The New Industrial Geography

Bruce Katz, Founder, Nowak Metro Finance Lab, Drexel University
ROADMAP Summit
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DREXEL UNIVERSITY
Nowak Metro Finance Lab
Lindy Institute for Urban Innovation

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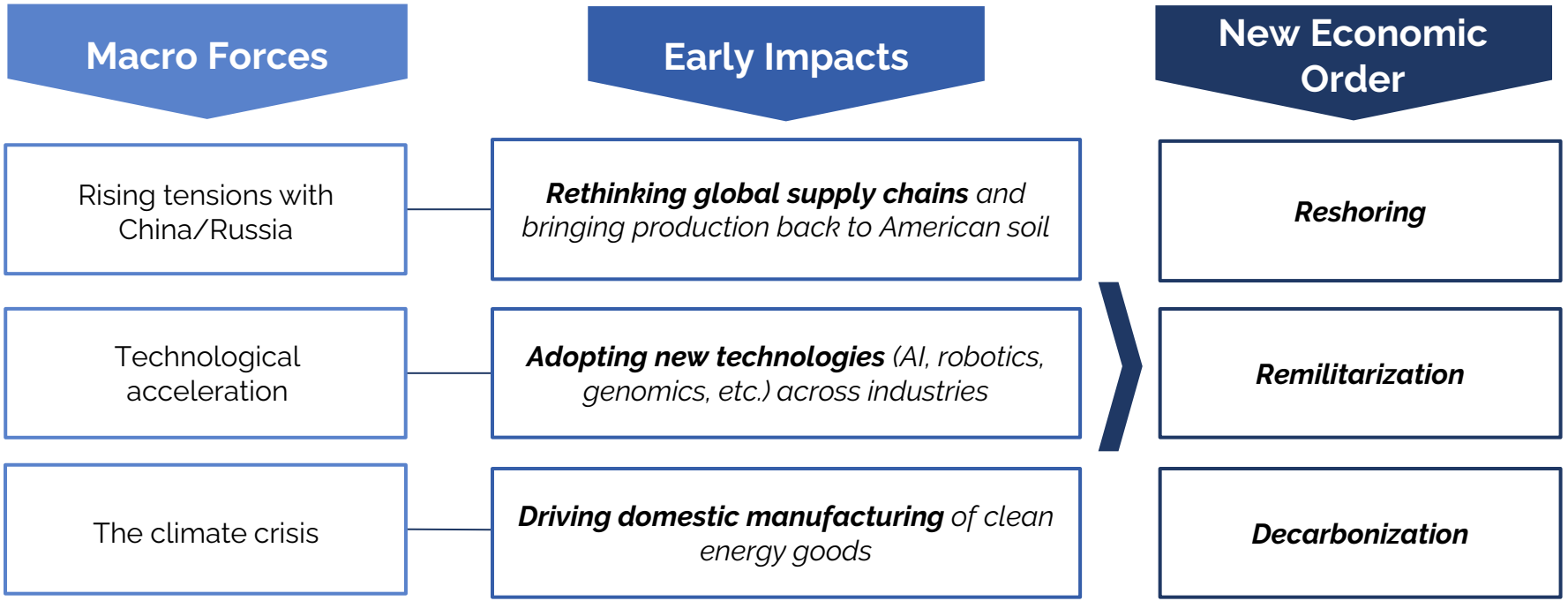
What Comes Next?

Macro forces combined with investment are driving a New Economic Order



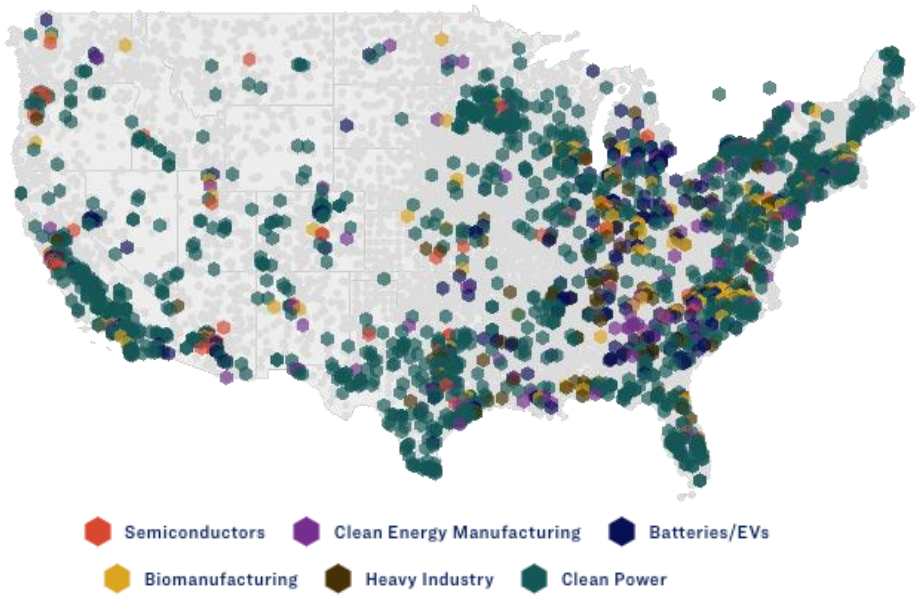
Source: The New Localism, https://www.thenewlocalism.com/newsletter/the-new-industrial-geography/

Unprecedented federal funding is undergirding the U.S. economic transformation

To seize this opportunity is crucial to break away from the crowd and embrace a programmatic assessment approach.

Private investments are reinforcing the existing pattern of industrial dispersion across the country

Private investments in selected industries (2021-2024)



Public investments via IRA and CHIPS have spurred private sector investments of over **$988 billion in hundreds of projects nationwide.**

These investments concentrate in industries that will boost U.S. competitiveness, strengthen supply chains, and help build a clean energy economy:

- **$446B** in Semiconductors & Electronics
- **$184B** in Clean Power
- **$180B** in EVs & Batteries
- **$84B** in Clean Energy Manufacturing & Infrastructure
- **$48B** in Heavy Industry
- **$46B** in Biomanufacturing

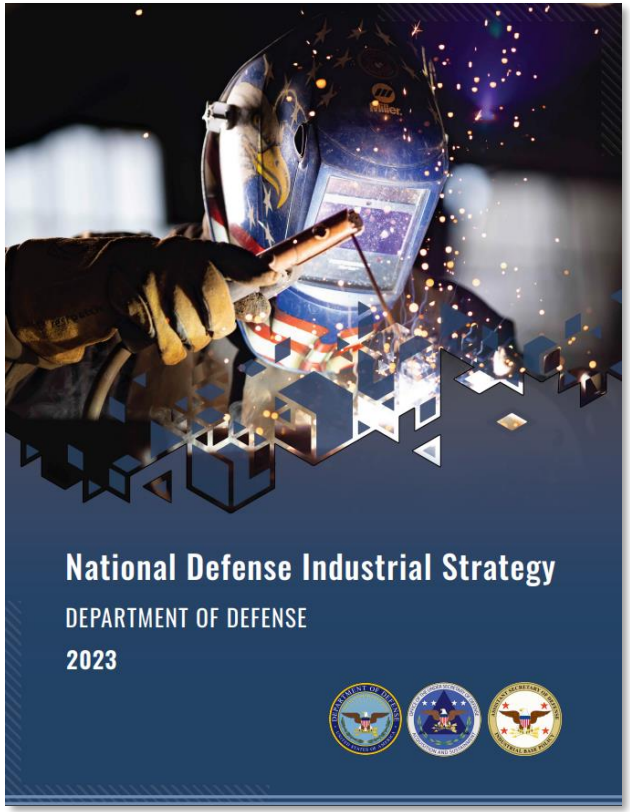
Source: White House. (n.d.). Retrieved on November 25, 2024 from https://www.whitehouse.gov/invest/

This reindustrialization is coming to ground across multiple geographies through production nodes and innovation hubs

Reindustrialization is forging a **new industrial geography** by creating and reactivating hubs of production.

Innovation hubs bring together disparate players to **invent, test, adapt and prototype** a broad range of solutions across multiple dimensions, specialized sectors, and stakeholder

This reindustrialization requires a new ecosystem



"We need to build a **modernized industrial ecosystem** that includes the traditional defense contractors – the primes and sub-tier defense contractors who provide equipment and services – and also includes **innovative new technology developers**; academia; research labs; technical centers; manufacturing centers of excellence; service providers; government-owned, contractor-operated (GOCO) facilities, and **finance streams**, especially private equity and venture capital." (NDIS, p. 9)

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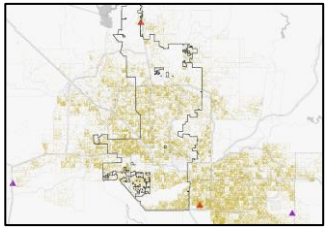
Mega forces are driving a new geography of production

Inter Metro

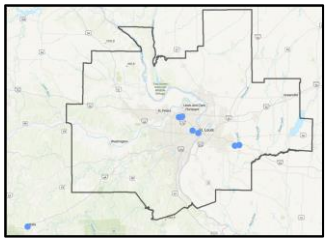
Macro forces are enabling an expanded group of metropolitan areas to participate in the new industrial economy.

Intra Metro



Metro areas have both innovation hubs in urban cores and new industrial facilities located on the periphery.

Metro Region

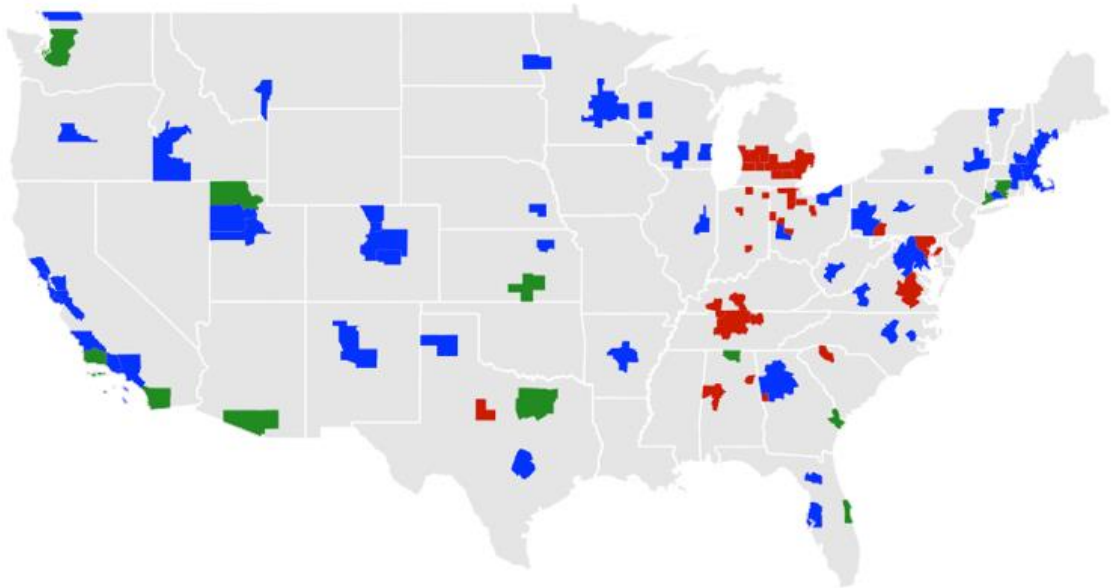


Reshoring of advanced production is forcing collaboration beyond the borders of metro areas to meet workforce, energy, supplier, and R&D demands.

Inter Metro: High-tech manufacturing hubs have historically been distributed across metros

Metros with high specialization employment in advanced manufacturing industries

High-technology manufacturing specializations are scattered in different regions: 51 MSAs specialize in **IT**, 31 in **Automotive** 12 in **Aerospace** & **Defense**.



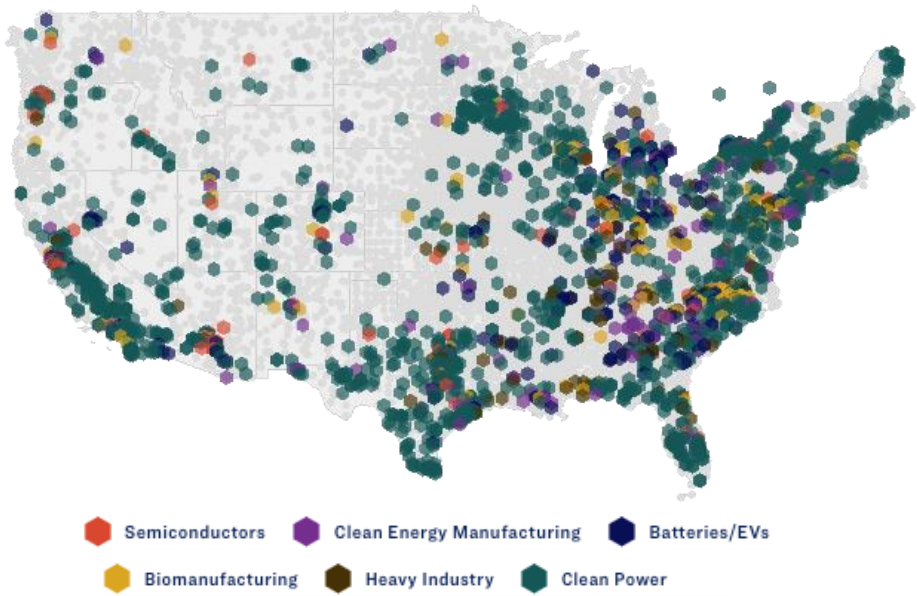
Cluster:	Aerospace Vehicles & Defense	Automotive	IT
Total MSAs	12	31	51

The locational differences between high-technology industries suggest that the industries **have very different skill, R&D, or supply chain needs that keep them apart.**

Notes: For metros specialized in more than one industry (four in total), the industry with the highest location quotient was selected
Source: Nowak Metro Finance Lab with data from U.S. Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School.

Inter Metro: Private investments are reinforcing the existing pattern of industrial dispersion across the country

Private investments during current administration in selected industries.



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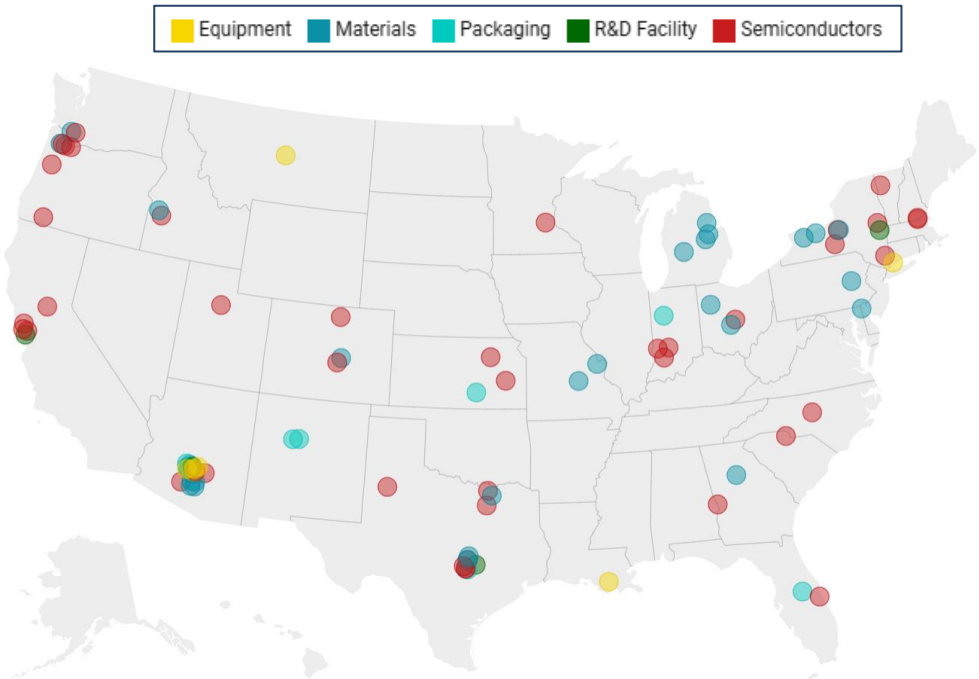
Inter Metro: Private investments to boost U.S. manufacturing capacity in the semiconductor supply chain have been predominantly focused on 5 states

Semiconductor industry supply chain investments:

- This map represents nearly **$450B in private investments** in 90 projects across 28 states
- **Arizona, Texas, New York, Ohio, and Oregon** account for 85% of semiconductor supply chain manufacturing investments.

	Category	Investment	Jobs	Projects
	Equipment	$455M+	2,100+	8
	Materials	$10.7B+	5,300+	31
	Packaging	$15.2B+	6,600+	6
	R&D Facility	$14.3B+	3,200+	3
	Semiconductors	$407.7B+	41,000+	42

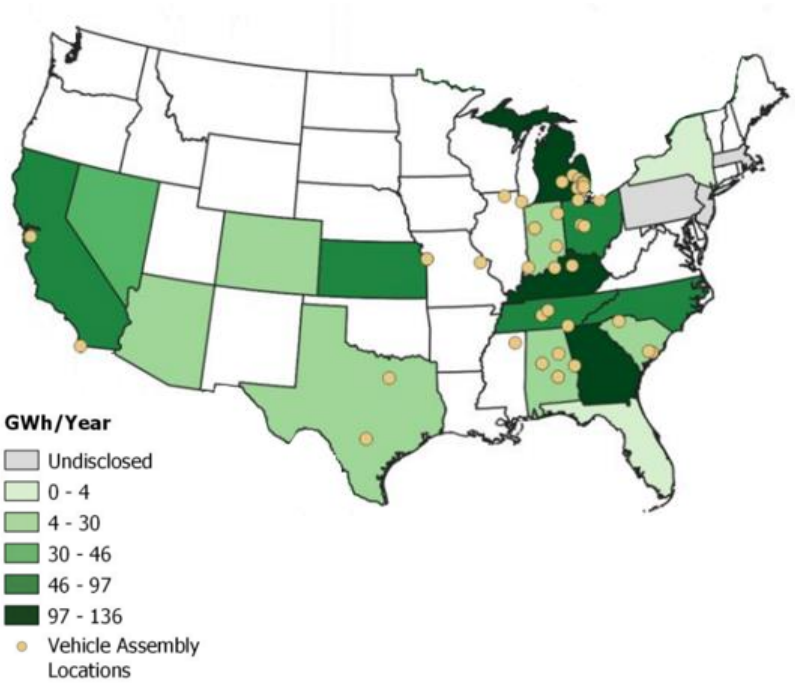
Semiconductor supply chain manufacturing investments (May 2020 – August 2024)



Source: Semiconductor Industry Association. Retrieved on November 25, 2024, https://www.semiconductors.org/the-chips-act-has-already-sparked-200-billion-in-private-investments-for-u-s-semiconductor-production/

Inter Metro: For EVs and batteries, investments to boost domestic mfg. concentrate along a north-south band from Michigan to Alabama

Planned battery plant capacity in the U.S. by 2030
(Based on 2021 Estimates)



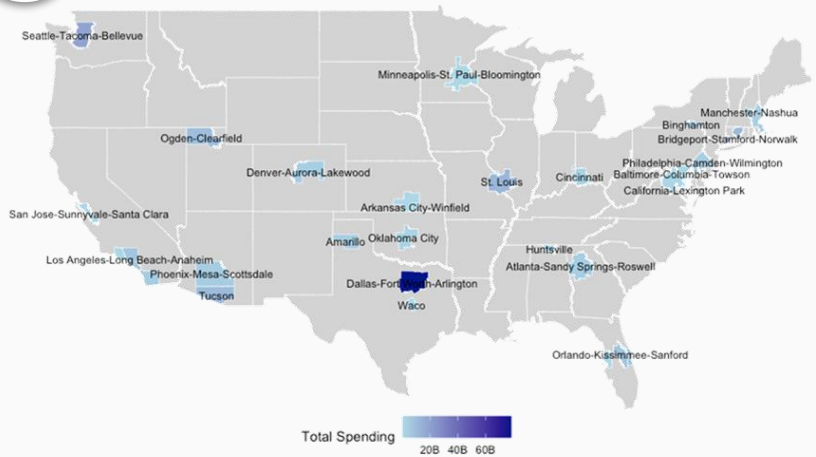
- DOE's investments in R&D have driven domestic battery manufacturing and supply chain investments, reaching a total of **$90B** and **creating over 60K jobs.**
- To optimize supply chain logistics, many **battery plants** will co-locate with automotive plants, concentrated along a north-south band from **Michigan to Georgia.**
- **Kentucky, Tennessee, Georgia, and Michigan** will see the highest growth in **battery mfg. capacity,** with Ford, SK Innovation, and LG Energy Solutions investing in these areas.

Source: North American Lithium-Ion Battery Manufacturing Capacity and Supply Chain Analysis, Argonne National Laboratory. Investments in American-Made Energy, U.S. Department of Energy.

Inter Metro: The industrial bases for aerospace manufacturing and submarine production are highly concentrated

Total Spending of DoD Manufacturing Contracts Over $250M in Strategic Industries by Metro Area (2021–2024)

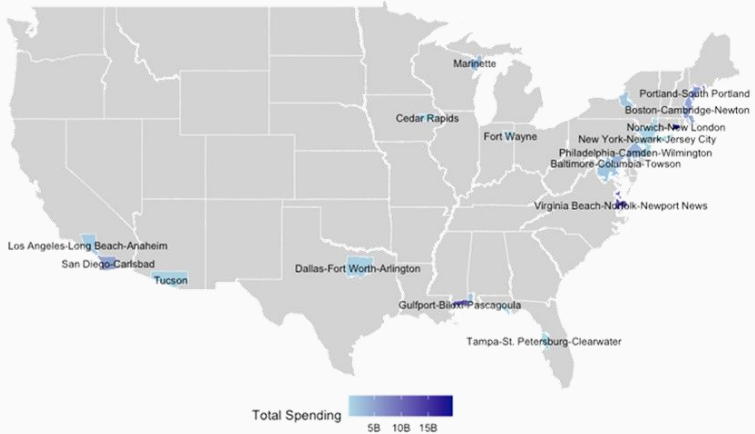
Aerospace Manufacturing



Key Players

Top 3 Metros	Dallas-Fort Worth-Arlington ($78.3 billion); Seattle-Tacoma-Bellevue ($18.6 billion); St. Louis ($11.96 billion
Top 3 vendors	Lockheed Martin, Boeing, and RTX (concentrate 67% of all. Spending)

Submarines and Naval Boat Building



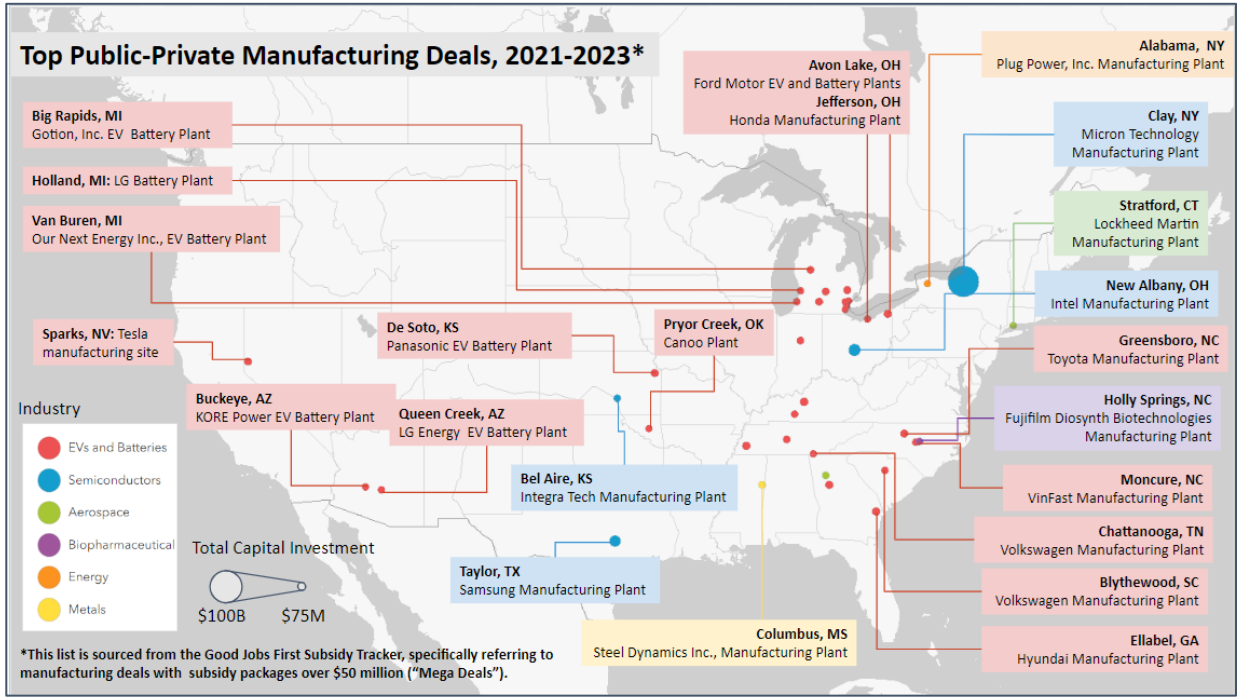
Key Players

Top 3 Metros	Norwich-New London ($19.5 billion); Virginia Beach-Norfolk-Newport News ($12.3 billion); Gulfport-Biloxi-Pascagoula ($11.96 billion);
Top 3 Vendors	Huntington Ingalls, Electric Boat, and Raytheon (concentrate 62% of spending)

Note: Aerospace spending covers NAICS codes for aircraft, missile, and engine manufacturing. Submarine spending includes shipbuilding, navigation systems, and boat manufacturing NAICS codes.
Source: Nowak Metro Finance Lab (2024) based on USASpending.

Intra Metro: The manufacturing boom is highly distributed, lending itself to industrial sprawl beyond urban centers.

Major facilities receiving public funding in the last two years are emerging in suburban and rural towns. Most of the plants **(95%) on this map are *not* within the largest city of their Metropolitan Statistical Area.**



Industry Sprawl Challenges

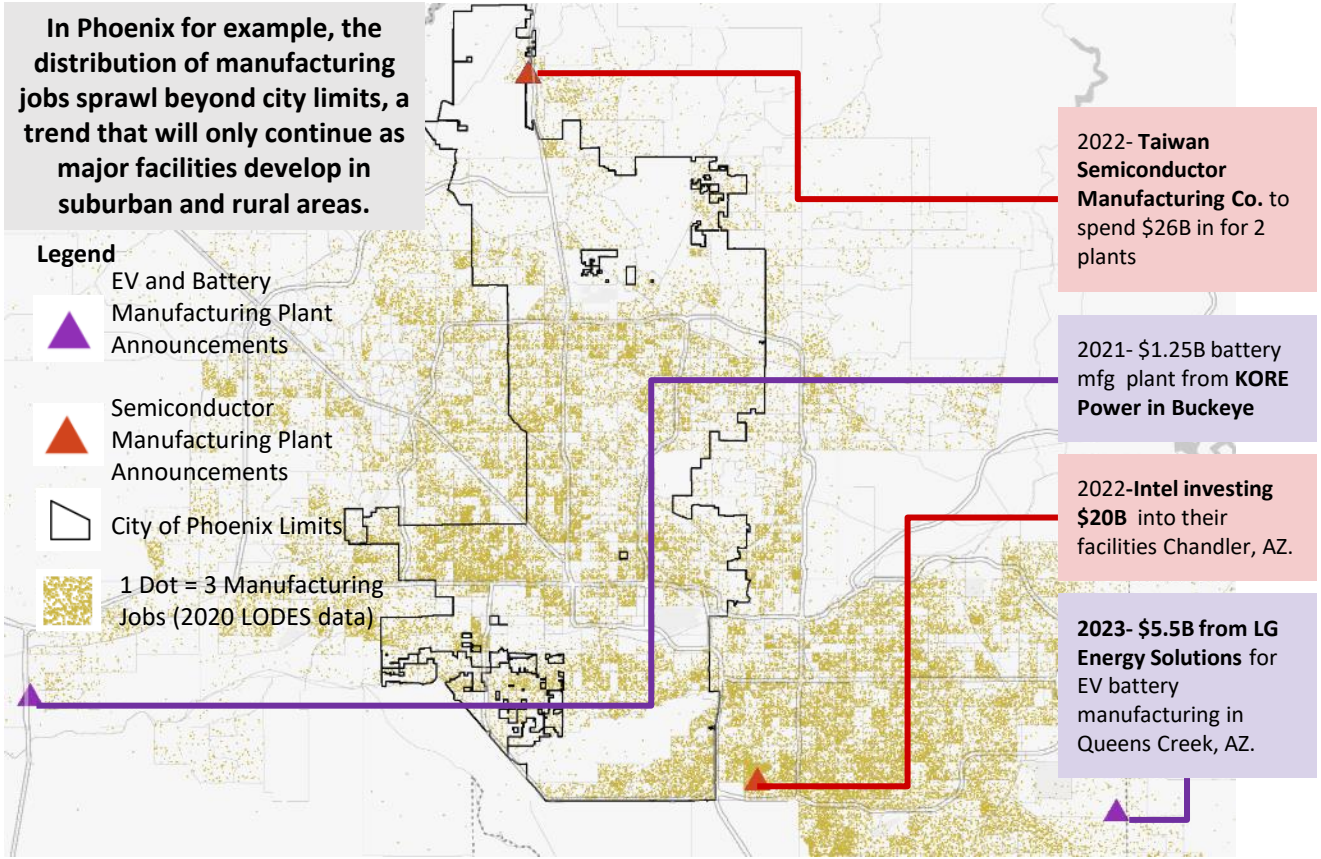
Facilities far from suppliers

Facilities far from universities and other anchor institutions

Source: Nowak Metro Finance Lab with data from Good Jobs First

Intra Metro: In Phoenix, manufacturing job hubs locate at the periphery of the metropolitan area

In Phoenix for example, the distribution of manufacturing jobs sprawl beyond city limits, a trend that will only continue as major facilities develop in suburban and rural areas.



2022- **Taiwan Semiconductor Manufacturing Co.** to spend $26B in for 2 plants

2021- $1.25B battery mfg plant from **KORE Power in Buckeye**

2022-**Intel investing $20B** into their facilities Chandler, AZ.

2023- $5.5B from LG Energy Solutions for EV battery manufacturing in Queens Creek, AZ.

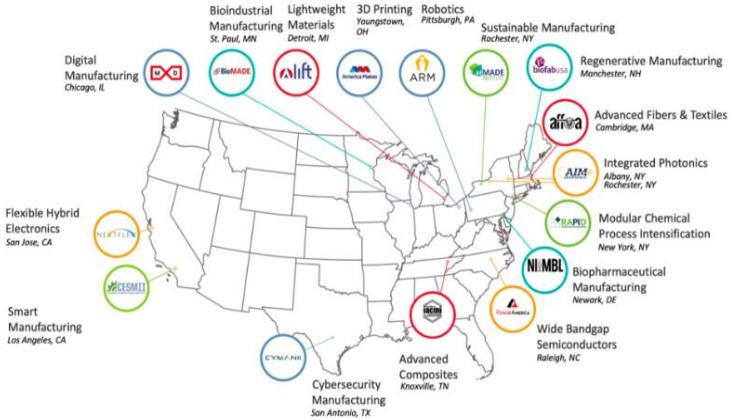
Spatial Mismatch Challenges

- Workers facing long commutes
- Training centers far from minority workers

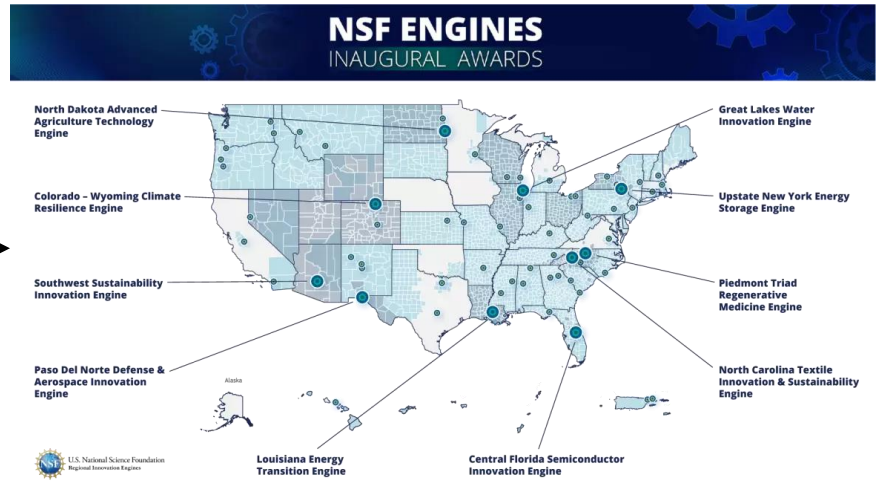
Source: Nowak Metro Finance Lab; Data on manufacturing jobs from 2020 LEHD Origin-Destination Employment Statistics; Plant sites identified from Good Jobs First Subsidy Tracker

Intra Metro: Many R&D assets concentrate in city centers and around universities

DOD's Manufacturing Innovation Institutes (MIIs):
67% of them are within the largest city of their MSA



Role for cities: Ground dispersed industries
Cities must position themselves as the leading centers for next-generation industry clusters by evaluating and leveraging their unique urban assets.



NSF Engines and Build Back Better awardees are leveraging ecosystem assets

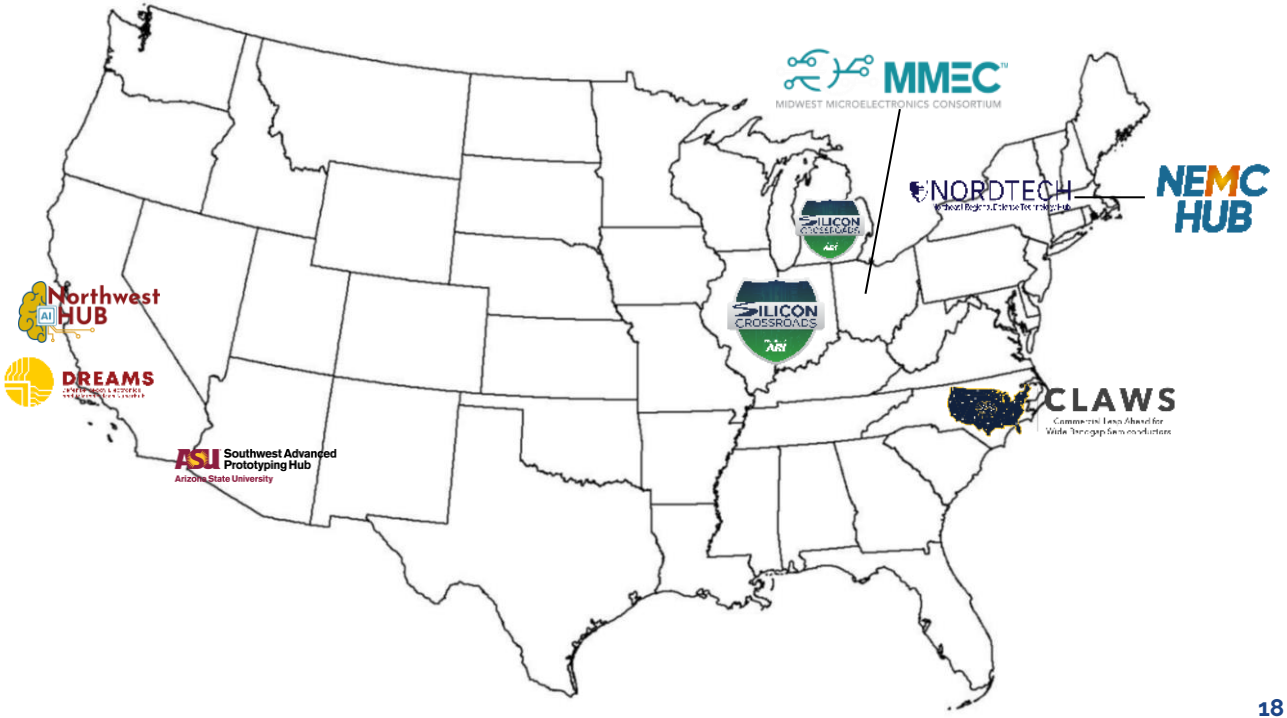
Source: Department of Defense. DoD Public-Private Partnerships Focus on Manufacturing Innovations to Fight COVID-19 and Build the Industrial Base.

Intra Metro: The CHIPS Act funded Microelectronic Commons program is designed to accelerate domestic prototyping and grow the pipeline of U.S.-based semiconductor talent

Hubs support these 6 technology areas

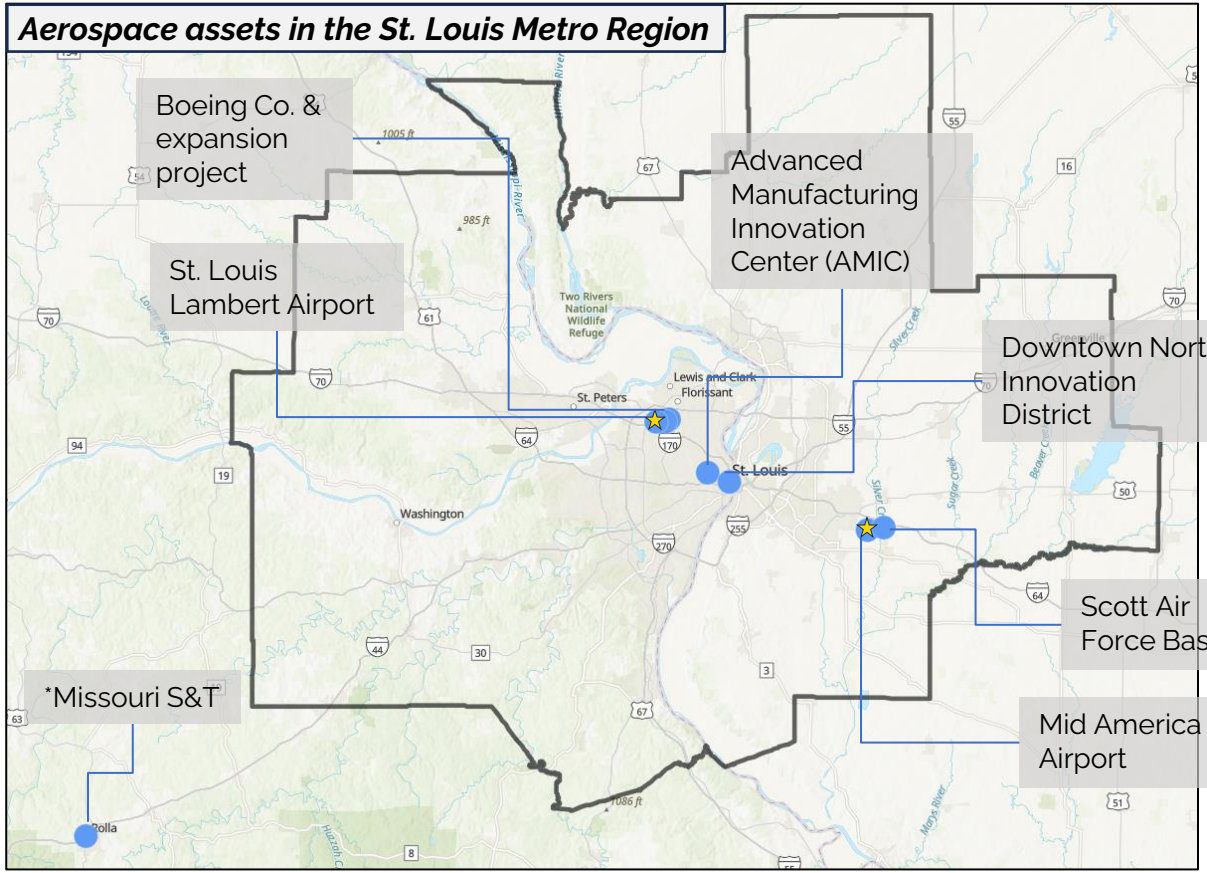
- 5G/6G Technology
- Artificial Intelligence Hardware
- Commercial Leap-Ahead Technologies
- Electromagnetic Warfare
- Secure Edge/IoT Computing
- Quantum Technology

DoD designated 8 regional hubs



Source: https://microelectronicscommons.org/

Metro Region: In St. Louis, the R&D hub is in the city, production facilities are in the suburbs, and the major public science university is outside the metro



Role for cities: Organizing disparate actors

- Industrial ecosystems are not confined by boundaries
- Metros need to organize stakeholders around their niche

Aerospace Research & Production

Airports

St. Louis MSA Boundary

A handful of metros are making the most of this unexpected moment by leveraging their position in the New Economic Order

Military Metros

St. Louis stands out as a military metro with Scott Air Force Base, the National Geo-Spatial Intelligence Agency, and the presence of Boeing. In FY2021, the metro received $11.4B in defense-related spending.

New Technology Hubs

Metros like Columbus, Ohio have successfully attracted major multinational semiconductor companies and related supply chain firms. The $20B Intel Plant in Ohio could become the largest chip plant in the world.

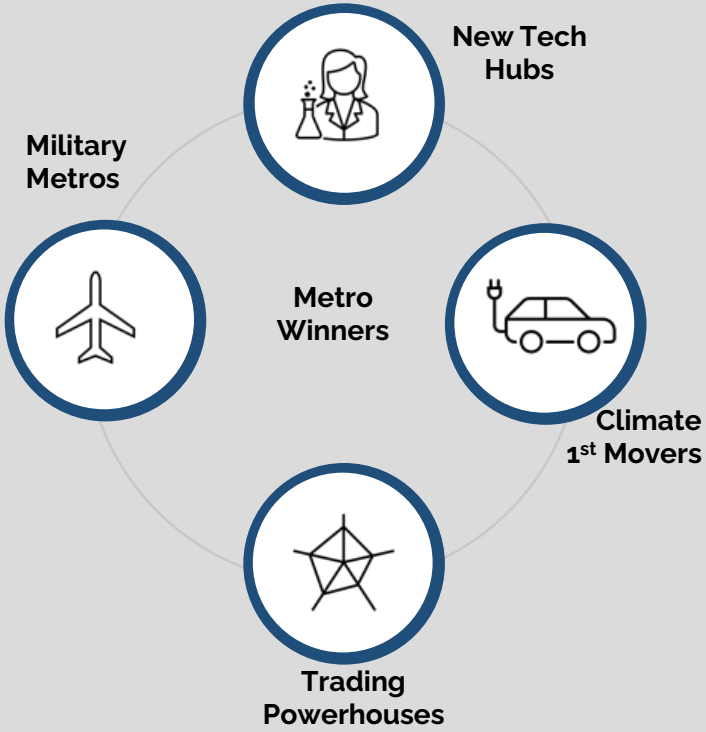
Climate First Movers

The Norfolk and Hampton Roads region is leading in offshore wind through the Dominion Energy Coastal Virginia Offshore Wind (CVOW) project. There are currently two wind turbines in operation that avoid up to 25,000 tons of carbon dioxide emissions annually. The project will provide renewable zero-carbon energy to as many as 660,000 customers when completed in 2026.

Trading Powerhouses

The Borderplex region, encompassing Juarez, Mexico; El Paso, Texas; and Las Cruces, New Mexico boasts the fifth-largest manufacturing hub in North America by employment, accounting for 17% of U.S.-Mexico trade. This bi-national metropolis is diversifying beyond resource extraction to food, clothing, electronics, medical equipment, aerospace, defense production, and other sectors.

Common Trends Across Metro Winners



Clear sense of economic position
Metro winners conduct a thorough assessment of their local economic environment, encompassing competitive advantages, federal assets, R&D capabilities, infrastructure, industry hubs, supplier networks & workforce development pools

Strong project-focused collaboration across public, private and civic sectors
Metro winners promote collaborative efforts involving investors, utilities, manufacturers, local and state officials, and philanthropy to attract investment.

Well resourced business/civic leadership groups
Metro winners invest in organizations that support their region's transition, emphasizing local projects with significant impact.

State engagement and backing
Metro winners benefit from states that support productive projects by offering financial incentives, streamlining regulatory processes, investing in infrastructure, fostering collaboration with diverse stakeholders, and providing access to state-level resources and programs.

Source: New Localism Associates.

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What Comes Next?

Metros need to adapt to these mega forces, understand their starting points to design and deliver strategies to maximize inclusive growth

Metros can:

- **Align federal investments** with distinctive aspects of a community
- **Layer investments** in same geography
- **Leverage** private, public, and civic resources

Are **Horizontally Integrated**

Metros

Have **Market Relevance**

Metros:

- Have **disproportionate economic impact**
- Are on the **front lines** of economic shifts
- Have considerable **spending power**

Have **Networked Power**

Metros have:

- **Multiple layers of power** and authority
- **Bring together** public, private, and civic leaders

Metros can "think like systems and act like entrepreneurs"

-Matthew Taylor, former head of the Royal Society of Arts

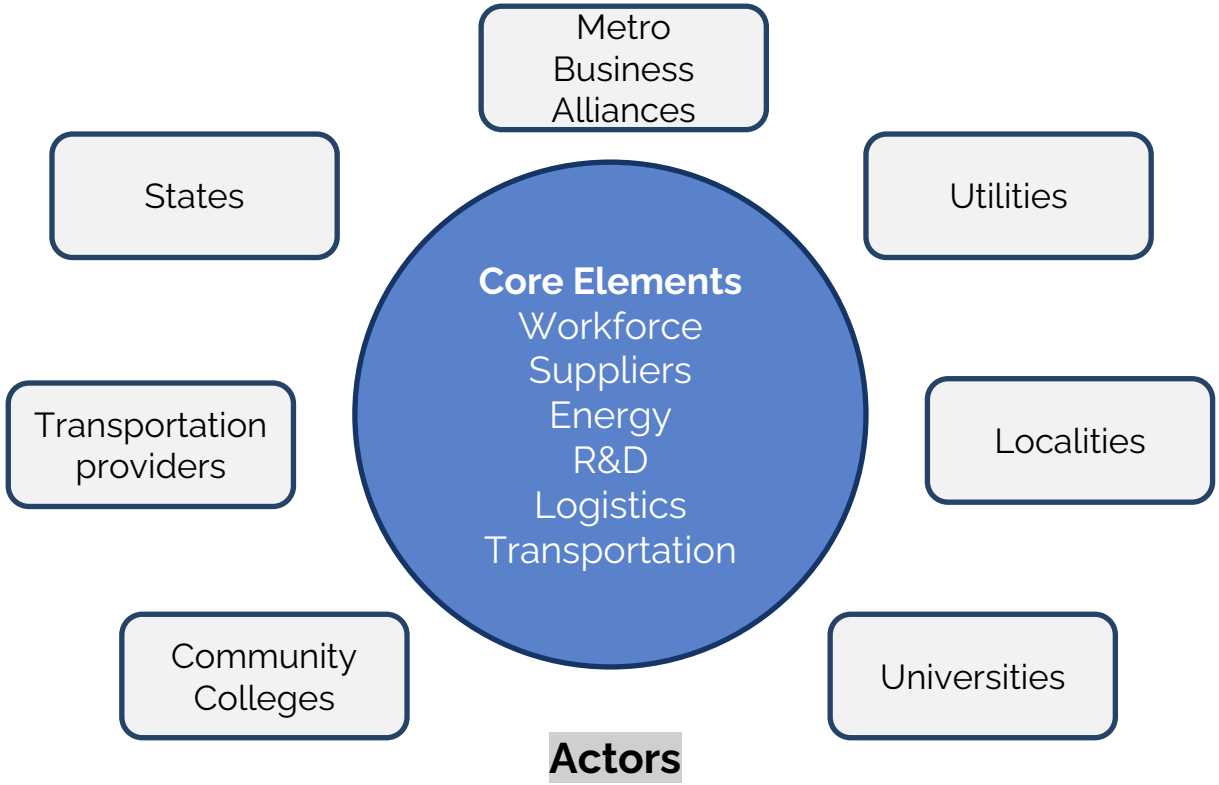
*"**Power is shifting** downward from national governments to cities and communities; horizontally from the public sector to networks of public, private and civic actors; and globally along circuits of capital, trade, and innovation.*

***New Localism** is the twenty-first century's means of solving the problems characteristic of modern life."*

-The New Localism, Bruce Katz and Jeremy Nowak

Source: New Localism Associates.

To realize the full potential of the new industrial geography, metros need to align and leverage disparate parts of the ecosystem



A new kind of metro-led industrial governance is emerging

	1	2	3	4	5	6	7	8	9	10
Project	**Land Assembly**	**Large mfg. plants**	**Supply chain firms**	**R&D Hubs**	**Tech Innovation**	**Skilled workers**	**Worker Support**	**Logistics/ Transp.**	**Energy/ water**	**Digital**
Delivery Entities	Land banks	OEMs-states	Tier 1-2-3 suppliers	Advanced universities/ corporations	Tech transfer, incubators	Community colleges, K8-12	Housing Transit Childcare providers	MPOs, ports, airports, DOTs	Electric and water utilities	Corps, universities
Capital providers	Fed (DOE, EPA)/ state/ Muni Bonds	Fed/ state/ corps	Fed/state/ Banks	Fed (DOC, DOD)/state/ feds/corps	VC/ impact investors	Fed (DOL)/ state	Public, Private, Civic	US (DOT) state/ authorities	Fed (DOE, EPA)/ state/ City	Fed/ State/ corps
Example	Port Authority Industrial Revitalization in **Cincinnati, OH**	Intel – **Columbus, OH**	Supplier initiative in **El Paso, TX**	Advanced Mfg. Innovation Center in **St. Louis, MO**	1871, Independence Innovation Hub in **Chicago Il**	Northland Workforce Training center in **Buffalo, NY**	Affordable housing near Tesla's Gigafactory in **Austin, Texas.**	Offshore Wind port in **East Providence, RI**	Upgrades for TSMC in **Phoenix, AZ**	Mfg. Readiness Grants in **Indianapolis IN**
Governance	Consortia of public, private, and civic institutions to integrate/coordinate the design finance and delivery of certain elements of the industrial ecosystem**, e.g. CenterState CEO in Syracuse, NY**									

Source: Nowak Lab

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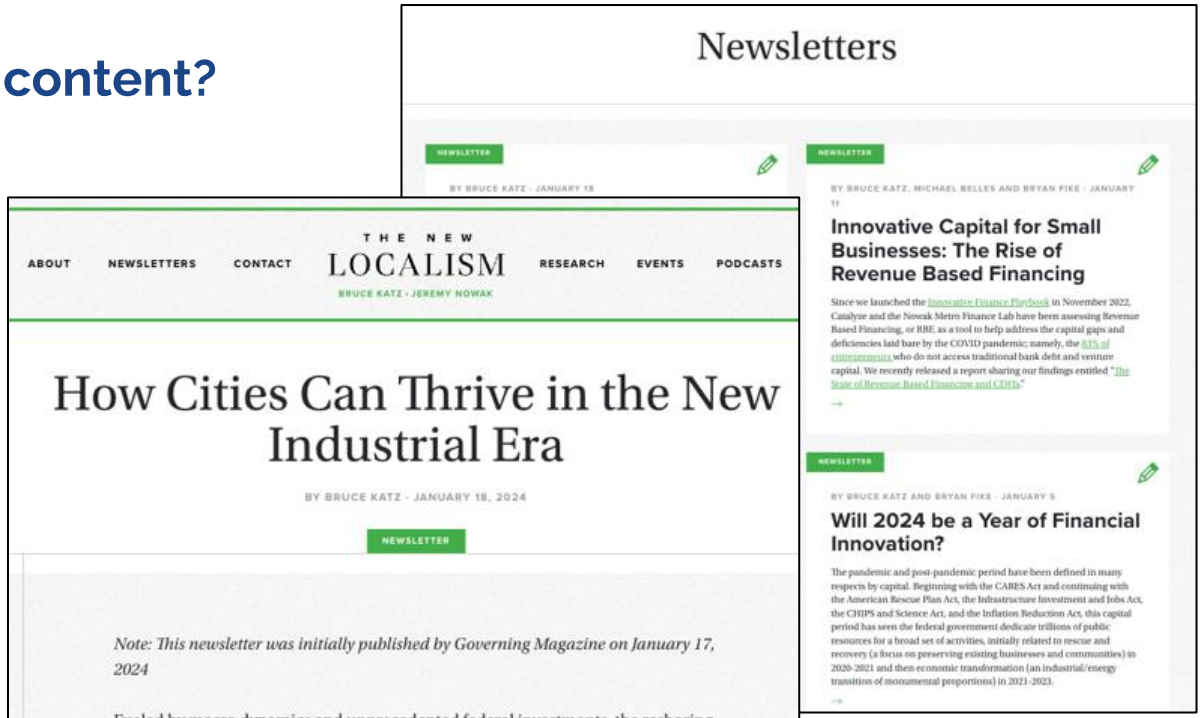

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