Global Supply Chains Begin at the State/Regional Level

University of Minnesota
Center for Transportation Studies
19th Annual Freight & Logistics Symposium
IHS Economics
Transportation & Trade

By
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Managing Director – IHS Economics
Data IS Available….

• Federal Government
• State Agencies
• MPOs
• Commercial sources....
• Custom-Tailored Research
• Thru blood, sweat & tears....
What is IHS Transearch©?

- Unified multi-modal goods movement database
- Standard source of US freight flow information
- Shows commodity by volume, mode and lane
- Integrates large scale proprietary truck flow sample with private and public source data
- Maps flow data to GIS networks
- Flow detail down to county level
- Supply Chain design, support, implementation options
- Consistent construction for current and forecast years
  - Covers both short and long term
## Provision Of Data Elements

<table>
<thead>
<tr>
<th>In Product</th>
<th>On Custom Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>All truck shipments of Manufactured Goods:</td>
<td>Truck shipments of:</td>
</tr>
<tr>
<td>• Primary &amp; Secondary</td>
<td>• Fish &amp; Forest products</td>
</tr>
<tr>
<td>• TL, LTL, Private</td>
<td>• Waste</td>
</tr>
<tr>
<td>All truck shipments of Agricultural Products, Coal, Ores, &amp; Minerals</td>
<td>• Mail, Express, Government</td>
</tr>
<tr>
<td>Empty trucks</td>
<td>Domestic water drayage</td>
</tr>
<tr>
<td>All rail, water, air shipments</td>
<td>Sub-county detail</td>
</tr>
<tr>
<td>• Plus air &amp; intermodal truck dray</td>
<td>Local data integration:</td>
</tr>
<tr>
<td>All US/Canada; US/Mexico</td>
<td>NEW Supply Chain OPTION, Fall 2016</td>
</tr>
<tr>
<td>Inland Movement of Overseas Shipments (Imports &amp; Exports)</td>
<td></td>
</tr>
</tbody>
</table>
How Can IHS Transearch support a SC design?

- Raw materials vendor/source locations
- Modes and modal options
- Supplant with IHS Freight Finder® to locate exact Vendors & Locations
- Add IHS World Trade Service® data for Import/Export support
- Routing tool to determine best routes for all modes
Is “no data” riskier than erroneous data?

“Without IHS Markit Transearch© proven, reliable, verified, freight flow data; you’re simply a group of planners with your own opinions”.

Supply Chain Optimization Options
Identify & Quantify Location Options

• By County
• By BEA
• By City, Metro Area, ZIP
• By Transportation Analysis Zones (TAZ), Industrial Parks, etc.
• By proximity to:
  ➢ Major highways, intersections, on/off ramps, access roads, transloading facilities
  ➢ Major Rail lines
  ➢ Intermodal Ramps
  ➢ Airports
  ➢ Inland Ports
  ➢ Intermodal yards
  ➢ Free-trade Zones
  ➢ Rivers, barge terminals
  ➢ Suppliers and Vendors
  ➢ Workforce demographics
Location Parameters (continued)

Transportation Rate* and Availability Benchmarks

- Motor Carrier – by type of equipment, service, etc.
- Rail – by equipment type, service, etc.
- Drayage – by type to/from transloading facilities, ramps, airports, Customers & Vendors
- Barge – to/from river terminals via truck, rail
- Warehousing availability, pricing levels, etc.
- Vendor identification by industry needs
- Labor Demographics
- Work-force availability
- Work-force Training availability

*Rate information derived from proprietary sources; for example, truck rates are sourced from paid freight bill data. No contractual covenants are breached between Shippers or service providers. Other rates/costs are derived from publically available data.
Transport Mode Options

List of all commercial transport modes serving the specified target area:

- Contact information for service providers

- Assistance with Requests for Indication of interest (RFIs) and Requests for Service/Price Proposals (RFPs)

- Management support of RFP responses (review, selection, implementation) also available
Simplified, Basic Supply Chain Design

Basic Supply Chain
From raw materials sources to
Factory to DC and beyond……
Primary domestic traffic flow sources

- Annual Motor Carrier Data Exchange (Proprietary Shipment Data)
- Annual STB Railroad Waybill Sample
- Annual Rail Carrier Data Exchange (Proprietary Shipment Data)
- Annual Corps of Engineers Waterborne Commerce Statistics
- Annual US DOT Airline & Airport Statistics
- US Customs Import/Export Trade Statistics
- Annual Department of Energy Coal Movement Statistics
- Bureau of Transportation Statistics - Commodity Flow Survey

Primary production and shipments sources

- Census County Business Patterns
- US Geological Survey Commodity Reports
- Annual Department of Agriculture Crop & Livestock Data
- Annual Railroad Freight Commodity Statistics
- IHS Industrial Sector Production & Business Transactions
- IHS Automotive Plant & Production Forecasts
- IHS Business Market Insights (Wage, Population & Economic Data)
- Inter-Industry Trade Patterns (Input/Output Table)

There are over 100 individual data sources used in the construction of Transearch.
<table>
<thead>
<tr>
<th>Source</th>
<th>Agency/Department</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Dept of Agriculture Census &amp; Annual Surveys</td>
<td>US &amp; STATE DEPT.S OF AGRICULTURE</td>
<td>CROP &amp; LIVESTOCK PRODUCTION FROM FARMS &amp; RANCHES</td>
</tr>
<tr>
<td>County Population Data</td>
<td>DEPT OF COMMERCE, CENSUS BUREAU</td>
<td>CENSUS OF POPULATION COLLECTED EVERY 10 YEARS AND ESTIMATED ANNUALLY</td>
</tr>
<tr>
<td>Inter-Industry Trade Patterns (Input/Output Table)</td>
<td>DEPT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS</td>
<td>INPUT-OUTPUT (IO) ACCOUNTS, BASED ON ECONOMIC CENSUS DATA</td>
</tr>
<tr>
<td>Private Port Directories</td>
<td>VARIOUS BARGE LINES, PORTS</td>
<td>PROPRIETARY INFORMATION ABOUT WATERWAY FACILITIES, COMPILED BY SURVEY</td>
</tr>
<tr>
<td>DEPT. OF ENERGY Coal Movement Statistics</td>
<td>DEPT. OF ENERGY</td>
<td>MONTHLY, QUARTERLY, ANNUAL SURVEYS OF ELECTRIC UTILITIES; EXIM CUSTOMS DATA</td>
</tr>
<tr>
<td>BTS Commodity Flow Survey</td>
<td>BUREAU OF TRANSPORTATION STATISTICS</td>
<td>COMPULSORY, STRATIFIED SURVEY: MANUFACTURERS, WHOLESALERS, SOME RESOURCE PRODUCERS</td>
</tr>
<tr>
<td>Statistics International Trade Data</td>
<td>STATISTICS INTERNATIONAL TRADE DIVISION</td>
<td>COLLECTED FROM CUSTOMS DECLARATIONS, IMPORT ENTRY FORMS</td>
</tr>
<tr>
<td>BTS Trans-Border Statistics</td>
<td>BUREAU OF TRANSPORTATION STATISTICS</td>
<td>SHIPPER EXPORT DECLARATIONS, IMPORT ENTRY FORMS</td>
</tr>
<tr>
<td>COE Waterborne Commerce Statistics - State to State Series</td>
<td>ARMY CORPS OF ENGINEERS</td>
<td>COMPULSORY SURVEY OF OWNERS, AGENTS, MASTERS, CLERKS OF VESSELS ON NAVIGABLE WATERS</td>
</tr>
<tr>
<td>COE Waterborne Commerce Statistics - Port Series</td>
<td>ARMY CORPS OF ENGINEERS</td>
<td>COMPULSORY SURVEY OF OWNERS, AGENTS, MASTERS, CLERKS OF VESSELS ON NAVIGABLE WATERS</td>
</tr>
<tr>
<td>BTS T-100 Domestic &amp; International Traffic Data</td>
<td>BTS, OFFICE OF AIRLINE INFORMATION</td>
<td>REPORTS OF U.S. AND FOREIGN CARRIERS OF FREIGHT AND/OR MAIL</td>
</tr>
<tr>
<td>BTS Form 41 T-3 Enplanement Statistics</td>
<td>BTS, OFFICE OF AIRLINE INFORMATION</td>
<td>REPORTS OF CERTIFICATED AIR CARRIERS BY</td>
</tr>
<tr>
<td>FAA 5010 Airport Database</td>
<td>DEPT OF TRANSPORTATION, FEDERAL AVIATION ADMIN</td>
<td>COMPILATION OF CERTIFICATED LANDING FACILITIES</td>
</tr>
<tr>
<td>STB Railroad Waybill Sample</td>
<td>SURFACE TRANSPORTATION BOARD</td>
<td>STRATIFIED, COMPULSORY WAYBILL SAMPLE FOR RAILROADS TERMINATING 4000+ LOADS/ YEAR</td>
</tr>
<tr>
<td>Source</td>
<td>Q1</td>
<td>Q2</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>USGS Mineral Reports</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>USDA Agriculture Surveys</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>BTS/FAA Air Activity</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DOE Coal Movements</td>
<td></td>
<td></td>
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One Year Lag
TRANSEARCH Processing Overview

Each mode uses distinct sources and processing.
IHS Transearch© Forecasts

• Long-term annual forecast of all base year IHS Transearch dimensions to 2045.

• Regional input/output modeling approach with industry establishment output and purchases and consumer purchases from the IHS Business Demographics Model at county level.

• Captures geographic shifts in production, population and sourcing.

• County growth constrained to National-level
Transearch Generations (The Reebie years)

• Before 1980 Traffic Year:
  Custom Project-Specific Data Sets

• 1980’s:
  State/BEA Level US Data
  Canada Province Cross-Border Flows

• 1990’s:
  Motor Carrier Data Exchange
  NAFTA Gateway & Mexico Cross-Border Flows by State
  Distribution Center/Wholesale Traffic
  County-level market coverage
  Freight Analysis Framework
  Ores/Minerals
  Drayage Traffic
Transearch Generations

• 2000’s:

Expanded coverage of Agriculture
Rail Data Exchange
Global Insight Production Drivers utilized
Empty Truck Traffic
2nd Generation Agriculture & Minerals-enhanced detailed coverage
Global Insight Integration: Business Sectors & Transactions data
Import/Export Identification on final records
Full Industry I/O Consumption Quantification
IHS Source Data Integration & QC Process
Integration of forecasts from other units within IHS
Polk Automotive Data Integration
NAFTA Detail

• Canada/Mexico to and from United States movements only
  • No Canada-to-Mexico or Mexico-to-Canada data in Transearch

• Geographical Detail
  • Canada: Province & Canadian Metropolitan Area (CMA) where applicable
  • Mexico: Mexican state only
  • US: County of ultimate origin/termination and border crossing county

• Sources
  • Primary sources are US Customs data and data from the Bureau of Transportation Statistics
    • Only shipments reported by customs are included in Transearch
  • Supplemental sources are Transport Canada data for Canada and the Mexico Economic Census (ENEGI) and annual port statistics (SCT)
Sample Move: Rail Intermodal & Drayage

- Transearch move consists of three parts:
  - Intra-BEA truck move in Los Angeles BEA (160)
    - STCC: 5021 (Rail Drayage to Ramp)
    - Tradetype: Import
  - Rail Intermodal move from Los Angeles to Illinois portion of Chicago BEA (64)
    - STCC: 4611 (Freight all kinds)
    - Tradetype: Import
  - Intra-BEA truck move in Chicago
    - STCC: 5022 (Rail Drayage from Ramp)
    - Tradetype: Import
Constructing IHS Transearch (sample model)
Business Market Insights® (BMI®) Coverage

- IHS Global Insights Business Market Insights® database consists of the following concepts:
  - Number of Establishments
  - Employment
  - Sales (Nominal & Real Dollars)

- Employment, establishment and sales are developed for all 6 digit NAICS code industries.

- Historical county level data available from 1990 to present for employment and establishments and from 1997 to present for sales

- Forecast extends 25 years into the future

- Data available for all of the nations 3,144 counties
IHS Transearch Quality Control Process-
The IHS Commitment to “Customer Delight”

### Annual Development Process
- Continuous Client Feedback
- Comparisons with Historic Transearch Patterns
- Comparisons with other Data Sources: CFS, FAF, Industry Data
- Verification of Select Facilities via Aerial Imagery

### Order Processing
- Pricing Proposal Creates Order Specification Sheet
- Incorporate Client-specific data
- Comparison of Results with Data Summaries & Previous Orders
- Results Review by Additional Staff
Future of IHS Markit Transearch©
The “Heart of America” (sample from Transearch® 2014)
IHS Markit **Point of View:** Supply Chain Freight Data is *NOT* the same as Freight Flow Data

<table>
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<th>Freight Flow Data</th>
<th>Supply Chain Data</th>
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<td>Where &amp; How a Shipment Moves</td>
<td>What Industry Segments Generates &amp; Consumes the Shipments</td>
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<td>Market-to-Market Activity</td>
<td>Follow All Steps through an Industry</td>
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<tr>
<td>Extensive use of Supply/Demand Models</td>
<td>Significant input from specific Industry Experts</td>
</tr>
</tbody>
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Supply chain freight planning requires industry data and expertise..............

*IHS CAN HELP!*
Optimally the supply chain will be modeled for each manufacturer.
Going Deeper:
Major Chemical Plants in DE

**Company** | **State** | **City**
---|---|---
BASF Corp. | DE | Seaford
Chesapeake Green Fuels | DE | Clayton
Croda Chemicals | DE | New Castle
Delaware City Ref. | DE | Delaware City
DuPont | DE | Edge Moor
DuPont Chem. | DE | Delaware City
FPC USA | DE | Delaware City
Invista | DE | Seaford
Kuehne | DE | Delaware City
NVF | DE | Yorklyn
Reichhold | DE | Cheswold
Standard Chlor. | DE | Delaware City
Supply-Chain Data Improves Freight Flow Development

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Existing</th>
<th>Supply-Chain Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Commodity Detail</td>
<td>4 digit</td>
<td>5 digit</td>
</tr>
<tr>
<td>Product Example</td>
<td>2812-Potassium or Sodium Compounds</td>
<td>28128-Chlorine</td>
</tr>
<tr>
<td>Market Detail</td>
<td>County</td>
<td>53 Production Plants (US); 1 in DE</td>
</tr>
<tr>
<td>Consumption Allocation</td>
<td>I/O Analysis</td>
<td>11 Detailed Uses - Chlorinated Intermediates (5%)</td>
</tr>
<tr>
<td>Consumer Detail</td>
<td>County</td>
<td>8 Plants Epichlorohydrin (6%) 2 Plants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inorganics (6%) 11 Plants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MDI (5%) 4 Plants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Others (21%) 66 Plants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Polycarbonates (2%) 4 Plants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Propylene Oxide (8%) 2 Plants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pulp &amp; Paper (1%) 11 Plants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TDI (3%) 2 Plants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vinyls (39%) 23 Plants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water Treatment (6%) up to 15,000 wholesale/distributors</td>
</tr>
</tbody>
</table>
Using IHS Transearch©

- Modal, capacity, and infrastructure planning
- State and regional Freight Planning
- Assessments of the economic impact of domestic & foreign trade
- Freight corridor studies
- Supply Chain Optimization
- Alternative transportation and diversion studies
- Network modeling such as rail, highway, and water
Transearch Redesign Underway – change dates

- In 2012, IHS began a top-to-bottom review of all of the processes involved in assembling Transearch
  - Goals: More accurate, more streamlined production, more consistent with other IHS data, more reflective of clients’ needs.
- Rolled out in TS2011
  - Integration with CMAI chemical data – netting of same & near plant chemical flows; improved Ethanol processing
  - Separate processing for West Coast petroleum products
- **Included in** TS2012
  - Redesign of Gravity Model
  - Crop specific agriculture processing
  - More integration with Downstream team (former Purvin & Gertz)
- Help us make Transearch fit your needs!
IHS Transearch© Usage: a few Case Studies
Need: What freight moves on Pennsylvania’s rail network? What routes and counties will grow in the next 50 Years?

Solution: Use TRANSEARCH and Federal rail data to identify and forecast Pennsylvania rail flows. Combine with rail carrier capital planning projects.
**Market Competitiveness**

**Need:** A Chamber of Commerce needed an assessment and analysis of its region’s current and projected infrastructure capacity and supply chain efficiencies; and a infrastructure development program.

**Solution:** A Supply Chain Optimization & Capacity Assessment of multimodal freight linkages, infrastructure and activity centers was conducted integrating surveys, interviews, *Transearch*, and *Freight Finder®*. IHS Transearch© forecasts of freight flows demonstrated future needs, and Freight Finder® identified facilities, their supply chains, and aided in prioritizing structure needs.

**Infrastructure Analysis to Support Key Sectors and Companies**

**Public Private Partnership for Transportation Improvements**
Inland Intermodal Port Market Assessment

**Need:** An inland port authority had the opportunity to build a multimodal facility with funding and land contributed by a Class I, if they proved its viability and gained additional funds from the State. The client needed a fact-based and credible business opportunity & infrastructure analysis.

**Solution:** Transearch determined regional freight volumes by mode & route, and quantified the potential to divert freight to the site. Freight Finder identified key industries to attract, and the IHS Transportation Economic Impact Model evaluated the economic impact of the facility on the State.
Moving Forward: Data Exchange Program

Historic & Current Partners

Motor Carriers 1990
Class I Railroads 1995
3rd Pty. Providers, Load Matching Services 1999

More Potential New Partners

Local/dray Trucking Companies added 2013
GPS Satellite, Barge, air cargo Data added 2015
Local Surveys & Studies on-added 2015
IHS Transearch©: Moving Forward

From This (Commodity Flow):

To This (Supply Chain)

adding Fall 2016!

See earlier slides for initial details
IHS Point of View: Supply Chain Freight Data is **NOT** the same as Freight Flow Data

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Supply chain/freight flow planning requires **BOTH** industry data and expertise............ IHS CAN HELP!
IHS has a unique set of expertise

Industry-expert business groups
- Agriculture
- Automotive
- Chemicals
- Construction
- Consumer & Retail
- Energy
- Metals & Mining
- JOC/PIERS®, Fairplay

Information Products
- Automotive supplier database
- Chemical databases
  - Supply & Demand
  - Capacity

World Trade Service
THANK YOU!

For more information and/or details on licensing of IHS Transearch© & Supply Chain Optimization Studies, contact:

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