

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

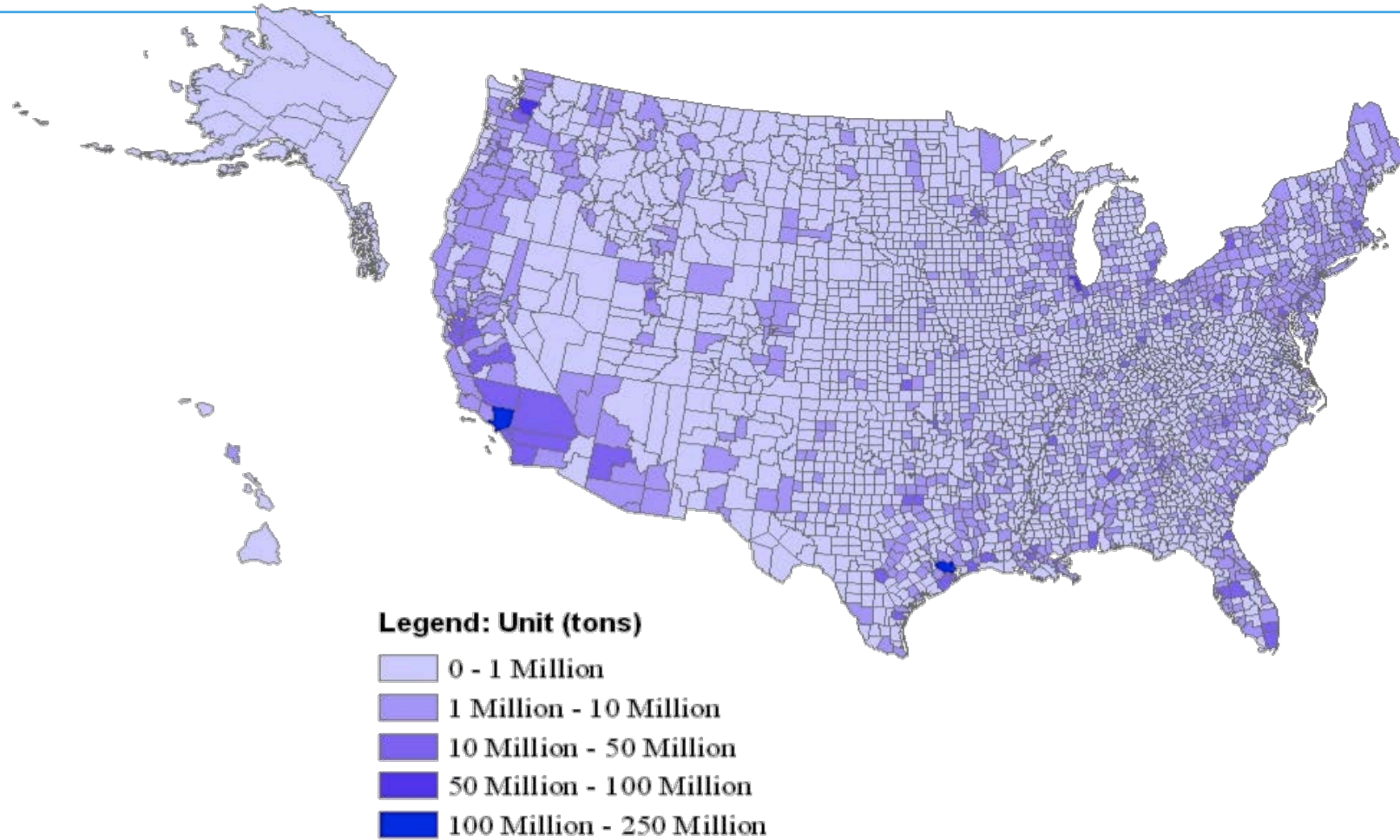
By
Charles W. (Chuck) Clowdis
Managing Director – IHS Economics

Data IS Available....

- Federal Government
- State Agencies
- MPOs
- Commercial sources....
- Custom-Tailored Research
- Thru blood, sweat & tears....



IHS Transearch© Overview





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



IHS Transearch© Features

Provision Of Data Elements	
In Product	On Custom Basis
<p>All truck shipments of Manufactured Goods:</p> <ul style="list-style-type: none">• Primary & Secondary• TL, LTL, Private <p>All truck shipments of Agricultural Products, Coal, Ores, & Minerals</p> <p>Empty trucks</p> <p>All rail, water, air shipments</p> <ul style="list-style-type: none">• Plus air & intermodal truck dray <p>All US/Canada; US/Mexico</p> <p>Inland Movement of Overseas Shipments (Imports & Exports)</p>	<p>Truck shipments of:</p> <ul style="list-style-type: none">• Fish & Forest products• Waste• Mail, Express, Government <p>Domestic water drayage</p> <p>Sub-county detail</p> <p>Local data integration:</p> <p><i>NEW Supply Chain OPTION, Fall 2016</i></p>

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

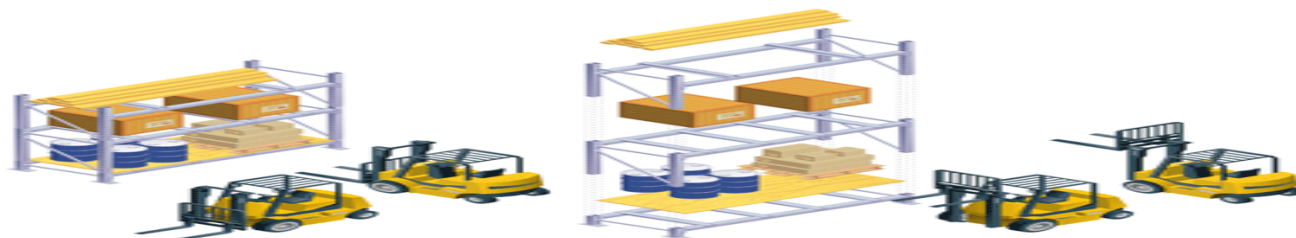


Basic Supply Chain

From raw materials sources to
Factory to DC and beyond.....



Illustration by Chris Gash





IHS Transearch© Source Data

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



IHS Transearch© Public Source Data

US GEOLOGICAL SURVEY MINERAL INDUSTRY REPORTS	DEPT OF THE INTERIOR, U.S. GEOLOGICAL SURVEY	QUESTIONNAIRES SENT TO PRODUCERS, PLANTS, DISTRIBUTORS, IMPORT TERMINALS
US DEPT OF AGRICULTURE CENSUS & ANNUAL SURVEYS	US & STATE DEPT.S OF AGRICULTURE	CROP & LIVESTOCK PRODUCTION FROM FARMS & RANCHES
COUNTY POPULATION DATA	DEPT OF COMMERCE, CENSUS BUREAU	CENSUS OF POPULATION COLLECTED EVERY 10 YEARS AND ESTIMATED ANNUALLY
INTER-INDUSTRY TRADE PATTERNS (INPUT/OUTPUT TABLE)	DEPT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS	INPUT-OUTPUT (IO) ACCOUNTS, BASED ON ECONOMIC CENSUS DATA
PRIVATE PORT DIRECTORIES	VARIOUS BARGE LINES, PORTS	PROPRIETARY INFORMATION ABOUT WATERWAY FACILITIES, COMPILED BY SURVEY
DEPT. OF ENERGY COAL MOVEMENT STATISTICS	DEPT. OF ENERGY	MONTHLY, QUARTERLY, ANNUAL SURVEYS OF ELECTRIC UTILITIES; EXIM CUSTOMS DATA
BTS COMMODITY FLOW SURVEY	BUREAU OF TRANSPORTATION STATISTICS	COMPULSORY, STRATIFIED SURVEY: MANUFACTURERS, WHOLESALERS, SOME RESOURCE PRODUCERS
STATISTICS INTERNATIONAL TRADE DATA	STATISTICS INTERNATIONAL TRADE DIVISION	COLLECTED FROM CUSTOMS DECLARATIONS, IMPORT ENTRY FORMS
BTS TRANS-BORDER STATISTICS	BUREAU OF TRANSPORTATION STATISTICS	SHIPPER EXPORT DECLARATIONS, IMPORT ENTRY FORMS
COE WATERBORNE COMMERCE STATISTICS - STATE TO STATE SERIES	ARMY CORPS OF ENGINEERS	COMPULSORY SURVEY OF OWNERS, AGENTS, MASTERS, CLERKS OF VESSELS ON NAVIGABLE WATERS
COE WATERBORNE COMMERCE STATISTICS - PORT SERIES	ARMY CORPS OF ENGINEERS	COMPULSORY SURVEY OF OWNERS, AGENTS, MASTERS, CLERKS OF VESSELS ON NAVIGABLE WATERS
BTS T-100 DOMESTIC & INTERNATIONAL TRAFFIC DATA	BTS, OFFICE OF AIRLINE INFORMATION	REPORTS OF U.S. AND FOREIGN CARRIERS OF FREIGHT AND/OR MAIL
BTS FORM 41 T-3 ENPLANEMENT STATISTICS	BTS, OFFICE OF AIRLINE INFORMATION	REPORTS OF CERTIFICATED AIR CARRIERS BY
FAA 5010 AIRPORT DATABASE	DEPT OF TRANSPORTATION, FEDERAL AVIATION ADMIN	COMPILATON OF CERTIFICATED LANDING FACILITIES
STB RAILROAD WAYBILL SAMPLE	SURFACE TRANSPORTATION BOARD	STRATIFIED, COMPULSORY WAYBILL SAMPLE FOR RAILROADS TERMINATING 4000+ LOADS/ YEAR

IHS Transearch©

Public Resources (examples)

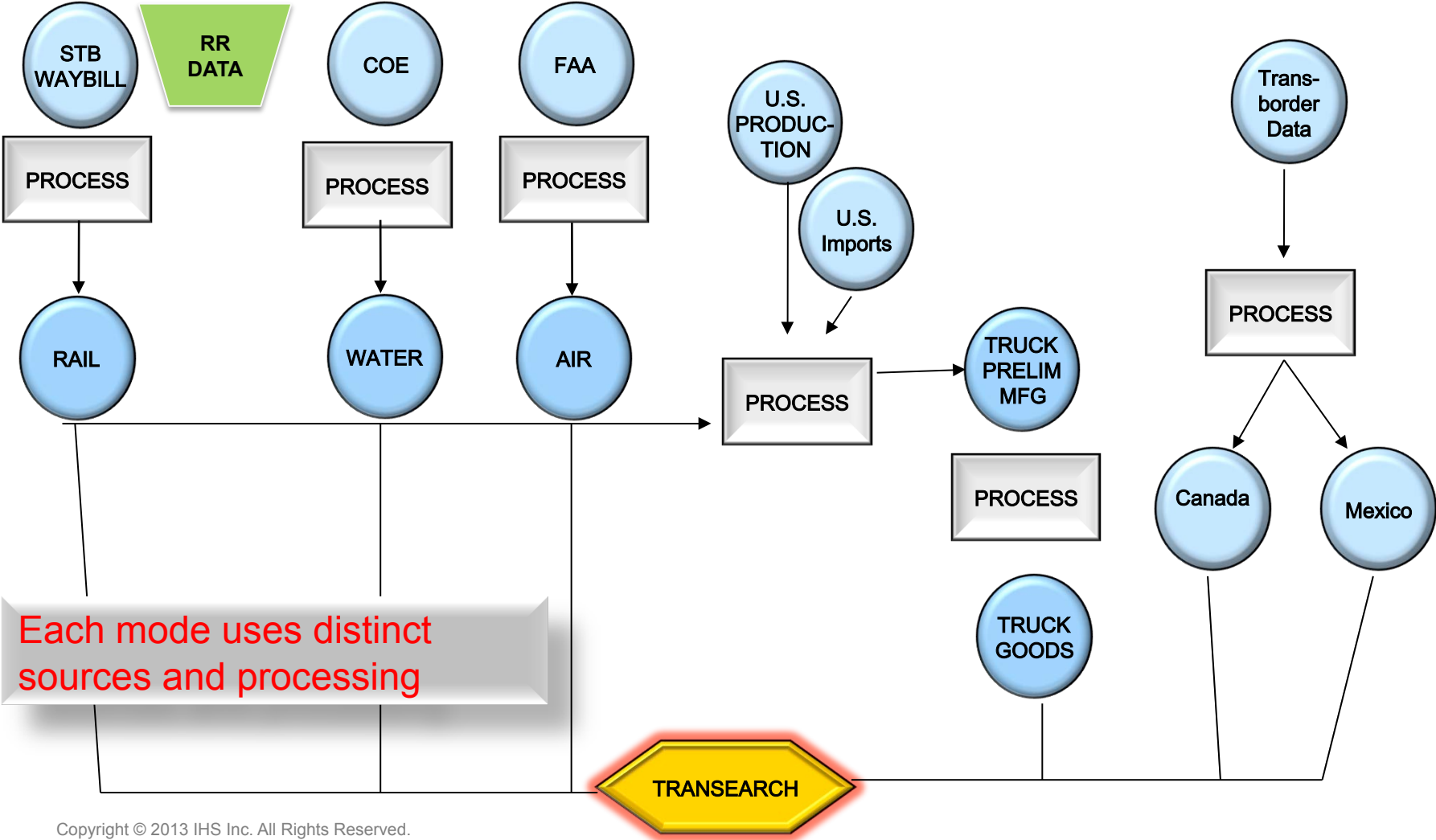


<u>Source</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>
USGS Mineral Reports		X		
USDA Agriculture Surveys	X	X		
BTS/FAA Air Activity	X	X		
DOE Coal Movements		X		
BTS Trans-Border Data	X	X		
STB Waybill			X	
COE Waterborne Commerce Data				

One Year Lag



TRANSEARCH Processing Overview



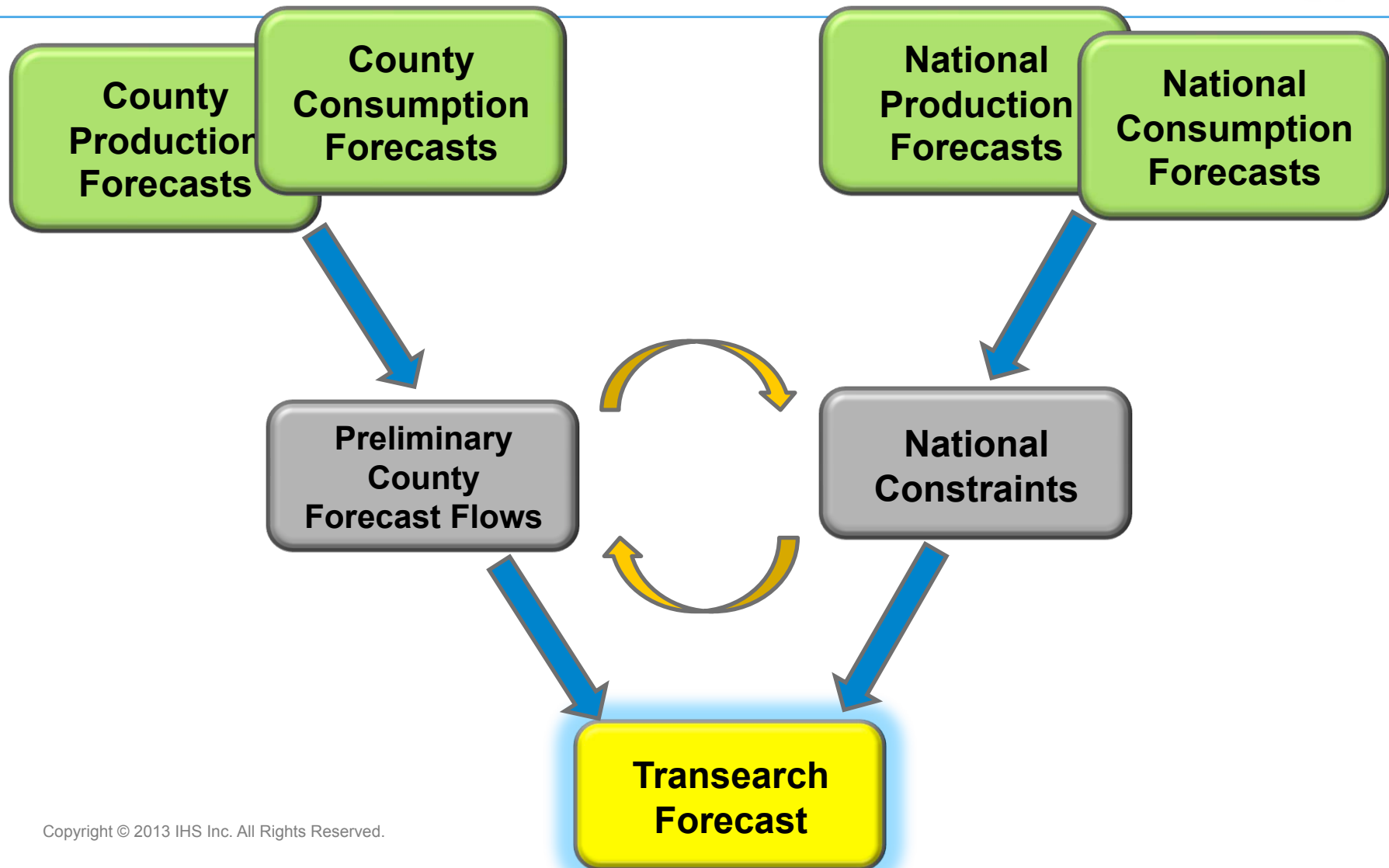


IHS Transearch© Forecasts

- 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 Forecast Process





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**





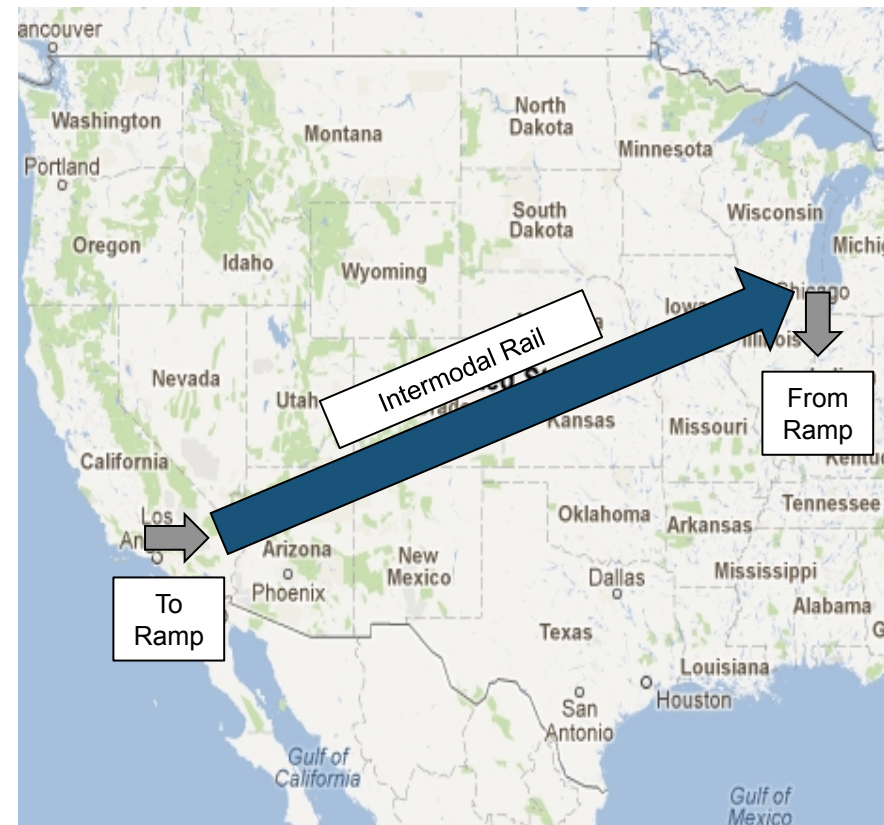
NAFTA Detail

- 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)



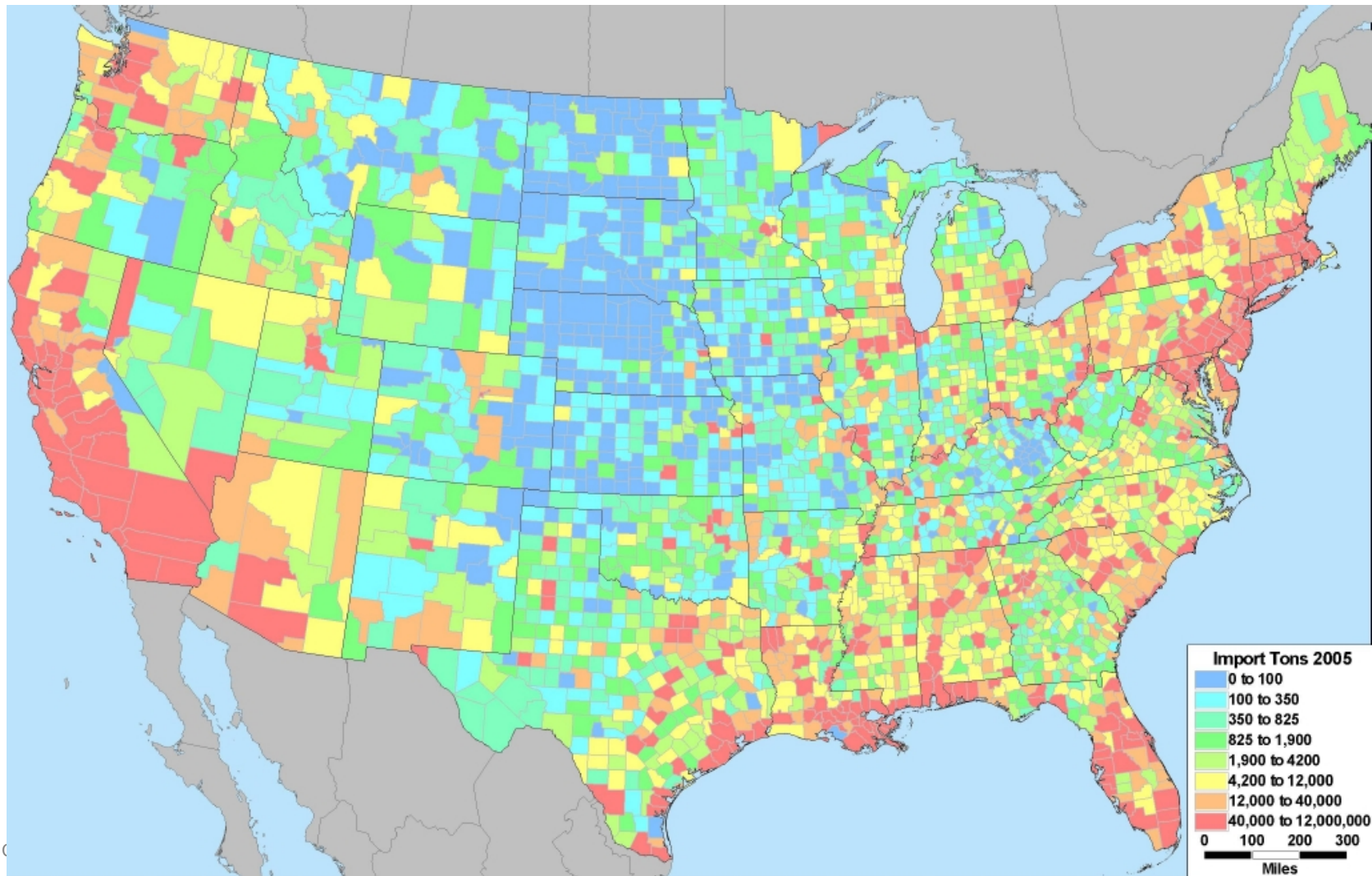
Sample Move: Rail Intermodal & Drayage

- 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



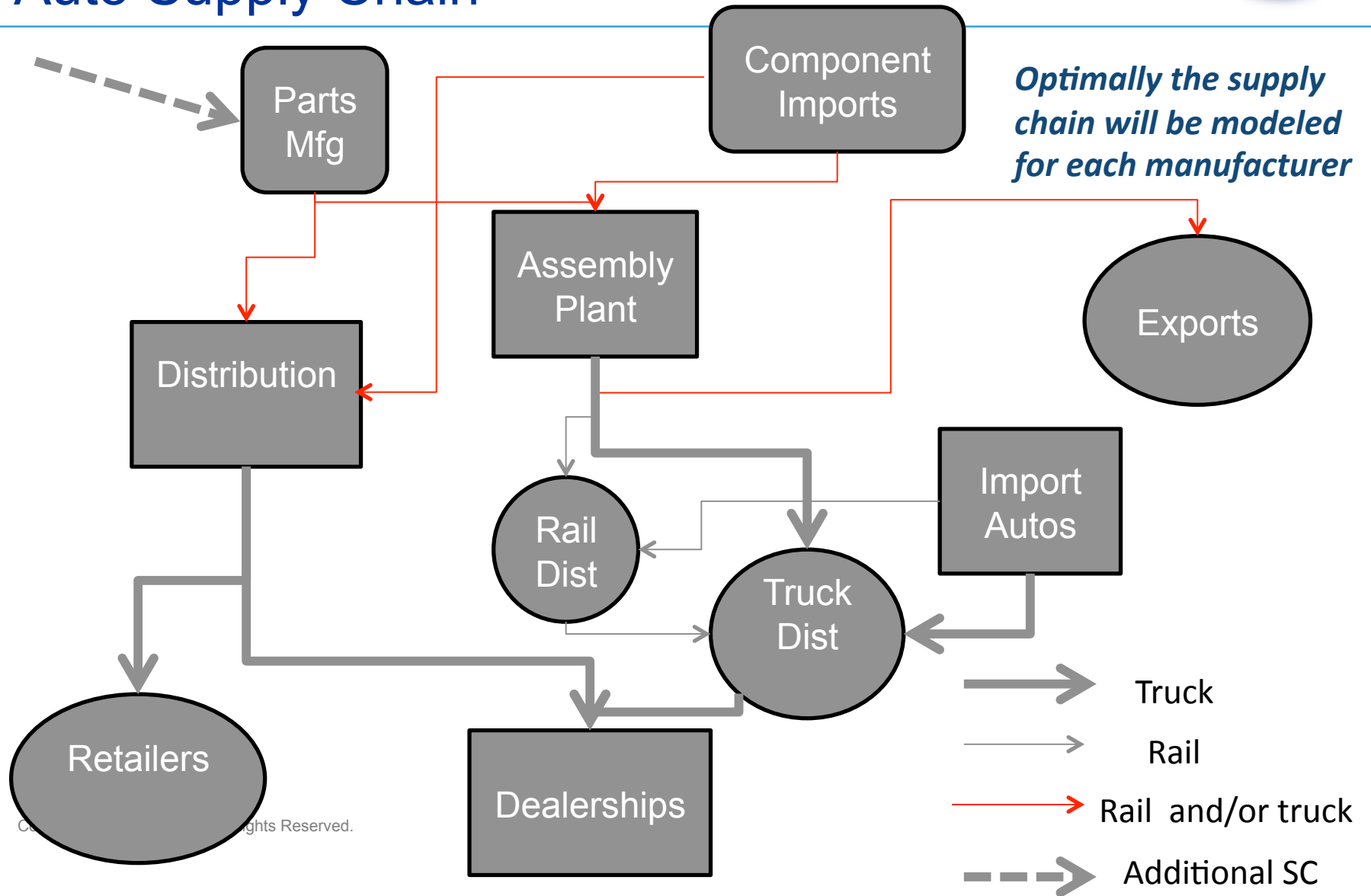
Freight Flow Data	Supply Chain Data
Where & How a Shipment Moves	What Industry Segments Generates & Consumes the Shipments
Market-to-Market Activity	Follow All Steps through an Industry
Extensive use of Supply/Demand Models	Significant input from specific Industry Experts

Supply chain freight planning requires industry data and expertise.....

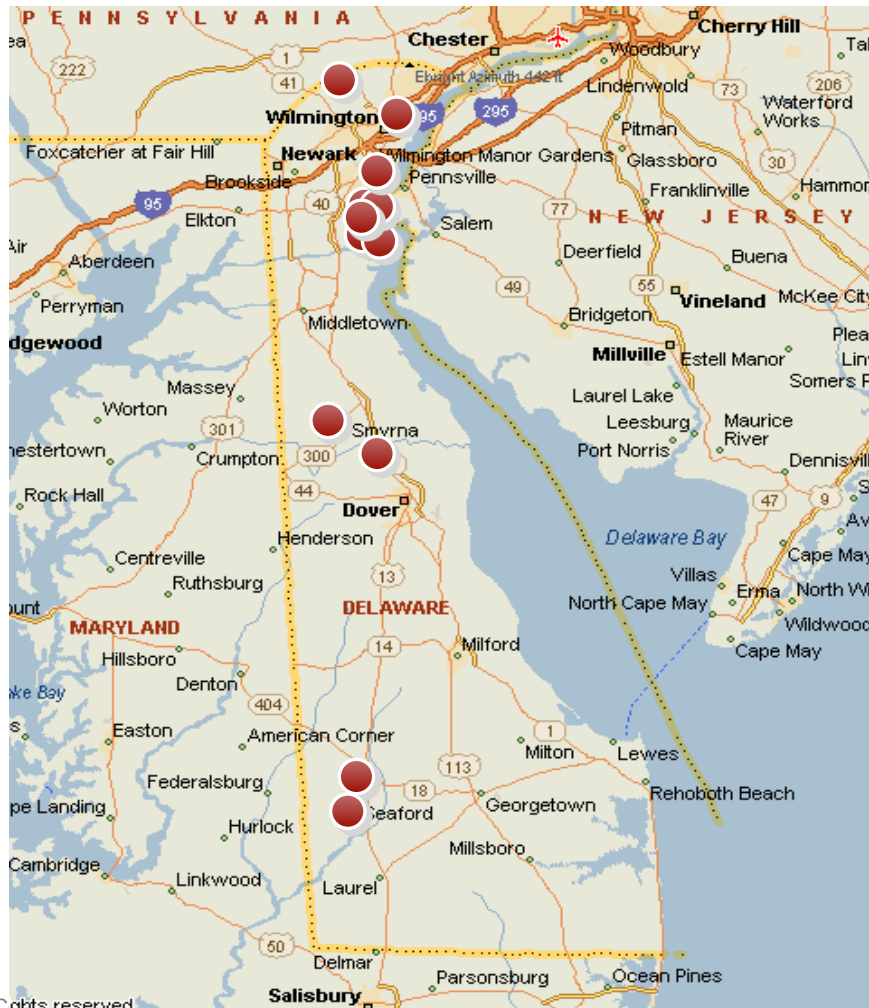
IHS CAN HELP!



Auto Supply Chain



Going Deeper: Major Chemical Plants in DE



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<u>Company</u>	<u>State</u>	<u>City</u>
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



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

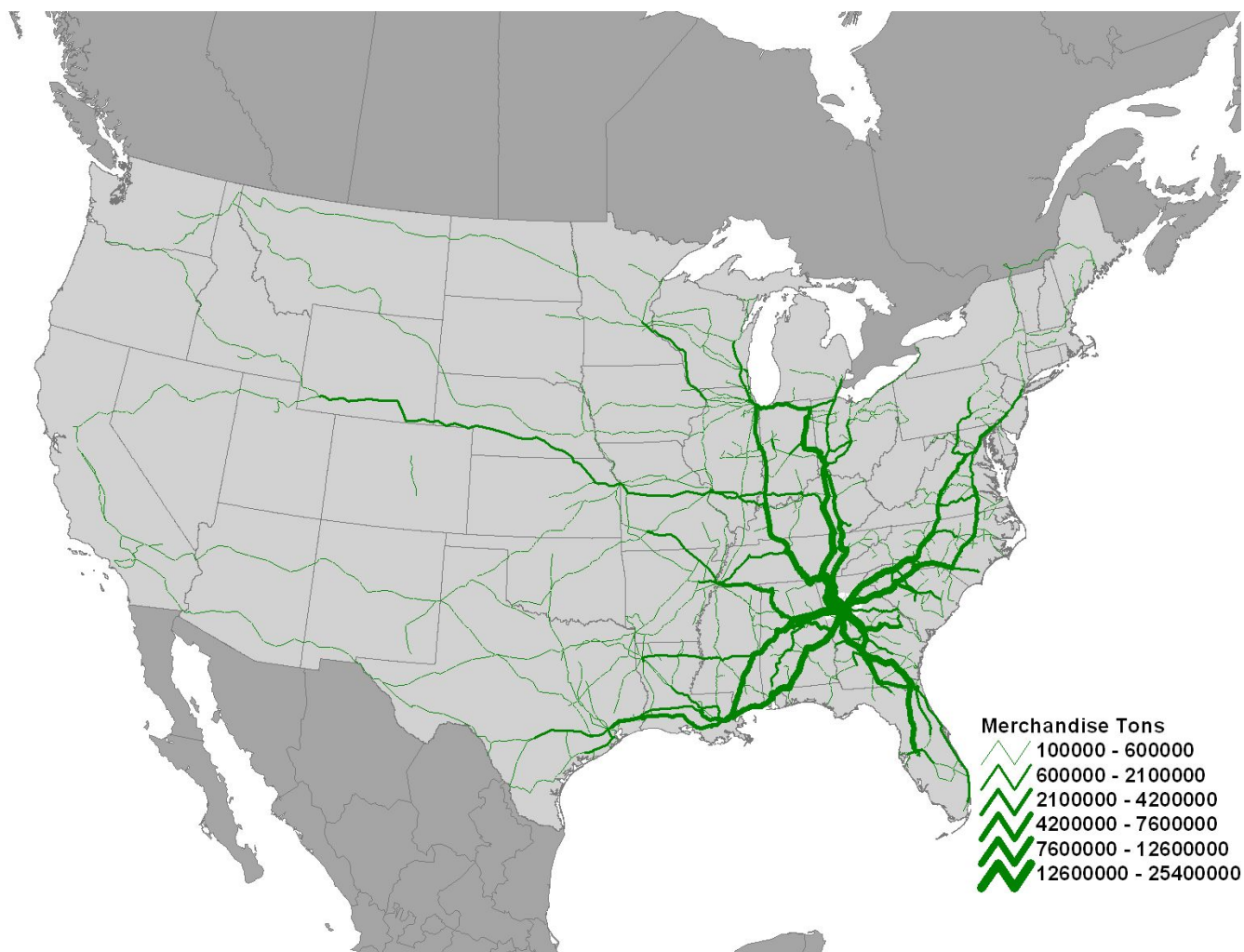
Transearch Redesign Underway – change dates



- 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!

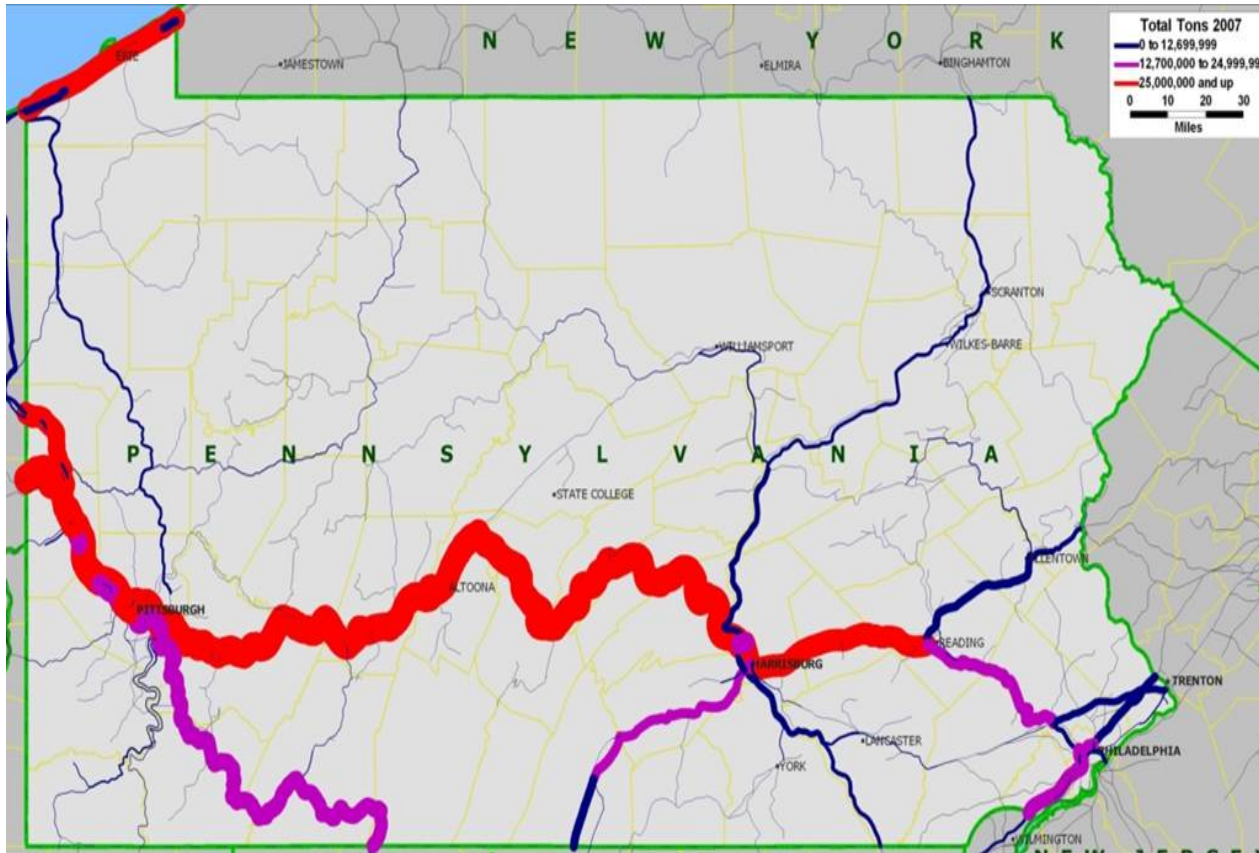


IHS Transearch© Usage: a few Case Studies





Rail Capacity: Meeting Future Needs



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 an 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.

If, Where and How to Build an Inland Port





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**

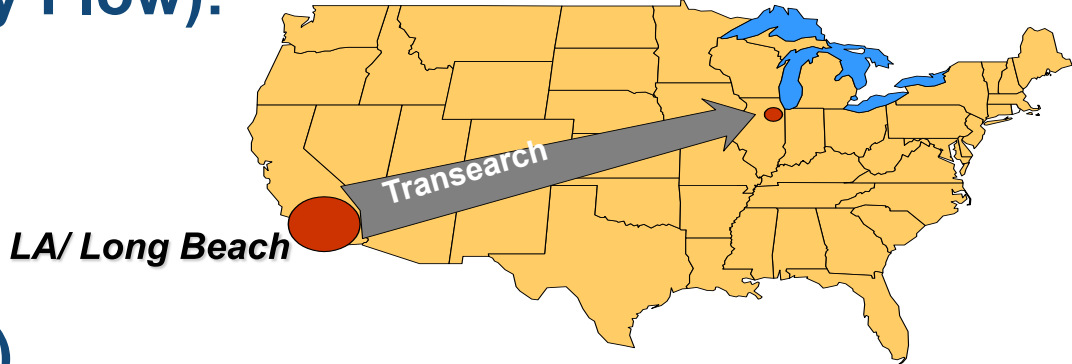
**GPS Satellite,
Barge, air
cargo Data
added 2015**

**Local
Surveys &
Studies on-
added 2015**



IHS Transearch©: Moving Forward

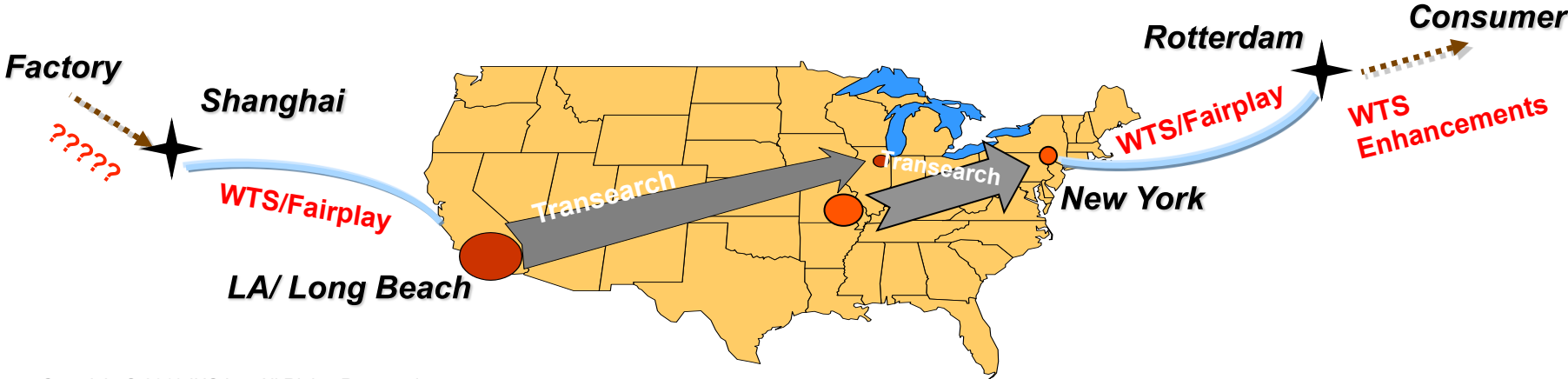
From This (Commodity Flow):



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



Freight Flow Data	Supply Chain Data
Where & How a Shipment Moves	What Industry Segments Generates & Consumes the Shipments
Market-to-Market Activity	Follow All Steps through an Industry
Extensive use of Supply/Demand Models	Significant input from specific Industry Experts

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

Questions?



THANK YOU!

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

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