Introduction to Midwest FreightView

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Part I: A Vision for a Freight Data Resource in the Midwest
BACKGROUND

Upper Midwest Freight Corridor Study (Mississippi Valley Freight Corridor Coalition)

To establish a regional approach for improving freight transportation in the Upper Midwest

To establish multi-state, multi-jurisdictional partnership of public and private sector stakeholder interests.

To study short- and long-term issues surrounding anticipated increases in freight movement and impacts on the region’s infrastructure and economic health.
Rationale

- Provide a Central Focus for Studying Freight Movements in the Midwest
  - A Regional Perspective in the Freight Infrastructure
  - Bring together a diversity of organizations and professionals: State Agencies, MPOs, Shippers, Carriers
  - Report on the Condition of the Regional Freight Infrastructure (Including Performance Measures)
  - Link Freight Movements with Economic Development

- Relate Data from a Wide Range of Sources:
  - Network Data: Flows / Capacity / Administration
  - Regional Data: Economic Activity / Population

- Analysis / Modeling / Simulation / Forecasting
Objectives

Provide a single repository for regional data with convenient secure access

Manage a comprehensive database relating:
- Economic activity among all sectors
- Regional population patterns
- Import and export flows
- Intra-regional flows
- System capacity among all modes
- Intermodal connectivity

Begin to assemble a regional database that can support freight modeling efforts.
Objectives

Comprehensive, seamless, spatially registered and current data repository in a GIS framework

Focus on data and information support functions for public public officials and policy analysts

Projected users:
- Federal, state, and local governments
- Metropolitan planning organizations (MPOs)
- Transportation-related associations
- University research centers
- Other public stakeholders
The Current Delivery System

- Internet-Based Delivery
- **CITRIX MetaFrame** Environment
  - Users access site using Web Browser
  - No software requirements for user
  - Limited Access
  - Users operate delivery system on Toledo Server
  - Images, not data, transferred to users

- GIS Format
  - Modified ArcView Application
  - Full range of mapping and query functions available
  - Analysis tools will be added
Challenges

Data Sources
- Dependence on Federal Data: FAF, BTS, etc.
- Primary Data Acquisition
- Commercial Data (e.g., PIERs, TranSearch, GTIS)

Data Reconciliation and Formatting

Data Compatibility / Availability among Jurisdictions

Frequency of Reporting, “Currentness”
Challenges

Providing functions for a wide range of users

- Basic prepared maps for viewing and download,
- Prepared tables and graphs for viewing and download
- Simple mapping functions in the data viewer,
- Query functions for more advanced users, and
- Analysis functions and specialized functions in the database for advanced users.
Challenges:

Training and Technology Transfer

- Workshop Sessions
- Technical Manuals / Users’ Guides
- On-Line Documentation (short tutorials) for selected tasks on Toledo Site web page
- Technical Support via telephone (at specific times) or via email for more complex problems

Limitations of Working with CITRIX/ArcView Platform

- Replacement User Interface
- Specialized Viewing / Retrieval / Analysis Functions
Midwest FreightView

Data Delivery System: Documentation

Improving the documentation of existing information on the Toledo project web page:

- Manuals and related documentation for use of the system.
- Formalized documentation of the contents of the database including
  - detailed inventory of the database
  - metadata
  - technical appendices
- Furnish secure direct access to the MWFV data viewer.
Part II: Midwest FreightView Today

• Contents of Online Database
• Contents of Data Repository
• Midwest FreightView User Interface
Midwest FreightView

Current Network Data:

- ORNL CTA North American Highway Network
- NHPN (FAF) Highway Network
- Integrated Highway Network
- Updated ORNL CTA North American Rail Network
- North American Transportation Atlas Data (NORTAD)
- BTS Intermodal Terminals, Ports, Airports
- USACE Dock Data
- GTIS Import/Export Database 1999+, by State, Customs Gateway
- FAF Zones and Centroids
- FAF$^2$ 2007 Provisional OD Flows (National Scale)
- Weather station data (NOAA, to approx. 60 Miles Inland)
Midwest FreightView

Economic/Population Data:

- US Census of Agriculture / NASS Data (County-Level)
- Demographics Plus 2003 *Business Counts*—Tract+
- US Census 2000 Long Form Database—Tract +
- Geographic Data: Counties, Census Tracts, ZIP Code Areas, Congressional Districts, MSAs, Urban Areas, ADIs, DMAs, Canadian Municipalities, Mexican States
- County-Level Employment by 3-Digit NAICS classification (Sources: BLS ES/202, County Business Patterns, supplemented with Minnesota IMPLAN Group, Inc. data)
**Data Repository Contents**

Data Residing in Repository outside of MWFV

- Import/Export Flows (GTIS)
- Satellite imagery / aerial photography of dock facilities
- Dock equipment, lock performance data—U.S. side only
- Establishments and employment by 2-6 Digit NAICS classification among counties, MSAs and individual Establishments in 10-State study region (Sources: Minnesota IMPLAN Group, Inc., Dun and Bradstreet/Harris InfoSearch)
- BEA gross domestic product by metropolitan area and by sector and by Year
- BEA regions in *ESRI* Shapefile format
Data Repository Contents

Data Residing in Repository outside of MWFV

- Coal Mine Database (Keystone Directory)
- Power Plant Database (eGRID, etc.)
- Air Freight Flow Network (by market & month)
- Dock equipment, lock performance data—U.S. side only
- Air Freight Data (T-100 1997-2007)
- MARAD international vessel movements & USACE Vessel Entrances and Clearances
- USACE Waterborne Commerce Database Part III (Great Lakes)
- ESRI Traffic Volumes
*Midwest FreightView:*
Geospatial Information Delivery

The Current GIS data viewer
AADTT 1998
AADTT 2010
AADTT 2020
Open economic data from pull down menu
Iron and Steel Mills (IMPLAN) & Downbound Crude Material Tonnage (USACE)
Electric Power Generation (IMPLAN)
(Rail Network in Red)
Electric Power Generation (IMPLAN) in Blue
Coal Mining (IMPLAN) in Green
Electric Power Generation (IMPLAN), Coal Mining, and Waterborne Tonnages (USACE)
FAF Zones and Railroads
Part III: Working with *Midwest FreightView*
Midwest FreightView: Geospatial Information Delivery

Accessing Midwest FreightView on the Network

http://www.maritime.utoledo.edu

http://midwestfreightdata.utoledo.edu
INTRODUCTION

The Mississippi Valley Freight Coalition has built upon the work of the Upper Midwest Freight Corridor Study to establish a regional organization to cooperate in the planning, operation, preservation, and improvement of transportation infrastructure in the Mississippi Valley region. The Mississippi Valley region includes ten states (Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Ohio, and Wisconsin) that share key interstate corridors, rail infrastructure, and inland and Great Lakes waterways. The signing of a Memorandum of Understanding by these states' Departments of Transportation indicates their willingness to meet freight demand through regional cooperative efforts.

The Mississippi Valley Freight Coalition is currently involved in the formation of Executive and Technical Committees, the surveying of transportation Customers in the region (to form a Customer Committee), and the development of a Charter and Assessment of Financial Needs.

DATA VIEWER

Here is the link to the Data Viewer: Click Below

Data Viewer
MVFC - DataViewer User's Guide

The data contained in the viewer has a complete meta-data, which could be found in the Data Documentation page.

PROJECT SPONSORS

- Midwest Regional University Transportation Center (University of Wisconsin-Madison)
Welcome

Please log in

To log in to MetaFrame Presentation Server, enter the credentials required, and then click Log In.

If you do not know your log in information, please contact your help desk or system administrator.

Message Center

The Message Center displays any information or error messages that may occur.
Click on MWFC
Initial view of *Midwest FreightView*
Part IV: Looking Ahead: Updates, Additions, Revisions and Improvements to Midwest FreightView
Midwest FreightView

Data Currently Being Added to MWFV:

- ORNL CTA North American Rail Interlining Network
- **Integrated Network**—Great Lakes Waterway, Highway, Rail linked to Commercial Docks, Locks (Army Corps of Engineers)
- Updated US Highway Network
  - Speed / Estimated Travel Times
  - Add ESRI Traffic Counts to integrated highway network
  - Add ATRI Travel Time Data (by time of day, day of week)
  - Link highways to Rail Network through Intermodal Sites/Ports
- Link BEA Regions/BEA GDP Data to Public Rail Waybill Data
- Encode EPA eGRID Power Plant Database, Keystone Coal Mine Database into MWFV; linkages to Rail and Waterway Networks
Midwest FreightView

Data Currently Being Added to MWFV:

- Add T100 Air Flows between Airports (by month, year)
- USACE Foreign Traffic Vessel Entrances and Clearances
- USACE Waterborne Commerce Data
- Recently finished “Last Mile” Connections and Added Satellite Imagery to Viewer Site
- County-to-County Mileage and Impedance Tables:
  - Highway
  - Rail
  - Water

Useful for Analytical Tools—Accessibility, Location Analysis, etc.
Parallel Projects:

Data Currently Being Added to Repository:

- Data Collection: USACE Master Docks Plus Data Collection
  - Developed and Tested New Methods for Data Collection
  - Tested Methods at Selected Ports
- FINDE: Federal Integrated Navigation Data Enhancement
  - Automated Data Gathering for Port Calls
  - Development of GIS Database at Dock Facilities
  - AIS-Data Acquisition referenced to GIS Dock Locations
  - Joint Project with USACE, US Customs, IRS, BTS

US Coast Guard
LOOKING AHEAD:

- Continue development of integrated network:
  - Highway Performance Indicators
  - Time-Dependent Vehicle Routing on Highway Network

- Development of New Data Viewer to Replace ArcView Interface

- Development of Streamlined Data Viewer

- Development of “User Friendly” Query Functions

- Continued Development of Analytical Tools
  - Location Analysis and Site Selection Models
  - Accessibility Measures and Trade Area Analysis
  - Economic Indices and Analyses
  - Intermodal Cargo Routing using Integrated Network
Midwest FreightView

Functions:

Basic prepared maps for viewing and download,
Midwest FreightView

Functions:
Prepared tables and graphs for viewing and download

Weekday Travel Times:
Kennedy Expressway
Addison to Fullerton
Midwest FreightView

Functions:
Query functions for more advanced users
Functions:
Query functions for more advanced users

Air Freight
Query and Mapping
Functions:
Query functions for more advanced users
**Functions:**

*Specialized analysis functions for advanced users*

- Mileage Tables
- Time-Based Routing
- Accessibility Computations
- Flow Mapping

- New forms of analysis to link freight flows to the regional economy:
  - Spatial Econometrics, Neural Net Analysis etc.
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Specialized analysis functions for advanced users

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US Households:
21% within 4 hours
52% within 10 hours
63% within 15 hours
76% within 20 hours
US Manufacturing:
24% within 4 hours
55% within 10 hours
64% within 15 hours
76% within 20 hours
Data Analysis Software

The map at the right displays the density of *wholesale trade* activity in the US among counties. This density map shows the proximity of wholesale distributors relative to each county, weighted by employment. Those regions in the darkest colors have the greatest accessibility to wholesale trade in the U.S.
Data Analysis Software

MWFV now uses the same software to display the density of heavy equipment manufacturing by county. This density map shows the proximity of heavy equipment manufacturers relative to each county weighted by employment. Those regions in the darkest colors have the greatest accessibility to this sector in the U.S.
Intermodal Routing through Seaway / Lakes
Intermodal Routing through Seaway / Lakes
Routing through Port of Chicago
Intermodal Routing through Seaway / Lakes
Routing through Port of Chicago
Connection via Highway to St. Louis
## Dock Information Systems

### Dock User's Guide

<table>
<thead>
<tr>
<th>GUID</th>
<th>Name</th>
<th>Waterway</th>
<th>Town</th>
<th>St./Prov.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0609</td>
<td>HUNGRY HARBOR DOCK</td>
<td>bon</td>
<td>Toledo</td>
<td>OH</td>
</tr>
<tr>
<td>0660</td>
<td>CITY DOCK PUT-IN-BAY</td>
<td></td>
<td>Put-In-Bay</td>
<td>OH</td>
</tr>
<tr>
<td>0666</td>
<td>LAFARGE NORTH AMERICA</td>
<td></td>
<td>Marblehead</td>
<td>OH</td>
</tr>
<tr>
<td>066A</td>
<td>STANDARD LAFARGE CEMENT CORP</td>
<td></td>
<td>Marblehead</td>
<td>OH</td>
</tr>
<tr>
<td>066A</td>
<td>LAFARGE NORTH AMERICA</td>
<td></td>
<td>Marblehead</td>
<td>OH</td>
</tr>
<tr>
<td>0704</td>
<td>ONTARIO STONE CORP., OLD RIVER DOCK NO. 1 AND 3</td>
<td></td>
<td>Cleveland</td>
<td>OH</td>
</tr>
<tr>
<td>0706</td>
<td>SUNDOG MID-AMERICA MARKETING &amp; REFINING CO HOCKING VALLEY PIER</td>
<td></td>
<td>Toledo</td>
<td>OH</td>
</tr>
<tr>
<td>0708</td>
<td>PINNEY DRK TRANSPORT DOCK, SANDSTIN R DRE</td>
<td></td>
<td>Ashtabula</td>
<td>OH</td>
</tr>
<tr>
<td>070A</td>
<td>S.H. BELL CO., STATE LINE &amp; LITTLE ENGLAND TANK WHARVES</td>
<td></td>
<td>East Liverpool</td>
<td>OH</td>
</tr>
<tr>
<td>070C</td>
<td>Agland Corp, East Liverpool Grain Dock,</td>
<td></td>
<td>East Liverpool</td>
<td>OH</td>
</tr>
</tbody>
</table>

**Dock Details will be displayed here once a dock is selected. (Please click on a magnifying glass to select a dock.)**
Thank you

Comments / Feedback are appreciated