
Location Trends for the U.S. Auto Industry

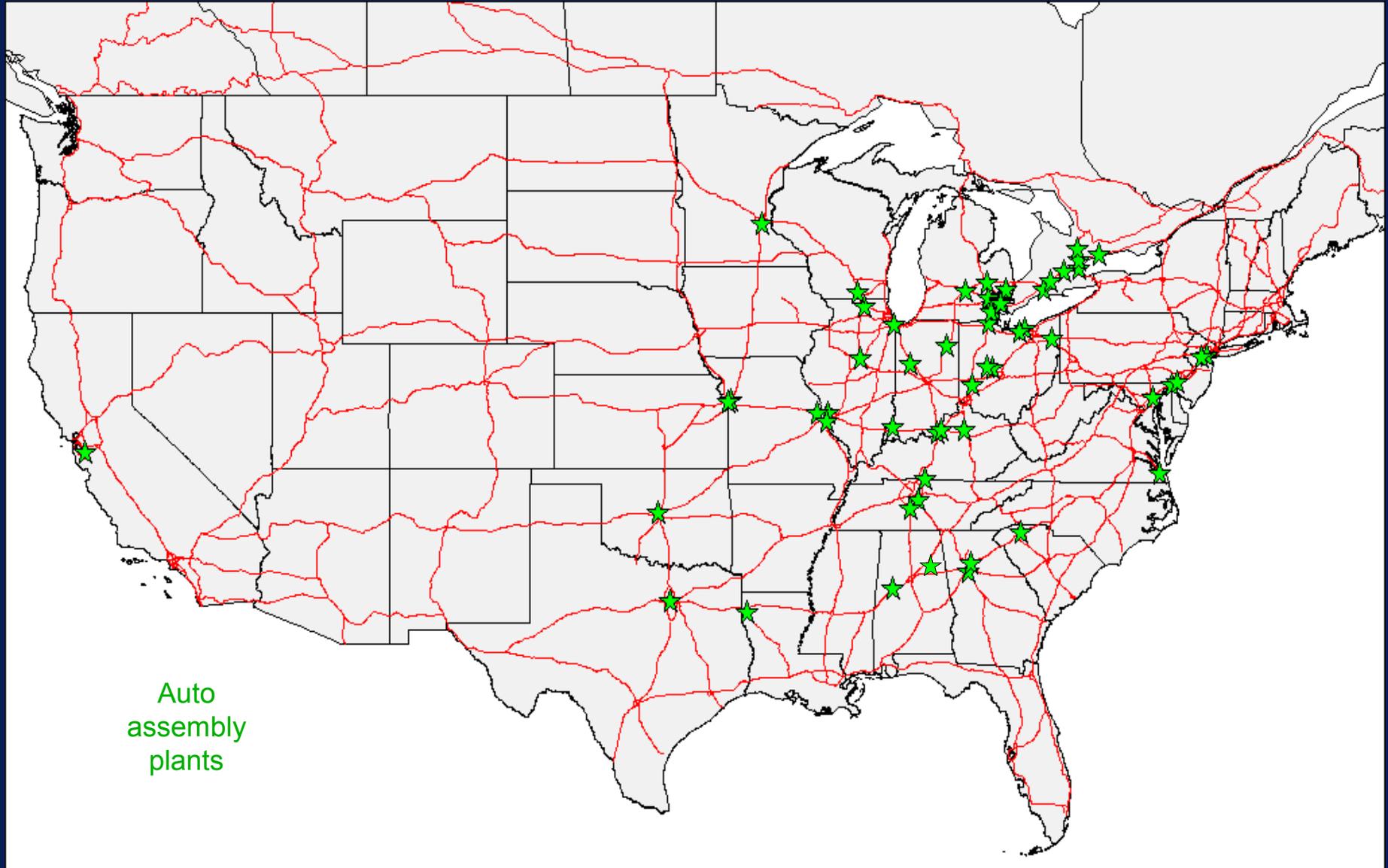
Geography of Auto Production-
Will Detroit Continue to be the Industry's Hub?
Detroit, Michigan
November 3, 2003

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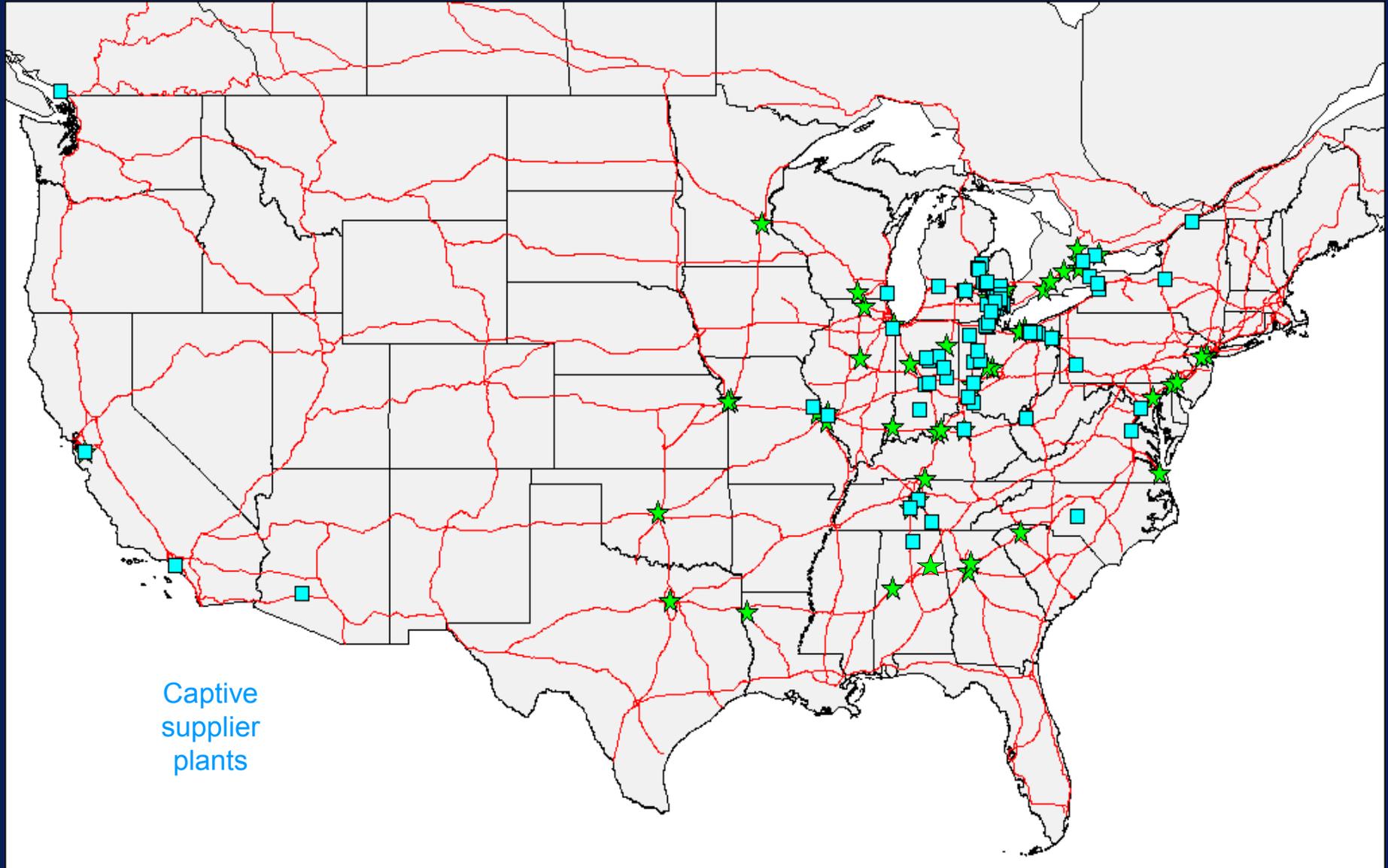
Outline

- **Geography of today's auto industry**
- **Looking back: How did we get here**
 - ◆ **assembly plants**
 - ◆ **supplier plants**
- **Looking ahead: Evolving location of industry**

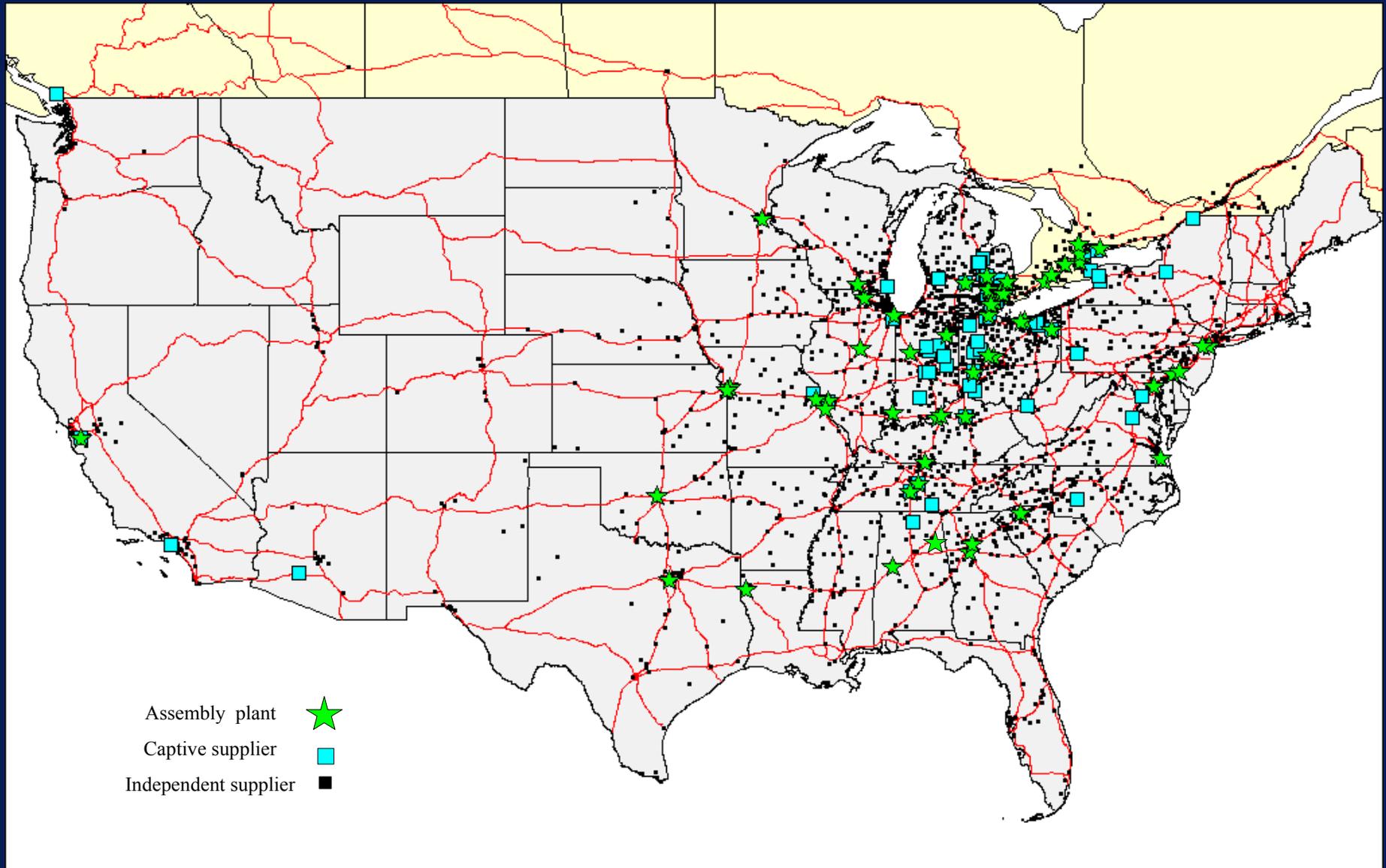
The Bird's Eye View: Assembly Plants



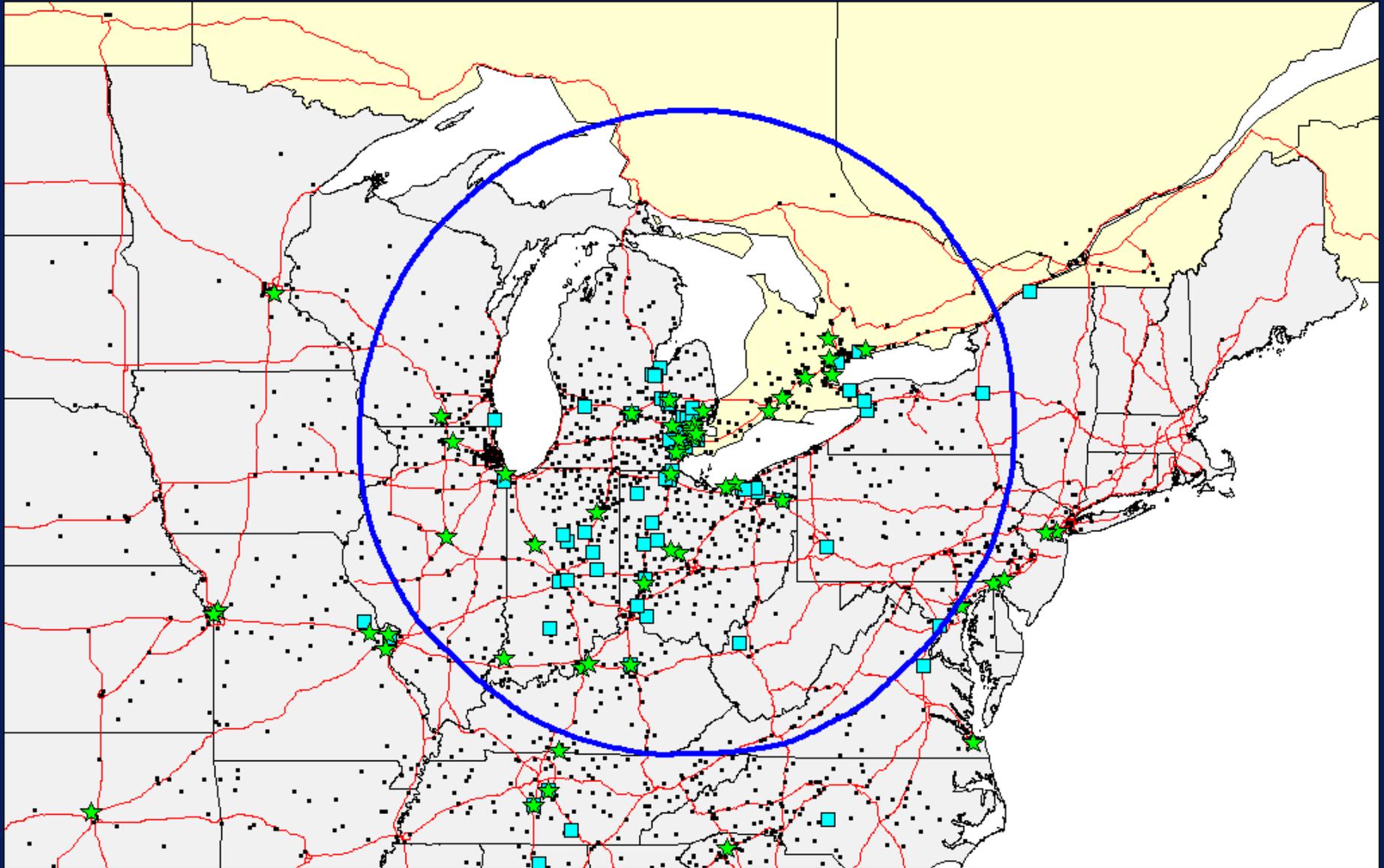
The Bird's Eye View: add Captive Suppliers



The Bird's Eye View: The Entire Industry



Zoom: Detroit Area as Hub of Auto Industry



In the Midwest, all roads lead to auto...

	Share of Plants within 400 miles of Detroit	
	U.S.	CDN
Assembly plants	58%	100%
Captive Plants	84%	91%
Tier 1 suppliers	65%	94%

Data analysis shows: Supplier networks are regional

Crucial: ability to deliver within a day

Assembly company	Number of suppliers	Median Distance	% < 100 miles	% < 400 miles
Honda	507	251	17	77
Toyota	452	285	10	76
A.-Alliance	360	242	29	65
Nissan	460	423	10	45
Saturn	300	477	8	35

Recap

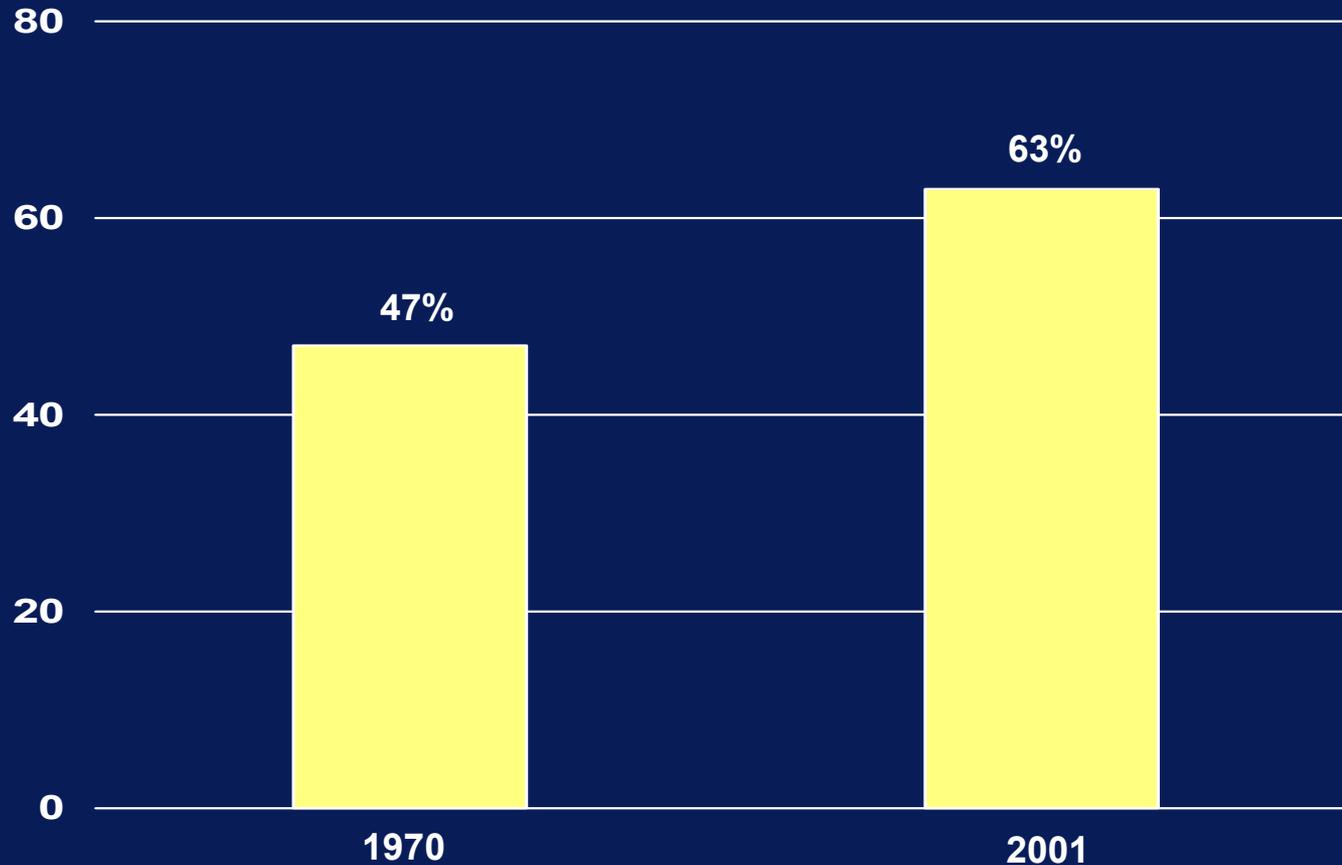
- **Today's auto industry is spatially concentrated**
- **The auto corridor extends north-south; reaches into Canada and Mexico**
- **Transportation infrastructure influences plant location**

Looking Back -- Assembly Plants

- **Increased fragmentation of light vehicle market impacts location choices of assembly plants**
 - ◆ **Central location again preferred due to economics of transporting final good to entire market**

Assembly Plants Re-Concentrate in Center

(Percent of light vehicle assembly plants in auto corridor -- WI, MI, IL, IN, OH, KY, TN)



Looking Back -- Supplier Plants (1)

- Long-term comparison reveals noticeable change in geography

From East-West to North-South in 55 Years

Distribution of Plants in SIC 3714

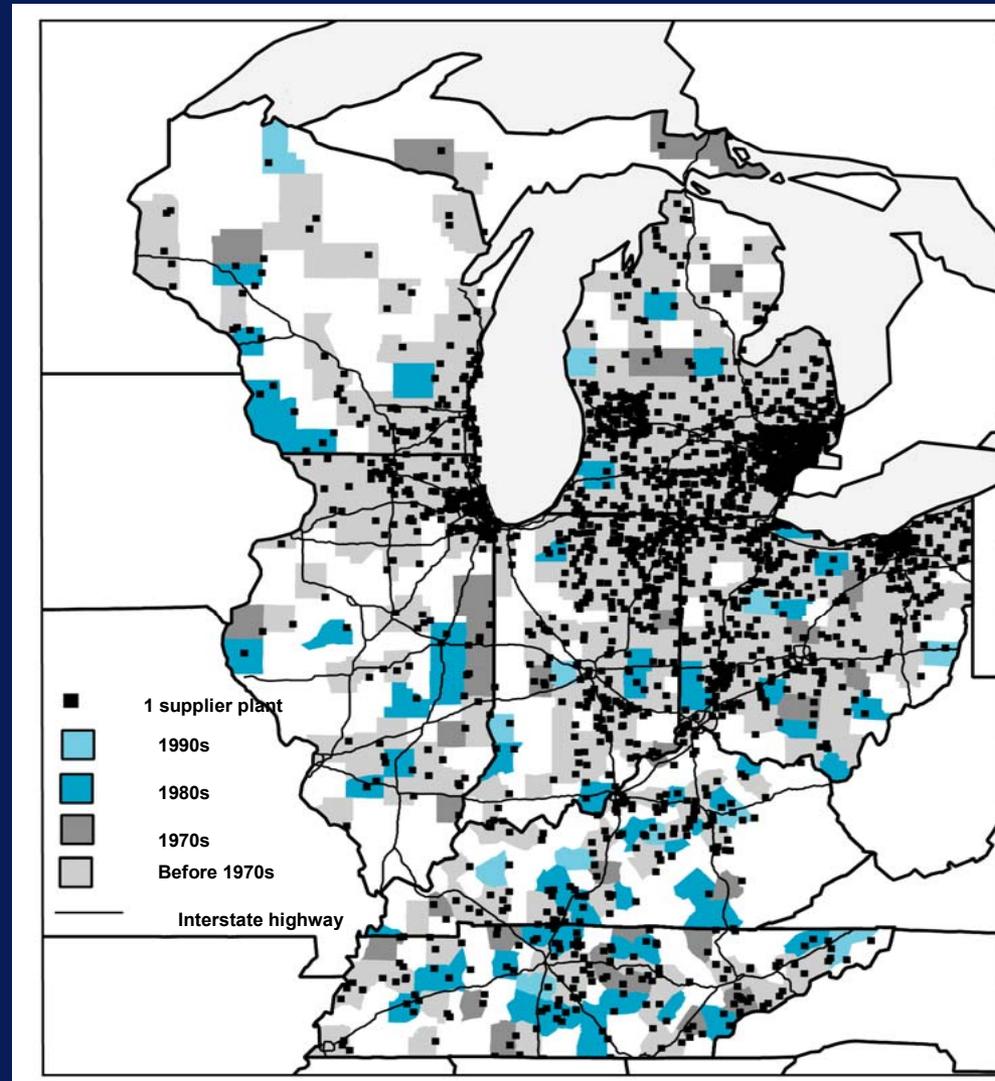
1937		1992	
MI	16%	CA	14%
CA	12%	MI	13%
NY	11%	OH	8%
IL	9%	IN	7%
OH	9%	TX	5%
PA	6%	IL	4%
IN	6%	TN	3%
	<hr/>		<hr/>
	69%		54%

Source: Census

Looking Back -- Supplier Plants (2)

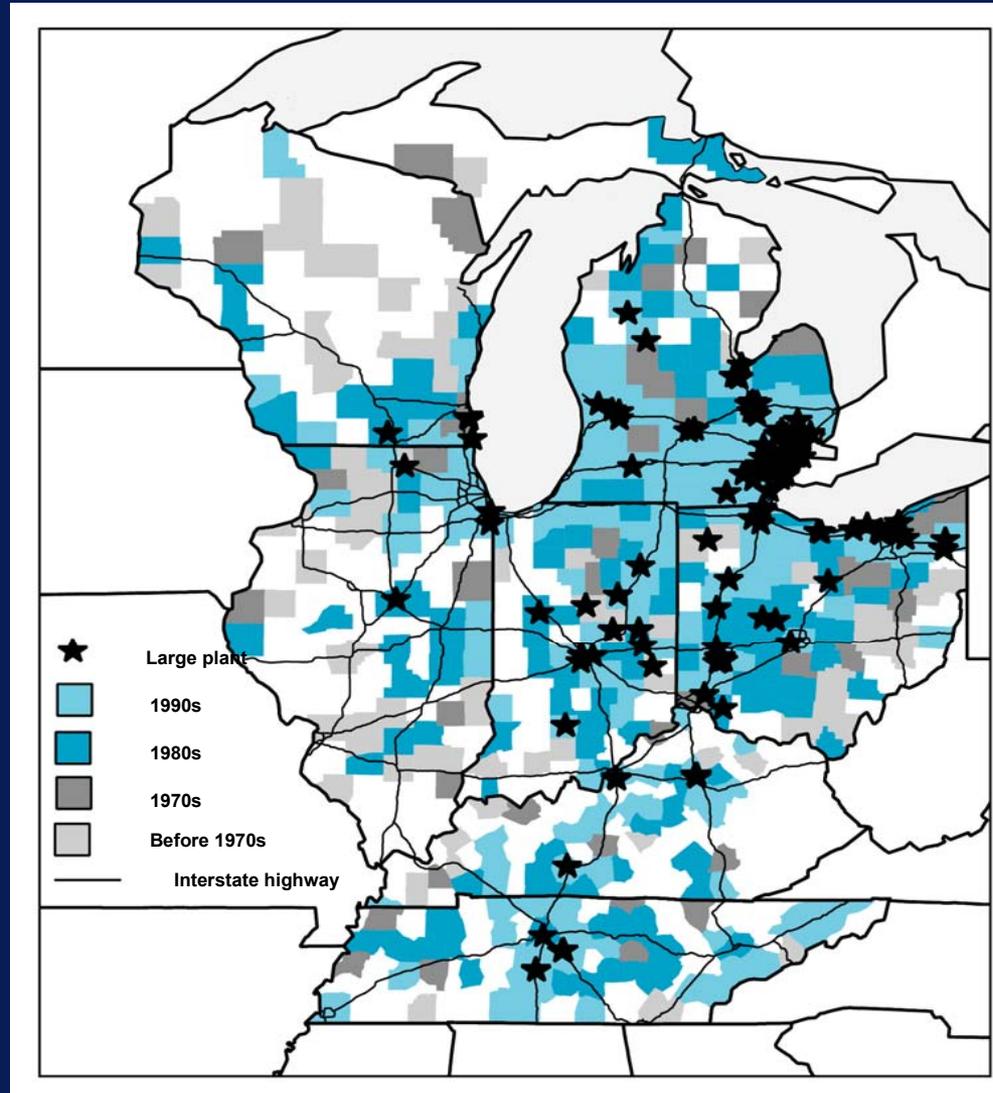
- **More recent trends: Where have new supplier plants located since 1980?**

Within Auto Corridor: More Rural/ Further South



County coded by
first year of entry

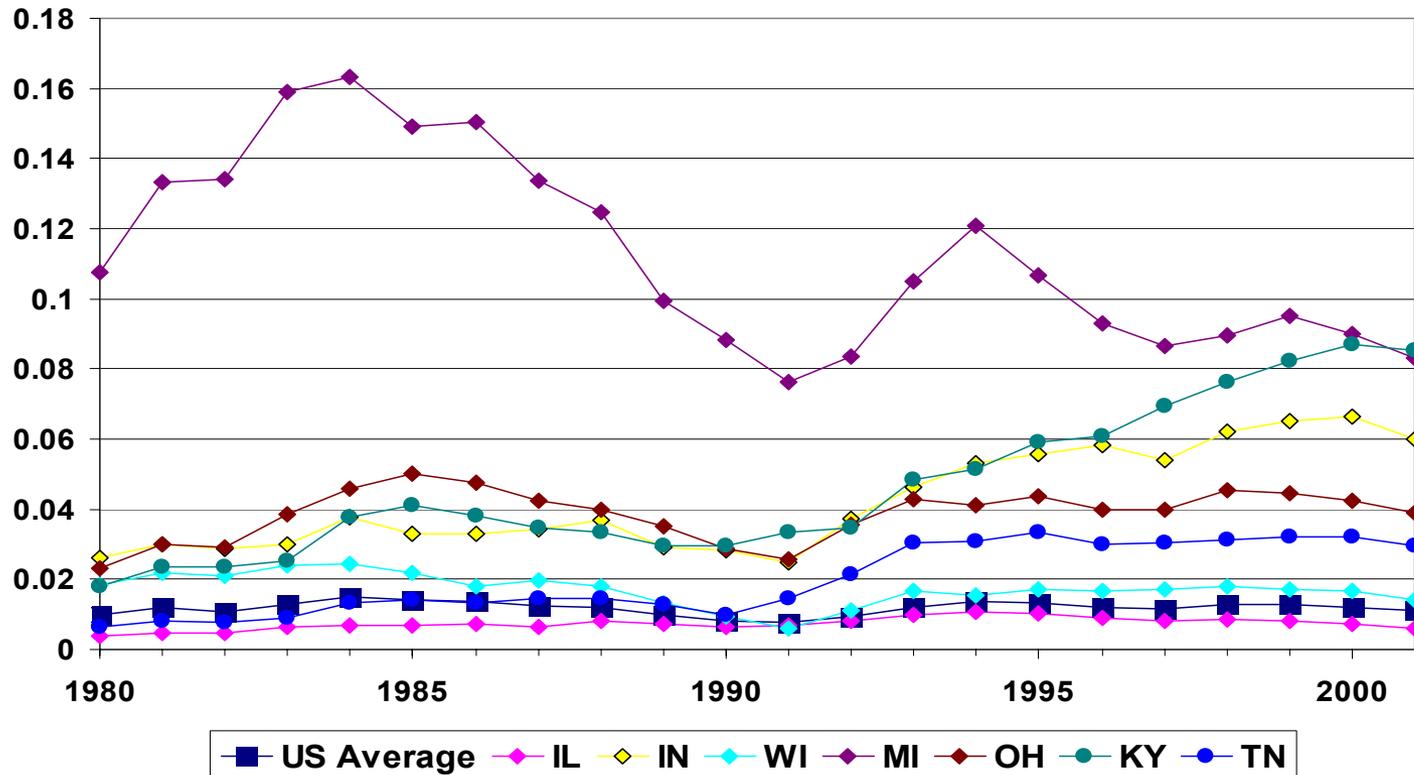
Yet: Hub of Industry Continues to Attract Plants



County coded by
last year of entry

On net: auto corridor has been extending south

Auto Share of Gross State Product by State



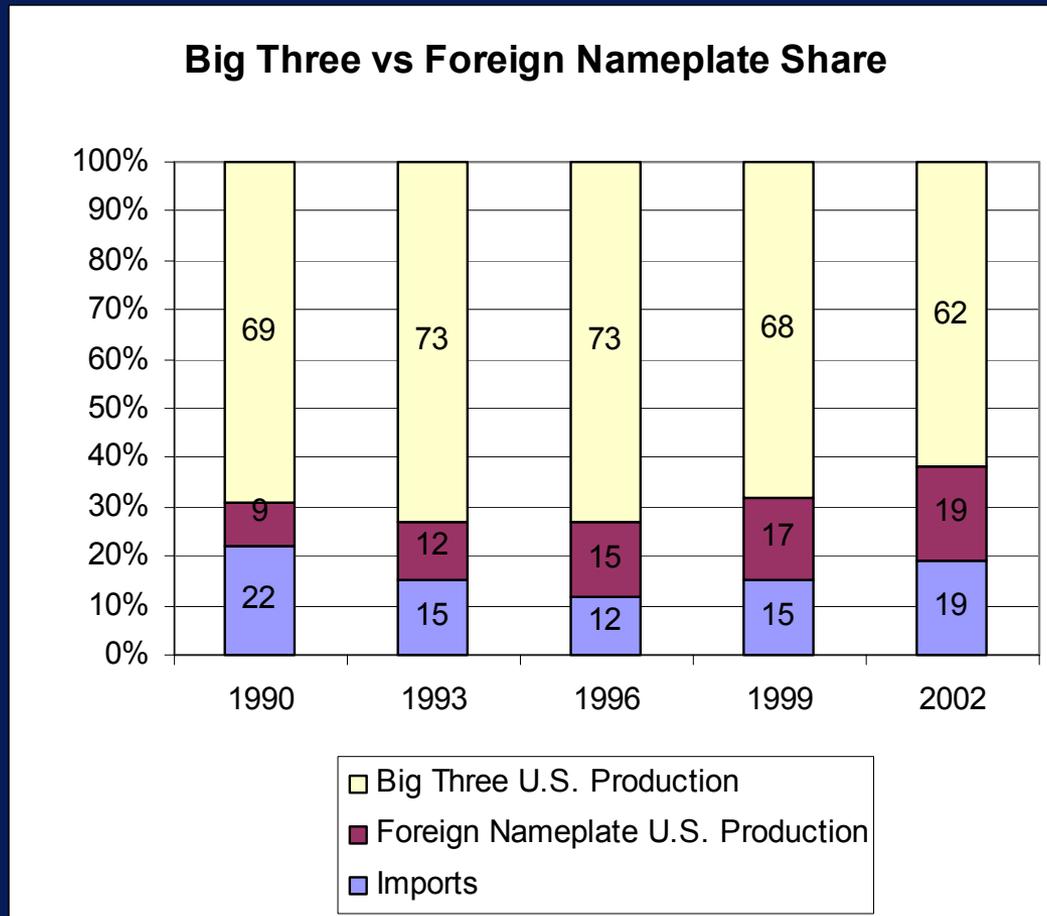
Looking ahead - Evolving location of industry

- **Border effect**
- **Location of assembly plants**
- **Location of supplier plants**

Proximity to border less advantageous since 9/11

- **Assemblers and suppliers are tightly linked across the U.S.-Canadian border. Yet physical movement of goods relies on few crucial border crossings. Ambassador Bridge alone is gateway for 27% of all US Canada US border traffic.**
- **Security measures implemented in light of 9/11 increased the potential for delay at the border and have raised costs across the supply chain.**
- **Bottom line: U.S. - Canada border now matters. Situation continues to be tenuous.**

Who is likely to reduce assembly capacity?



Source: Ward's
Automotive Yearbook

Assembly plant geography - recap

- **Big 3 dominate the northern end of the auto corridor (WI, IL, MI, IN, OH). Today over half of all US light vehicle assembly plants remain in that region - 81% of these are Big Three facilities. Southern end of auto corridor is home to about 20% of assembly plants, half of which are foreign producer facilities.**

Outlook for Supplier locations

- **Changing regional distribution of assembly facilities matters**
- **Supply chains are regional, yet distance to customer assembly plants matters**
- **Supplier location choices influenced by:**
 - assembly customer mix**
 - assembly customer location**

Who are your assembly customers?

The auto corridor has two parts

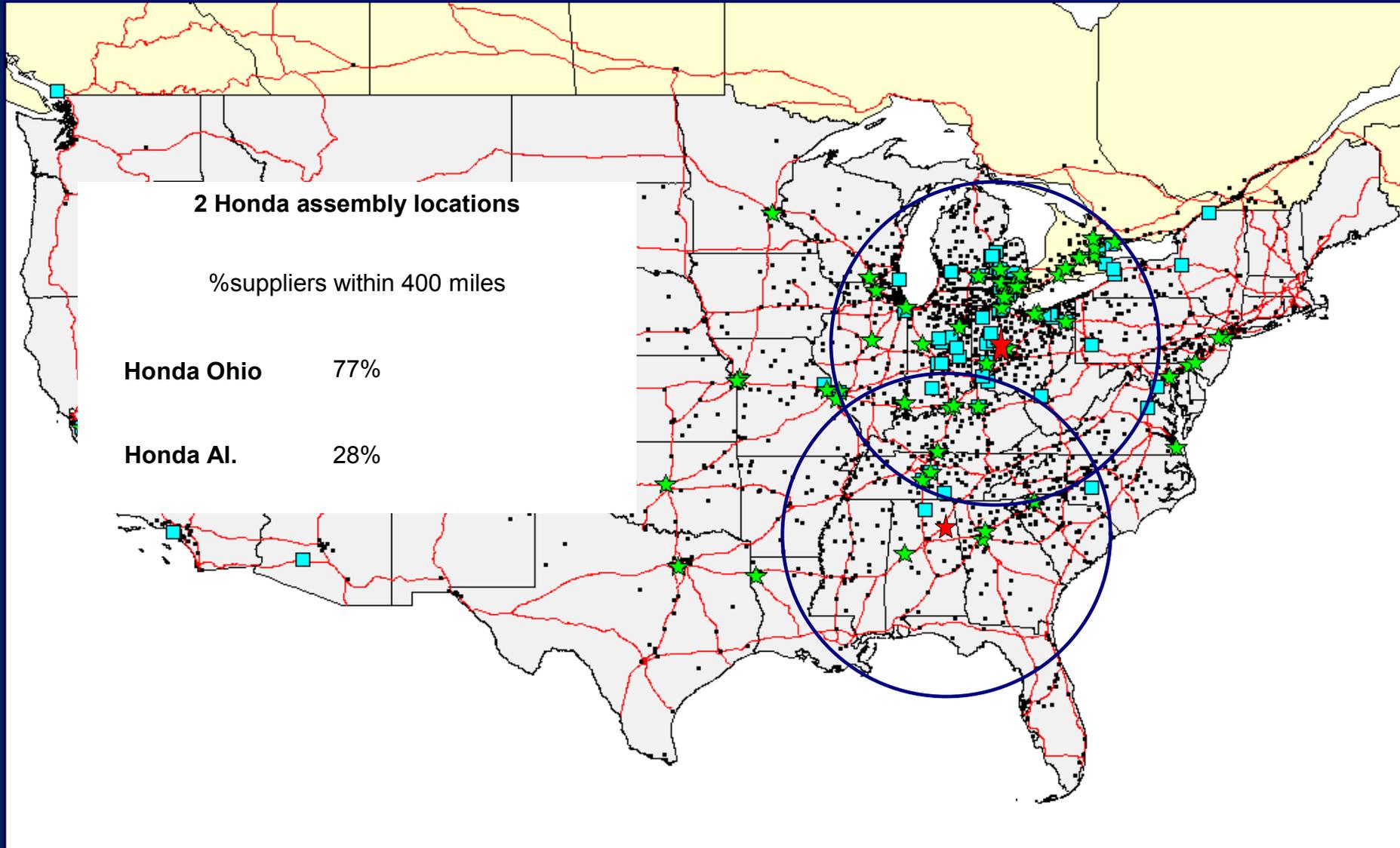
Domestic supplier plants			Japanese supplier plants		
Customer	All	only Big 3		All	no Big 3
MI	31.3	40.0	OH	20.8	28.6
IN	10.9	11.4	KY	18.5	21.4
OH	10.4	10.2	TN	13.3	14.3
TN	6.3	4.2	IN	11.0	12.9
KY	4.1	1.8	MI	9.2	0.0
Top 3	52.6	61.6	Top 3	52.6	64.3
Number of plants	607	166		173	70

Supplier plants that opened between 1980 and 1997

Distance to customer matters

- **Reliability of delivery crucial for operation of tight supply chains.**
- **Auto corridor's transportation infrastructure is well developed and allows suppliers to serve multiple assembly plants from one location.**
- **Over what distance? Can ship from Grand Rapids, Michigan, to Louisville, Kentucky within a day (450 mile delivery radius), but not to San Antonio, Texas.**

Distance to customer matters



Summary

- **Border has become location factor**
- **Big Three assembly and parts capacity concentrated at the northern end of the auto corridor**
- **Suppliers value ability to serve multiple assembly plants from one location**

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