code</th>
<th>GIS Data</th>
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</thead>
<tbody>
<tr>
<td>Trade Stat Express</td>
<td>Aggregated</td>
<td>States and Countries</td>
<td>Free</td>
<td>HS, SITC</td>
<td>No</td>
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<tr>
<td>USA Trade Online</td>
<td>9 digit commodities</td>
<td>US ports and countries</td>
<td>Purchase required</td>
<td>HS</td>
<td>No</td>
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<td>US States</td>
<td>Free</td>
<td>HS, SIC, SITC</td>
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<td>US States and Metropolitan Areas</td>
<td>Free</td>
<td>SITC</td>
<td>No</td>
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<tr>
<td>PIERS Global Intelligence Solution</td>
<td>9 digit commodities</td>
<td>US Ports and cities, countries</td>
<td>Purchase required</td>
<td>HS</td>
<td>No</td>
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<td>Yes National Transportation Networks, Transborder Freight Data</td>
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<td>US county level and countries</td>
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<td>STCC</td>
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<td>HS, SITC</td>
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<td>US Metropolitan areas</td>
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<td>SCTG, STCC</td>
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<td>Oakridge National Laboratory</td>
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<tr>
<td>US Maritime Administration</td>
<td>Number of containers</td>
<td>US Ports</td>
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<td>None</td>
<td>No</td>
</tr>
</tbody>
</table>
Data Problems

- Incomplete
- Aggregate
- Not enough information

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Network & Software Problems

- Inter-modal stations
- Software training
- Analysis methods
Other Improvements

- Integration between international trade data and domestic trade flows
- Domain of the shipper
- International port locations