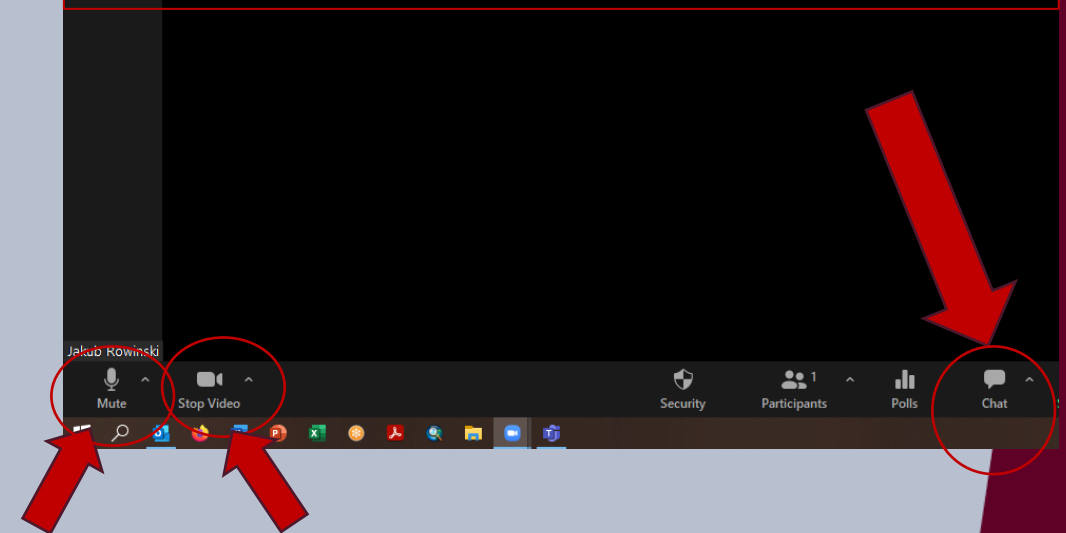


Uses for and Approaches for Disaggregating Freight Analysis Framework (FAF) Information Workshop Agenda

1.0		Welcome and Meeting Objectives	David Behrend, Executive Director, North Jersey Transportation Planning Authority (NJTPA) Anne Strauss-Wieder, NJTPA
2.0		Why Freight Data is Important	Paul Baumer, Deputy Director for Infrastructure Development, Office of Multimodal Freight Infrastructure and Policy, Office of the Secretary, U.S. Department of Transportation
3.0		What is FAF and the Current Status of the BTS Disaggregation Work	Monique Stinson, Freight Estimation, Forecasting, and Analysis Manager at the USDOT/OST-R Bureau of Transportation Statistics
4.0		The Why – Why Do Agencies Use Disaggregated FAF Data	
	a.	NJTPA	Anne Strauss-Wieder and Jakub Rowinski, NJTPA
	b.	The Eastern Transportation Coalition (ETC) FAF Disaggregation Initiative	Marygrace Parker, TET Coalition
	c.	Southwestern Pennsylvania Commission (SPC)	Sara Walfoort, SPC
5.0		The How – Approaches to Disaggregating FAF	
	a.	NJTPA 2050 Freight Industry Level Forecasts Update	Dan Beagan, Cambridge Systematics
	b.	FHWA FAF Disaggregation Handbook	Birat Paney, FHWA- Office of Freight Management and Operations
	c.	An Agriculture/Food Research Application	Megan Konar, William J. and Elaine F. Hall Faculty Fellow and Associate Professor, University of Illinois
6.0		Wrap Up	Anne Strauss-Wieder, NJTPA

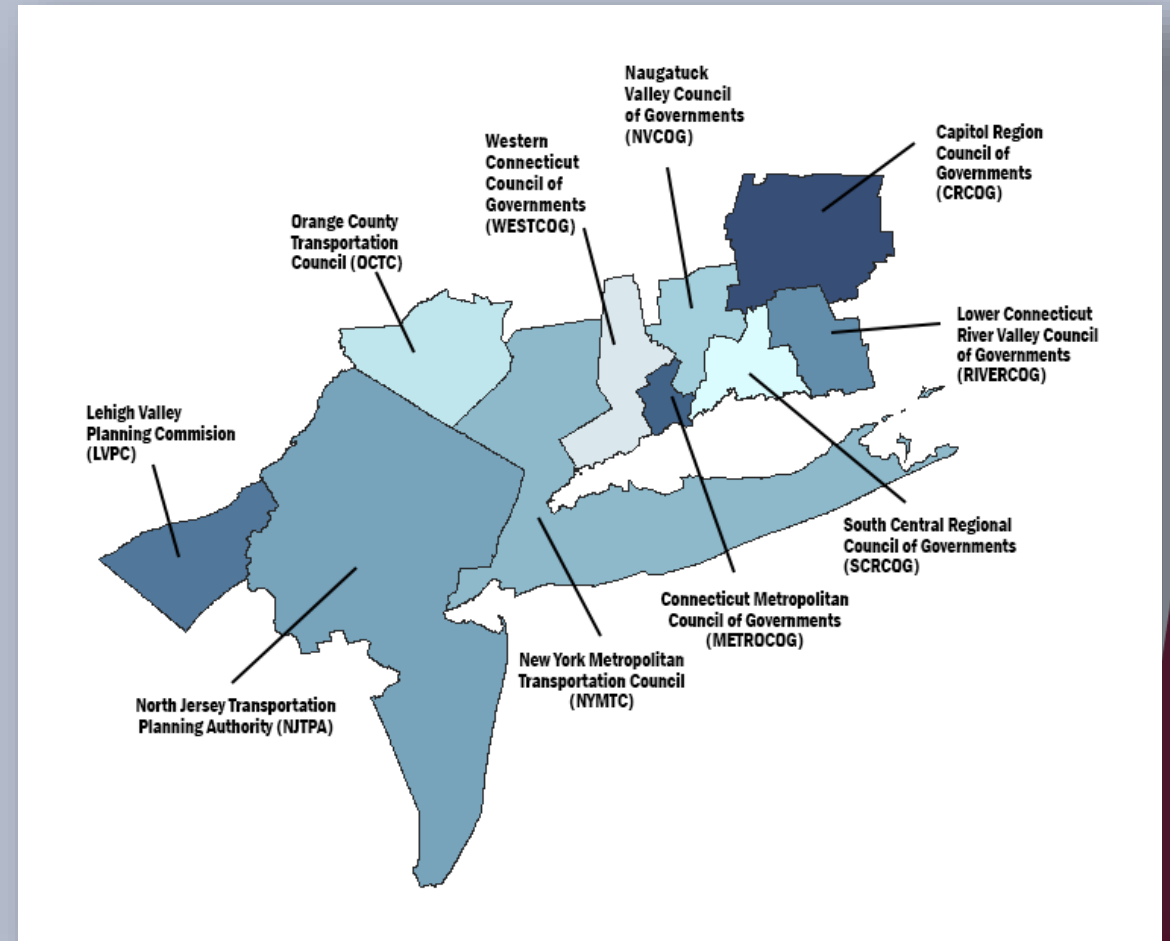
Please use the Chat box to ask questions during the presentations and if requesting credits, please post your name and email, followed by AICP



Please mute and turn off your video when not speaking.

Welcome and Meeting Objectives

- David Behrend, Executive Director, North Jersey Transportation Planning Authority (NJTPA)
- Anne Strauss-Wieder, NJTPA



Uses for and Approaches for FAF Information Workshop

Why Freight Data is Important

- Paul Baumer, Deputy Director for Infrastructure Development, Office of Multimodal Freight Infrastructure and Policy, Office of the Secretary, U.S. Department of Transportation



U.S. Department
of Transportation

Office of Multimodal Freight Infrastructure and Policy

Why is Freight Data Important?

Presentation to MAP Forum Workshop

April 18, 2024

1. Brief Introduction: Who we are
2. The National Multimodal Freight Policy
3. Freight Data in Use: The National Multimodal Freight Network



USDOT Office of Multimodal Freight Infrastructure and Policy

Led by the Assistant Secretary for Multimodal Freight Infrastructure and Policy, our mission is to carry out the National Multimodal Freight Policy

- Develop and manage the National Freight Strategic Plan and the National Multimodal Freight Network
- Oversee the development and updates of State freight plans
- Assist cities and States in developing freight mobility and supply chain expertise
- Assist States in the establishment of freight advisory committees and multi-State freight mobility compacts
- Promote and facilitate the sharing of freight information between the private and public sectors
- Provide input to the Bureau of Transportation Statistics regarding freight data and planning tools
- Conduct research on improving multimodal freight mobility and oversee the freight research within the Department
- Liaise and coordinate with other Federal Departments and agencies on freight transportation policy



Section 70101: National Multimodal Freight Policy

It is the policy of the United States to maintain and improve the condition and performance of the National Multimodal Freight Network...to ensure that the Network provides a foundation for the United States to compete in the global economy.

The goals of the national multimodal freight Policy are:

- (1) to identify infrastructure improvements, policies, and operational innovations that—
 - (A) strengthen the contribution of the National Multimodal Freight Network to the economic competitiveness of the United States;
 - (B) reduce congestion and eliminate bottlenecks on the National Multimodal Freight Network; and
 - (C) increase productivity, particularly for domestic industries and businesses that create high-value jobs;
- (2) to improve the safety, security, efficiency, and resiliency of multimodal freight transportation;
- (3) to achieve and maintain a state of good repair on the National Multimodal Freight Network;
- (4) to use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Multimodal Freight Network;
- (5) to improve the economic efficiency and productivity of the National Multimodal Freight Network;
- (6) to improve the reliability of freight transportation;
- (7) to improve the short- and long-distance movement of goods that—
 - (A) travel across rural areas between population centers;
 - (B) travel between rural areas and population centers; and
 - (C) travel from the Nation's ports, airports, and gateways to the National Multimodal Freight Network;
- (8) to improve the flexibility of States to support multi-State corridor planning and the creation of multi-State organizations to increase the ability of States to address multimodal freight connectivity;
- (9) to reduce the adverse environmental impacts of freight movement on the National Multimodal Freight Network; and
- (10) to pursue the goals described in this subsection in a manner that is not burdensome to State and local governments.



Why is Freight Data important to the National Multimodal Freight Network (NMFN)?

Statutory Factors for Designating the NMFN

Economic Factors, Trade Balance

Intermodal Links and Connectivity

Facilities and Corridors of
Critical Importance to a Region

Major Distribution Centers,
Inland Intermodal & First-and
Last- Mile Facilities

Access to Energy Exploration,
Development, Installation, and
Production

Key Freight Origins and Destinations

Access to Manufacturing,
Agriculture, Natural Resources

Access to Border Crossings,
Airports, Seaports and Pipelines

Impact of All Freight Modes

Freight Strategic Importance,
Volume, Value, Tonnage

Significance of Goods Movement
and Supply Chain Considerations

Freight Congestion,
Choke Points, and Delay

INPUTS

Forthcoming
Official NMFN Map



Intended Uses of the NMFN

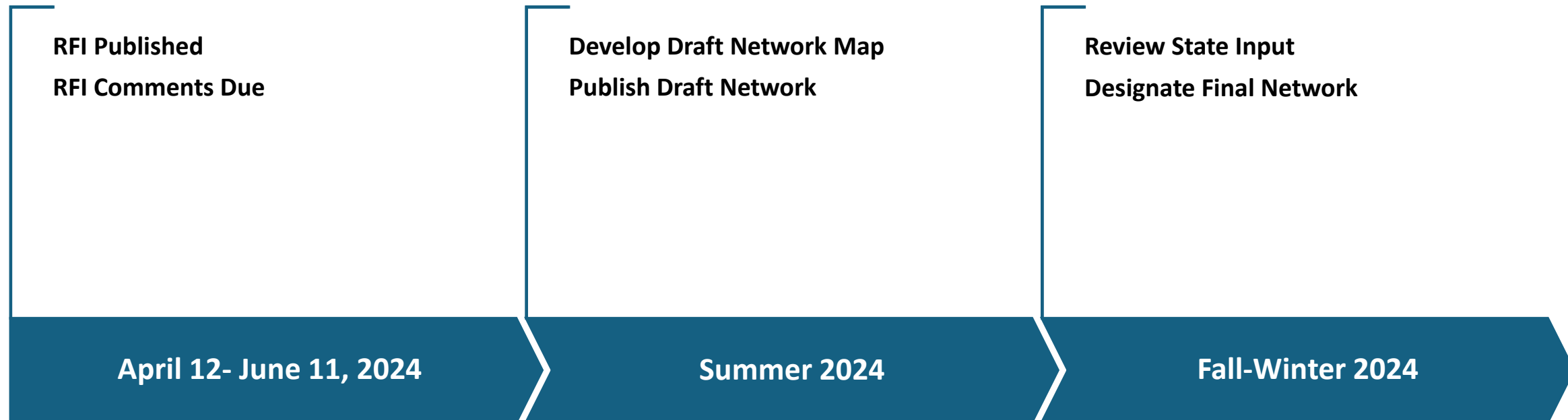
Congress directed that the NMFN be used to:

1. Assist States in strategically directing resources to improve the efficiency of freight movement on the NMFN
2. Inform freight transportation planning
3. Assist in the prioritization of Federal investments
4. Assess and support Federal investments to achieve the national multimodal freight policy goals and the National Highway Freight Program goals



Proposed Process for Designation

The NMFN statute requires considerable public outreach, including Notice and Comment on a draft system prior to establishing the NMFN. The statute also provides a framework for States to formally submit additional designations to the network (“State Input”), in an amount that is not more than 30% of the total mileage in the State. States must certify that they considered nominations from MPOs, Stat Freight Advisory Committees, and owners and operators of port, rail, pipeline and airport facilities in order for their designation to be accepted by DOT. DOT is proposing to solicit the “State Input” following the publication of the Draft Map.



How to Continue to Engage

Comment on the RFI (by June 11, 2024)

Example considerations...

- How will *you* use a designated National Multimodal Freight Network?
- How should DOT prioritize among the 12 factors for designation to ensure the Network provides the foundation for the U.S. to compete in the global economy?
- What data should DOT use to inform the application of each factor?

Coordinate with State DOT

- Coordinate with State DOT regarding any nominations during State Input Process

Continue to Collaborate on Needs

- NMFN to be updated every five years



Thank You!

Contact information:

Paul.Baumer@dot.gov



Uses for and Approaches for FAF Information Workshop

What is FAF and the Current Status of the BTS Disaggregation Work

- Monique Stinson, Freight Estimation, Forecasting, and Analysis Manager at the USDOT/OST-R Bureau of Transportation Statistics



U.S. Department of Transportation
Office of the Secretary of Transportation

Bureau of Transportation Statistics

What is the Freight Analysis Framework (FAF) & Status Update of the BTS Disaggregation Work

Presented at the *Workshop on Uses for and Approaches
for Disaggregating Freight Analysis Framework (FAF) Information*

Hosted by the Metropolitan Area Planning (MAP) Forum's Multi-State Freight Working Group

April 18, 2024

Monique Stinson, PhD

FAF@DOT.GOV

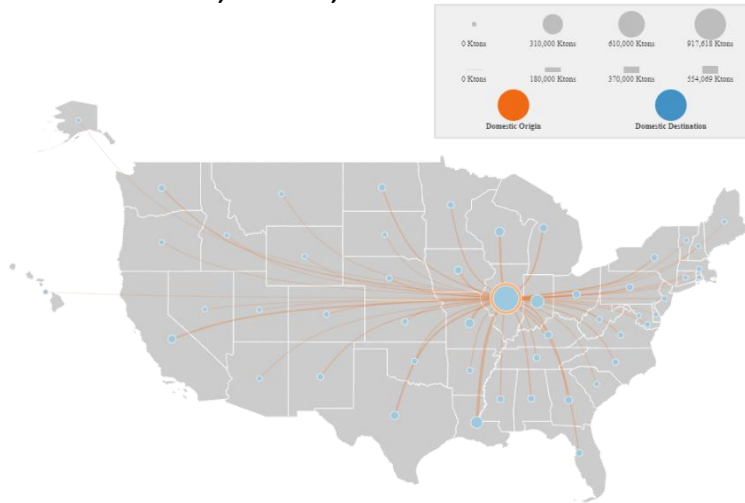
WHAT IS FAF



FAF Provides Estimates of US Freight Flows

Product 1: Database of flows by Origin (O), Destination (D), 42 Commodities, & *8 Modes

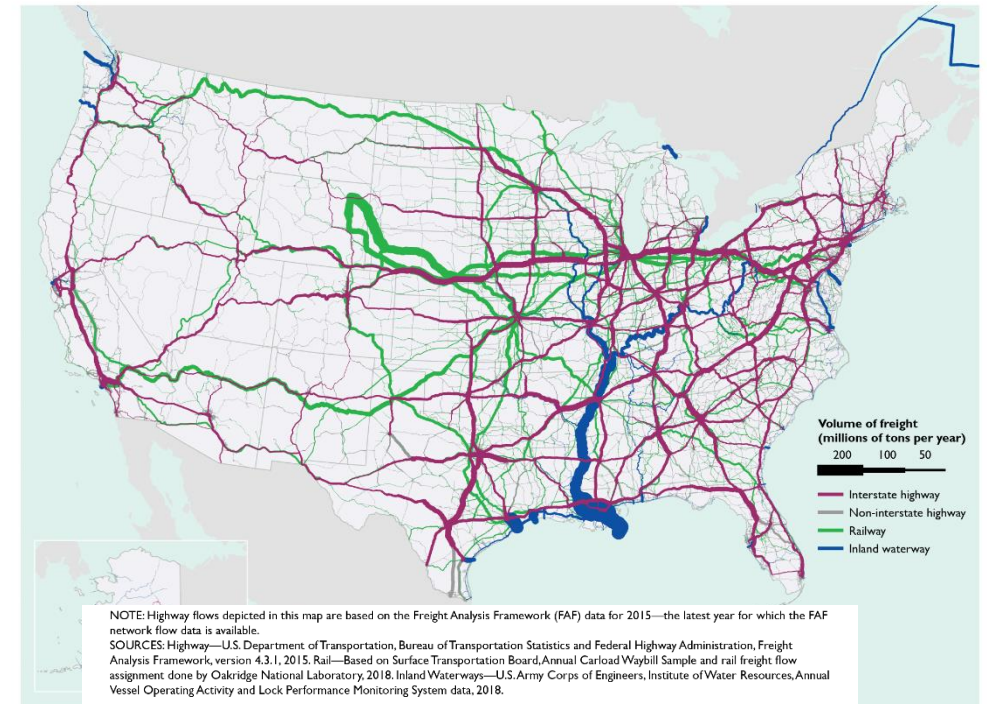
- Includes foreign O/D and mode (if applicable)
- Volumes: tons, value, and ton-miles



Origin	Destination	SCTG2	Tons	Value	Ton-miles	Domestic Mode	Foreign Mode
Wyoming	Chicago region	Coal	xx	xx	xx	xx	xx
...

Product 2: Network flows by Truck, Rail and Water (e.g., estimated volumes on interstates)

Freight Flows by Highway, Railway, and Waterway: 2018



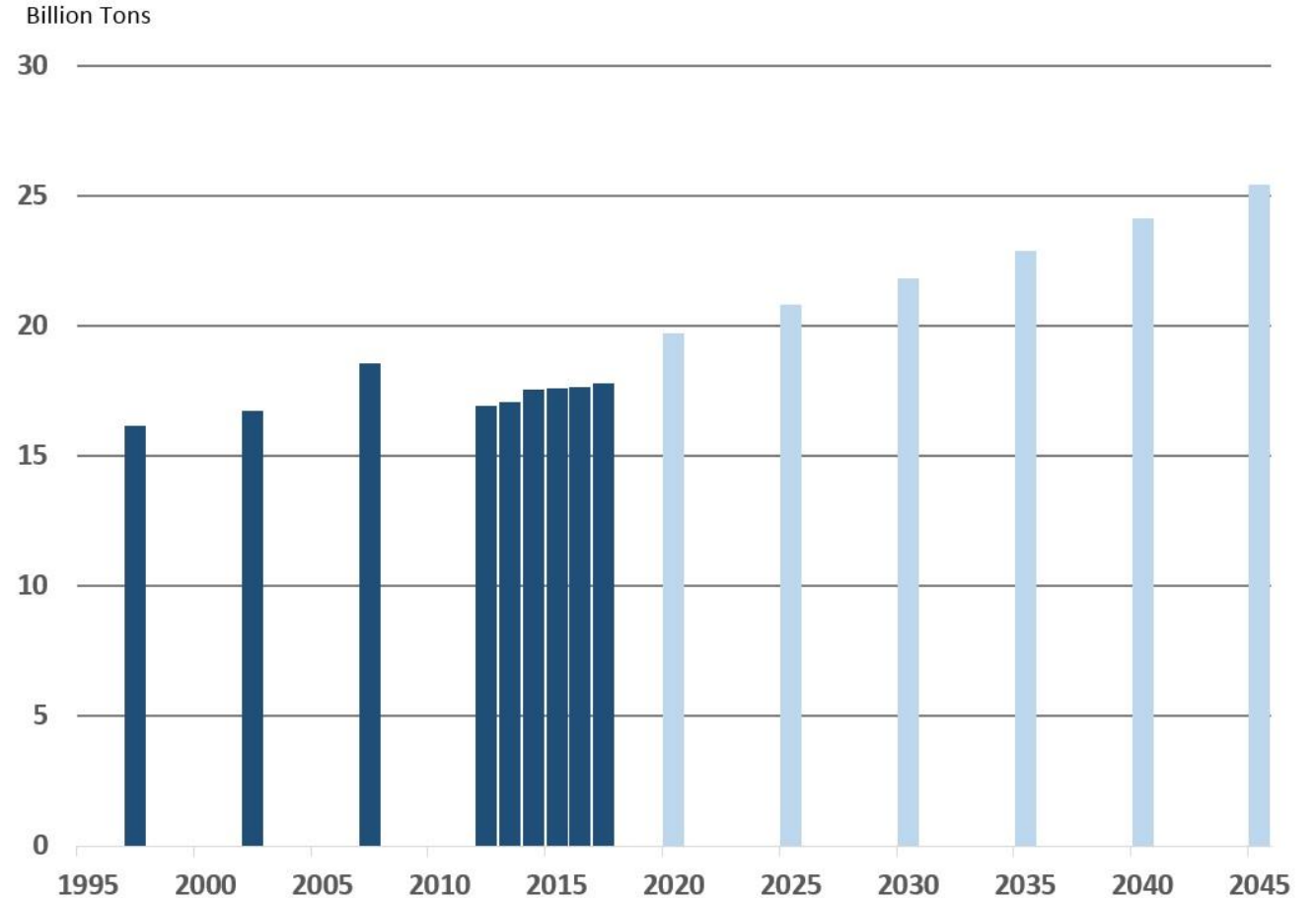
*Modes: Truck, Rail, Water, Air, Multiple Modes & Mail, Pipeline, Other/unknown, No domestic mode



Beyond the Present Day

- Annual Estimates
- Historic Series
- Forecasts

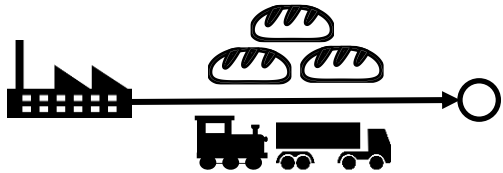
Illustration for FAF4



Developing the Estimates

Main Input: the BTS-Census Commodity Flow Survey (CFS)

CFS SHIPMENT DATA

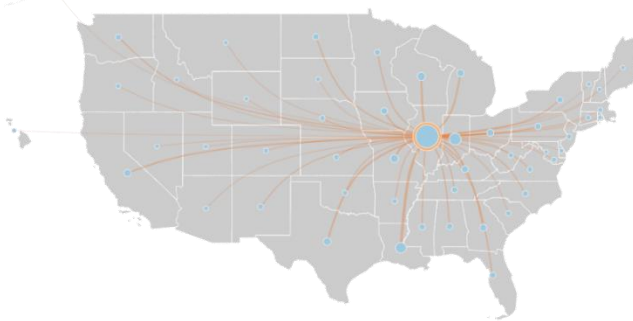


FLOW or PRODUCTION VOLUME DATA:

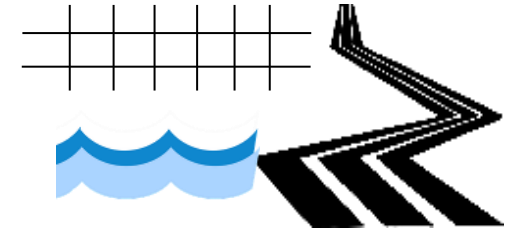
11 OOS (Out of Scope) Data
Sources:

Farm-based agriculture, fisheries, logging,
crude petroleum, natural gas, retail,
service, moving, foreign trade,
construction and demolition, waste [from
USDA, NOAA, EPA, Census FTD / USATO,
BEA, EIA, USACE, states, industries]

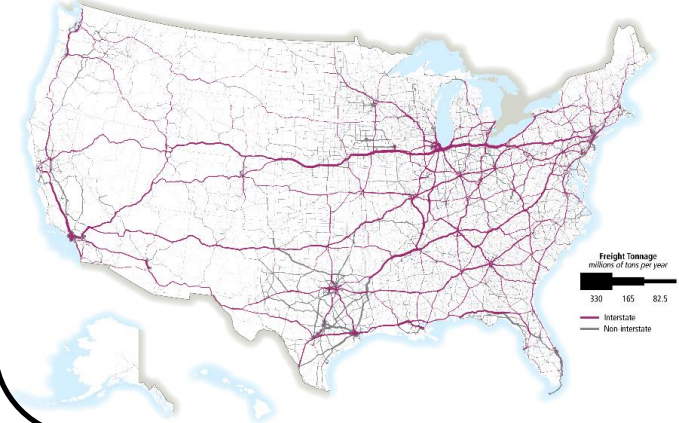
OD FLOWS DATABASE



NETWORKS

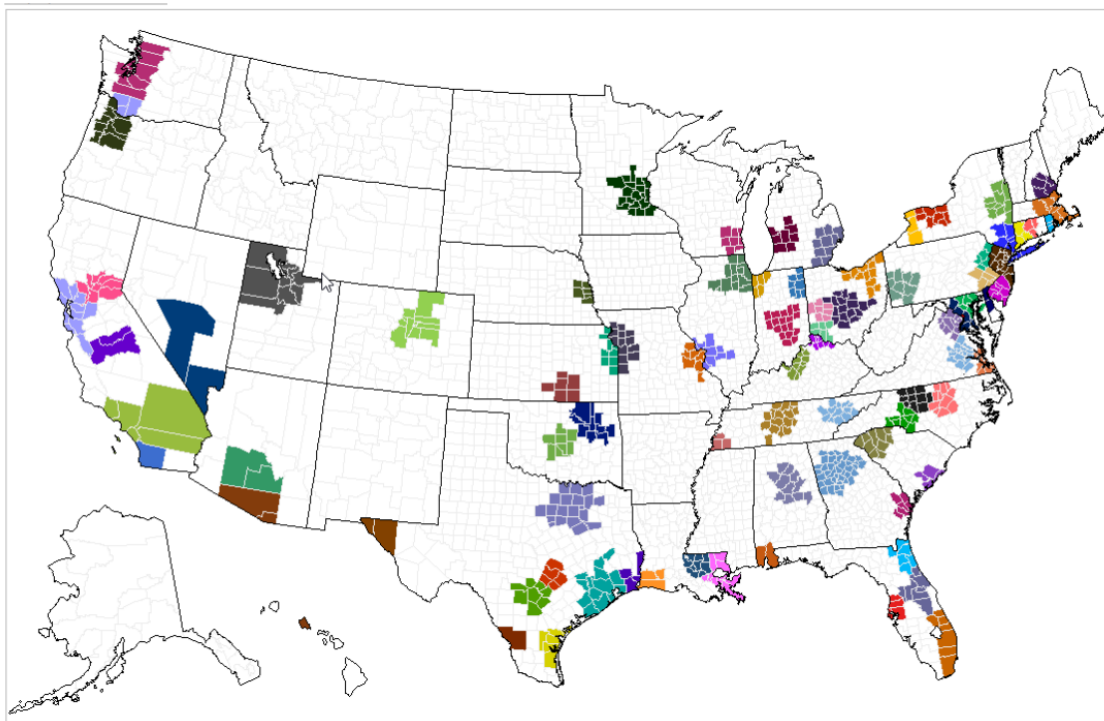


NETWORK FLOWS



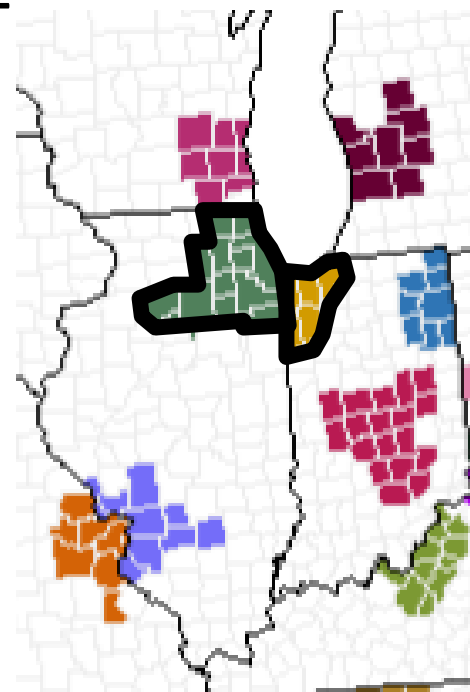
Geographic Granularity:

CFS & FAF Flows Are Represented Using 132 US Zones



The Chicago Metro Region, for example, consists of 2 FAF zones:

- The Illinois zone (dark green) comprises 13 counties
- The Indiana zone (gold) comprises 5 counties



Access products at
<https://www.bts.gov/faf>

- Freight flow databases & shapefiles
- Visualization tools
- Other (summary statistics, documentation, ...)

FAF Data Tabulation Tool

Custom Selection of FAF Data

Flow Type: Import Flows

Year: (Estimates for years 2025-2050 are forecasts.)
2017
2018
2019
2020
2021
2022
2025
2030
2035
2040
2045
2050

Measure:
tons
value
current_value
tmiles

Forecast Scenarios:
(2025-2050)
☐ Low Growth
☐ High Growth

Origin-Destination Geography:

Foreign Origin

801 - Canada
802 - Mexico
803 - Rest of Americas
804 - Europe
805 - Africa
806 - SW & Central Asia
807 - Eastern Asia
808 - SE Asia & Oceania

US Entry Region (Domestic Origin)

Domestic Destination

FAF zone (sort by state)
011 - Birmingham AL
012 - Mobile AL
019 - Rest of AL
020 - Alaska
041 - Phoenix AZ
042 - Tucson AZ
049 - Rest of AZ
050 - Arkansas

Commodity:
Commodity

Mode & Distance:

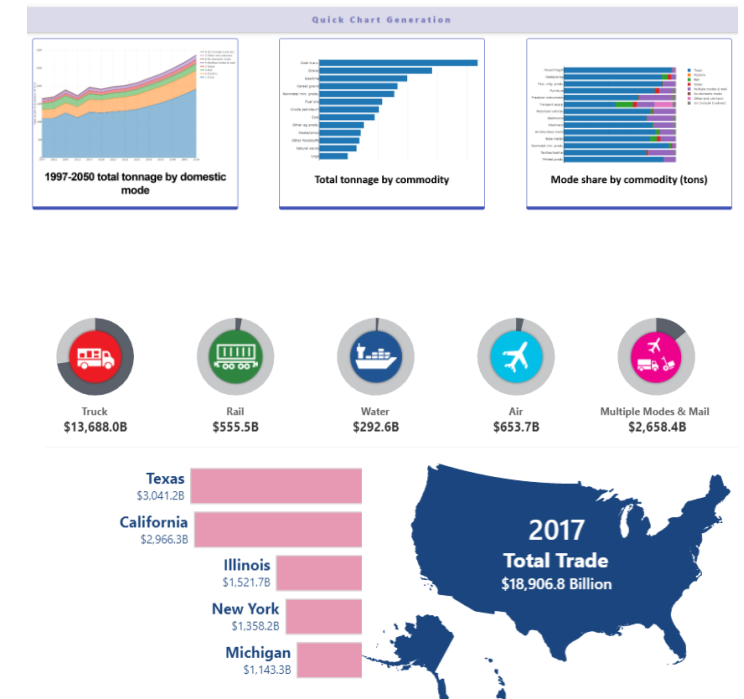
Foreign In-Mode

Domestic Mode

1 - Truck
2 - Rail
3 - Water
4 - Air (include truck-air)
5 - Multiple modes & mail
6 - Pipeline
7 - Other and unknown
8 - No domestic mode

Distance Band

Visualization Tools



New dashboard:

https://explore.dot.gov/t/FHWA/views/FAF5_5_1VisualizationFinalv1_1_09_14_2023/NationalSummaryDashboard?%3Aembed=y&%3Aiid=2&%3AisGuestRedirectFromVizportal=y&%3Atabs=n



U.S. Department of Transportation

Office of the Assistant Secretary for
Research and Technology

Applications Include

- Assess current network performance
- Impacts of freight movements on congestion, infrastructure, safety, equity and the environment
 - Example transportation planning application: Bottleneck analysis → understand what goods are impacted
- Impacts on freight from shifts across industries and economic geographies
- Plan for the future – e.g., where to make investments that improve freight movements
 - Asset management (infrastructure) – e.g., pavement, bridges
 - Operational, policy, or other improvements
- How freight will impact economic development
- Supply chain analysis
 - Top domestic and foreign trading partners
 - Top commodities
 - Mode shares
- Climate resilience
- Et cetera...
- Sectors (not a complete list)
 - Public: transportation planning agencies, industry specialists, ...
 - Private
 - Economic analysts
 - Real estate
 - Transportation & warehousing companies, e.g., third-party logistics providers (3PLs)
 - Academic researchers



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ONGOING & FUTURE ENHANCEMENTS



***U** = 49 USC §6303 requirement
***B** = BTS Mission requirement
***F** = OST-F requirement

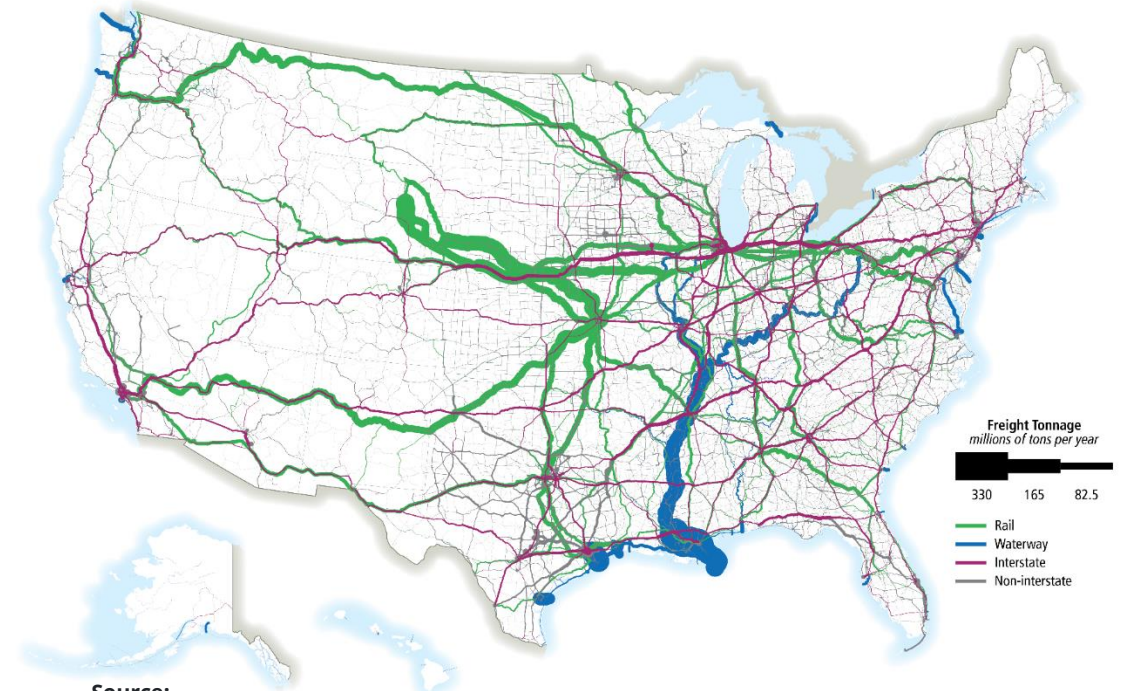
Product Assessment

- FY2023-FY2024: Evaluated FAF in terms of Production, Quality, and Useability
- Useability evaluation focused on sufficiency for:
 - Federal, state, MPO, international studies (***U**)
 - Single-mode and multi-modal trips (***F**)
 - Studies of the US transportation system (***B**), (past / current / future) consequences of freight (***B**)
- Useability conclusion:
 - MPO and State: limited due to spatial resolution
 - Multi-modal assignment—in progress
 - Forecast: no capacity constraint; might not align with local growth assumptions



Summary of Ongoing & Upcoming Plans

- Product extensions – in progress (scheduled for release in 2024):
 - Multimodal network assignment
 - County-level OD flows
- Product improvements – upcoming:
 - Improve forecast useability by:
 - Adding network capacity constraints (mode choice)
 - Improving consistency with local growth projections
 - Improve production process
- Modernization
 - Methods and data ~same since 2002
 - BTS is exploring ways to modernize FAF
- Seeking feedback on improvements



Source:

Freight Flows by Highway, Railway, and Waterway

Highway: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, Freight Analysis Framework, version 5.4, 2022; Rail: Based on Surface Transportation Board, Annual Carload Waybill Sample and rail freight flow assignment done by Federal Railroad Administration, 2019; Inland Waterways: U.S. Army Corps of Engineers, Institute of Water Resources, Annual Vessel Operating Activity and Lock Performance Monitoring System data, 2022.



U.S. Department of Transportation
**Office of the Assistant Secretary for
Research and Technology**

FAF Modernization in Three Stages

Forecast Only (by 2026)

Goal: Improve mode share forecasts (quality, useability).

How: We will set up select elements of the modernized FAF, putting the most effort into mode share model development and validation. We will explore using employment & economic growth data (from BLS, States & MPOs) to project total growth in flows. The resulting forecast will be sensitive to network infrastructure capacity.

Demand Modernization (timeline & funding TBD)

Goal: Improve demand estimation processes in FAF (production, quality, and useability).

How: We will transform the way FAF (or parts of it, e.g., OOS flows) is developed, moving from construction to model-based estimates while leveraging new data that are now available to BTS. Development and validation will focus on demand elements.

Extended Modernization: End-to-End Supply Chain Analysis Tool (need funding)

Goal: Add supply features and improve demand features (useability, quality).

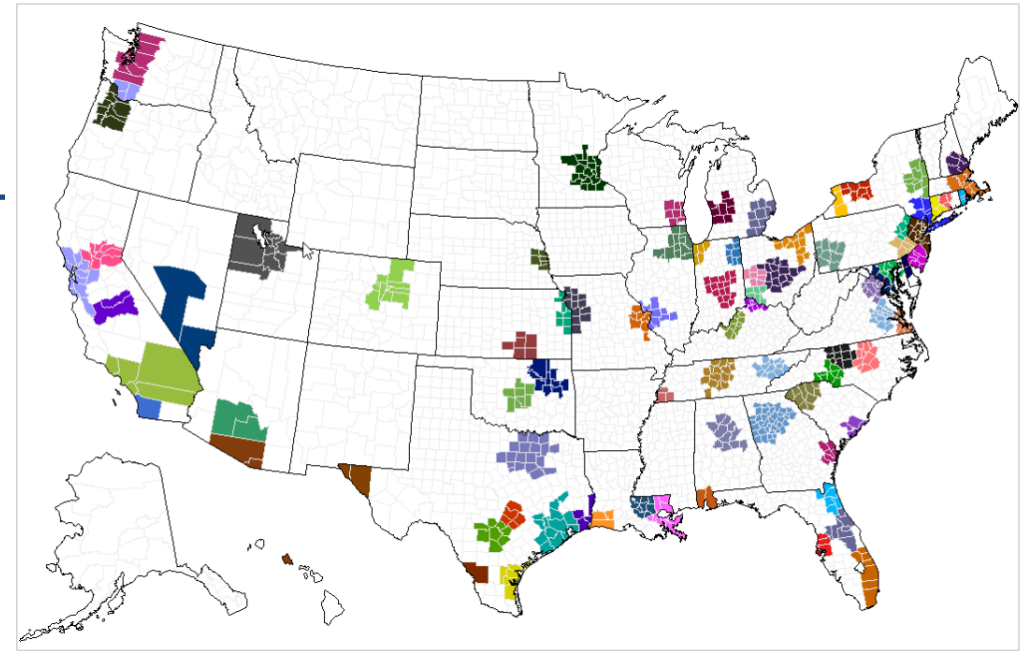
How: We will add new features that integrate richer data and use updated methodologies, especially filling in the transportation supply side. Extensive attention will be given to validation to ensure robust performance in scenario analysis of both demand and supply. Finally, an EIA NEMS-like scenario tool will be developed for others to use.



In Progress: County-level OD Flows Development

- **Objective:** Disaggregate FAF OD flows from 132 regions to 3,143 counties
- **Proposed approach:** ensemble method
 - Disaggregate flows with several methods
 - Blend the estimates
 - Output: a single “best” estimate
 - Compare to validation targets
 - Iterate until the “best” estimate is (reasonably) close to validation targets
 - Summarize across all US counties
 - Need to decide what is “close”
 - Will need to aggregate commodity categories
- **Data**
 - FAF5.5 OD flows
 - County-level data (employment, population, ...)
 - Validation targets: real-world flows (HPMS counts, USACE water tons, ...)

132 domestic regions



Status

- Completed: Literature review on existing disaggregation methods
- Underway
 - Selecting methods to include
 - Implementing in computational framework
- Target release date: Late 2024



Considerations for the Initial Release

- Will likely label it as an experimental product
- Feedback/comments on the estimates, including suggestions for how to improve them using local data, will be welcome
- All flows will have Origin County & Destination County
- However, we may reduce detail to improve overall product quality – for example:
 - Commodity detail may be reduced or removed
 - Will try using all modes, reducing detail as needed



THANK YOU
FAF@DOT.GOV



Uses for and Approaches for FAF Information Workshop

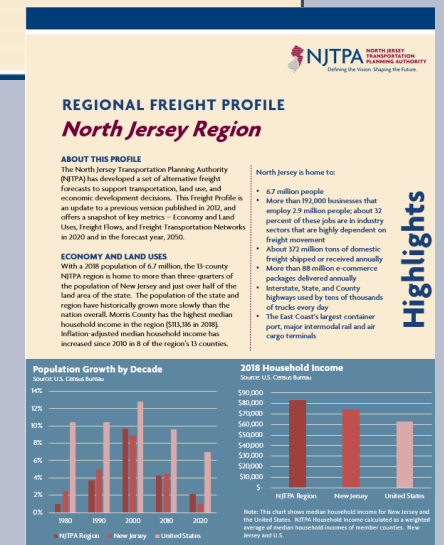
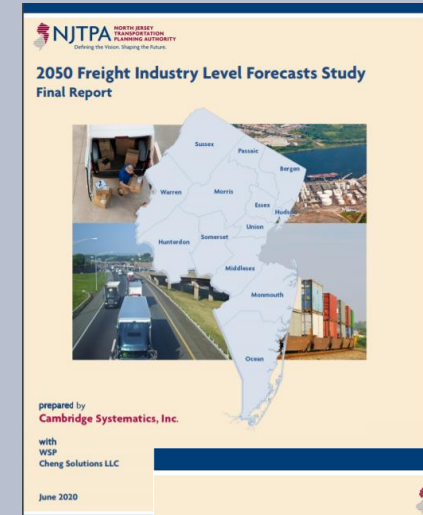
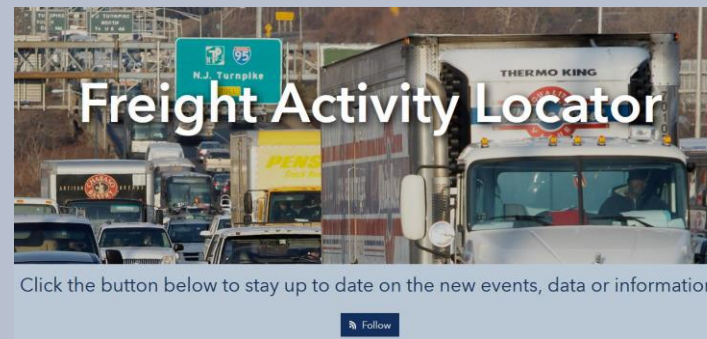
The Why – Why Do Agencies Use Disaggregated FAF Data

- NJTPA – Anne Strauss-Wieder and Jakub Rowinski
- The Eastern Transportation Coalition – Marygrace Parker
- Southwestern Pennsylvania Commission – Sara Walfoort

NJTPA's Transition to FAF

- Freight Forecasting Background
- Freight Forecasting Tool
- Forecasting Products
- Support for the Long Range Transportation Plan

- Study Website





TETC FAF Disaggregation Efforts

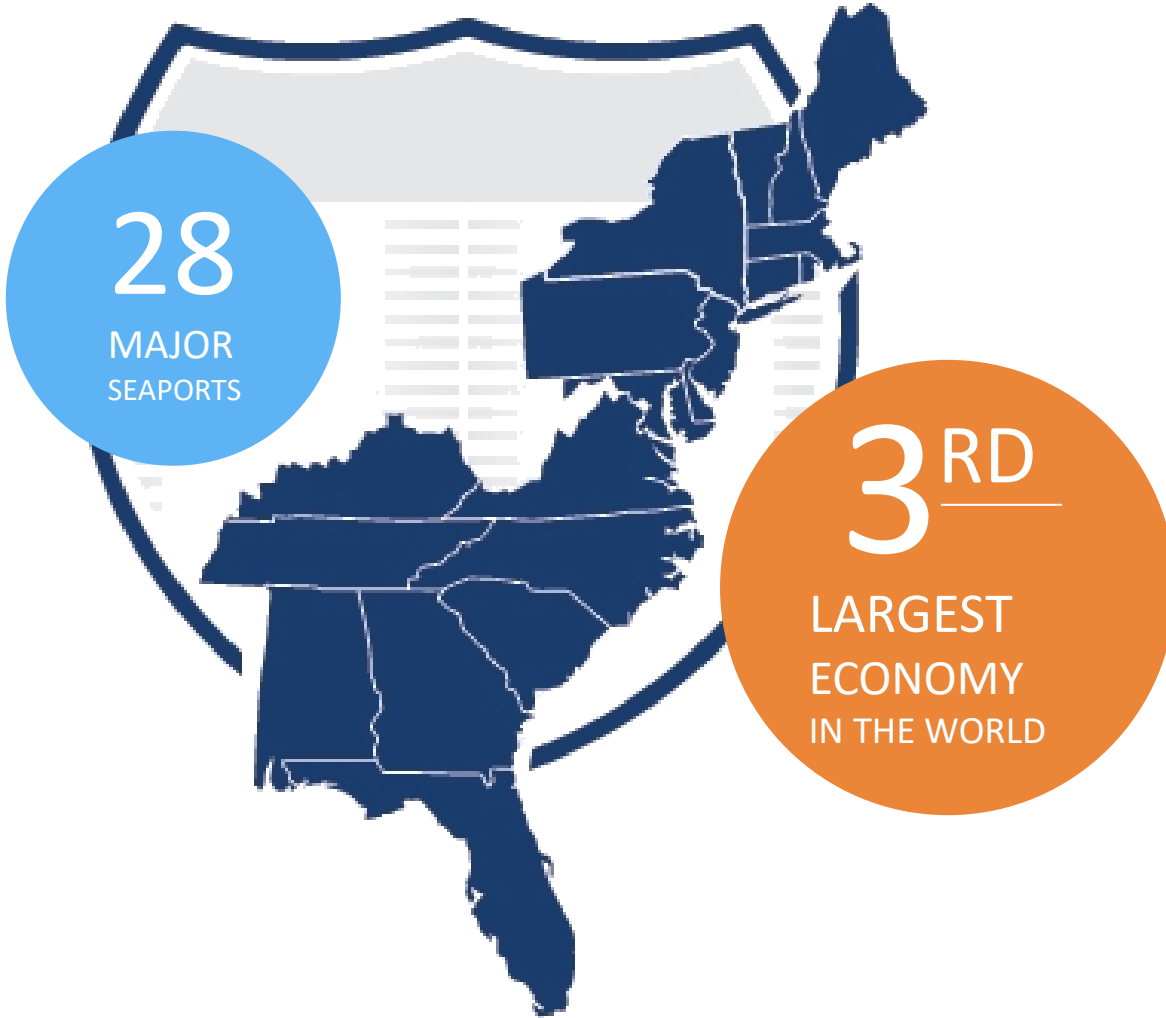
Presentation to Multi-State Freight Working Group: Uses for and Approaches for Disaggregating FAF Information Workshop

April 18, 2024

Today's Presentation

Topic
TETC Coalition Overview – Who We Are
TETC FAF Disaggregation Effort <ul style="list-style-type: none">• What we did (FAF 5.0)• Why disaggregate• Why share regionally/corridor wide
TETC State Use Examples
Next Steps – TETC FAF Disaggregation 5.5.1





18 States + D.C.

and 200+ agencies

- 40% OF THE U.S. POPULATION
- 38% OF THE NATION'S JOBS
- 35% U.S. VEHICLE MILES TRAVELED
- 21% OF THE U.S. ROAD MILES

Stronger Together for 30 years

tetcoalition.org



Freight Data & Planning Working Group



- Goal: To help agencies understand and optimize the use of Freight Data for planning and operations including:
 - Agency innovative applications of data for freight analysis
 - Support agency use of publicly available data
 - Support use of/Share agency applications of FAF Disaggregated Data
 - Support agencies in the use of Transportation Data Marketplace freight data



TETC Disaggregation of FAF Data Project (Phase 1 – FY 22/23)

Objective: Provide TETC member agencies with (FAF) 5.0 Disaggregated data to serve as an additional data/analytical resource

Why we did it: To allow agencies to view freight at the county level and where applicable, across jurisdictional guidelines

What we did:

- Each state received their FAF disaggregated data files for their state
- Member DOTs received all other TETC member states' files, plus WV and Ohio
- Files shared with MPOs/Planning organizations as requested



FAF Disaggregation Project- Deliverables



Webinar on disaggregation methodology approach and data output examples held with TETC agencies on



Draft Technical Memorandum on Methodology provided to agencies



FAF Disaggregated files for all Coalition states and key border states were distributed to member agencies



Review/share agency experiences/applications using FAF disaggregated data in TETC Data & Freight Planning Working Group Meetings (on-going)

*“Wonderful to have this data!”
- Pam Cotter, Rhode Island DOT*

*“Thank you for sharing this data as it will be very helpful in our Freight Plan update, especially with freight flow forecasting”
- RI Statewide Planning Staff*



Examples of Agencies' Use of FAF Disaggregated Data

- **Tennessee DOT** used the FAF disaggregated data files for:
 - Internal analysis to determine commodity flows along TN's functional classes of different road
 - Examining the different types of commodities going in and out of Tennessee

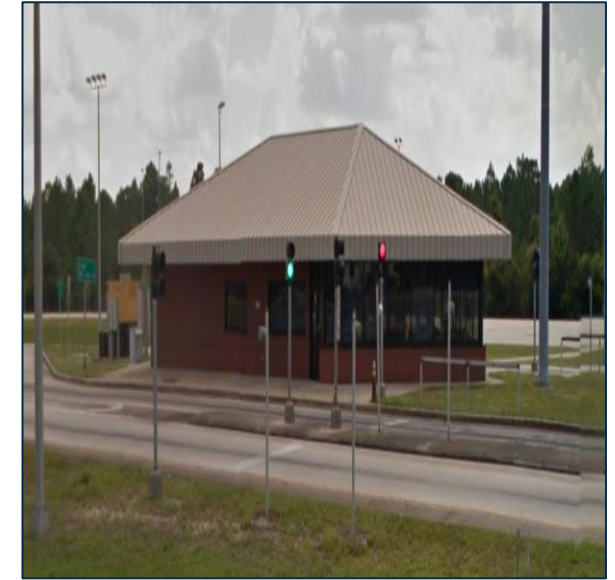
TDOT: Thankful for another data source by TETC and the state collaboration and use of the data in the future.



Example: FDOT's Disaggregated FAF Application

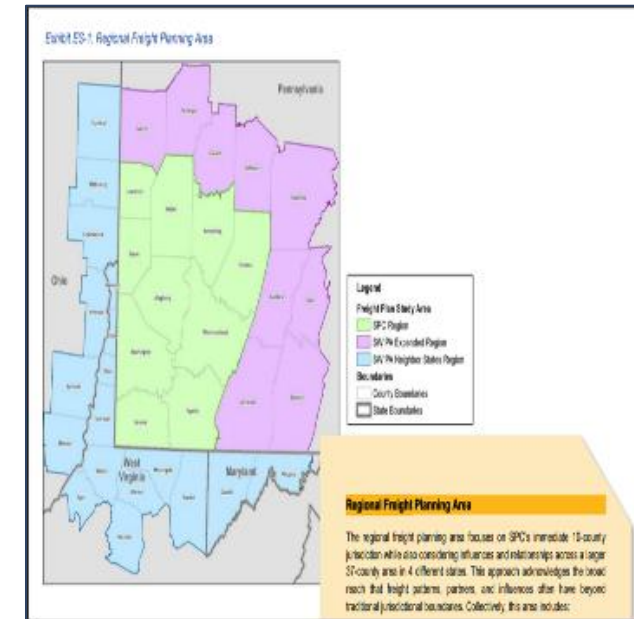
- The **Florida DOT** used the FAF5 disaggregated data to determine Commodity-specific OD tonnages by FDOT District.
- This information was then used to adjust Weigh-In-Motion (WIM) derived tonnages as part of a larger effort to use the WIM information to improve understanding of Empty Truck behavior on the system.

“This effort will give the department further insight into the freight behavior on its system and will allow more refined infrastructure planning for freight.”



Example: Southwestern Pennsylvania Commission (SPC)

- Utilized Data for briefing paper content to illustrate that transportation benefits of the region's river system extend well beyond the riverfront communities
- Data was utilized in an application for Marine Highway Projects funds under USDOT Maritime Administration NOFO



TETC Disaggregation of Freight Analysis Framework (FAF) Data Project – Phase II

Objective: Provide TETC member agencies with the most recent FAF (5.5.1) Disaggregated Files

- Each state will receive FAF disaggregated data files for their state and all TETC states (plus OH and WV)
- Files will be shared with MPOs/Planning organizations participating in TETC states, upon request
- Freight Data & Planning Working Group will discuss agency efforts with this data in a quarterly roundtable



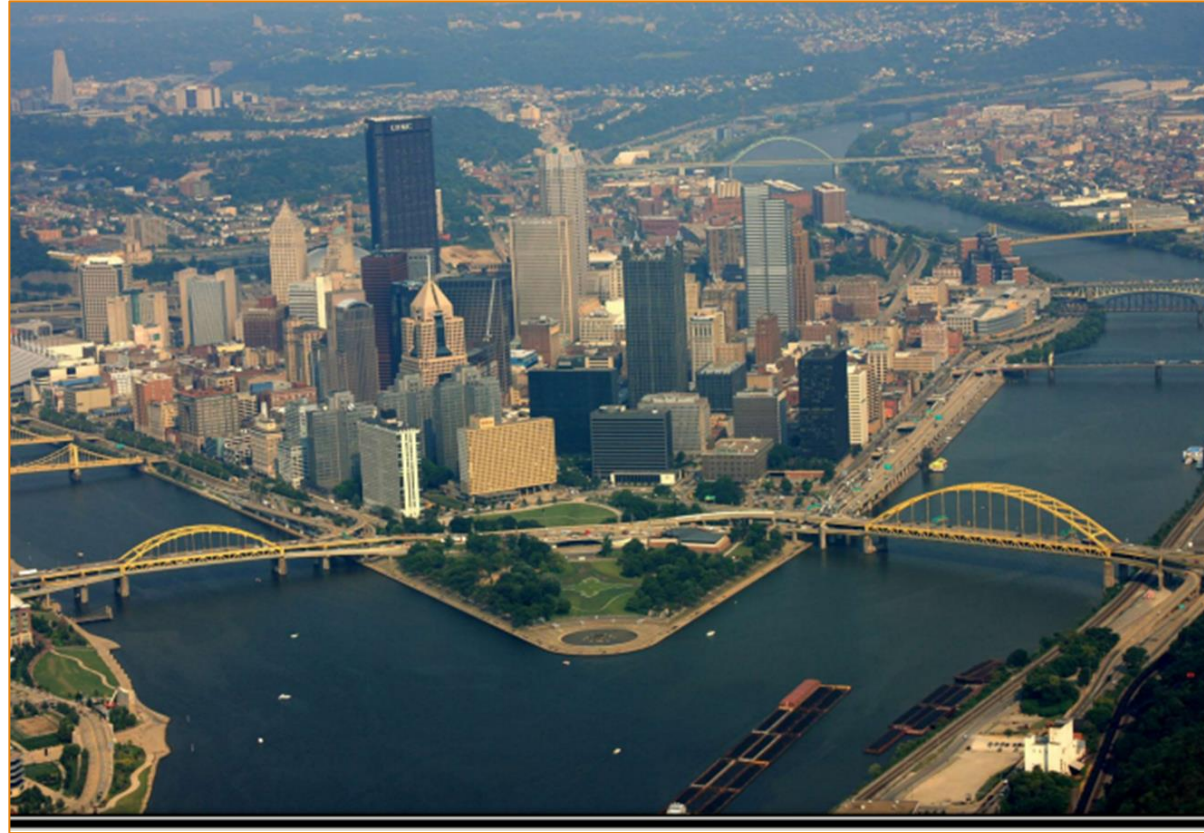
THE EASTERN
TRANSPORTATION
COALITION

CONNECTING FOR SOLUTIONS



THANK YOU

Marygrace Parker
Freight Program Director
The Eastern Transportation Coalition
mgparker@tetcoalition.org

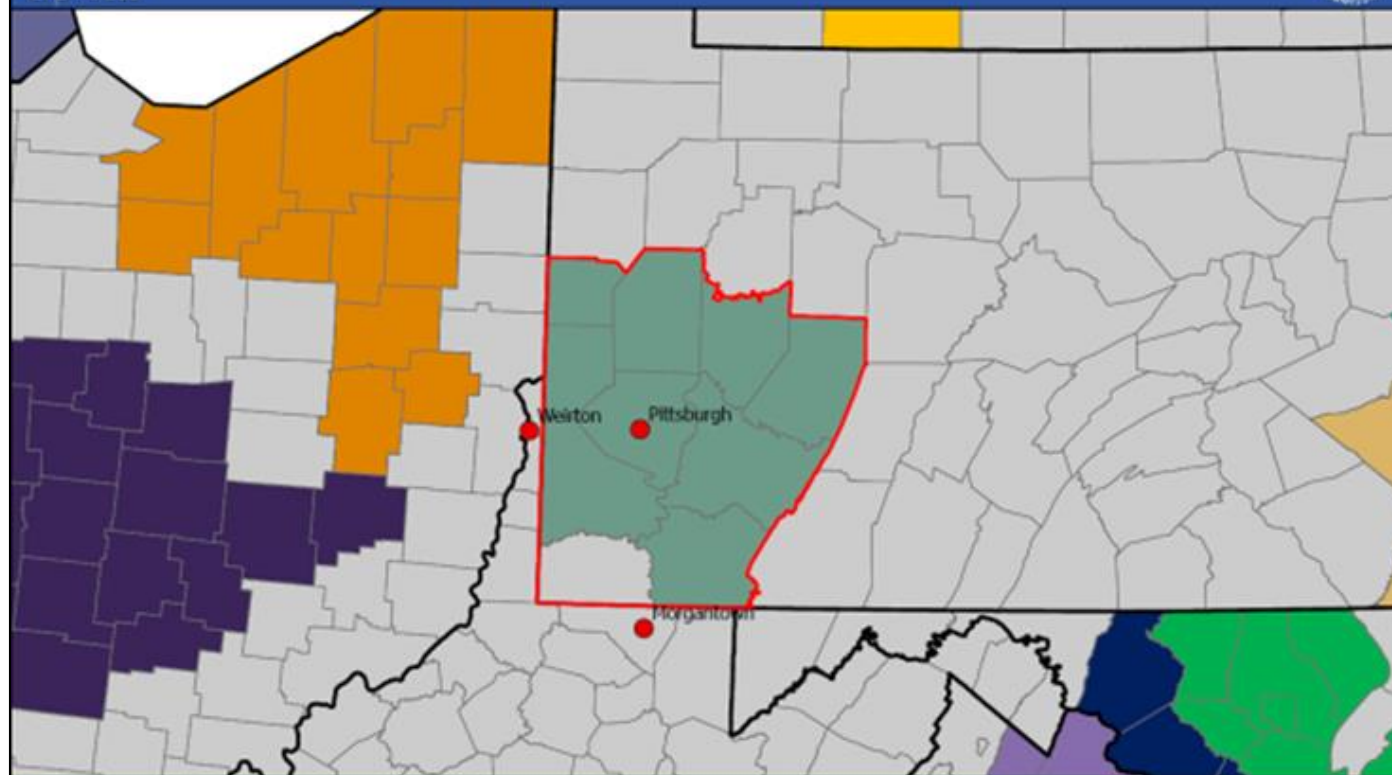


PRESENTATION TO THE NJTPA MULTI-STATE FREIGHT WORKING GROUP FREIGHT ANALYSIS FRAMEWORK WORKSHOP: MPO CASE STUDY

SARA WALFOORT, SOUTHWESTERN PENNSYLVANIA COMMISSION

Commodity Flow Area with MPO Boundary

CFS Areas



CFS Metro Areas

Name

Baltimore-Columbia-Towson, MD CFS Area

Buffalo-Cheektowaga, NY CFS Area

Cleveland-Akron-Canton, OH CFS Area

Columbus-Marietta-Zanesville, OH CFS Area

Detroit-Warren-Dearborn, MI CFS Area

New York-Newark, NY-NJ-CT-PA CFS Area (NY, NJ, CT)

Philadelphia-Reading-Camden, PA-NJ-DE-MD CFS Area (PA, NJ, DE, MD)

Pittsburgh-New Castle-Weirton, PA-OH-WV CFS Area (PA, OH, WV)

Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (MD, VA, DC)

Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (VA, DC, WV)

City

SPC Boundary

County Boundary

State Boundary

Remainder of States



9/11/2023

Case Study 1:

Regional Significance of Inland Waterways



Decline in use of coal for heating and power generation has resulted in reduced river traffic, but rivers are still vital transportation options

Commercial (barge) traffic on local rivers is virtually invisible to local residents, offers the lowest transportation costs and is energy efficient; an important regional transportation system

Rivers / segments may be subject to reduction in USACE operations and maintenance due to “low use”

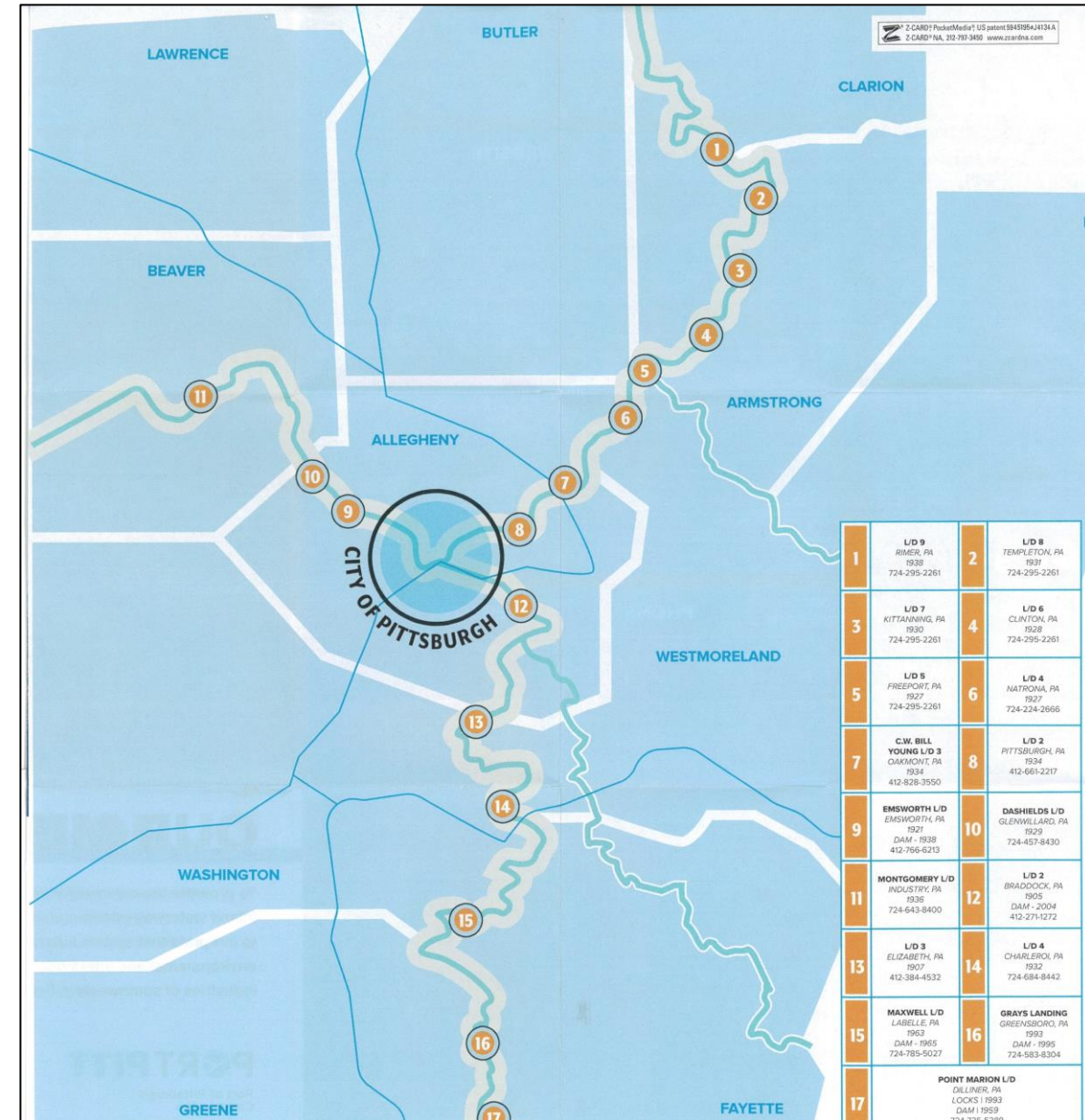
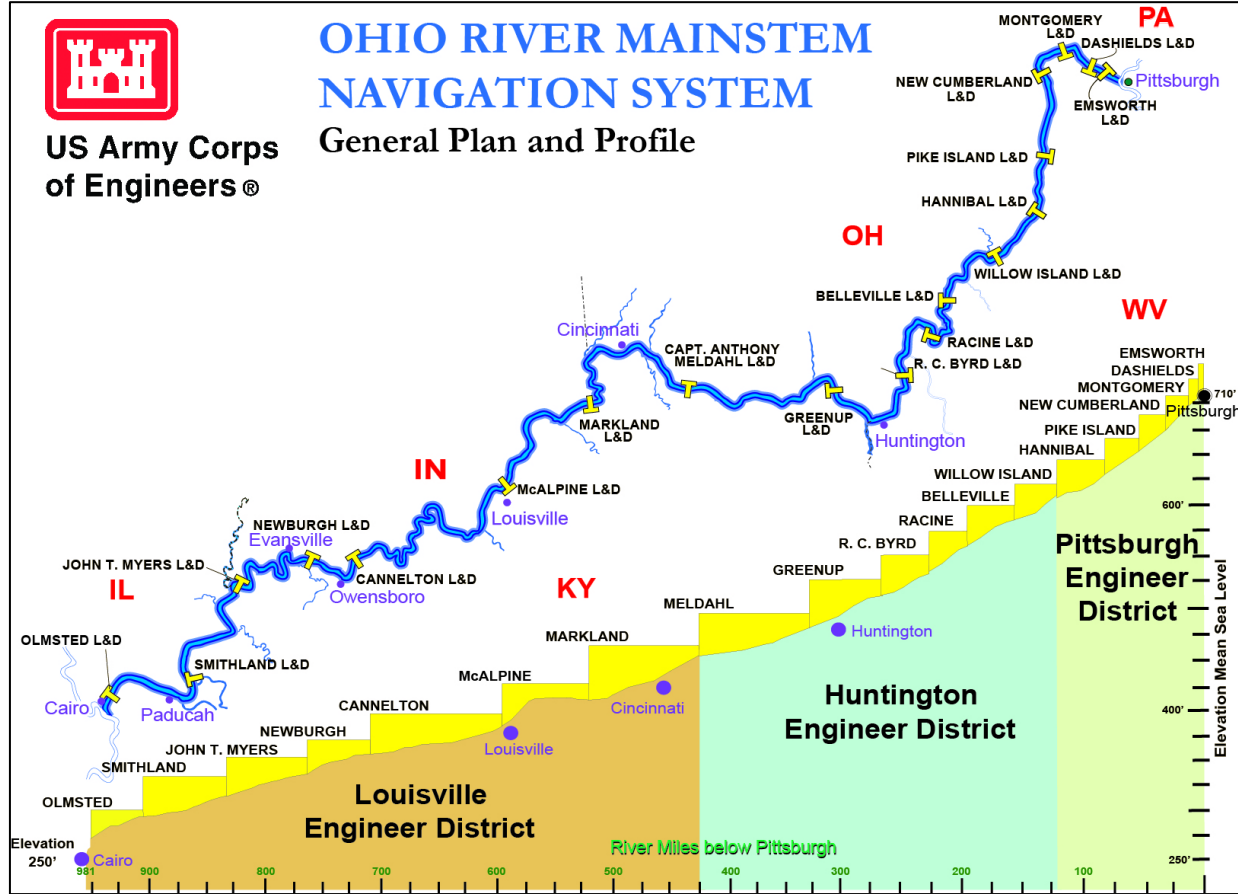
Application to MARAD for Marine Route designation for Allegheny and Monongahela Rivers which opens new funding opportunities



US Army Corps
of Engineers®

OHIO RIVER MAINSTEM NAVIGATION SYSTEM

General Plan and Profile



The River System that Built America

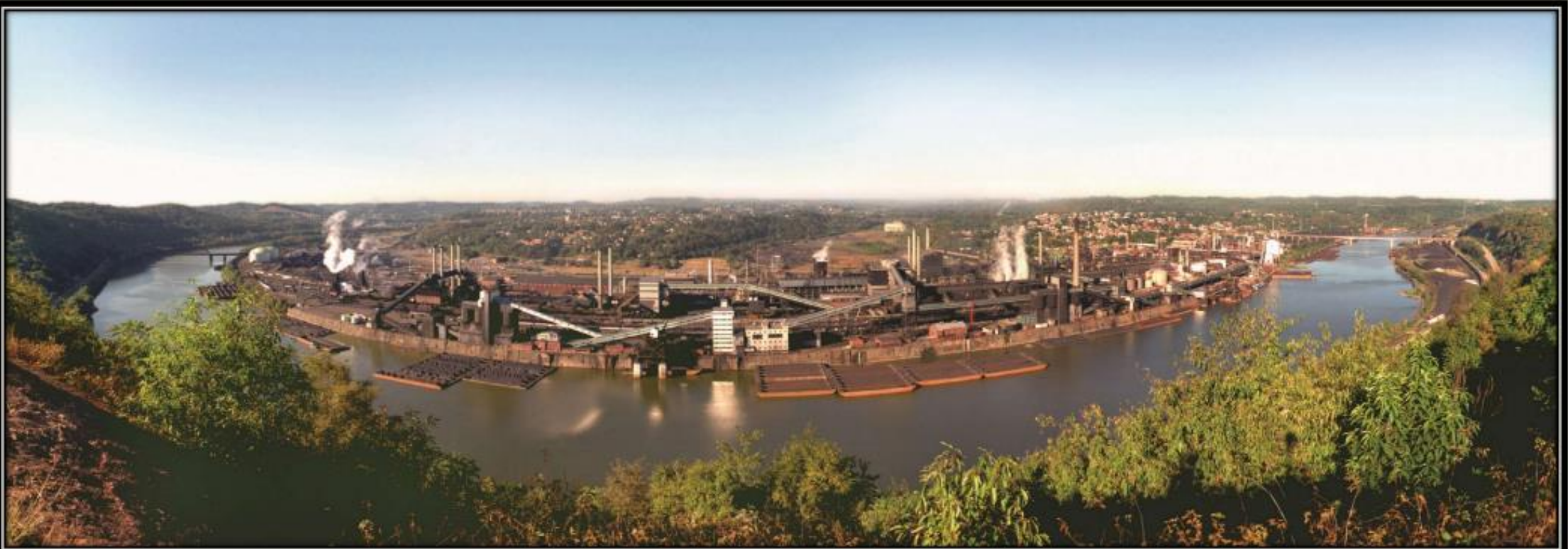
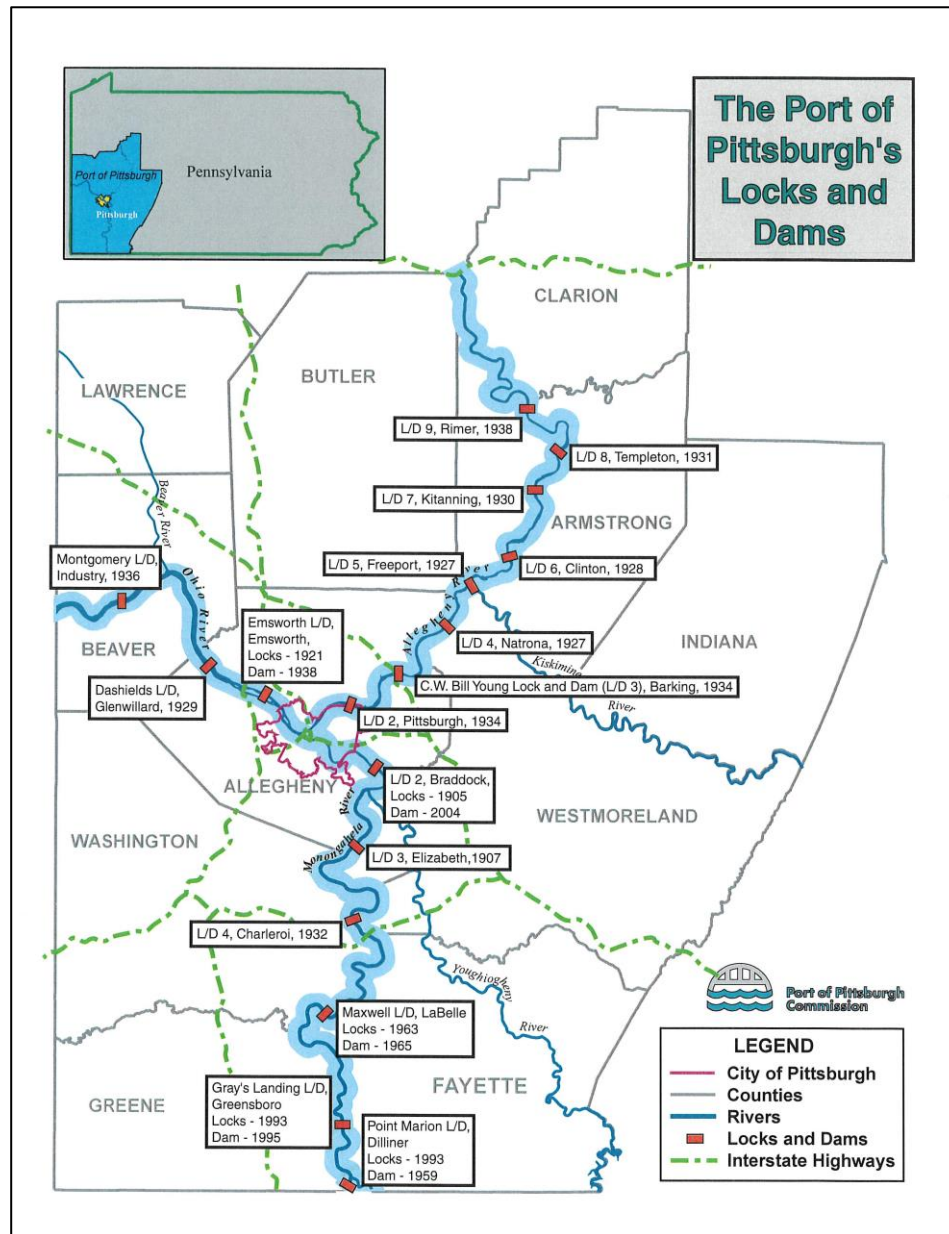


Photo used with permission of USS



17 dams “pool” the water to maintain navigable river depth; locks permit passage between the pools – the staircase of the system

The locks on the PA system are the oldest and smallest on the Ohio River System; as much as 100% older than their design life

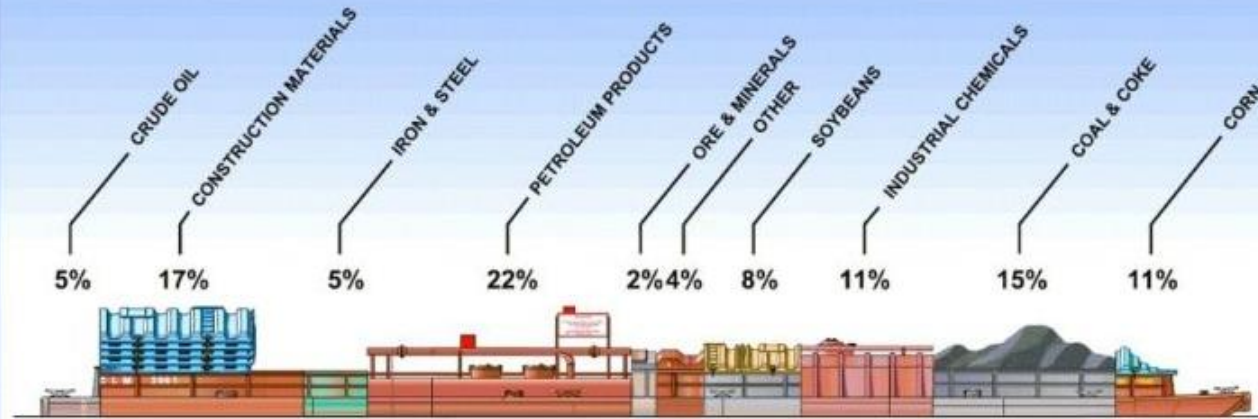
USACE supports a vital inland waterways system, but allocates funding to specific projects; each lock competes for funding at a national level

USACE funding timeline is ill-suited to cyclical changes in commodity mix and global economy; timeframes typically differ by decades

How to demonstrate regional/national significance of the river system (using USACE data)

"What's In Those Barges?"

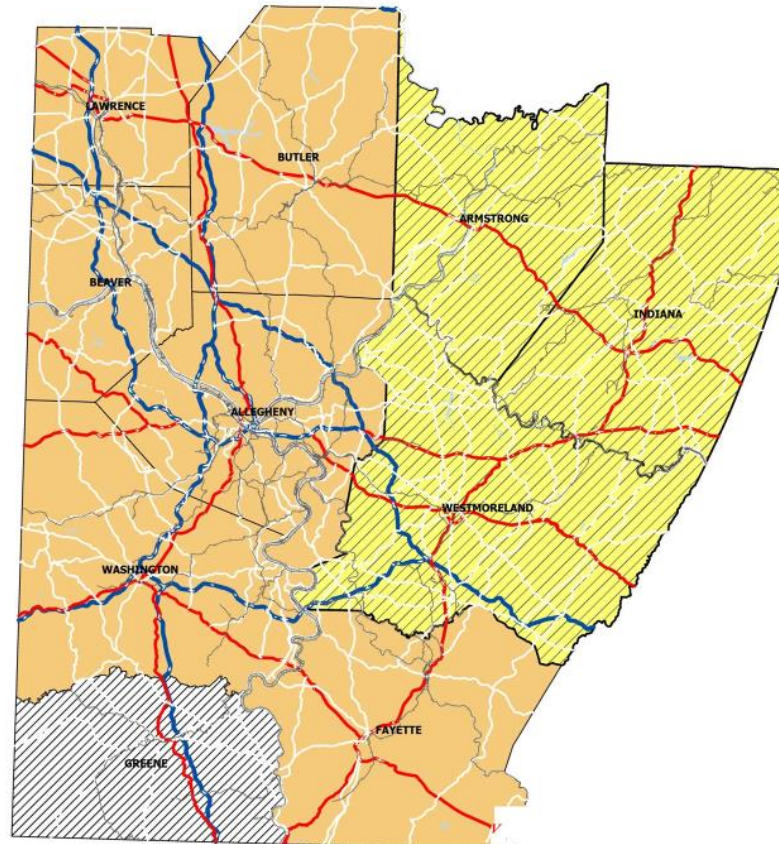
Commodities Moved on America's Inland Waterways



SOURCE: WATERBORNE COMMERCE STATISTICS & CHEROKEE GRAPHICS

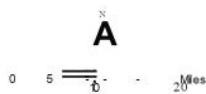


WATERWAYS
COUNCIL, INC.



FAF Counties Roads

Counties	Class
[Z] FAF Counties	Interstate
[Z] FAF Counties	U.S. Route
[Z] Non-FAF County	State Route
[Z] Railroads	Ramp
	Bodies of Water



Used FAF Dis-Aggregated Data to create an understanding of the regional significance of the inland waterways through the identification of movement patterns and trade partners

Coal is a determining commodity in the USACE consideration of “de-staffing” select locks on the system; Greene County (Monongahela River) is the largest coal producing / handling County in the region, but is not part of the FAF Region.

FAF Dis-Aggregated Data from the TETC permitted an assessment of water movements from each of the 10 Counties (and region as a whole)

There were clear indications that coal, coal n.e.c, liquid petroleum products and dimensional cargo were being moved via the Ohio River System to cities and regions throughout middle America, and to international trade gateways on the Gulf Coast

A White Paper was prepared for SPC Commission members and was used as supporting documentation in application to MARAD for Marine Route Status for M-79 designation for the Allegheny and Monongahela Rivers

Case Study 2:

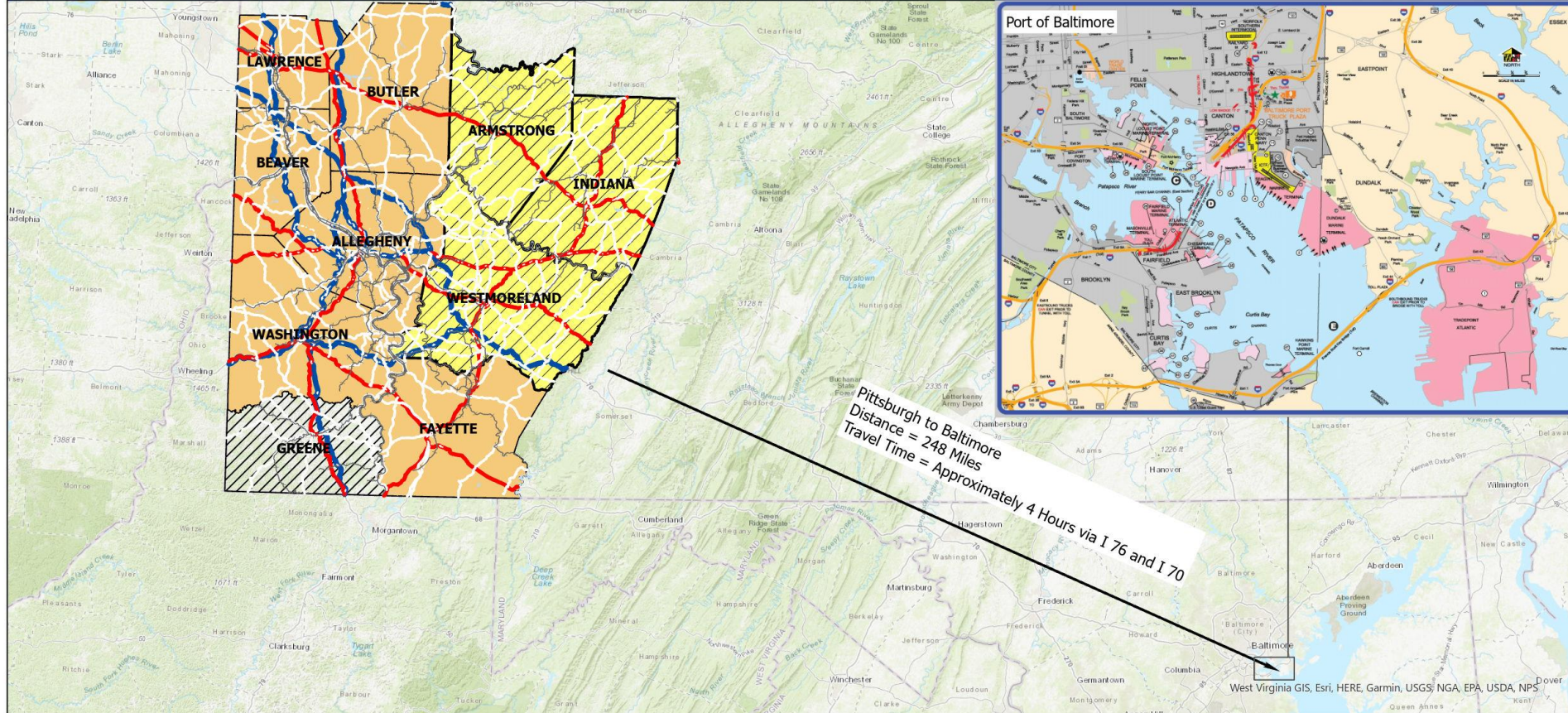
Regional Significance of National Events



Media Inquiry: Are any businesses in (insert location) affected by the bridge collapse in Baltimore?

SPC Region

Proximity to Port of Baltimore



FAF Counties

Counties

FAF Counties

FAF Counties

Non-FAF County

Distance to Baltimore

Railroads

Roads

Class

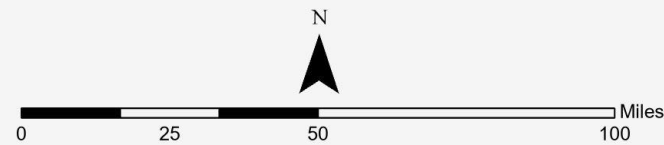
Interstate

US Route

State Route

Ramp

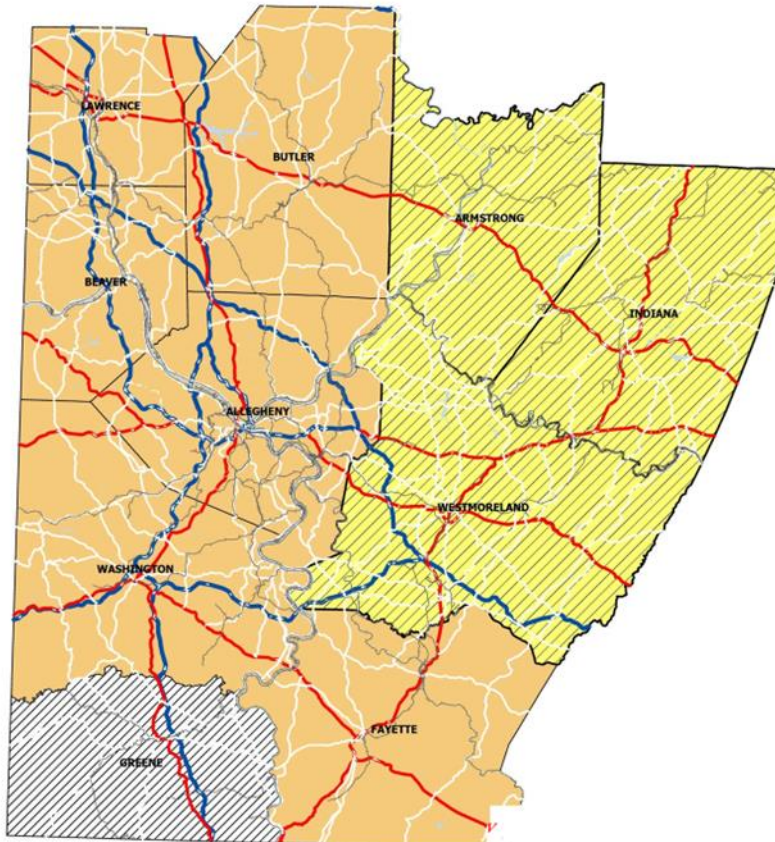
Bodies of Water



4/11/2024

SPC Region

FAF Counties



FAF Counties

Counties

[Z] FAF Counties

[Z] FAF Counties

[Z] FAF Counties

[Z] FAF Counties

[Z] FAF Counties

Roads

Class

Interstate

U.S. Route

State Route

Ramp

Bodies of Water



4/11/2024

Key Bridge collapse media inquiry came from a reporter working for a newspaper with readership concentrated in the three counties highlighted in yellow.

Are any businesses in my area affected by the bridge collapse? Who are they?

SPC used FAF-Disaggregated data and simple Excel pivot tables to identify the commodities that move between those three counties (in yellow on map) and the Baltimore FAF region, AND THEN leave Baltimore by water (to keep focus in on the Port of Baltimore)

SPC provided a summary of the data to reporter, highlighting the top ten commodity types (tonnage and value), and being careful to add caveat that the data was from 2017 and therefore not completely indicative of conditions in 2024.

https://www.indianagazette.com/news/baltimore-bridge-collapse-affects-shipments-of-billions-of-tons-of-area-goods/article_c1380dd2-4b41-565c-9bb4-8212d279e6e5.html

FEATURED

Baltimore bridge collapse affects shipments of billions of tons of area goods

By PATRICK CLOONAN pcloonan@indianagazette.net
Apr 1, 2024



Cranes stood idle in Baltimore on Wednesday.

Matt Rourke/Associated Press

Data request was received by SPC on a Thursday.

SPC responded to the reporter on Friday.

This article appeared in the Indiana (PA) Gazette on Monday.

Why Use FAF Dis-aggregated Data: The SPC Experience

1. Permits enhanced definition of “region”
2. Maintains overall integrity of FAF data
3. Ease of Use; no need for expensive and time-consuming consultant contract
4. Permits almost instantaneous responsiveness
5. Highly effective as a “storytelling” device

Uses for and Approaches for FAF Information Workshop

The How – Approaches to Disaggregating FAF

- NJTPA 2050 Freight Industry Level Forecasts Update – Dan Beagan, Cambridge Systematics
- FHWA FAF Disaggregation Handbook – Birat Paney, FHWA
- An Agriculture/Food Research Application – Megan Konar, William J. and Elaine F. Hall Faculty Fellow and Associate Professor, University of Illinois



CAMBRIDGE
SYSTEMATICS

Think  Forward

NJTPA 2055 Freight Industry Level Forecasts Update

Slides

presented to

Multi-State Freight Working Group

presented by

Cambridge Systematics, Inc.

Dan Beagan

April 18, 2024 Zoom Webinar

FAF disaggregation for NJTPA

- Historical Context
- Disaggregation Methods
 - » Trip table disaggregation/Matrix expansion
 - I-I, I-X, X-I,
 - where X is External zone and I is geographically smaller Internal Zone
 - » Network disaggregation/ Sub-area extraction
 - X-X not pass thru, X-X pass thru, I-X, X-I
 - where X is External zone and I is geographically original Internal Zone
- NJTPA FFT methods
- “Validation”

Historical Context

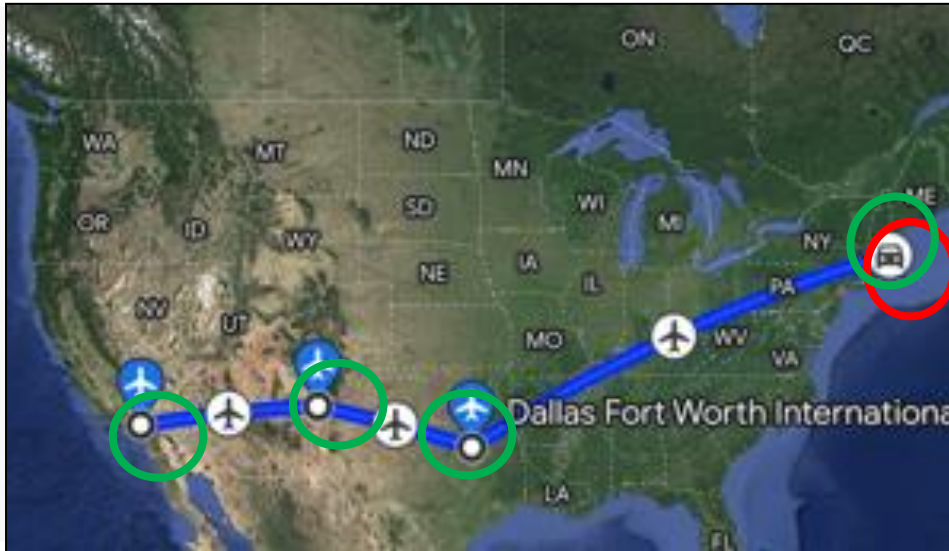
Freight Analysis Framework and NJTPA Freight Forecasting Tools

- FAF1 released in 2001
 - » Based on Reebe (now called TRANSEARCH) data
 - » Available for OD trucks at county-equivalent level
- Original NJTPA Freight Forecasting Tool, FFT, used NJDOT TRANSEARCH AS **input** in 2012 to produce flows to 2040
- FAF2 released in 2005
 - » Used CFS instead of TRANSEARCH
- CS developed FAF2 trip table disaggregation tool for FHWA
 - » Factors developed from regression
 - » Impractical- required 3 MS Access databases to store
- NJTPA wanted to update FFT to include latest FAF

TRANSEARCH vs FAF

- TRANSEARCH is *Carrier* centric (from Waybills)
 - » Proprietary available at various geographic levels
 - » May include **both** customers (shippers and receivers) **AND** carrier stops
 - » Uses STCC 4-digit level commodities
- FAF is *Shipper* centric (from expansion of CFS)
 - » Publicly available at CFS zone level
 - » Includes **only** customers (shippers and receivers)
 - » Uses SCTG 2-digit level commodities

Shipper versus Carrier Centric



Shipper only knows home and son's address. ○

Carrier/UPS also uses airports (e.g. Logan, DFW, Sun Coast, Ontario) and sorting facilities (e.g. South Bay) ○



iPhone left at home on vacation.

Shipped by UPS from home to son's apartment



Disaggregation Methods

Trip table disaggregation/matrix expansion

- Relative share smaller zone is of larger region
 - » E. g. 50% geographic relative share for 2 counties in a region
 - » E. g. Origins should be based on share of productions
 - » E. g. Destinations should be based on share of attractions
 - » Shares should differ by Commodity
- For expansion, only relative share of **customers** matters.
 - » Share of **carrier** stops is NOT relevant
 - » Carrier stops include driver stops, vehicle stops, operational stops

Trip table disaggregation/matrix expansion (cont'd)

➤ Source of relative expansion factors

» Regression

- Similar to Trip Generation equations
- Can use any explanatory variable (e.g. crop acres in production)
- Variables with negative variables are discarded
- May only result in one explanatory variable
- Explanatory variable may be spurious; “correlation is not causation”

» Economic Activity

- From Economic I-O Models
- Uses only economic value as explanatory variable
- Economic Value is assumed to be correlated with sector employment
- Many economic sectors as explanatory variables
- Should use same source of employment for all zones
- Need relationship between
Economic Sectors (NAICS3) and commodities (SCTG2)

Network disaggregation/extraction

- Selected “OR” Link
 - » Analyzes every link within study area
 - » Neither aggregates NOR re-labels external zones to external stations
- Subarea extraction
 - » Analyzes only links on border of study area
 - » Aggregates AND re-labels external zones to external stations
- Special Coding
 - » Analyzes only links on border of study area
 - » Neither aggregates NOR re-labels external zones to external stations

NJTPA FFT Methods

NJTPA FFT Choices

- Matrix expansion factors –Economic Activity
 - » Employment source is BLS/Census County Business Patterns
 - » Suppressed employment estimated from mid point of establishments
 - » Relationship from NAICS to SCTG2 from Economic I-O Make Use table
 - » R/ECON tables proprietary, so used BEA Make & Use tables
- Use special coding for network disaggregation
- Identify selected carrier stops
 - » Borders-BTS Transborder
 - » Ports- USACE Waterborne Commerce Statistics Center; PANYNJ data
 - » Intermodal Rail terminals – STB Carload Waybill Survey

Validation

Validation

- No validation possible. Most probable, not exact
 - » Have assumed all employees are equally productive
 - » Have assumed all firms have same SCTG2 mix
 - » Have assumed sector employment is equal to sector value
 - » **Being** House, not **Beating** House
- Tons in Trucks can't exceed capacity of Trucks on road
- Review by stakeholders/TAC
- Review by neighboring MPOs and sDOTs, as well as FHWA/BTS

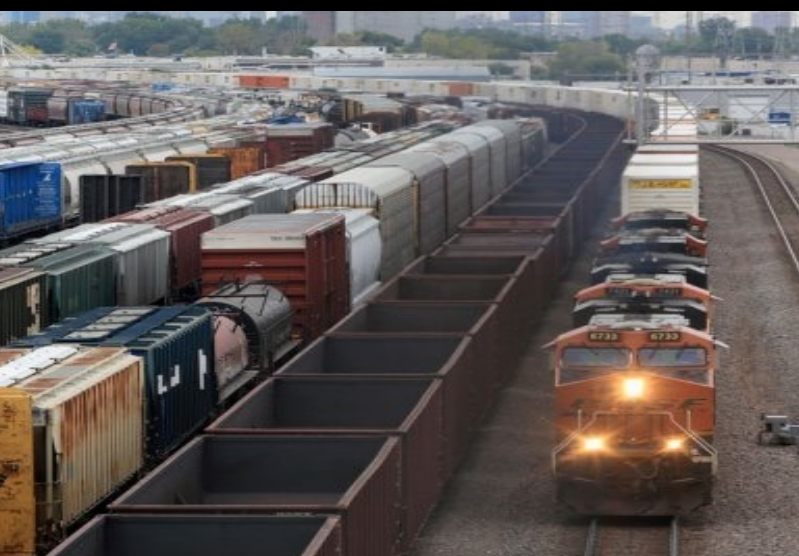


Food flows between counties in the United States

Megan Konar



Civil and Environmental Engineering, University of Illinois at Urbana-Champaign



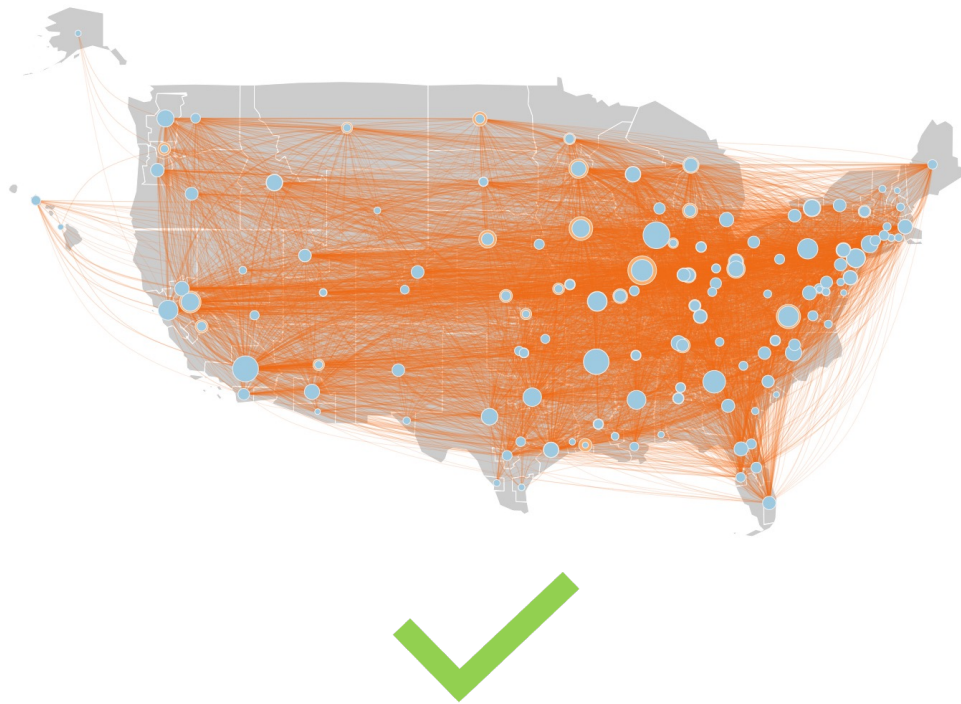
Multi-State Freight Working Group
Uses for and Approaches for Disaggregating Freight Analysis Framework (FAF)
Information Workshop
18 April 2024

Temporal agri-food flows between U.S. counties



What are the **spatial trends through time** in the agri-food flow networks?

Problem: We do not know how agri-food commodities move at a **finer resolution over time**

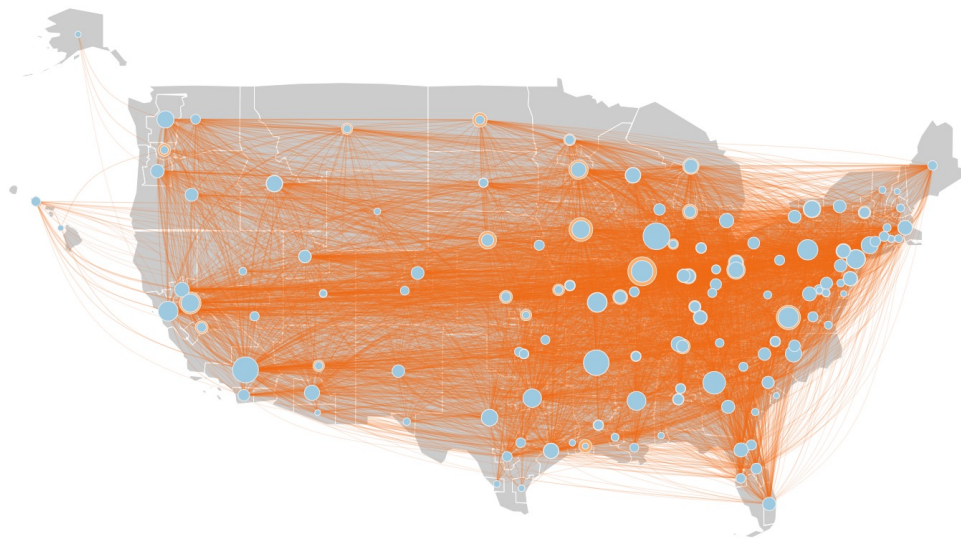


Temporal agri-food flows between U.S. counties



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Temporal agri-food flows between U.S. counties



What are the **spatial trends through time** in the agri-food flow networks?

- Freight Analysis Framework (FAF) data for 2007, 2012, and 2017



132 FAF regions

Temporal agri-food flows between U.S. counties

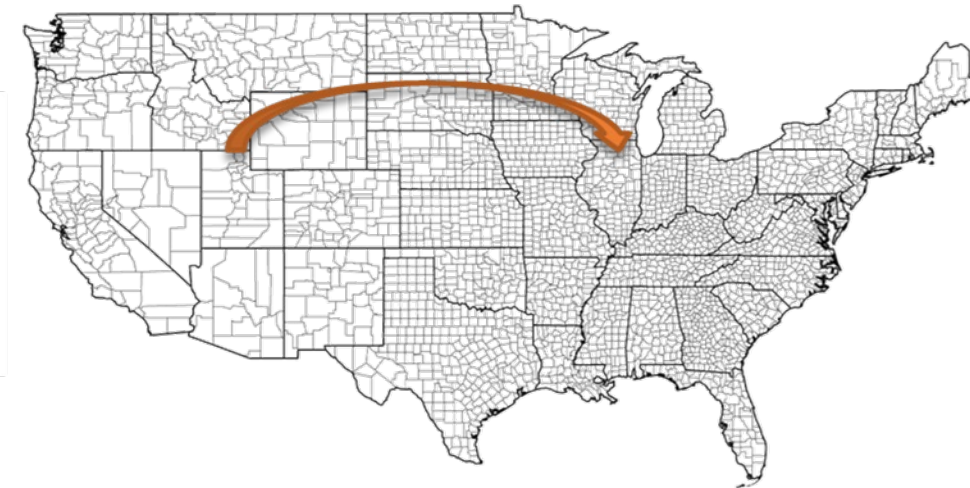
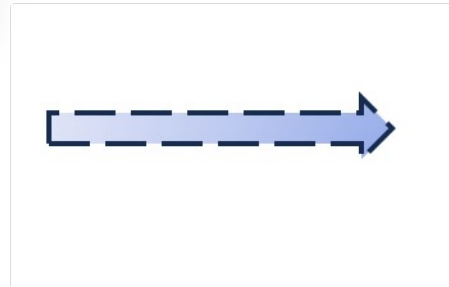


What are the **spatial trends through time** in the agri-food flow networks?

- Freight Analysis Framework (FAF) data for 2007, 2012, and 2017



132 FAF regions



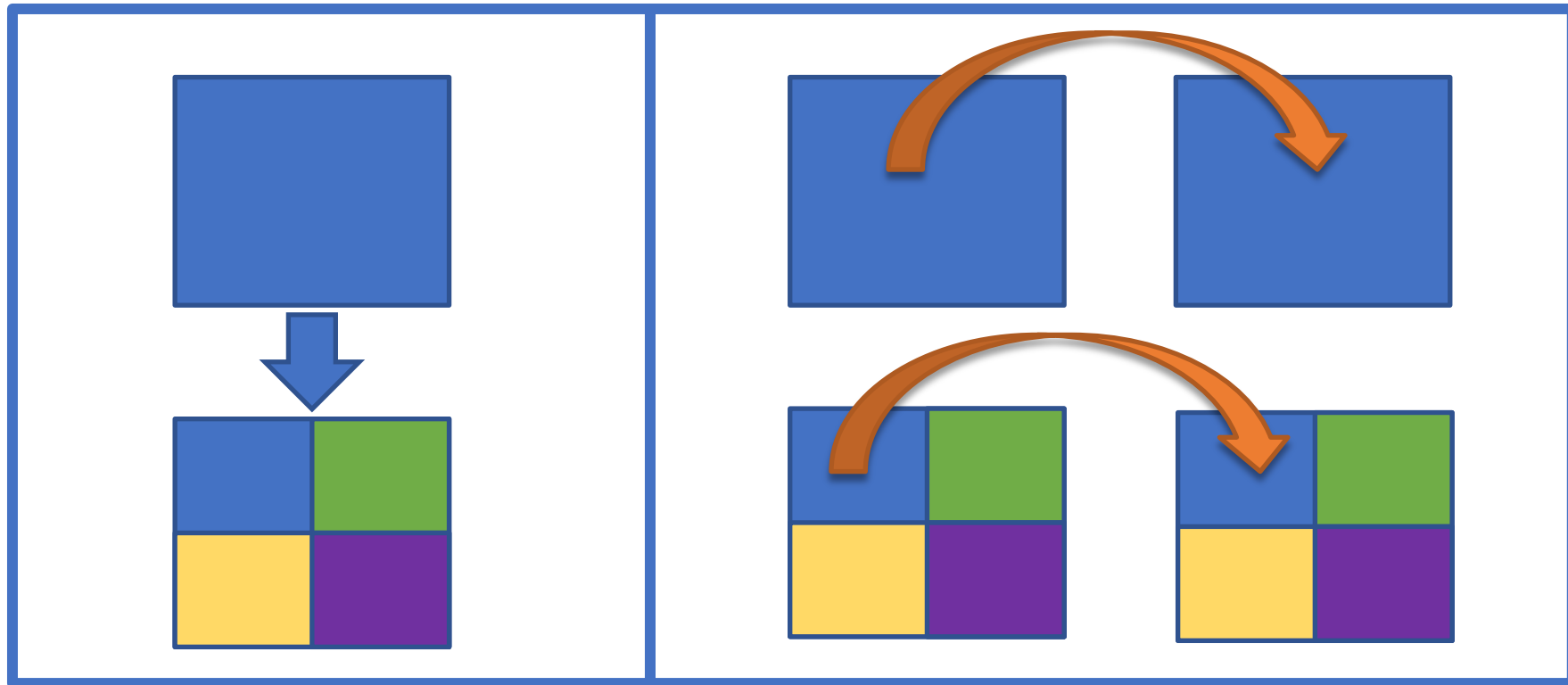
3,132 counties

Temporal agri-food flows between U.S. counties



This is a complex downscaling problem, because information between pairs is required.

- Ensure FAF and county level flows are consistent.

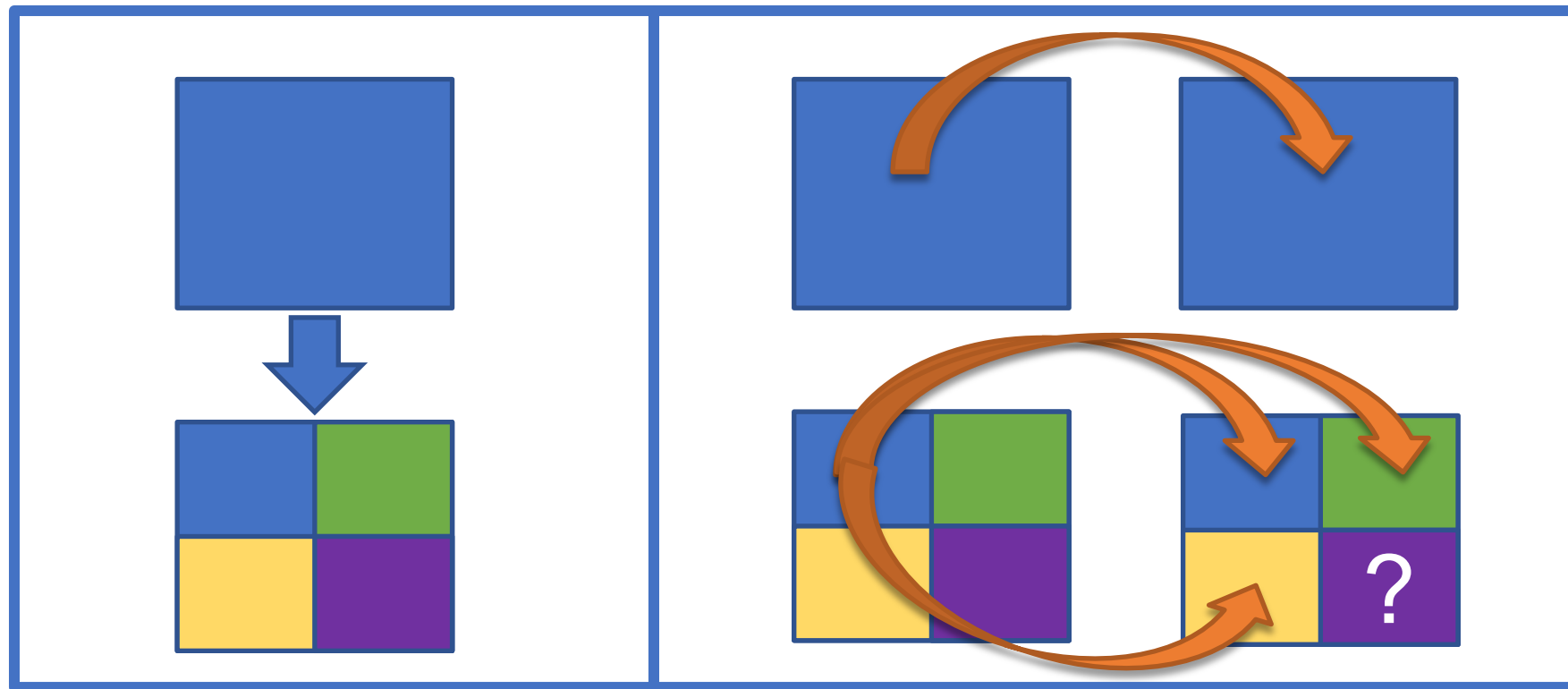


Temporal agri-food flows between U.S. counties



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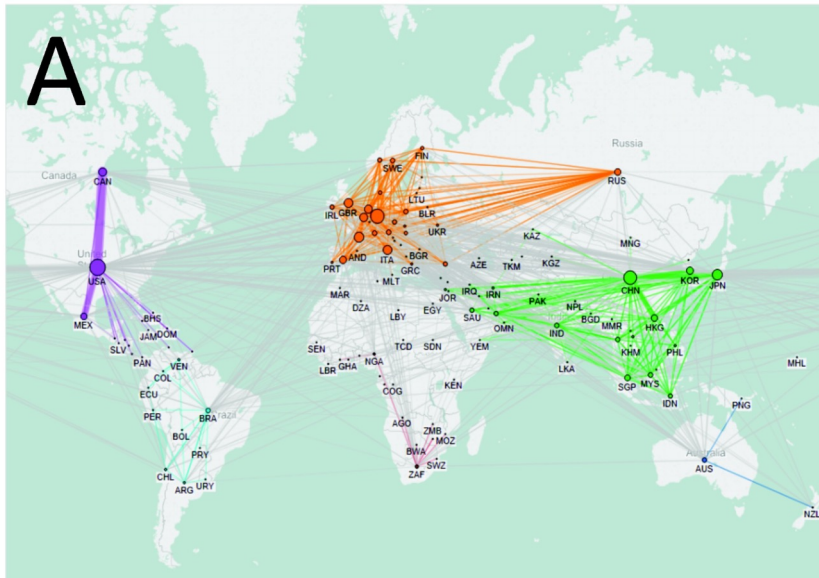


scales $n*(n-1)$

Temporal agri-food flows between U.S. counties



A key insight is that food flows follow the same statistical distribution across spatial scales.



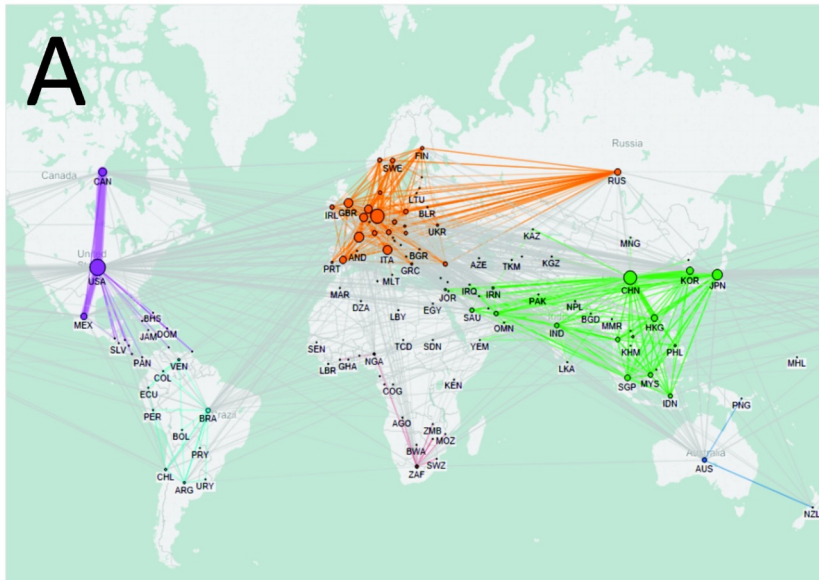
Global

Konar et al
2018

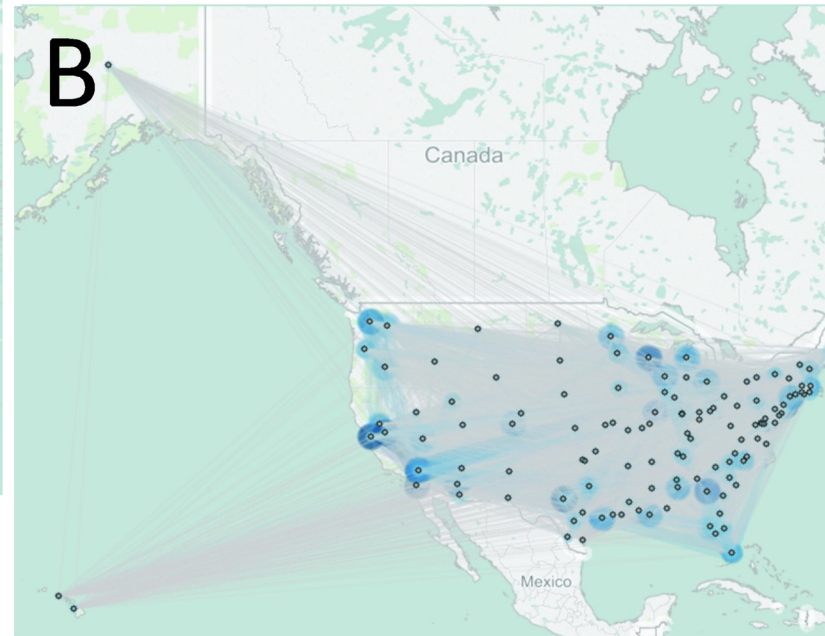
Temporal agri-food flows between U.S. counties



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Global



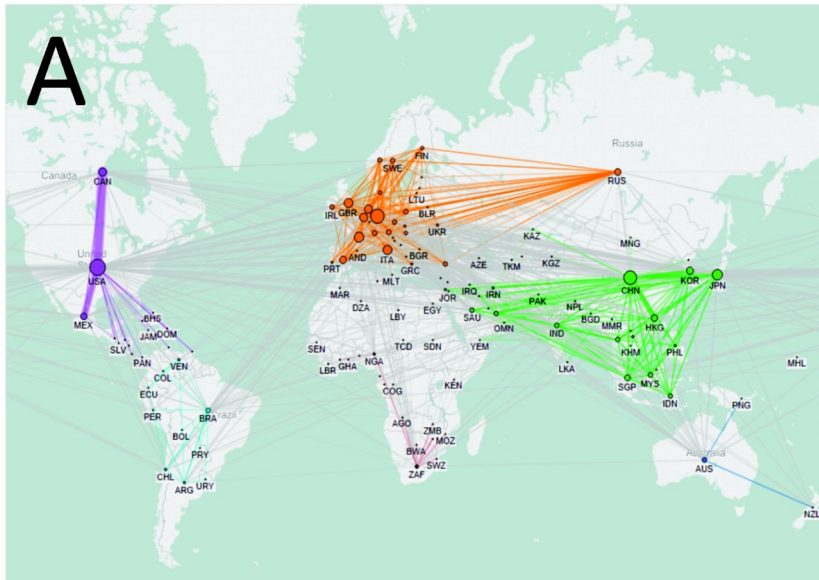
**United
States**

Konar et al
2018

Temporal agri-food flows between U.S. counties

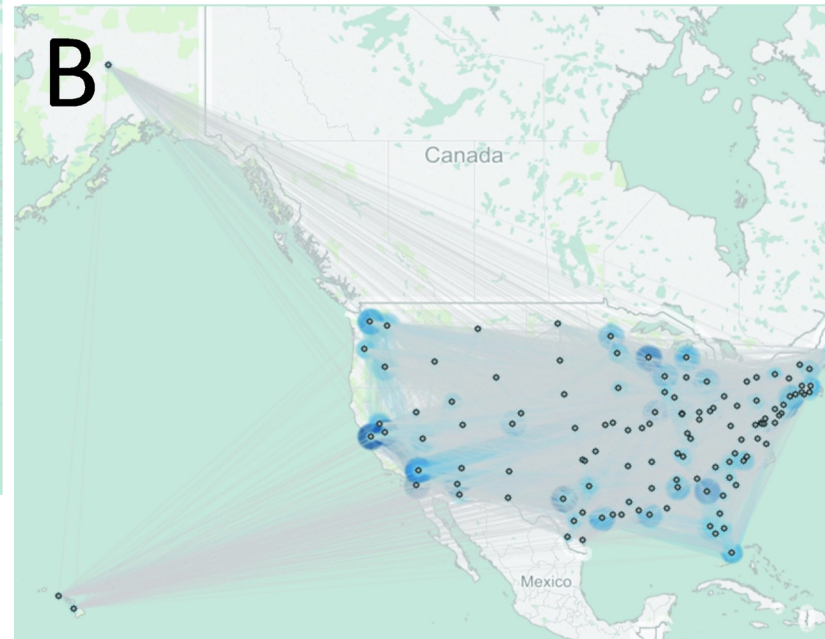


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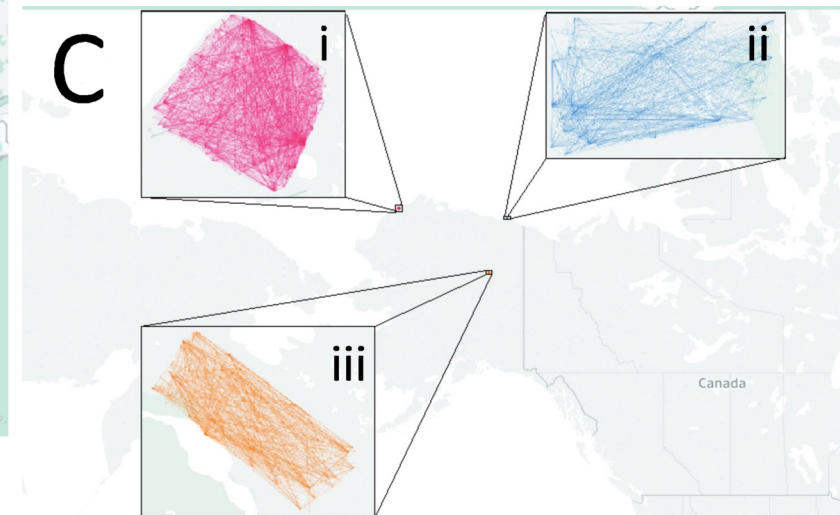


Global

Konar et al
2018



**United
States**

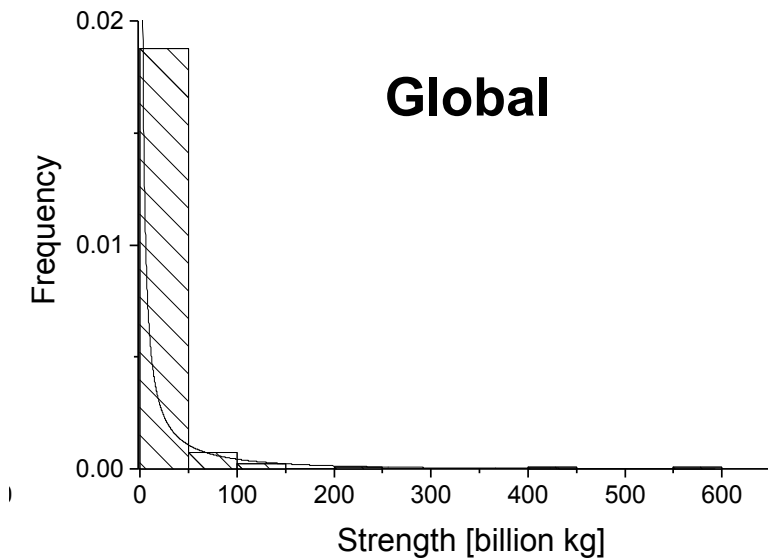


Village

Temporal agri-food flows between U.S. counties



A key insight is that food mass flux follows a Gamma distribution across spatial scales.

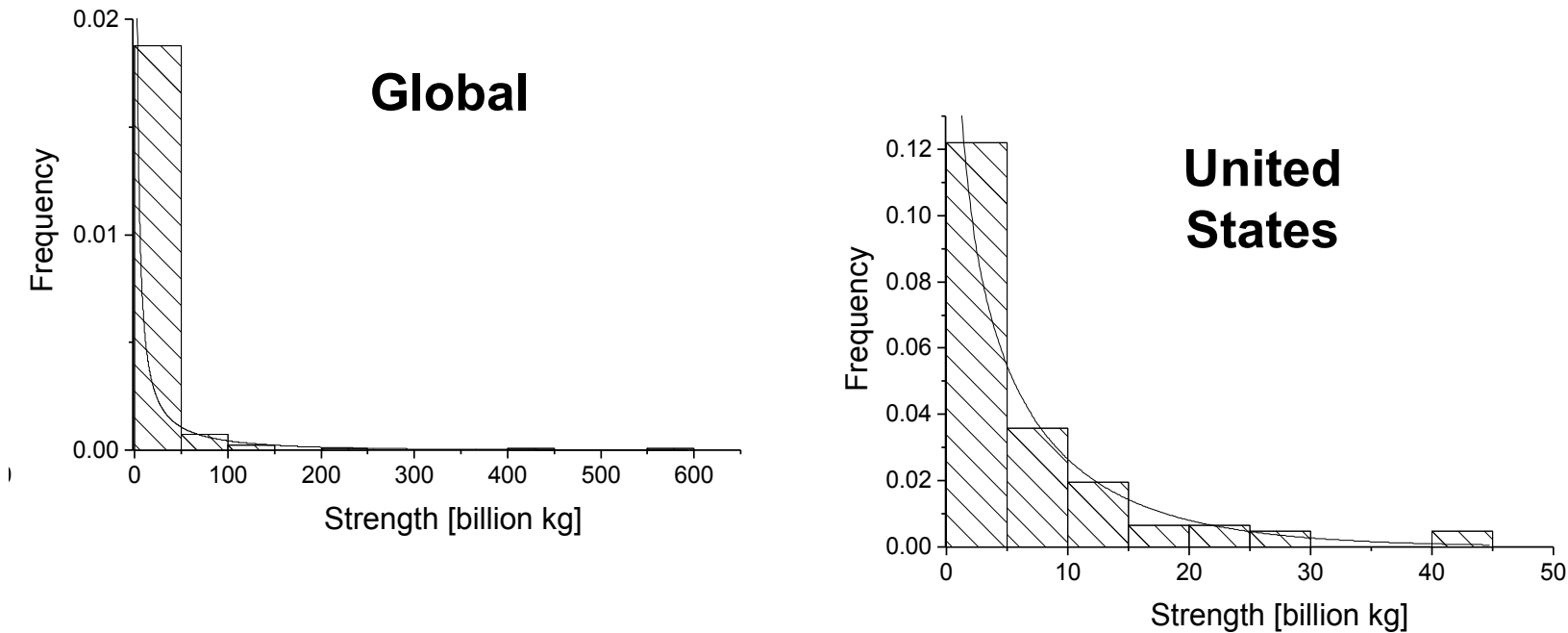


Konar et al
2018

Temporal agri-food flows between U.S. counties



A key insight is that food mass flux follows a Gamma distribution across spatial scales.

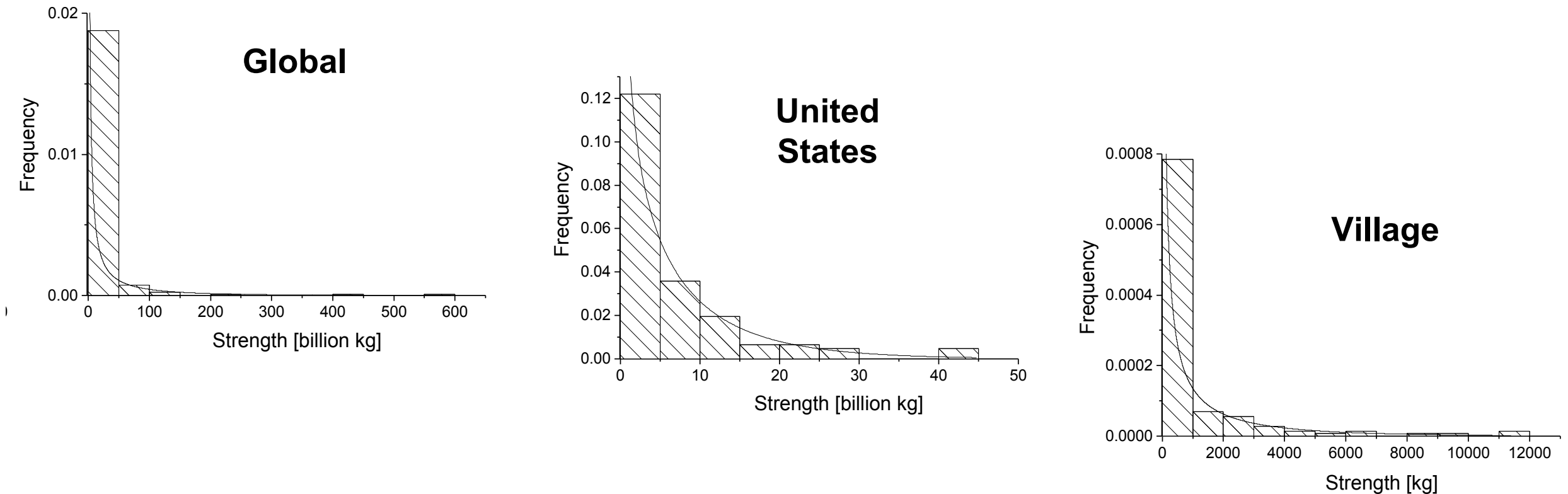


Konar et al
2018

Temporal agri-food flows between U.S. counties



A key insight is that food mass flux follows a Gamma distribution across spatial scales.



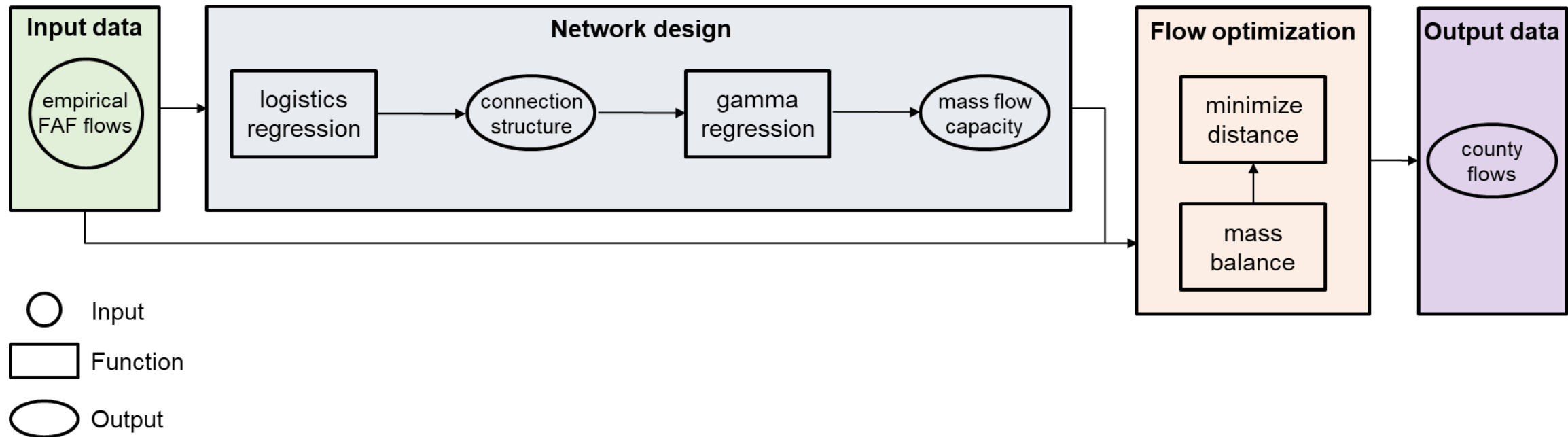
Konar et al
2018

Temporal agri-food flows between U.S. counties



Establish a framework to **estimate agri-food flows between counties** over time.

- The Food Flow Model, a data-driven framework



Temporal agri-food flows between U.S. counties



Establish a framework to **estimate agri-food flows between counties** over time.

- The Food Flow Model, a data-driven framework

SCTG	Description
01	Live animals and fish
02	Cereal grains
03	Agricultural products
04	Animal feed and products of animal origin
05	Meat, poultry, and seafood
06	Milled grain products, and bakery products
07	Other prepared food stuffs

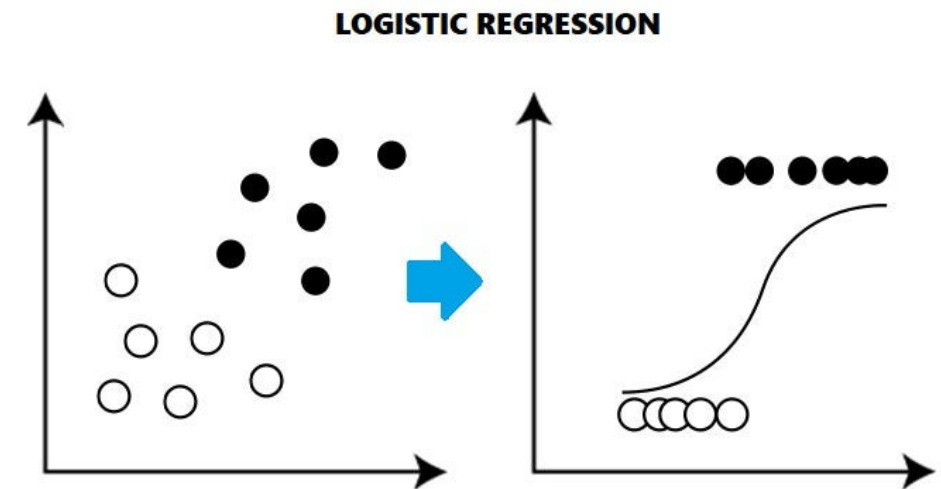
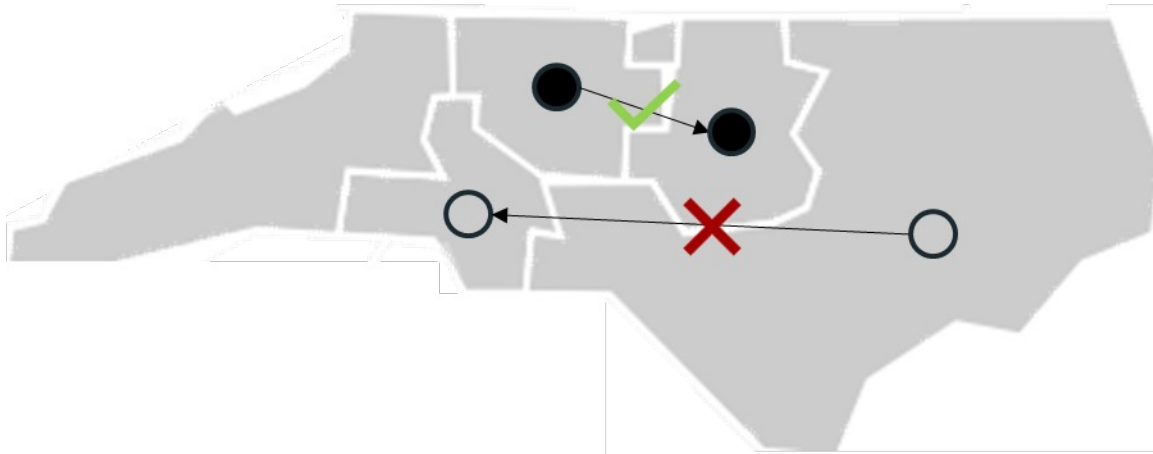
Variable	Definition
A	Adjacency matrix of connectivity for all county pairs
F	Food flows in mass [kg] for all county pairs
D	Distance between all counties
GDP	Gross domestic production [\$]
POP	Population
P	Production in mass [tons]
LIVE	Inventory of all livestock
IND	Sum of industrial products utilizing a particular SCTG as input
IMP	Total import value of a particular SCTG through port trade [\$]
EXP	Total export value of a particular SCTG through port trade [\$]

Temporal agri-food flows between U.S. counties



Establish a framework to **estimate agri-food flows between counties** over time.

- The Food Flow Model, a data-driven framework

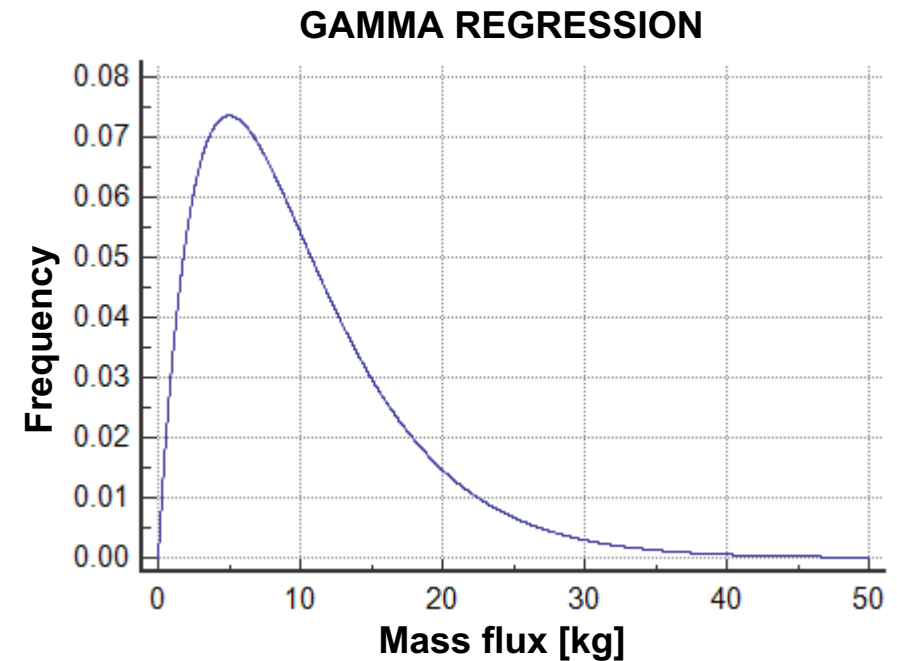
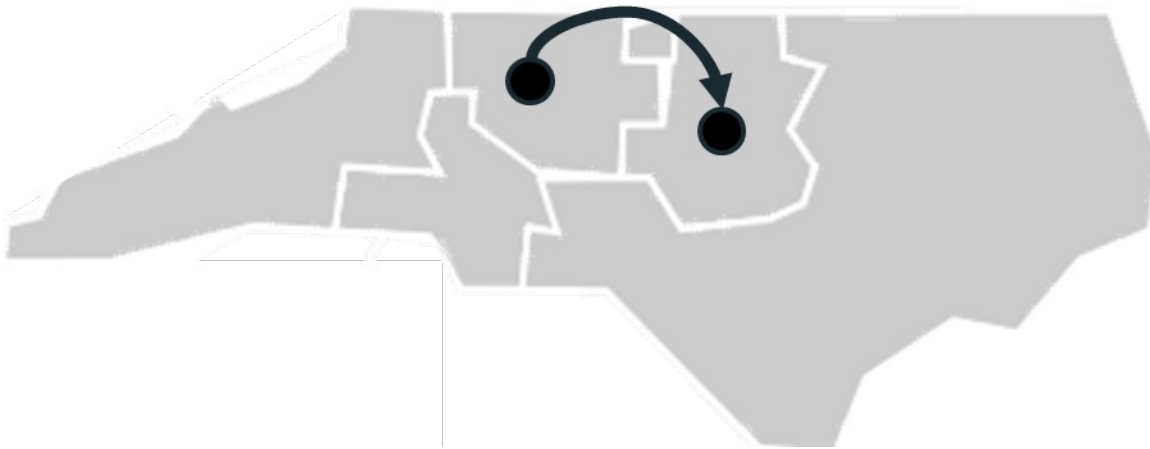


Temporal agri-food flows between U.S. counties



Establish a framework to **estimate agri-food flows between counties** over time.

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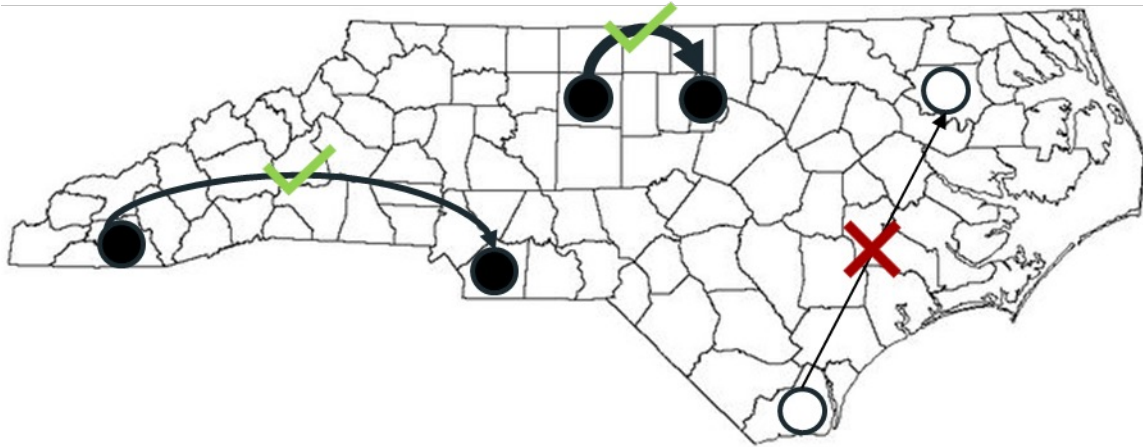


Temporal food flows between the U.S. counties



Establish a framework to **estimate agri-food flows between counties** over time.

- The Food Flow Model, a data-driven framework



GRAVITY MODEL OF TRADE

$$T_{ij} = \frac{GDP_i^\alpha GDP_j^\beta}{D_{ij}^\theta}$$

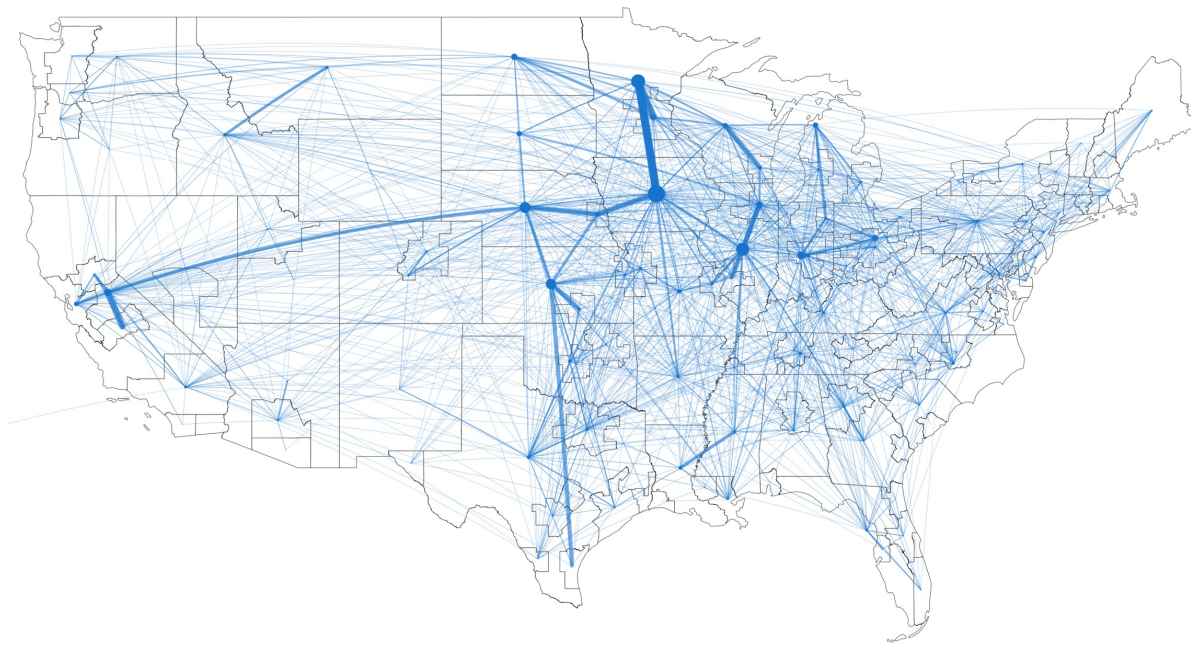
MASS BALANCE

$$\sum_i c_{ik}^{in} = F_k^{in}$$
$$\sum_i c_{ik}^{out} = F_k^{out}$$

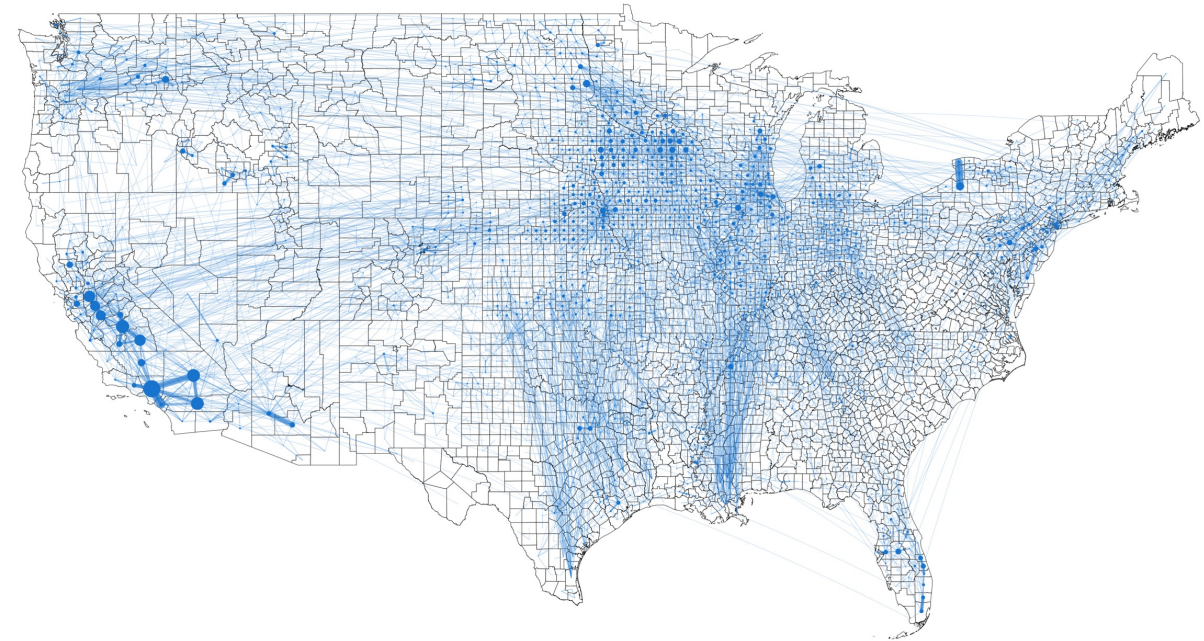
Temporal agri-food flows between U.S. counties



Maps of **spatially detailed** agri-food flows within the United States.



**FAF4
data**

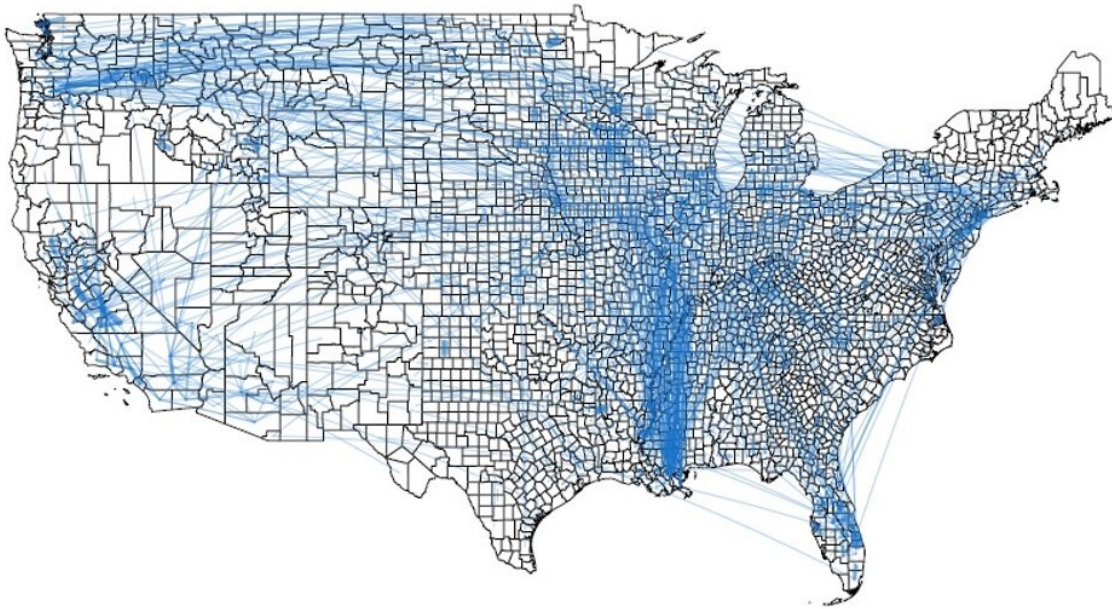


**Lin et al
(2019)**

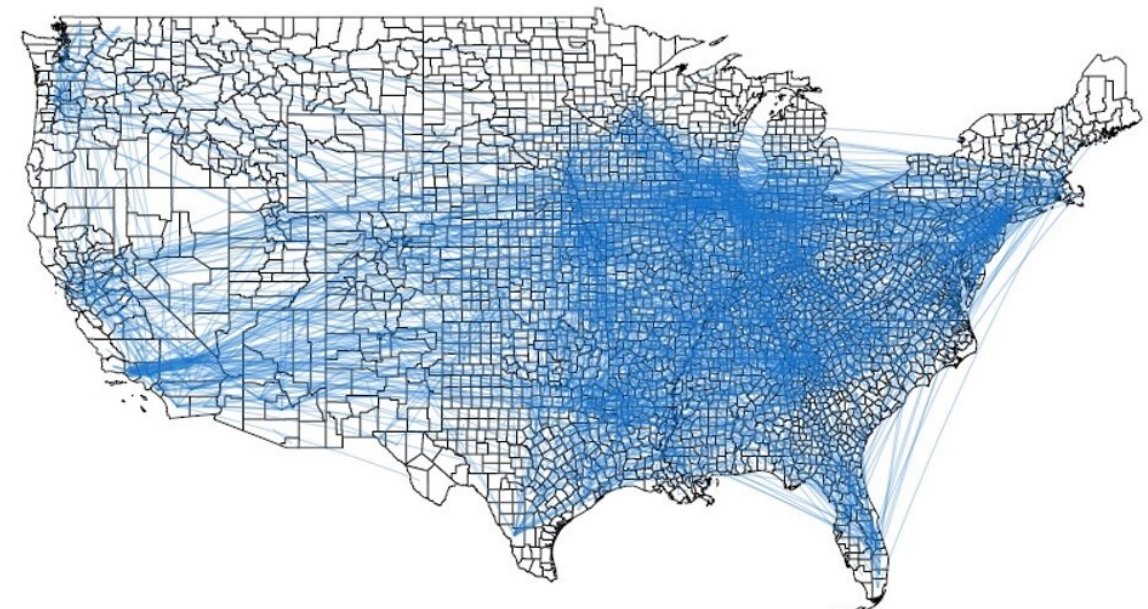
Temporal agri-food flows between U.S. counties



Maps of **spatially detailed** agri-food flows within the United States.



SCTG 03

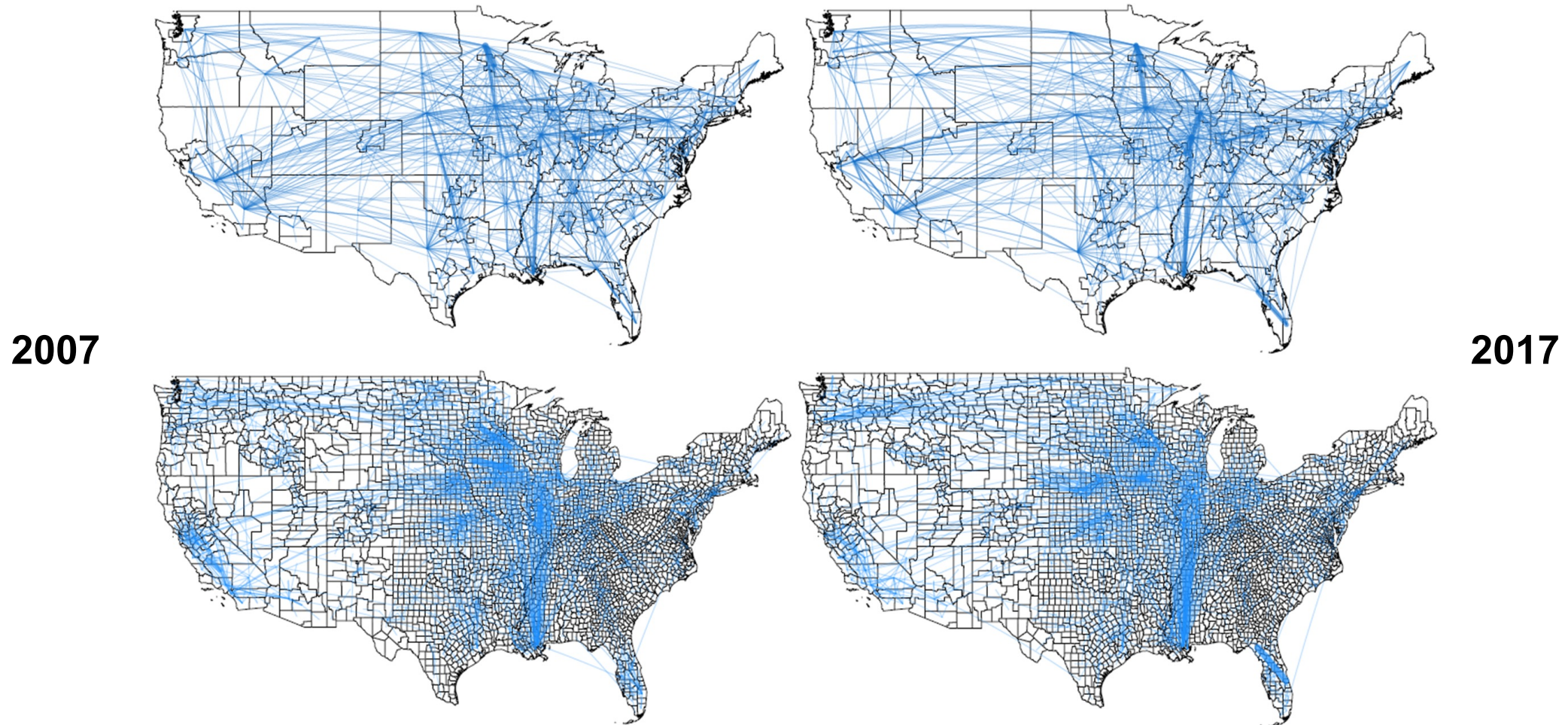


SCTG 05

Temporal agri-food flows between U.S. counties



What are the **spatial trends through time** in the agri-food flow networks?

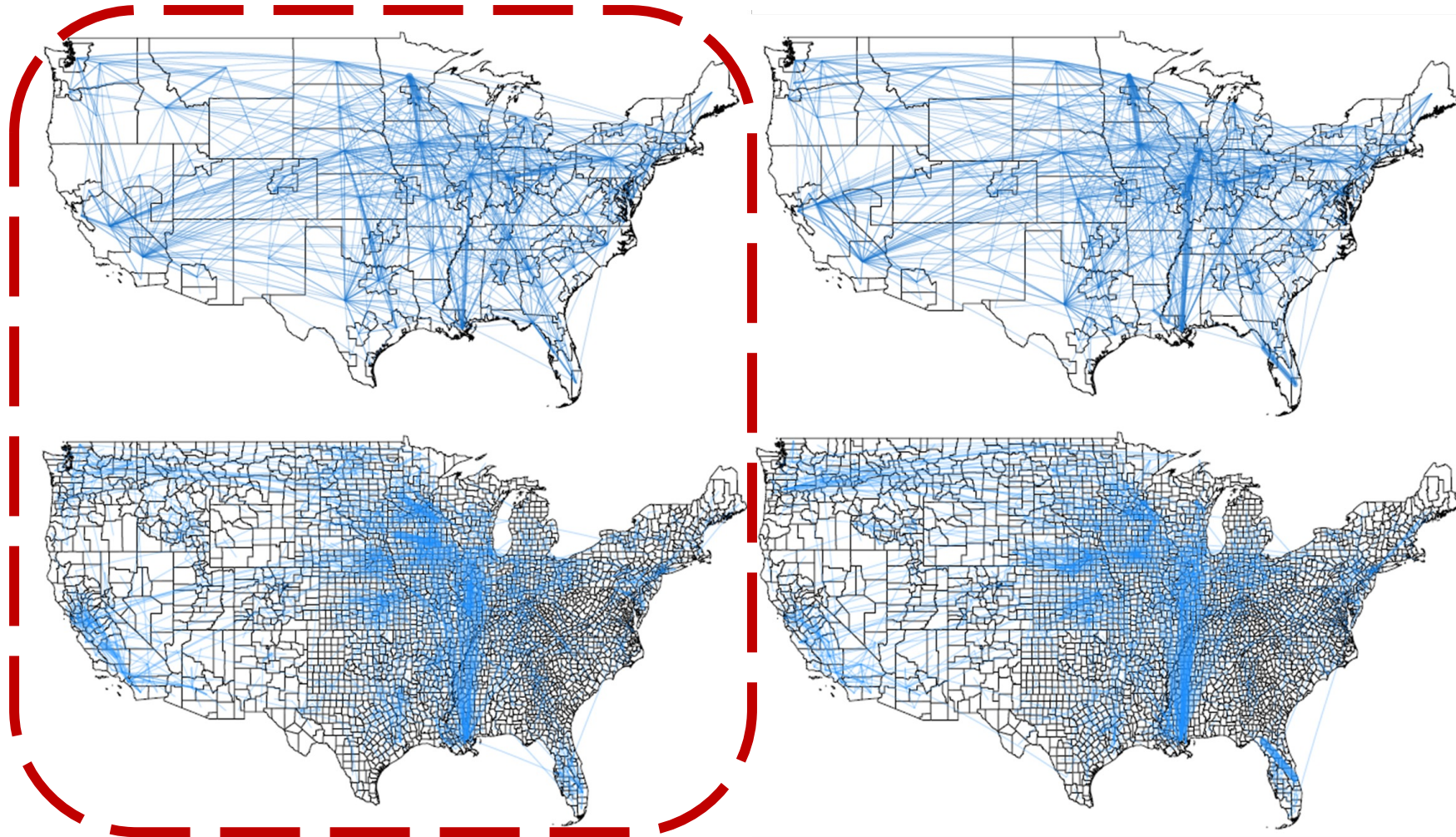


Temporal agri-food flows between U.S. counties



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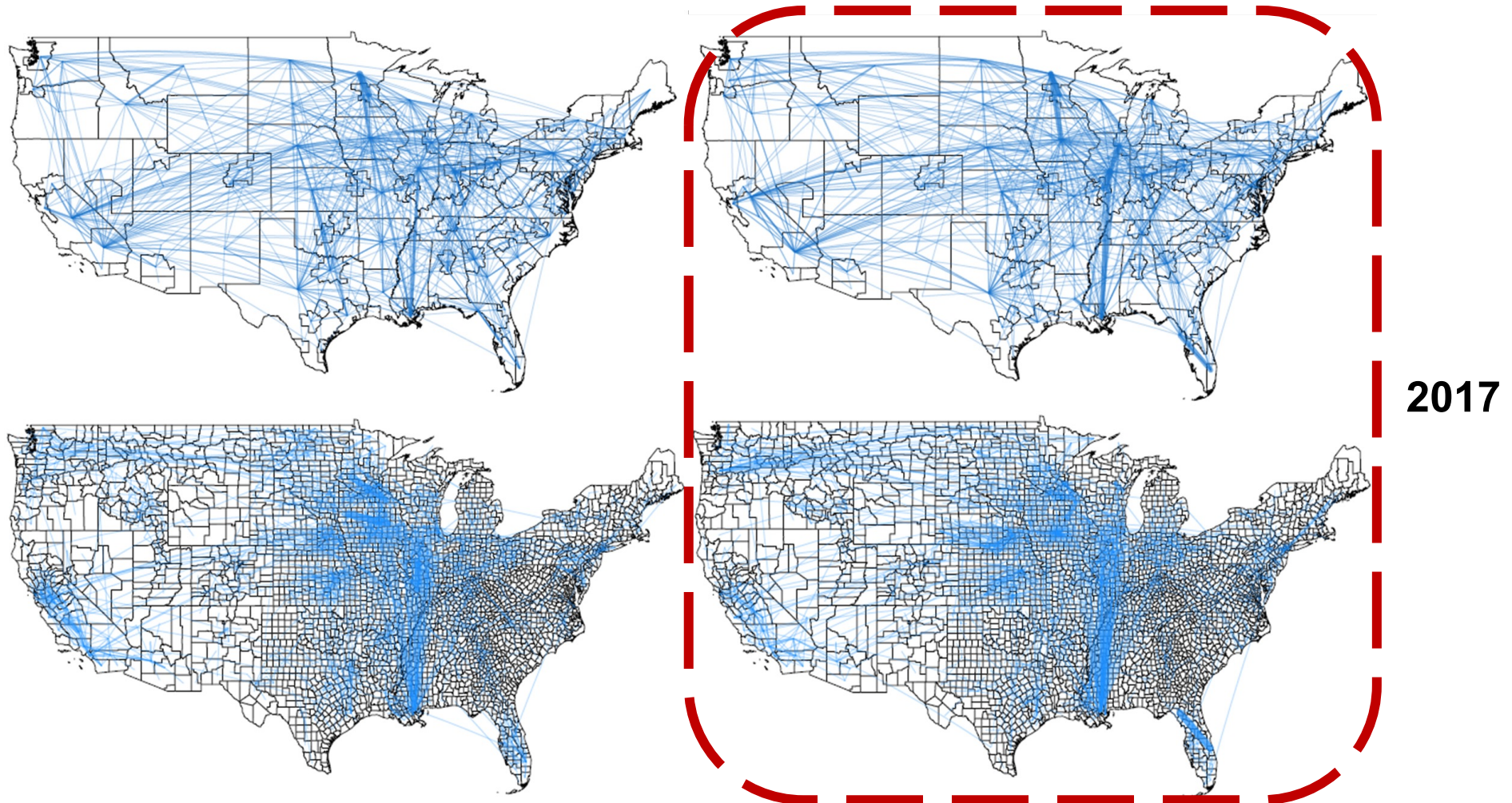
2007



Temporal agri-food flows between U.S. counties



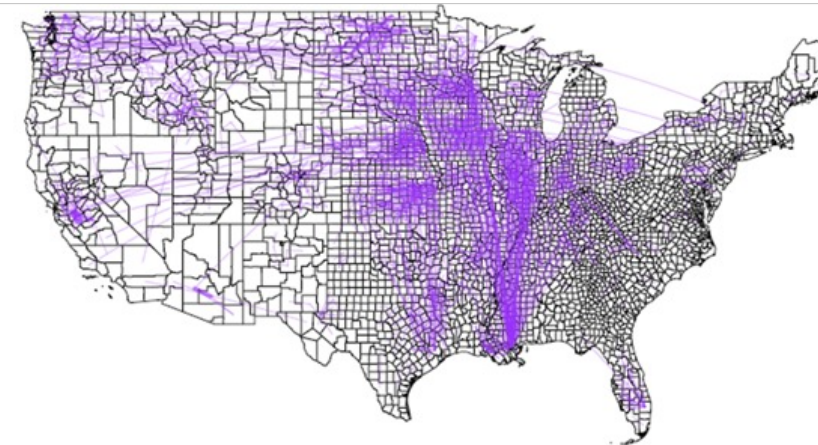
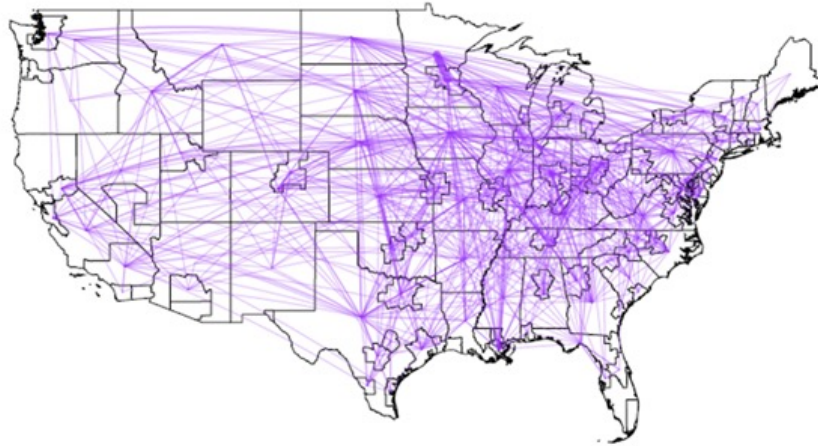
What are the **spatial trends through time** in the agri-food flow networks?



Temporal agri-food flows between U.S. counties



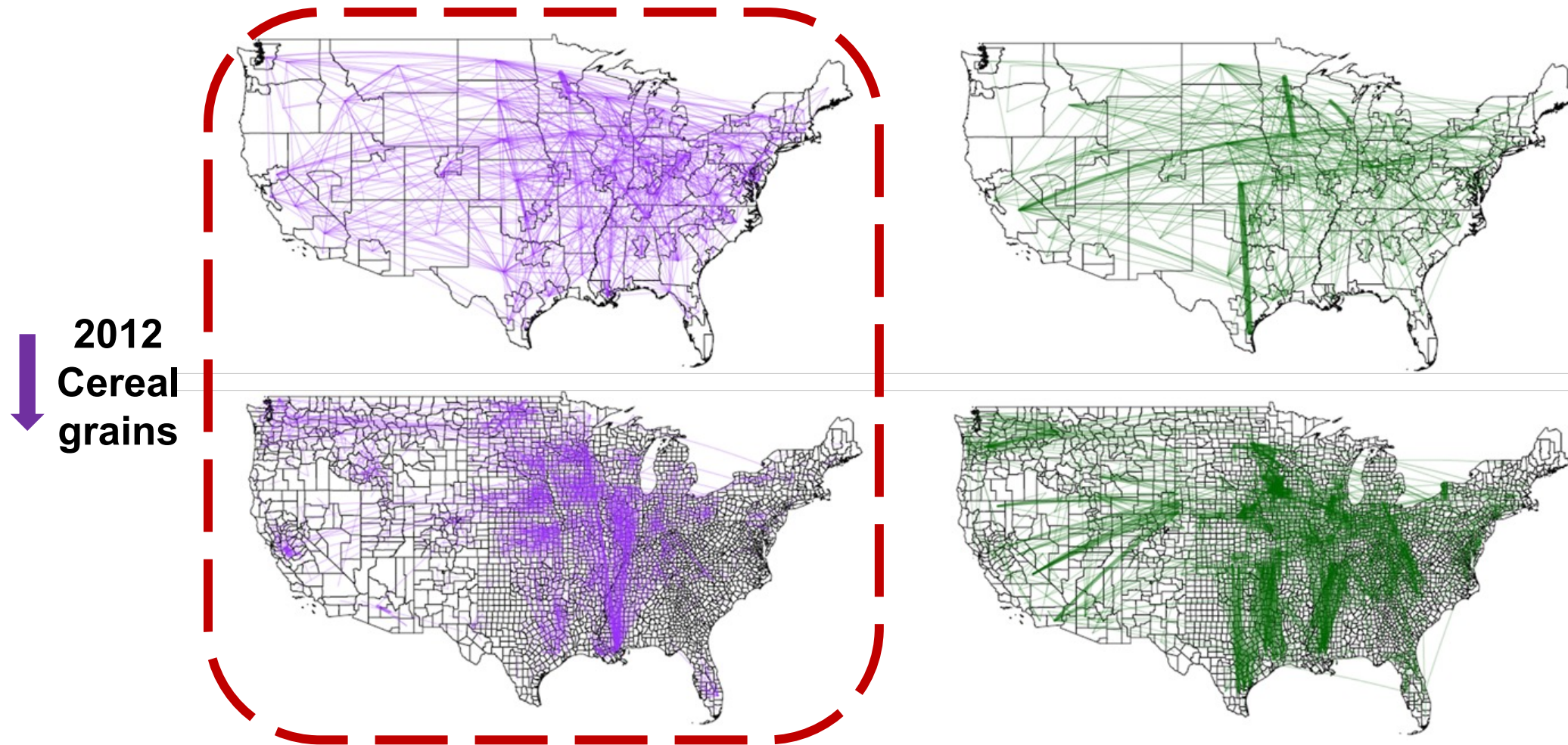
What are the **spatial trends through time** in the agri-food flow networks?



Temporal agri-food flows between U.S. counties



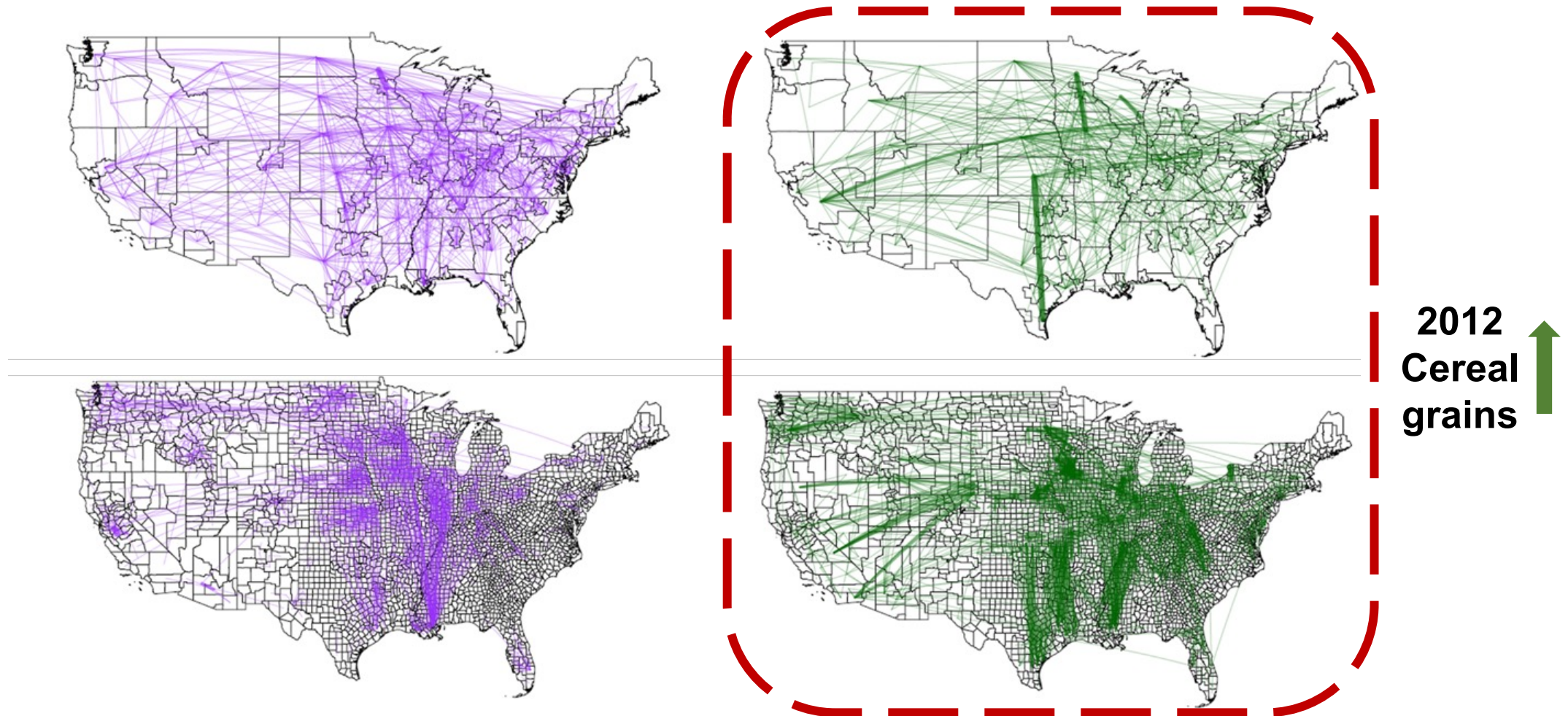
What are the **spatial trends through time** in the agri-food flow networks?



Temporal agri-food flows between U.S. counties



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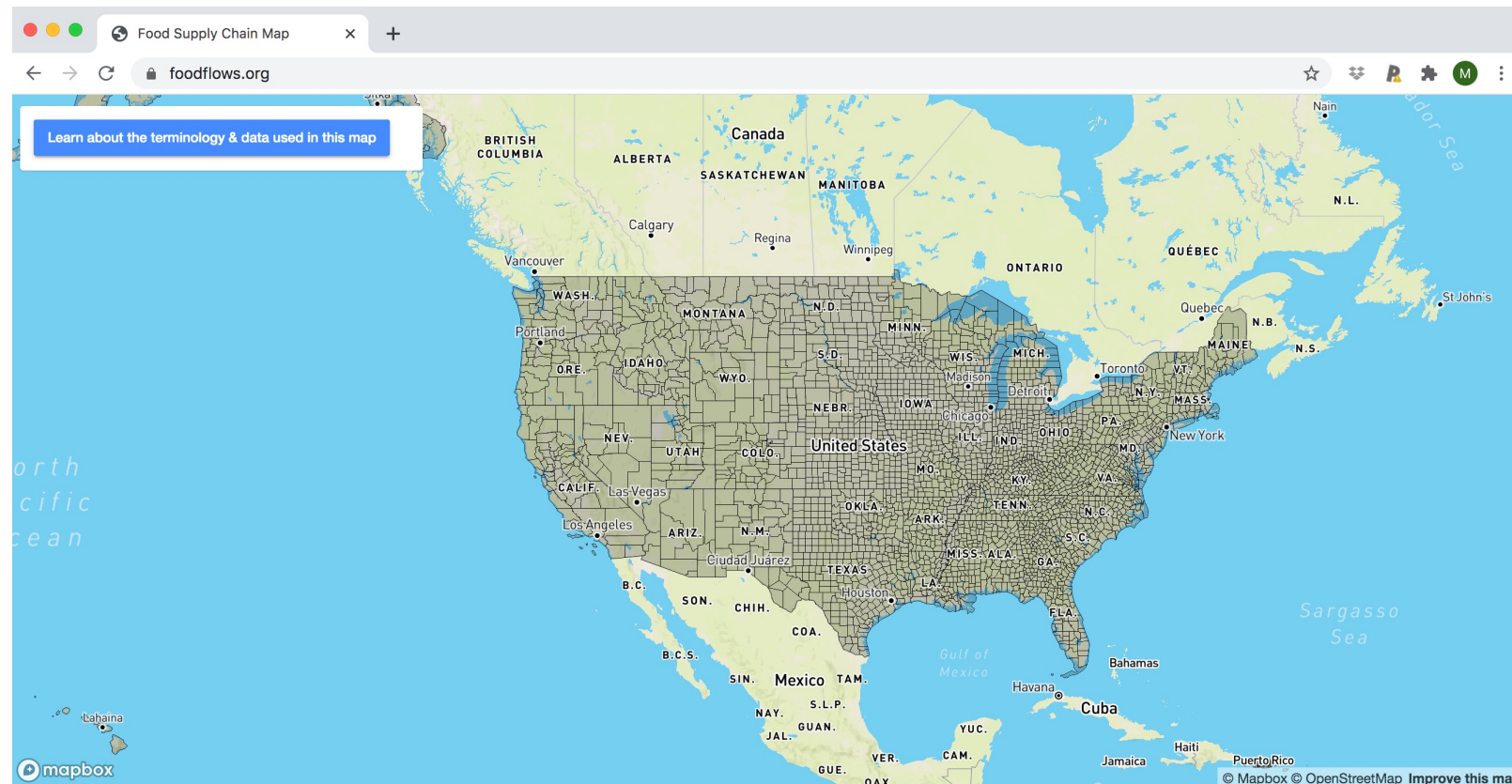


Temporal agri-food flows between U.S. counties



We developed an interactive visualization system for Food Flow Model estimates.

- Approximately 70 million data points per year.

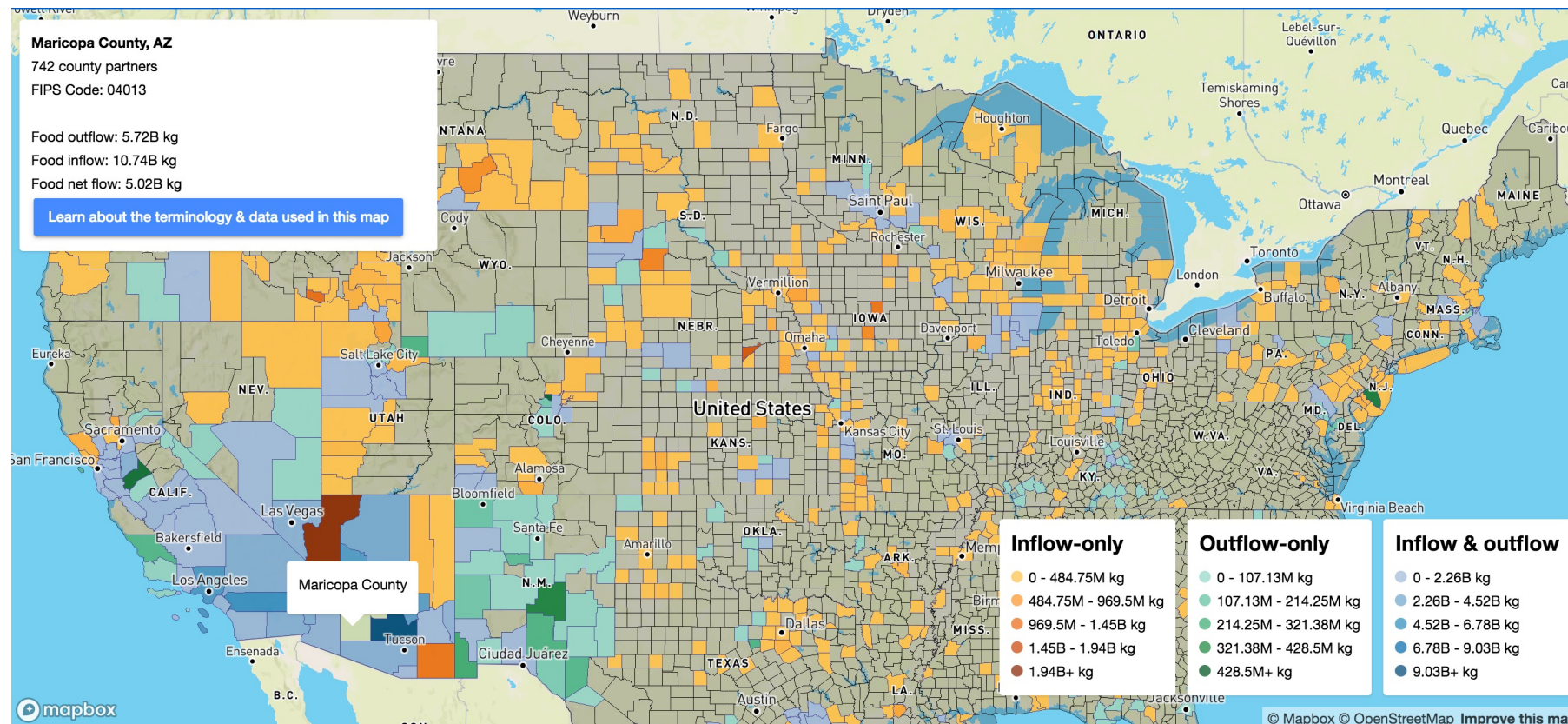


Temporal agri-food flows between U.S. counties



We developed an interactive visualization system for Food Flow Model estimates.

- Maricopa County, Arizona: A major consumer.

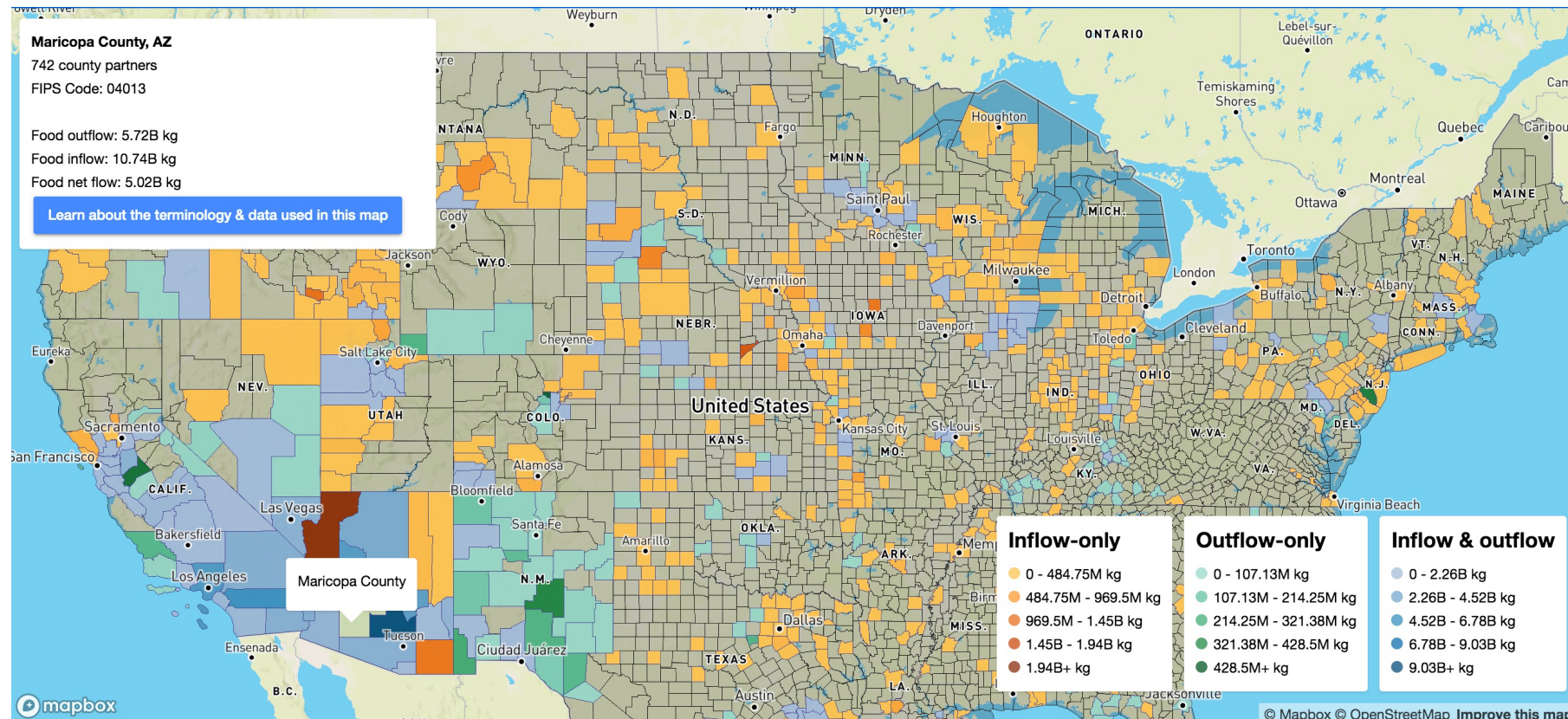


Temporal agri-food flows between U.S. counties



We developed an interactive visualization system for Food Flow Model estimates.

- Erie County, New York: An international port.

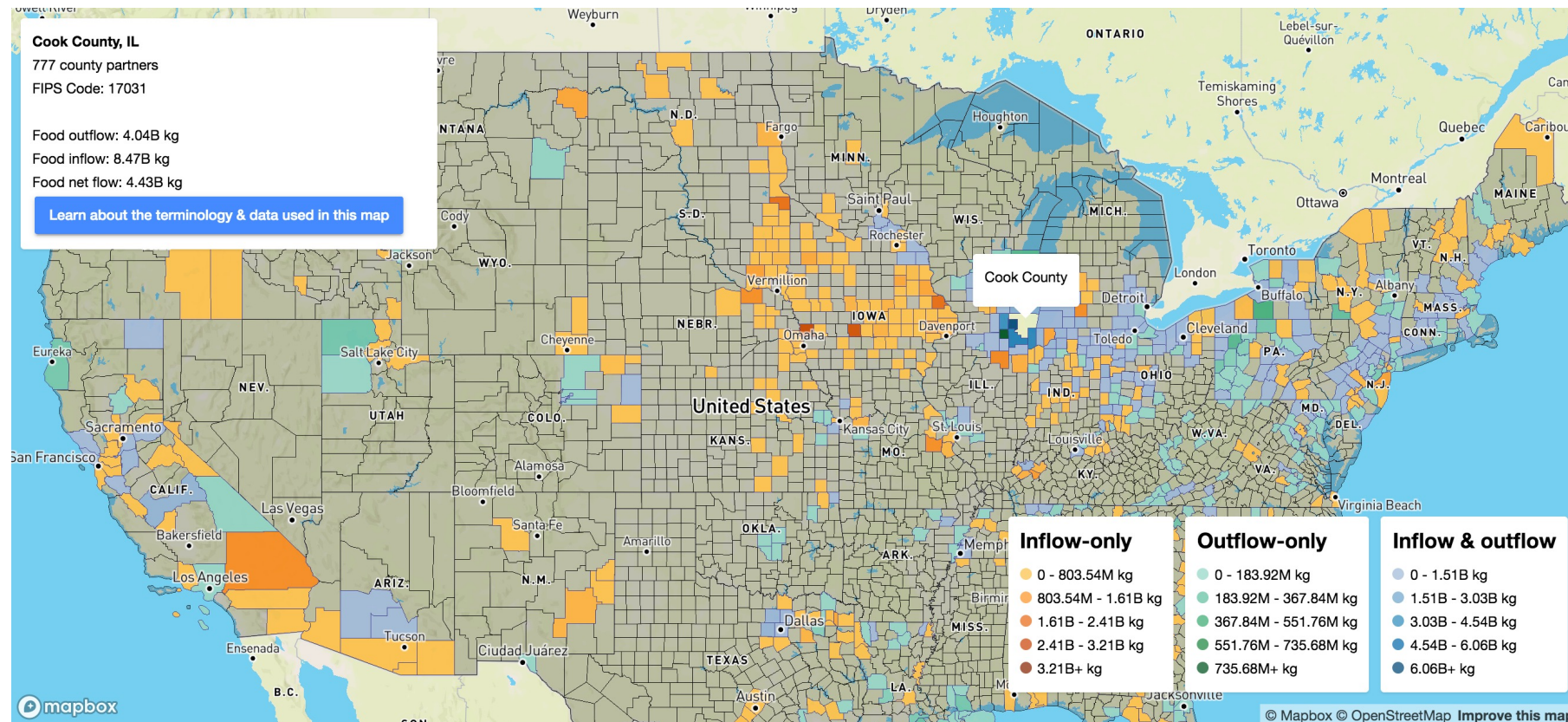


Temporal agri-food flows between U.S. counties



We developed an interactive visualization system for Food Flow Model estimates.

- Cook County, Illinois: A major transit hub.



Temporal agri-food flows between U.S. counties



The Food Flow Model is just the beginning ...

- This is the **first study** to estimate agri-food flows between counties and over time



To guide **detailed decision-making**
for societal well-being



Lin, X., Q. Dang, and M. Konar (2014), A network analysis of food flows within the USA, *Environmental Science & Technology*, Vol 48, Issue 10, pp. 5439-5447.

Konar, M., X. Lin, B. Ruddell, and M. Sivapalan (2018), Scaling properties of food flow networks, *PLoS ONE*, Vol 13, Issue 7, pp. e0199498.

Lin, X., P.J. Ruess, L. Marston, and M. Konar (2019) Food flows between counties in the United States, *Environmental Research Letters*, Vol 14, Issue 3, pp. 084011.

Karakoc, D.B., J. Wang, and M. Konar (2022) Food flows between counties in the United States from 2007 to 2017, *Environmental Research Letters*, Vol 17, pp. 034035.

Wang, J., D.B. Karakoc, and M. Konar (2022) The carbon footprint of cold chain food flows in the United States, *Environmental Research: Infrastructure and Sustainability*, Vol 2, pp. 0021002.

Karakoc, D.B., M. Konar, M.J. Puma, and L.R. Varshney (2023) Structural chokepoints determine the resilience of agri-food supply chains in the United States, *Nature Food*, Vol 4, pp. 607-615.

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Konar Research Group



water



• food



• policy

SCTG DESCRIPTION AND CODE

SCTG DESCRIPTION AND CODE			
Description	SCTG	Description	SCTG
01 Animals and Fish (live)		► Fruits and nuts, edible, fresh, chilled, or dried – Continued	
Live bovine animals	01001	Other citrus fruit, fresh or chilled	03319
Live swine	01002	Bananas and plantains, fresh or chilled	03321
Live poultry	01003	Grapes, fresh or chilled	03322
Live fish (includes live eels and aquarium fish)	01004	Melons, fresh or chilled	03323
Other live animals (includes horses, sheep, goats, fur-bearing animals, reptiles, honey bees, insect larvae, bait, pet or song birds, cats, and dogs) (excludes live shellfish, crustaceans such as crabs and lobsters, squid, octopus, and other aquatic invertebrates, see 05204)	01009	Apples, fresh or chilled	03324
		Other fresh or chilled fruit (excludes olives, see 03219)	03329
		Dried grapes (includes raisins and "currants")	03331
		Other dried fruit, (includes mixtures of dried fruit)	03339
		Nuts in the shell (excludes peanuts, see 03501)	03341
		Shelled nuts (includes sliced, chopped, shredded, stoned, pulped, and peeled, but not further processed) (excludes peanuts, see 03501)	03342
02 Cereal Grains (includes seed)		► Other agricultural products (oil seeds, bulbs, live plants or parts of plants, cut flowers, unmanufactured tobacco), not elsewhere classified	
Wheat	02100	Soy beans (includes for sowing)	03400
Corn (excludes sweet, see 03219)	02200	Peanuts, unroasted (includes for sowing)	03501
Rye	02901	Linseed (flaxseed) (includes for sowing)	03502
Barley	02902	Colza (rape) or canola seeds (includes for sowing)	03503
Oats	02903	Sunflower seeds (includes for sowing)	03504
Grain sorghum	02904	Cotton seeds (includes for sowing)	03505
Other cereal grains (includes rice) (excludes soy beans, see 03400, and other seeds, see 0350x)	02909	Mustard seeds (includes for sowing)	03506
		Other oil seeds and nuts	03509
		Bulbs and roots and similar products, live trees and other plants, and mushroom spawn	03601
		Other seeds for sowing	03602
03 Agricultural Products (excludes Animal Feed, Cereal Grains, and Forage Products)		► Fresh-cut flowers, plants, and parts of plants, and other agricultural products (excludes forage products and cereal straw or husks)	
► Vegetables, fresh, chilled, or dried		Fresh-cut flowers	03910
Potatoes (includes seed, fresh or chilled) (excludes sweet potatoes, see 03219)	03100	Tobacco, not stemmed or stripped	03921
Tomatoes, fresh or chilled	03211	Stemmed and partially stemmed tobacco	03922
Onions, shallots, garlic, leeks, and onion sets, fresh or chilled	03212	Raw cotton (not carded or combed)	03930
Lettuce, fresh or chilled	03213	Unprocessed coffee and unfermented tea	03991
Leguminous vegetables such as peas and beans, fresh or chilled	03214	Sugar beet and sugar cane (excludes raw cane, see 07501)	03992
Other fresh or chilled vegetables (includes olives)	03219	Other agricultural products (includes cotton linters, seaweed, and forestry products) (excludes forage products and cereal straw, see 04110, raw spices, see 07303, natural rubber and gums, see 24102, and plants processed for ornamentation, see 40999)	03999
Leguminous vegetables, dried, such as peas, lentils, beans (includes those for use as seed and fodder) (excludes milled vegetables, see 06299)	03221		
Other dried vegetables, such as potatoes, mushrooms, and onions (includes those for use as seed) (excludes milled vegetables, see 06299)	03229		
► Fruits and nuts, edible, fresh, chilled, or dried			
Oranges, fresh or chilled	03311		
Grapefruit, fresh or chilled	03312		

SCTG DESCRIPTION AND CODE – Continued

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Description	SCTG	Description	SCTG
04 Animal Feed, Eggs, Honey, and Other Products of Animal Origin		Aquatic invertebrates, live, fresh, chilled, frozen, salted, in brine, or dried, and crustaceans in shell (<i>such as lobsters, shrimps, crabs</i>) cooked by steaming or by boiling in water)	
➤ Eggs, cereal straw or husks, forage products, residues and waste from the food industries used in animal feeding, and other products of animal origin not elsewhere classified		05204	
Cereal straw or husks and forage products	04110	➤ Preparations, extracts, and juices	
Inedible flours, meals, and pellets of meat, fish, or seafood, and greaves	04120	Preparations, extracts, and juices of meat (<i>includes poultry</i>) (<i>excludes soups and broths, see 07720</i>)	05310
Bran, sharps, and other residues of cereals or leguminous plants	04130	Preparations, extracts, and juices of fish or seafood (aquatic invertebrates) (<i>excludes soups and broths, see 07720</i>)	05320
Oil cake and other solid residues from the manufacture of vegetable fats or oils	04140	06 Milled Grain Products and Preparations, and Bakery Products	
Eggs in the shell	04191	➤ Milled or otherwise worked grain products	
Raw hides and skins (<i>includes fur skins</i>)	04192	Wheat flour, groats, and meal (<i>excludes by products, see 04130</i>)	06100
Shorn or pulled greasy wool, animal hair not carded or combed, silk-worm cocoons suitable for reeling, and raw silk	04193	Malt	06210
Other products of animal origin, and residues and waste from the food industries used in animal feeding, not elsewhere classified (<i>includes natural honey, sausage casings, down, pigs' bristles, horsehair, degelatinized bone, shells, natural sponges, animal products used in the preparation of pharmaceuticals, bovine semen, and blood meal, and other feed ingredients such as vegetable waste, residues, or by-products such as gluten meal, dried beet-pulp, brewers' and distillers spent grains, malt sprouts, wine lees and argol, and acorns and horse-chestnuts</i>)	04199	Milled rice (<i>includes husked, broken, flour, groats, and meal</i>)	06291
Dog or cat food put up for retail sale	04210	Corn flour, groats, and meal	06292
Other animal feed preparations (<i>includes complete feeds, premixes, bird seed, fish food, and feed supplements</i>)	04290	Starches and modified starches	06293
05 Meat, Poultry, Fish, Seafood, and Their Preparations		Inulin; wheat gluten; milled cereals and other vegetables; and grains otherwise worked, (<i>includes rolled, flaked, hulled, pearled, sliced, or kibbled</i>) (<i>excludes milling by-products, see 04130</i>)	06299
Meat, fresh or chilled (<i>excludes poultry</i>)	05111	➤ Bakery products and food preparations of cereals, flour, starch or milk	
Meat, frozen (<i>excludes poultry</i>)	05112	Pasta (<i>includes stuffed, canned, frozen, or dried</i>) and couscous	06310
Poultry, fresh or chilled	05121	Breakfast cereal foods, swelled, roasted, or partially cooked	06320
Poultry, frozen	05122	Mixes and dough for the preparation of bakery products (<i>includes batters</i>)	06391
Meat, salted, in brine, dried, or smoked (<i>includes smoked hams, pork bellies, back bacon, cottage rolls, and pickled beef, edible flours and meals, and pig or poultry fat, not rendered</i>)	05130	Rice preparations, instant rice, and partially cooked rice	06392
➤ Fish (<i>excludes live, seafood, and their preparations</i>)		Other food preparations of cereals, flour, starch, or milk, not elsewhere classified (<i>includes tapioca, malt extract, ice cream and milk shake mixes, pudding powders, and infant formula</i>)	06399
Fresh or chilled fish (<i>includes fillets</i>)	05201	➤ Baked products, including frozen	
Frozen fish (<i>includes fillets</i>)	05202	Baked snack foods (<i>includes pretzels, cheese sticks, and tortilla chips</i>) (<i>excludes cookies and crackers, see 06432</i>)	06410
Fish, salted, in brine, dried, or smoked, and edible fish meal	05203	Frozen baked products (<i>includes quiche, pizza, bagels, waffles, and pastries</i>)	06420
		Perishable baked products (<i>includes fresh bread, pastries, pies, cakes, doughnuts, pizza, and quiche</i>)	06431
		Dry baked products (<i>includes cookies, crackers, and taco shells</i>)	06432

SCTG DESCRIPTION AND CODE – Continued

Description	SCTG	Description	SCTG
07 Other Prepared Foodstuffs, Fats and Oils – Continued		Denatured ethyl alcohol of a strength by volume of less than 80% volume, not for human consumption (<i>excludes ethanol for use as biofuel, see 17500 and 17600</i>)	08420
► Other edible preparations not elsewhere classified, and vinegar			
Tomato sauces (<i>includes ketchup and chili sauces</i>)	07711		
Other sauces and sauce mixes (<i>includes prepared mustard, mustard flours and meals, soy sauce, mayonnaise, salad dressings including dried, and mixed condiments and seasonings, not elsewhere classified</i>)	07719		
Soups and broths (<i>includes mixes</i>), and baby or dietetic foods	07720		
Syrups and concentrates used in food preparations or beverages	07731		
Flavoring powders, extracts, or essences including cocktail mixes	07732		
Processed eggs (<i>includes egg albumin</i>)	07791		
Yeasts and baking powder	07792		
Sugar syrups with added flavors and/or colors (<i>includes table syrups</i>)	07793		
Edible preparations, not elsewhere classified (<i>includes protein concentrates, tofu, vegetable preparations for flavoring, jelly powders, concentrated juice fortified with vitamins or minerals, and vinegar</i>)	07799		
► Non-alcoholic beverages not elsewhere classified, and ice			
Carbonated soft drinks	07811		
Other sweetened or flavored water	07819		
Water, unsweetened and unflavored (<i>includes potable, spring, carbonated, or mineral</i>)	07891		
Ice and other non-alcoholic beverages (<i>includes soya, almond, coconut, chocolate, and other milk drinks, and juices fortified with vitamins and minerals, not concentrated, and not elsewhere classified</i>) (<i>excludes dry ice (carbon dioxide), see 20241</i>)	07899		
08 Alcoholic Beverages and Denatured Alcohol			
Beer (malt beer) (<i>excludes non-alcoholic beer, see 07899</i>) . . .	08100		
Wine and other fermented beverages (<i>excludes non-alcoholic wine, see 07899</i>) . . .	08200		
► Spirituous beverages and ethyl alcohol			
Undenatured ethyl alcohol that is 80% or more alcohol by volume	08310		
Spirits, liqueurs, and other spirituous beverages, and undenatured ethyl alcohol that is less than 80% alcohol by volume	08320		
► Denatured ethyl alcohol, not for human consumption			
Denatured ethyl alcohol of a strength of more than 80% by volume (<i>excludes ethanol for use as biofuel, see 17600</i>)	08410		

09 Tobacco Products	
Cigarettes	09010
Tobacco products (manufactured), not elsewhere classified (<i>includes cigars, tobacco extracts and essences, and tobacco substitutes</i>) (<i>excludes leaf tobacco, see 0392x</i>)	09090
10 Monumental or Building Stone	
Calcareous monumental or building stone	10010
Monumental or building stone, other (<i>includes slate</i>) (<i>excludes dolomite, see 13300</i>)	10020
11 Natural Sands	
Silica sands and quartz sands for construction use	11010
Silica sands and quartz sands for uses other than construction; and other sands such as feldspathic, filter, fire, and clayey sands such as kaolinic	11020
12 Gravel and Crushed Stone (<i>excludes Dolomite and Slate</i>)	
Limestone flux	12011
Agricultural limestone	12012
Other gravel and crushed, powdered, or broken limestone and chalk (calcium carbonate)	12019
Other gravel and crushed stone (<i>excludes dolomite, see 13300; slate, see 13999; and limestone and chalk, see 1201x</i>)	12020
13 Other Non-Metallic Minerals not elsewhere classified	
► Salt	
Table salt (<i>includes sea salt</i>)	13101
Other salt (<i>includes rock salt, brine, and pure sodium chloride</i>)	13109
Natural calcium phosphates, natural aluminum-calcium phosphates, and phosphatic chalk . .	13200
Dolomite (<i>includes monumental, building, and crushed</i>)	13300
Sulfur (<i>excludes sublimed, precipitated, or colloidal, see 20210</i>)	13910
Kaolinic clays (<i>includes China</i>)	13921
Other clays (<i>includes bentonite, fire-clay, andalusite, kyanite, sillimanite, mullite, chamotte, and dinas earths</i>)	13929
Pumice stone, emery, and natural abrasives . . .	13991
Gypsum and anhydrite	13992
Asbestos	13993
Leucite, nepheline and nepheline syenite	13994

Wrap Up and Take Aways

- Anne Strauss-Wieder, NJTPA



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