



Planning for Freight in the Face of Disruption and Uncertainty

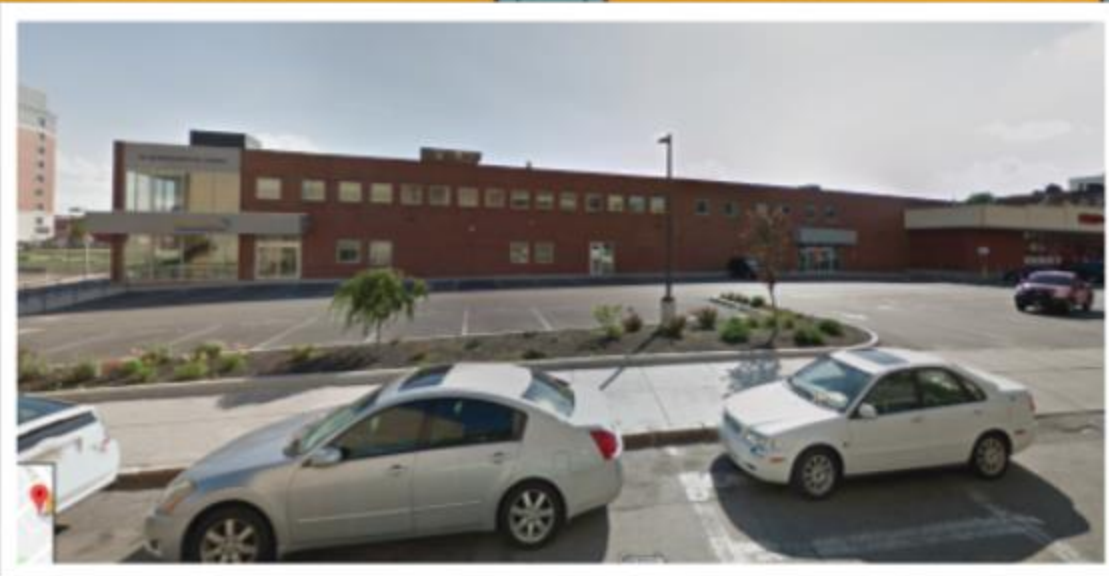
*Drawing Conclusions
Instead of Drawing Blanks*

Peter Plumeau, EDR Group

New York State Association of MPOs, 16 July 2019

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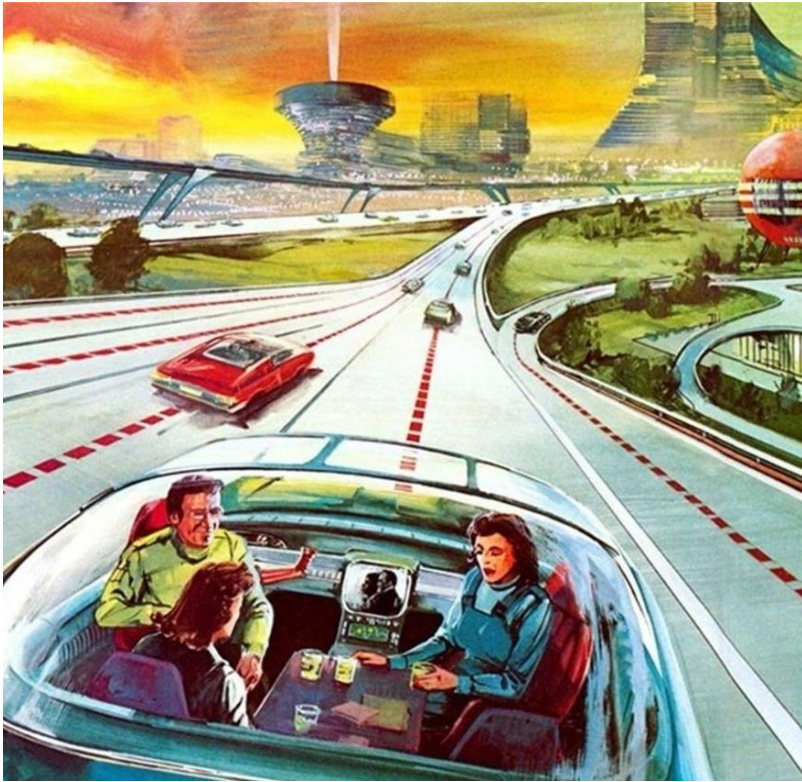




Technology, Climate, & Societal Changes are Driving Tectonic Changes in Freight



Planning in an Era of Disruption is Hard



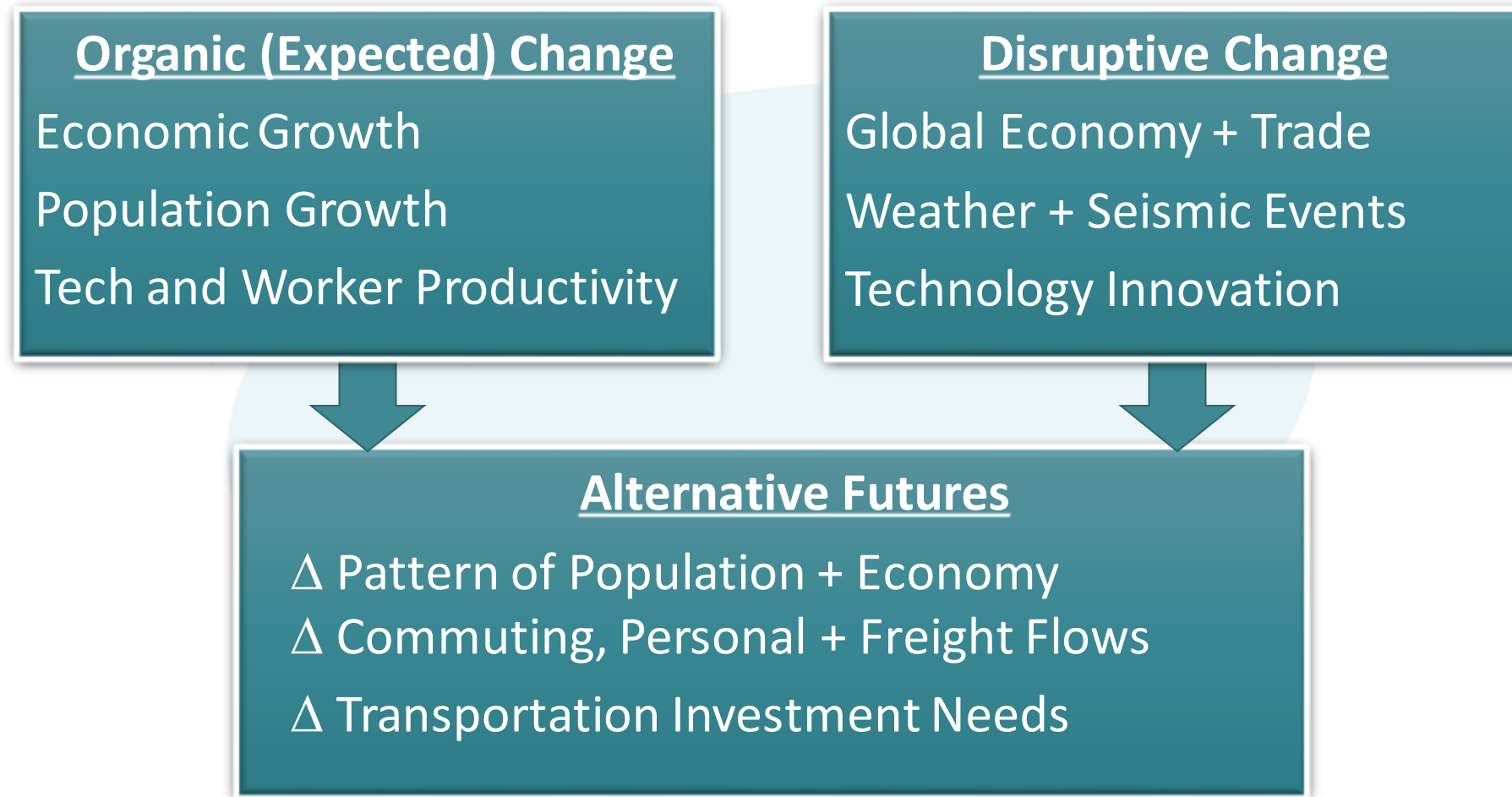
Economy and technology are always **changing**

Planning for **disruption** and **uncertainty** is a challenge

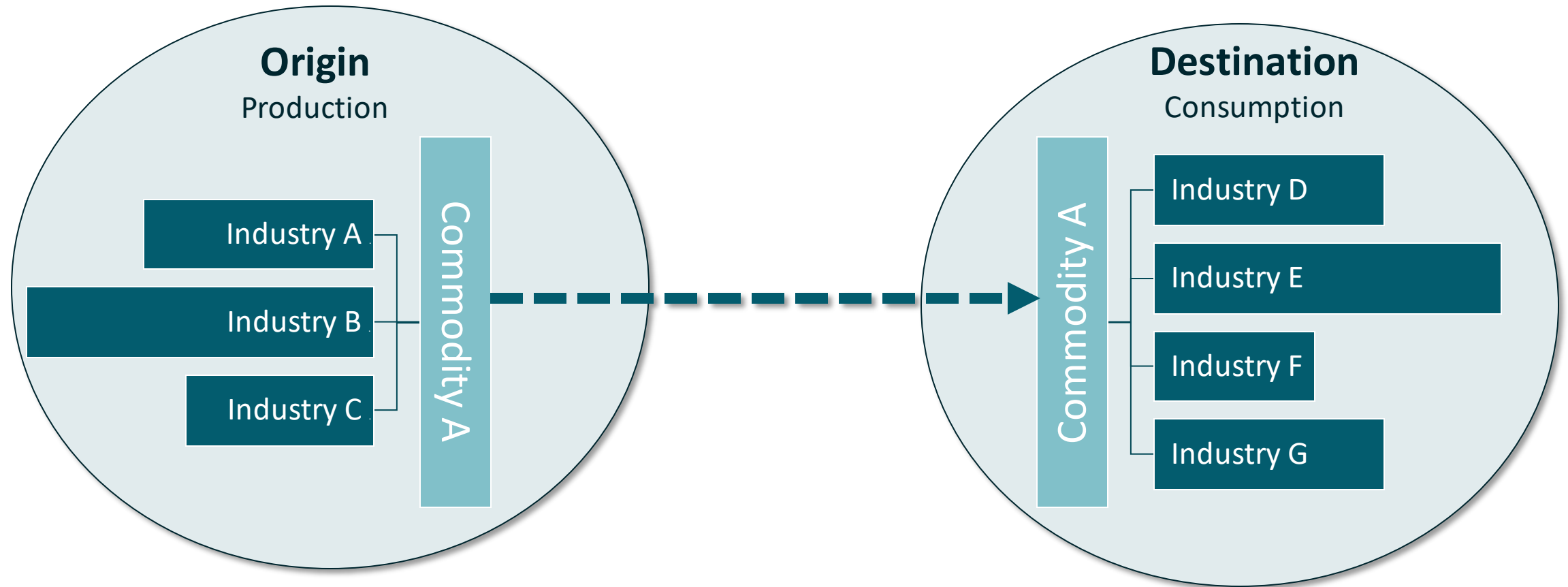
Plans need to consider **tradeoffs** and **asymmetrical consequences**

How can we pull insights from limited data?

Two Types of Change



Using Economic Data to Understand Freight Movement



Freight Movement - the physical manifestation of the economy

Understanding Change in the Planning Context

1) Organic Change:

Forecasting Freight Flows from
New York State

2) Understanding Disruptive Change:

The Impact of Disruptions to
Normal and Historic Freight
Flows

Tools and Sources



**Freight Analysis
Framework (FAF)**

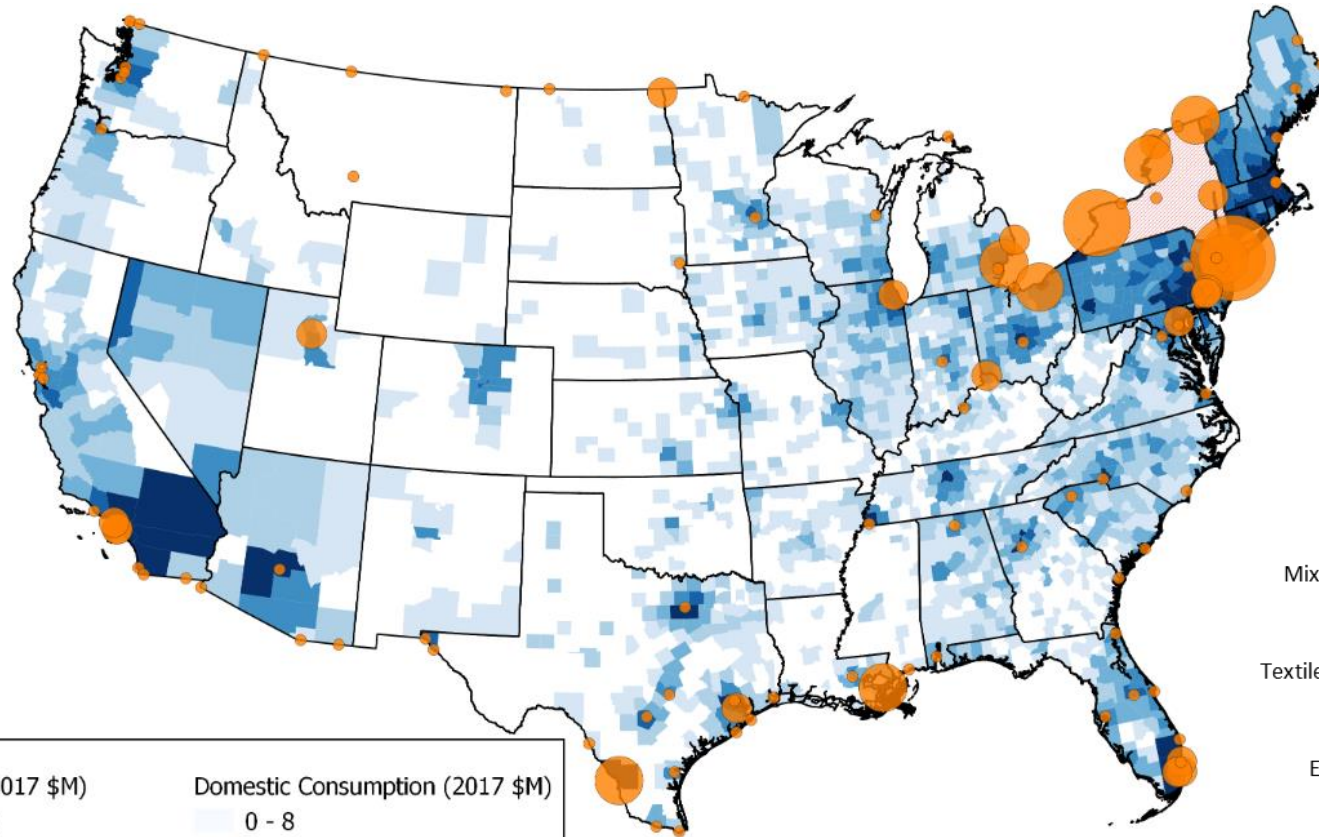


TREDPLAN

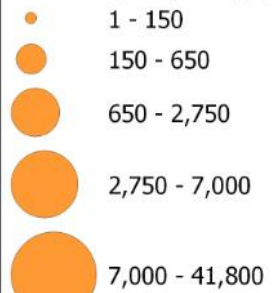
MOODY'S
ANALYTICS



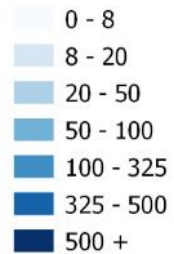
Freight Flows from NYS (2017)



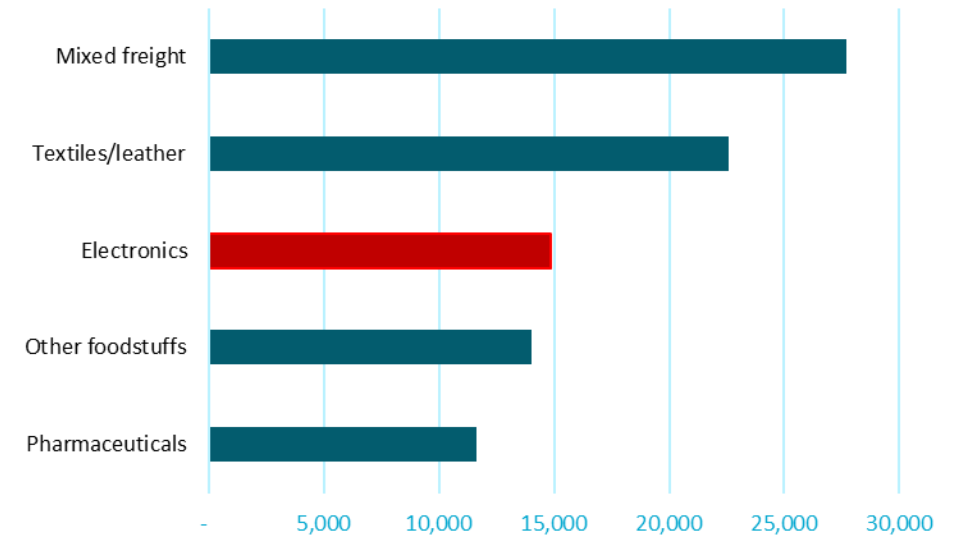
Port of Export (2017 \$M)



Domestic Consumption (2017 \$M)

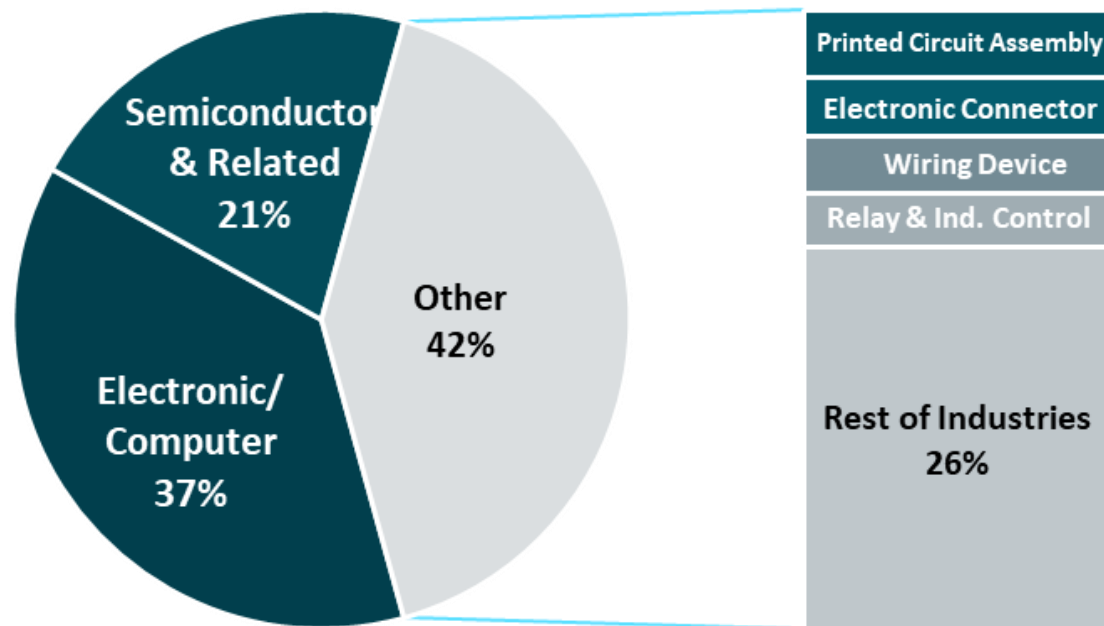


Top Commodities Shipped by Truck (2017 \$M)



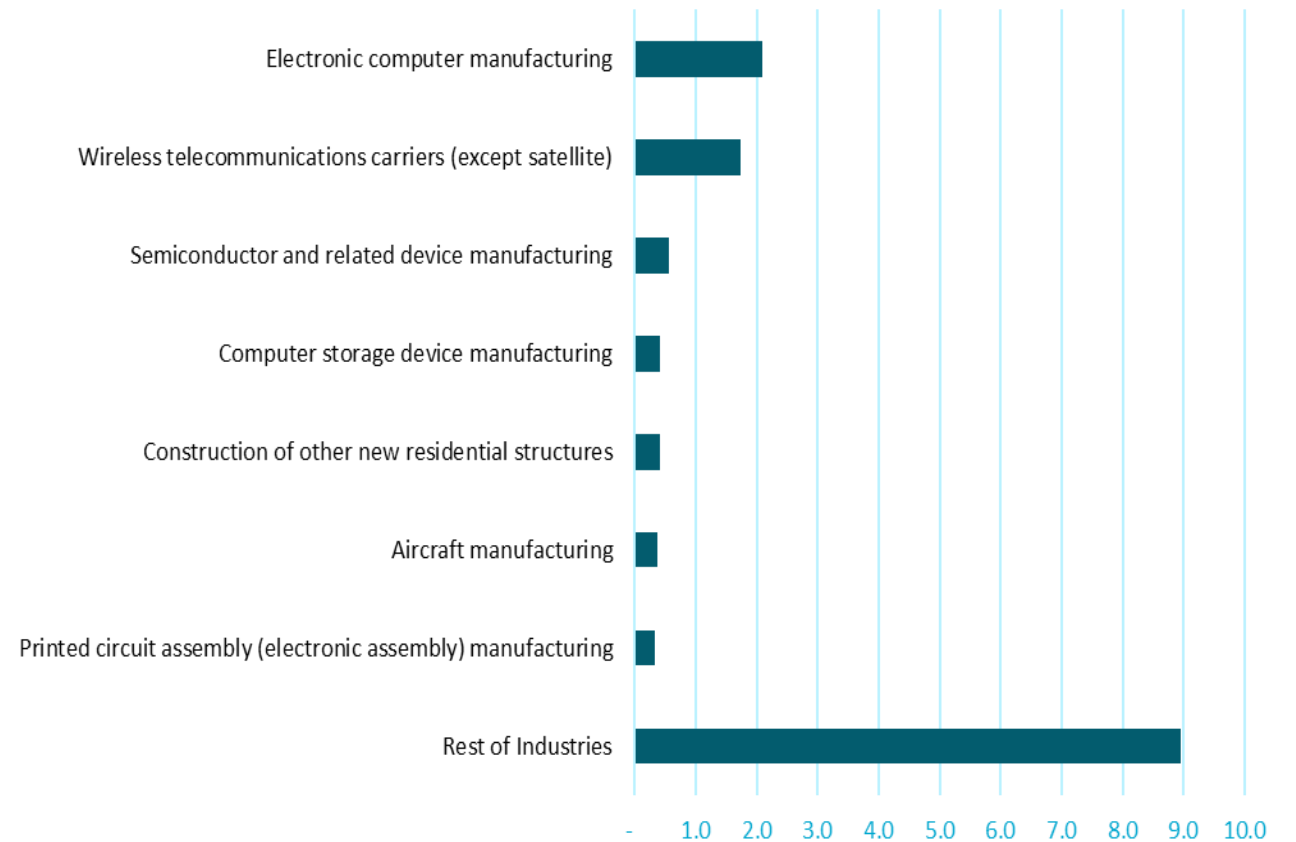
Freight Flows from NYS (2017)

What does New York make?



Who consumes it?

Top Industries "Consuming" Electronics



Organic Change - Future NYS Freight Distribution (2045)

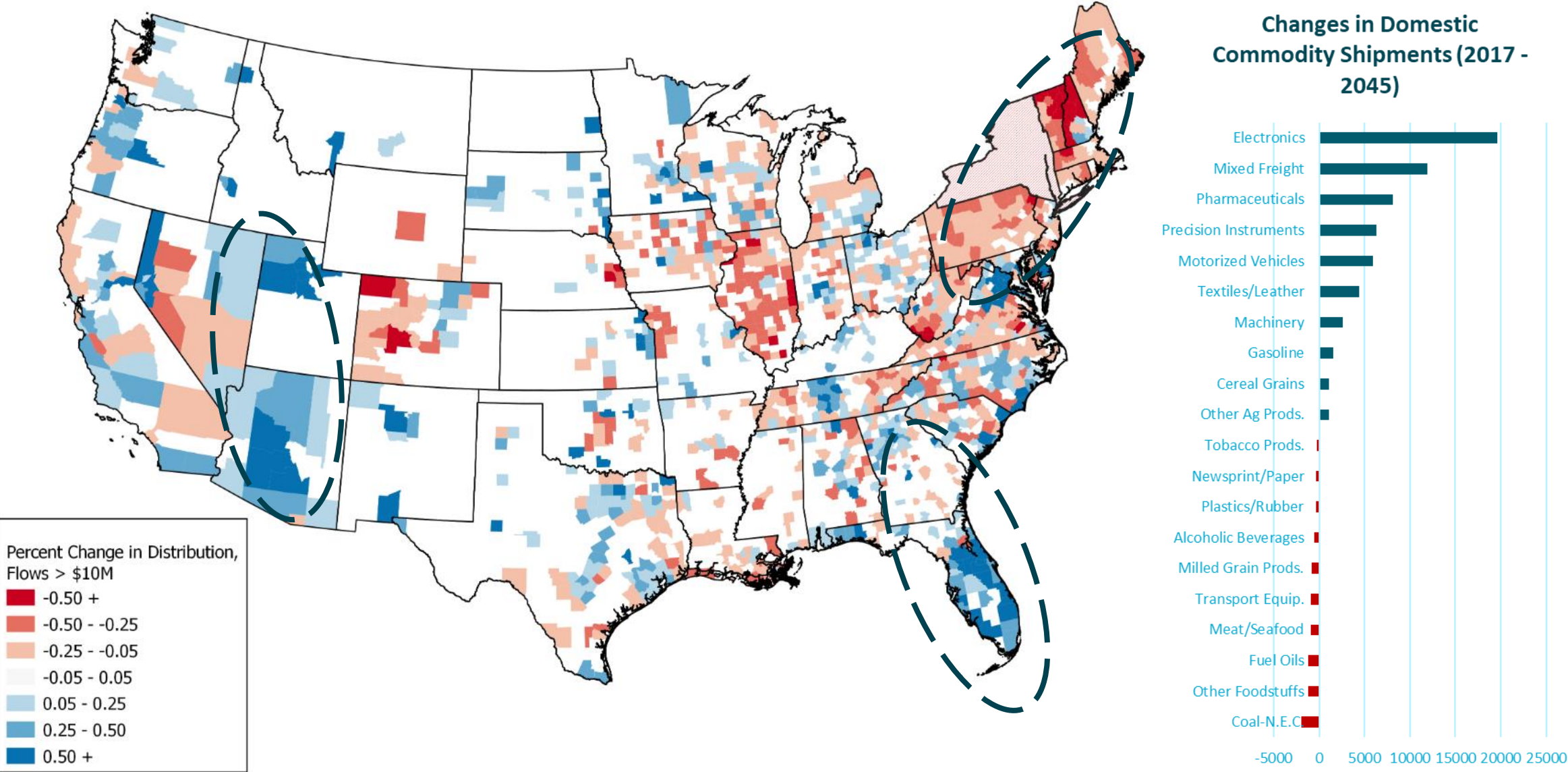
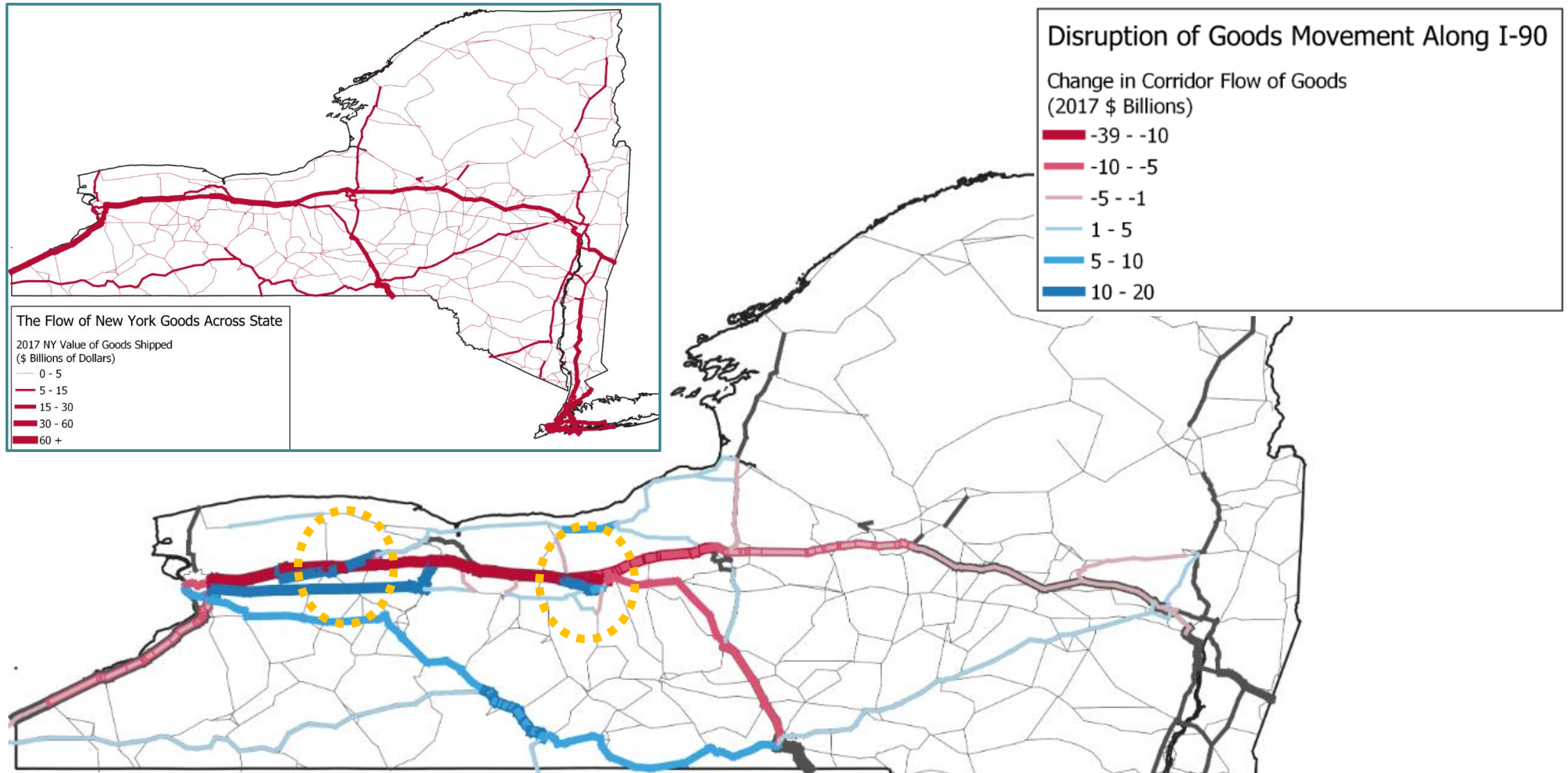
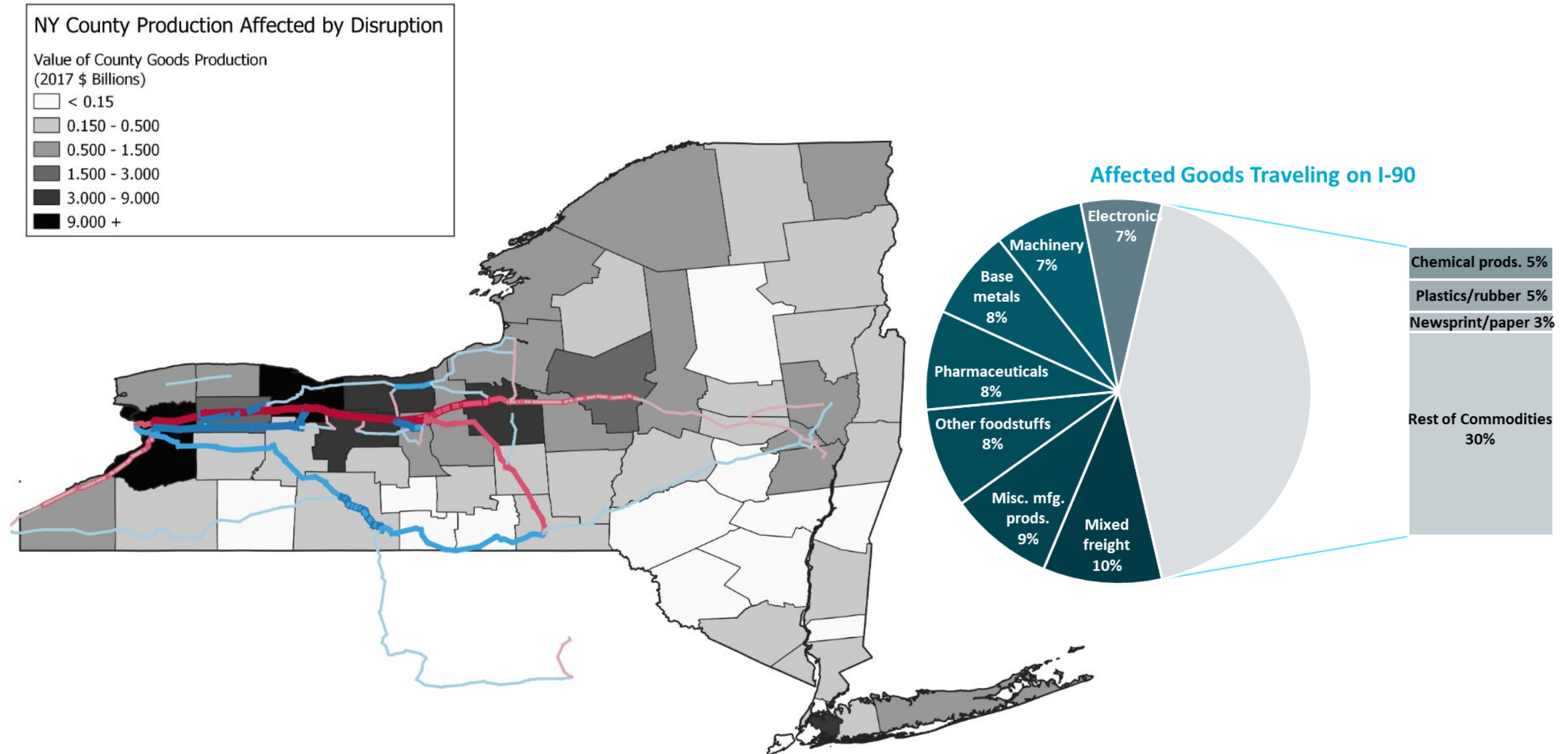


Illustration of Unpredictable Event - I-90 Corridor Severed



Disruption to I-90 Has Far-flung Consequences



How Does I-90 Disruption Affect Key NYS Industries



Direct Economic Dependence on I-90		Added (\$M)	Output (\$M)
Industry	Employment		
Chemical Mfg		3,479	8,767
Wholesale Trade		4,100	5,862
Computer and Electronic Mfg		2,014	5,427
Food Manufacturing		1,255	5,413
Miscellaneous Mfg		1,670	4,162
Primary Metal Mfg		999	4,147
Machinery Mfg		1,428	3,688
Fabricated Metal Mfg	1,000	1,325	2,955
Plastics & Rubber Products Mfg	5,000		
Paper Mfg	3,600		
Transportation Equipment Mfg	3,687		
Beverage & Tobacco Product Mfg	1,800		
Petroleum and Coal Products Mfg			
Crop Production			
Nonmetal Mineral Product Mfg	259		1,141
Animal Production	116	329	1,131
Furniture Mfg	306	361	978
Electrical Equipment & Appliance Mfg	1,649	236	845
Apparel Mfg	4,664	267	747
Media & Information	946	114	531
Oil and Gas Extraction	5,261	73	523
Wood Product Mfg	2,374	145	482
Textile Mills & Products Mfg	1,780	121	441
Mining, Quarrying, & Support	1,257	89	260
Business Services (Admin, Support, Waste)	1,001	66	211
Leather Product Mfg	355	19	82
Fishing, etc.	1,738	37	73
Printing	392	22	67
Forestry & Logging	726	26	48
Total	187,373	13,202	58,744

Disruption from Technology Innovations

Connected & Autonomous Trucks

Anticipated changes

Driverless trucks eliminate

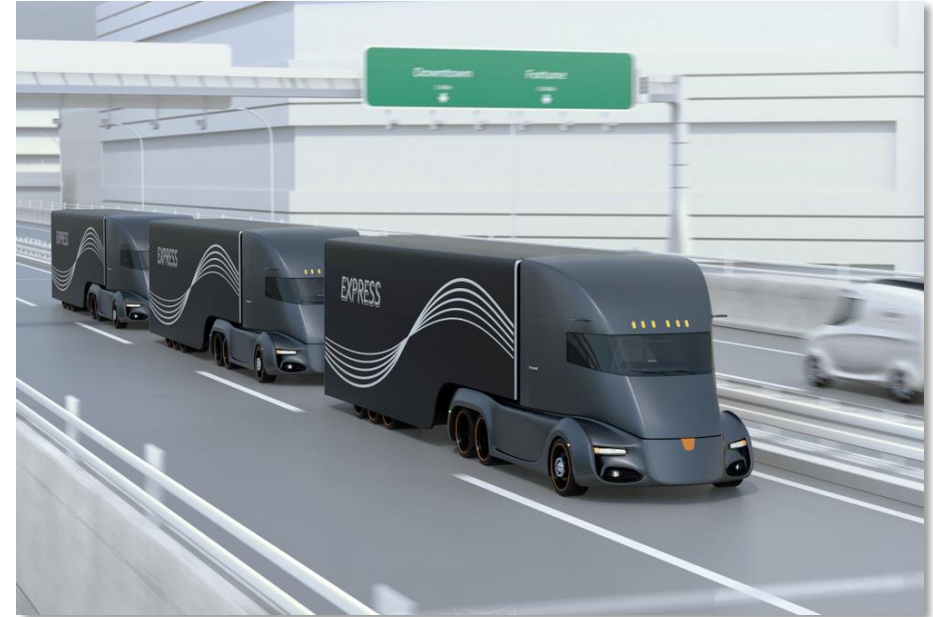
- driver cost
- driver/operator time limits
- driver breaks

Connected 3-truck platoons enable

- operating cost savings
- safety + emissions improvement

Why it matters

- “Same-day” deliveries - longer distance + lower cost
- Shift locations for warehouses + truck facilities

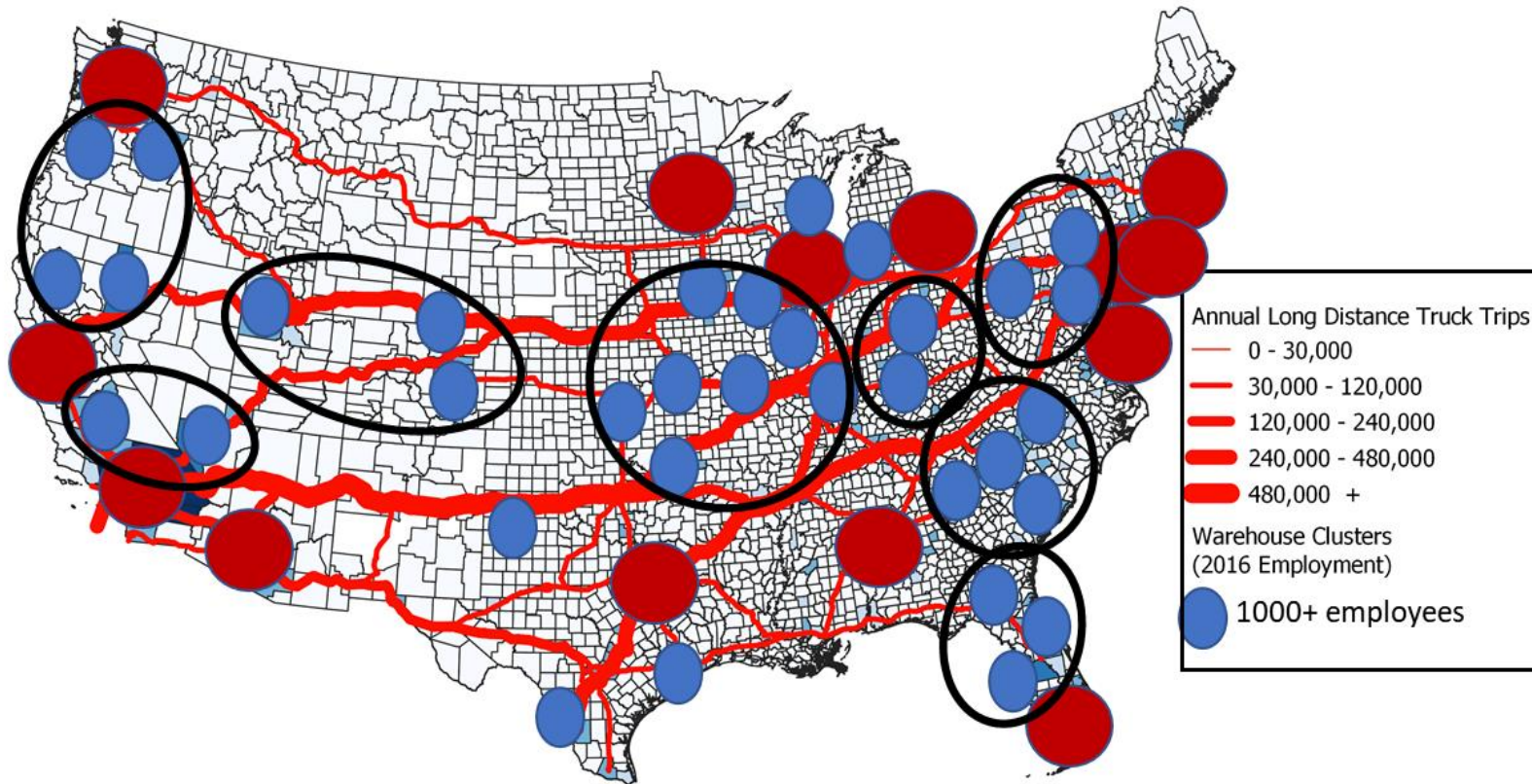


How Might Technology Disrupt Distribution Networks?

Warehousing Centers along Long-distance Truck Routes

Red = Largest Metro Areas

Blue = Regional Distribution Centers



CAVs Enable Longer Distance Deliveries

Most affected industries:

- Electronics
- Pharmaceuticals
- Instruments
- Machinery

Predictive future analytics courtesy of **TREDPLAN**

Planning Needs to Adopt a Risk-reduction Perspective

Unless we adequately
consider the future,
unanticipated
consequences are
inevitable



Final Thoughts



- **It is possible** to more effectively plan for the future
- We can identify and plan for the **broader consequences** of change and disruption
- Tools and methods are available to help us **allocate resources** with more confidence
- Understanding and analyzing the **linkage of freight to the economy** helps us manage future risk and uncertainty

Thank You