



The Auto Industry in the Southeast

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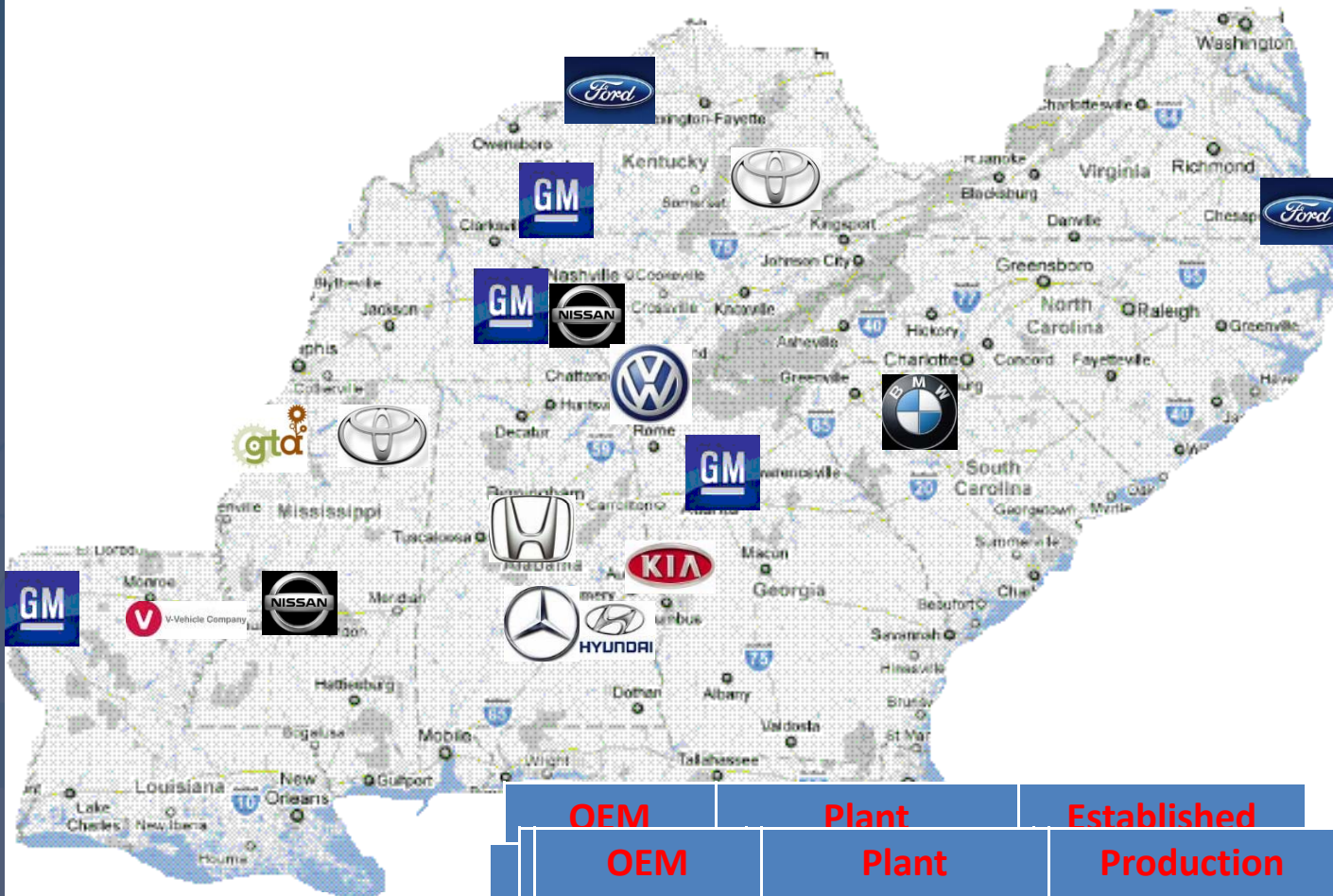
Brian Aldstad
EDR Group

Outline

- History of the Southern Auto Industry
- Production and Markets
- Logistics and Supply Chains
- Economic Development Pressures
- Future of the Industry

What caused the auto industry to move from the North to the South?

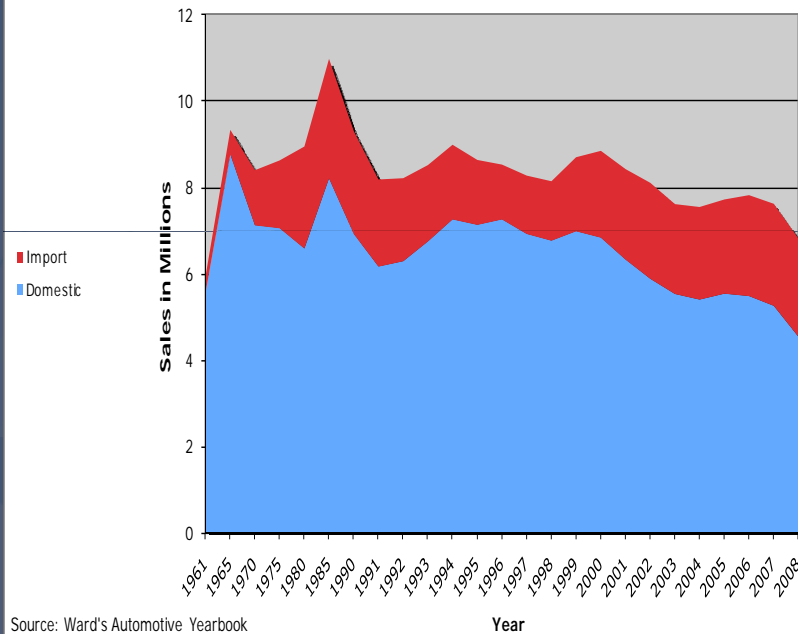
- Demographics
- Workforce
- Greenfield Sites
- Demise of the Branch Plant Assembly System
- Intermodal Network
- Economic Development Efforts



	OEM	Plant	Established
S	Toyota	Blue Springs	??
E	Volkswagen	Chattanooga	2011
M	V-Vehicles	Monroe	TBA
	Greentech	Tunica	TBA

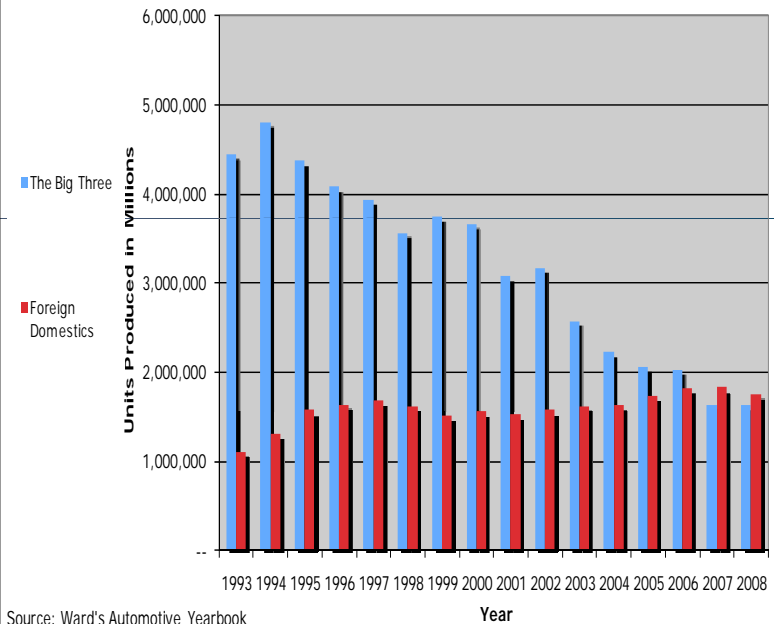
The Rise of Foreign Domestic Lead to the Southern Auto Corridor

U.S. Total Car Sales
(Nominal U.S. Dollars)



Source: Ward's Automotive Yearbook
(Southfield, MI: Annual Issues).

The Big Three vs. Foreign Domestic
U.S. Car Production



Source: Ward's Automotive Yearbook
(Southfield, MI: 2009).

	1998	2008
U.S. Owned Suppliers	66%	35%
F-D Suppliers	15%	32%
Imported Parts	19%	33%

Source: DesRoisers

Geographic Characteristics

- Multistate Corridor
 - I-65/I-75
 - Northern Tier – U.S.
 - Southern Tier – Foreign
- Integration with NAFTA Flows

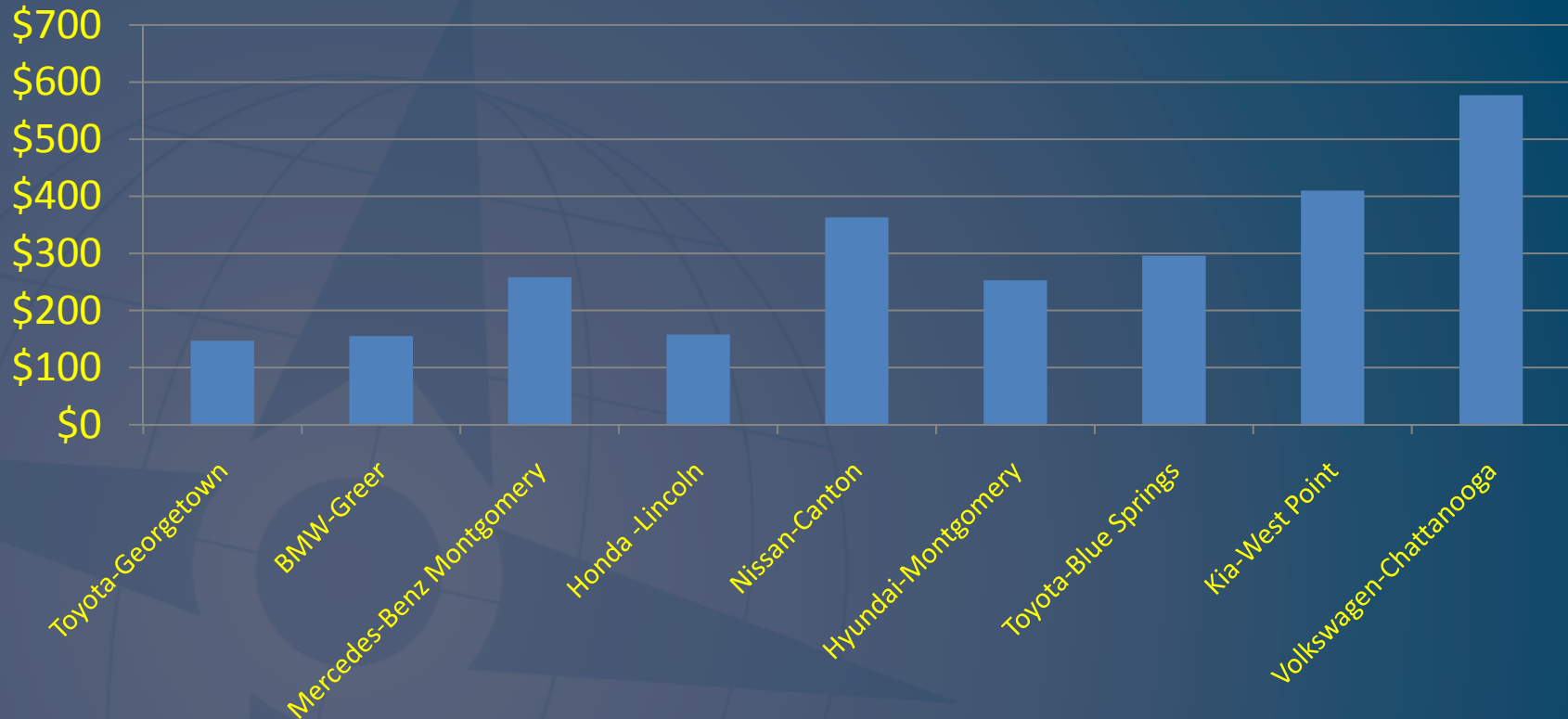
A multi-state agglomeration of U.S. motor vehicle production along an interstate highway network framed by I-65 and I-75



Auto Plant	Estimated Incentive package	Est. Cost Per Assembly Plant Job	Capital Investment by Automaker	Site incentives
Toyota-Georgetown	\$147m	\$49k	\$0.8b	\$92m
BMW-Greer	\$155m	\$81k	\$05.b	\$36.6m
Mercedes-Benz Vance	\$258m	\$168k	Over \$1b	\$92.2m
Honda -Lincoln	\$158.4m	\$105k	\$1.27b	\$102m
Nissan-Canton	\$363m	\$91k	\$1.4b	\$32m
Hyundai-Montgomery	\$253m	\$126k	\$1.4b	\$55m
Toyota-Blue Springs	\$296m	\$178k	\$1.3b	\$67m
Kia-West Point	\$410m	\$160k	\$1.2b	\$61m
Volkswagen-Chattanooga	\$577m	\$290k	\$1b	\$81m

Economic Incentives

OEM Incentive Packages (Million \$)



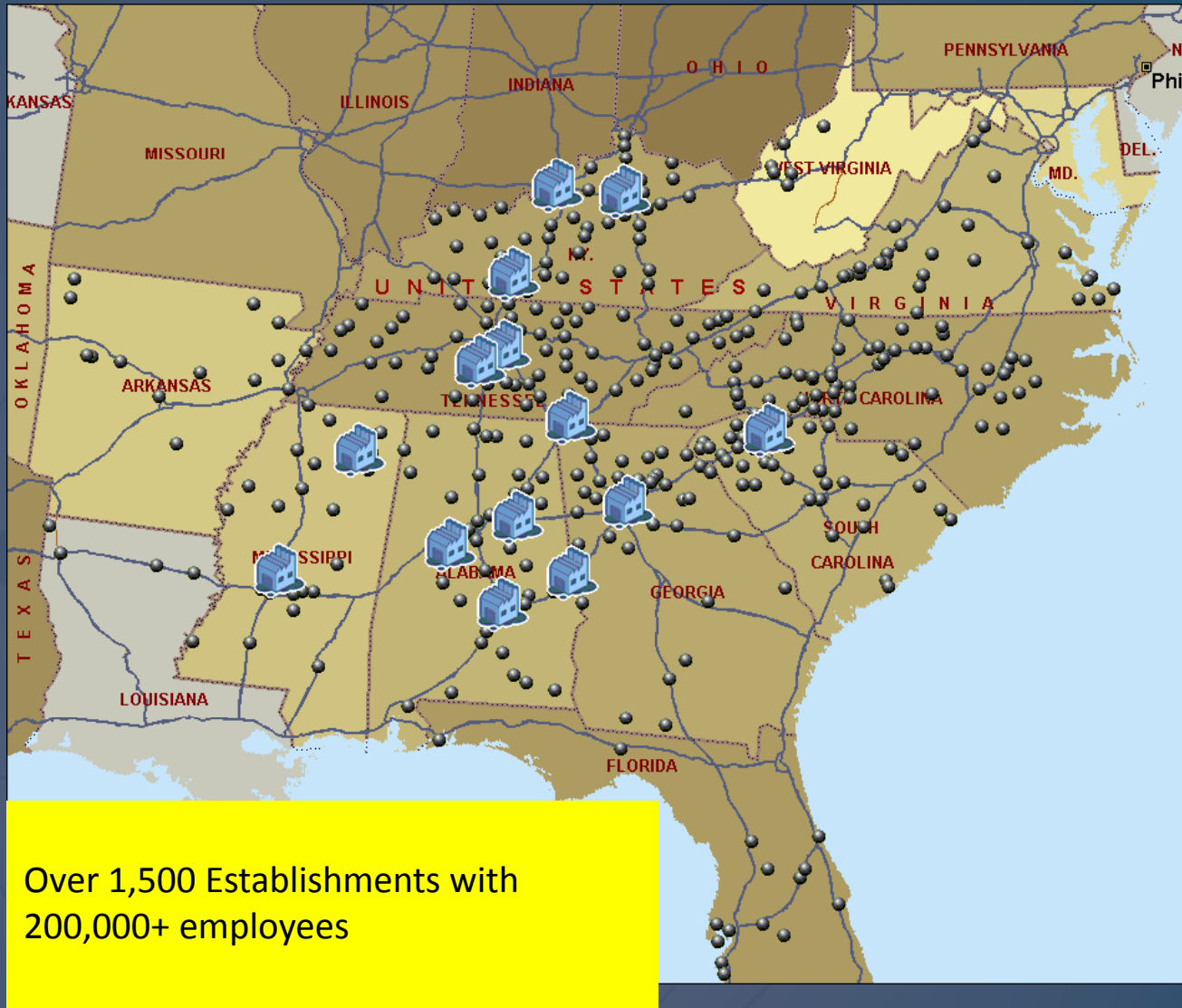
Why move south? Cont'd

Auto Assembly Facility	Supplier Type	Median Distance	<100 miles from assembly plant	<400 miles from assembly plant
Honda	Domestic	281 miles	13%	73%
	Foreign	175 miles	26%	83%
Toyota	Domestic	311 miles	5%	73%
	Foreign	199 miles	19%	84%
Nissan	Domestic	447 miles	7%	37%
	Foreign	272 miles	17%	65%
BMW	Domestic	495 miles	18%	40%
	Foreign	398 miles	23%	50%
Mercedes-Benz	Domestic	639 miles	6%	27%
	Foreign	435 miles	12%	48%

Source: Klier 1995

Southern Auto Corridor

OEMs, Tier 1 Suppliers, and States Coded by Supplier Establishments



Share of U.S. Auto Industry 2008

Production
26%

Vehicle GDP
27%

Parts Suppliers
24%

Employment
26%

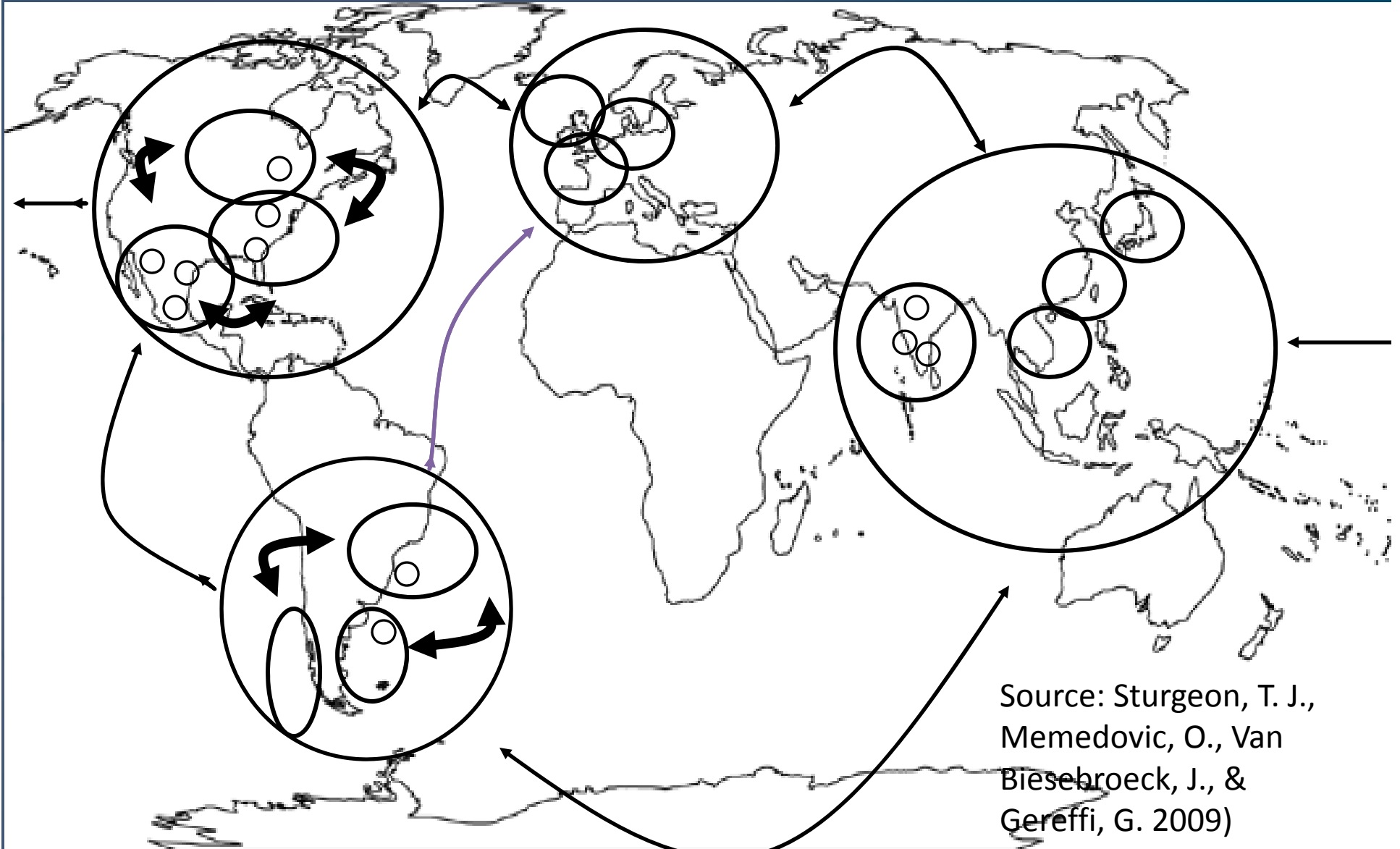
Sales of New Vehicles
23%

Source: ELM International

Auto Supplier Location Criteria

- One day delivery drive time to a final assembly plant
- Ideally two final assembly plants located within the one day drive
- Access to four-lane divided highway/interstate or two-lane highways with limited access and few stoplights
- Two route options for inbound and outbound material
- Access to rail (not a requirement for all suppliers)
- Workforce density 100-150 times the number of projected employees
- Educational assets
- workforce training programs

Global Nested Geographic and Organizational Structure



Automotive Trade Tends to be Within Regions

Automotive Products Exported between Partner Regions

Export To →	Asia		Europe		North America		South & Central America	
	2000	2007	2000	2007	2000	2007	2000	2007
Export From ↓								
Asia	18%	22%	16%	18%	51%	33%	4%	5%
Europe	4%	5%	80%	78%	10%	8%	1%	1%
North America	4%	4%	5%	9%	89%	78%	2%	4%
South & Central America	1%	1%	12%	10%	28%	17%	57%	64%

Source: World Trade Organization – International Trade Statistics

Nested in the NAFTA Region

U.S. Exports and Imports of Vehicles and Auto Parts

Regions	Exports of Vehicles (HS 8703)		Imports of Vehicles (HS 8703)		Exports of Auto Parts (HS 8708)		Imports of Auto Parts (HS 8708)	
	1990	2008	1990	2008	1990	2008	1990	2008
NAFTA	57%	38%	34%	36%	80%	74%	43%	49%
MERCUSOR	0%	1%	0%	0%	1%	2%	2%	2%
EU 15	15%	25%	19%	22%	8%	9%	14%	14%
China	0%	1%	0%	0%	0%	2%	1%	8%
Japan	8%	1%	43%	33%	3%	3%	33%	15%
Korea	1%	1%	2%	6%	1%	1%	2%	4%
ASEAN	0%	1%	0%	0%	1%	1%	2%	3%
Former USSR	0%	4%	0%	0%	0%	1%	0%	0%
Rest of the World	19%	27%	0%	3%	6%	9%	4%	6%

Source: Source: United States International Trade Commission

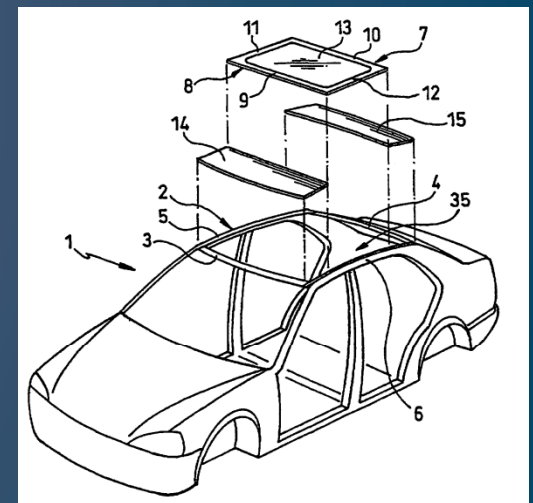
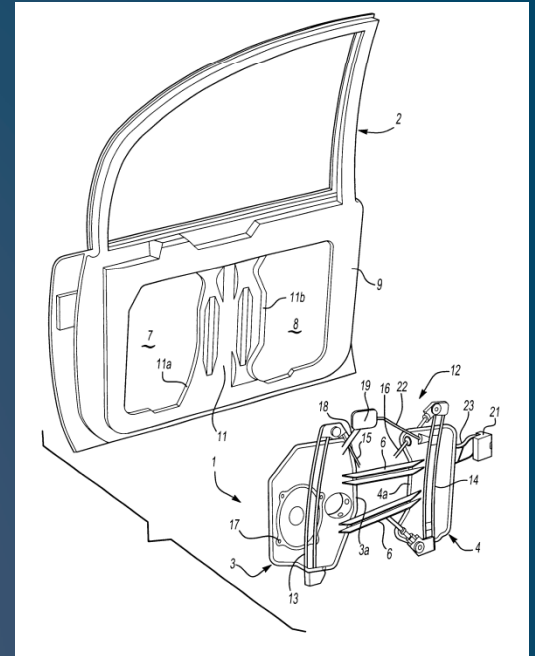
Comparison of Cluster Forms

<i>Growth-Pole Cluster</i>	<i>Porterian Industrial Cluster</i>
Linked predominately in an input-output sense	Linked in multiple ways including social
Dominated by a propulsive or stimulant industry	Poly-centric stimulation without singular domination
The stimulant industry is the engine of development and innovation	Innovation and development is ubiquitous, decentralized, and endogenous
Polarization with respect to the intensity of interfirm transactions	Network pattern of interfirm transactions
Characterized by formal vertical focused knowledge sharing	Extensive informal social interaction leading to fortuitous knowledge sharing
<i>Implications for Transportation Infrastructure</i>	<i>Implications for Transportation Infrastructure</i>
The comparable emphasis should involve the development of new or upgraded routes in order to focus on growth poles, as opposed to a general upgrading of the existing network	General upgrading of the existing network to promote collaboration and matrix flow of goods and people

Source: Parr 1999 Porter 2000

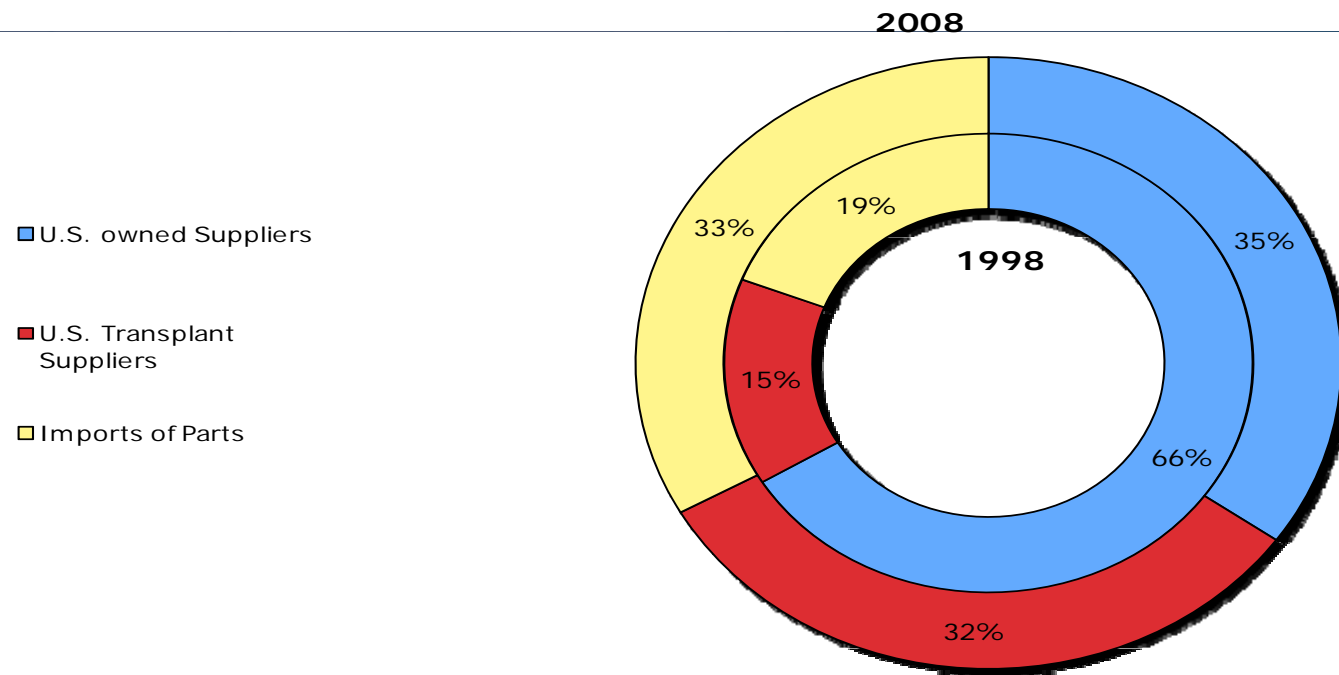
Auto Supplier Trends

- 1. Financial Problems for Suppliers:** More than half of small- to mid-size US suppliers will go out of business within the next five years (Minahan 2008, AT Kearny 2009)
- 2. Modularity:** Skills required to become a modular supplier are likely to result in a number of first-tier suppliers either exiting the industry or becoming second or third-tier suppliers (Doran 2004)
- 3. OEMs Minimizing Number of Suppliers:** Close to half of Toyota's U.S. parts supplies, in revenue terms, are produced by component manufacturers that also supply Detroit's automakers (Priddle 2009)
- 4. Long Term Relationships:** Following Japanese business model



Greater Share of Imported and Foreign-Domestic Auto Parts

Market Share of Total U.S. Parts



Source: DesRoisers

Growth of Suppliers in the South

Number of Establishments in Motor Vehicle Parts Manufacturing (NAICS 3363)			
States	2001	2008	% Change from 2001-2008
Alabama	111	154	39%
Arkansas	65	60	-8%
Florida	180	178	-1%
Georgia	155	171	10%
Kentucky	155	180	16%
Louisiana	46	38	-17%
Mississippi	70	73	4%
North Carolina	150	162	8%
South Carolina	112	118	5%
Tennessee	228	239	5%
Virginia	91	87	-4%
West Virginia	13	11	-15%
Southeast	1376	1471	7%
Share	20%	24%	
U.S. Total	6842	6234	-9%

Source: Bureau of Labor Statistics. Quarterly Census of Employment and Wages.

Changing Supplier/Automaker Relationship

- Multi-tiered system
 - OEM, Tier 1, Tier 2, Tier 3
- Massive transformation because independent suppliers now play a larger role in production versus when automakers used mostly of their own parts (Hill, Menk et al. 2007).

Other Supplier Trends

Suppliers Taking on More Responsibilities: Technological capability and financial issues are crucial for Tier 1 suppliers (Choi and Hartley 1996).

Suppliers Handling Logistics: Most supply chain problems were caused by unstable demand, suppliers underinvesting in capacity, and suppliers' overproducing because OEM overstate their forecasts (AT Kearny 2008)

Going Green: the automotive sector was less than most sectors in environmental initiatives (Bearingpoint 2008)

Greater Use of 3PLs: view 3PLs as tactical service providers as opposed to supply chain integrators or logistics strategist (Langley 2008)



Transformation of the Auto Parts Sector

<i>Changes coming from OEMS</i>	<i>Impact on Suppliers</i>
Reduction in the number of components manufactured in the assembly plants	Seeking significant cost reductions
Consolidation of common platforms for the development of vehicles	Growing interdependence between suppliers and assemblers
Consolidation of the first-tier base	Need to develop systems and modules
Reduction in the number of suppliers	Globalization of the supplier base
Pressure to reduce prices	More expenditure on R&D
Single supplier policy	Increased acquisitions and mergers
Changes in production methods because of modularity	Emergence of mega-suppliers

Source: Santos and Pinhao 2002

Large User of the Intermodal System

- Alabama, annual automotive truck traffic is expected to increase 150% from 750,000 trips to 1,880,000 trips. In a typical hour, there are 156 trucks carrying automotive freight on Alabama roads (Harris and Killingsworth 2003).
- In 2008, the Port of Mobile handled 108,000 tons of steel, 10,000 containers of auto parts, and 5,000 export containers for Hyundai (Hyundai Creates 2009).
-
- Nissan's Smyrna plant received approximately 450 trucks and 50 containers daily from 450 suppliers of which 125 are in TN. Outbound the plant daily shipped 75 to 100 railcars (average cars per rail car is 12) and 100 trucks (average cars per truck 9) (Wellborn 2007)

OEM Logistics Location Criteria

- Access to an interstate highway (or 4-lane limited access divided highway) is required by all OEMs
- Most OEMs prefer a site that has dual-rail service because approximately 70% of finished vehicles move the markets by rail
- A link to a deepwater port via rail and interstate highways is important

Location Theory and OEM's

- Alfred Weber's classical location theory in which an industry will locate where the transportation costs of materials and final product is at a minimum
- Transportation and labor considerations appear to explain most of the spatial changes
 - nonunion labor force availability

Auto Supplier Location Criteria

- One day delivery drive time (approx. 400 miles) to a final assembly plant
- Ideally two final assembly plants located within the one day drive
- Access to four-lane divided highway/interstate or two-lane highways with limited access and few stoplights
- Two route options for inbound and outbound material
- Access to rail (not a requirement for all suppliers)
- Workforce density 100-150 times the number of projected employees
 - Avoid competing workforce
- Educational assets – location near engineering programs and engineering support for new employee recruitment and research and development collaborations; job skill training programs through community colleges or local/state workforce training programs

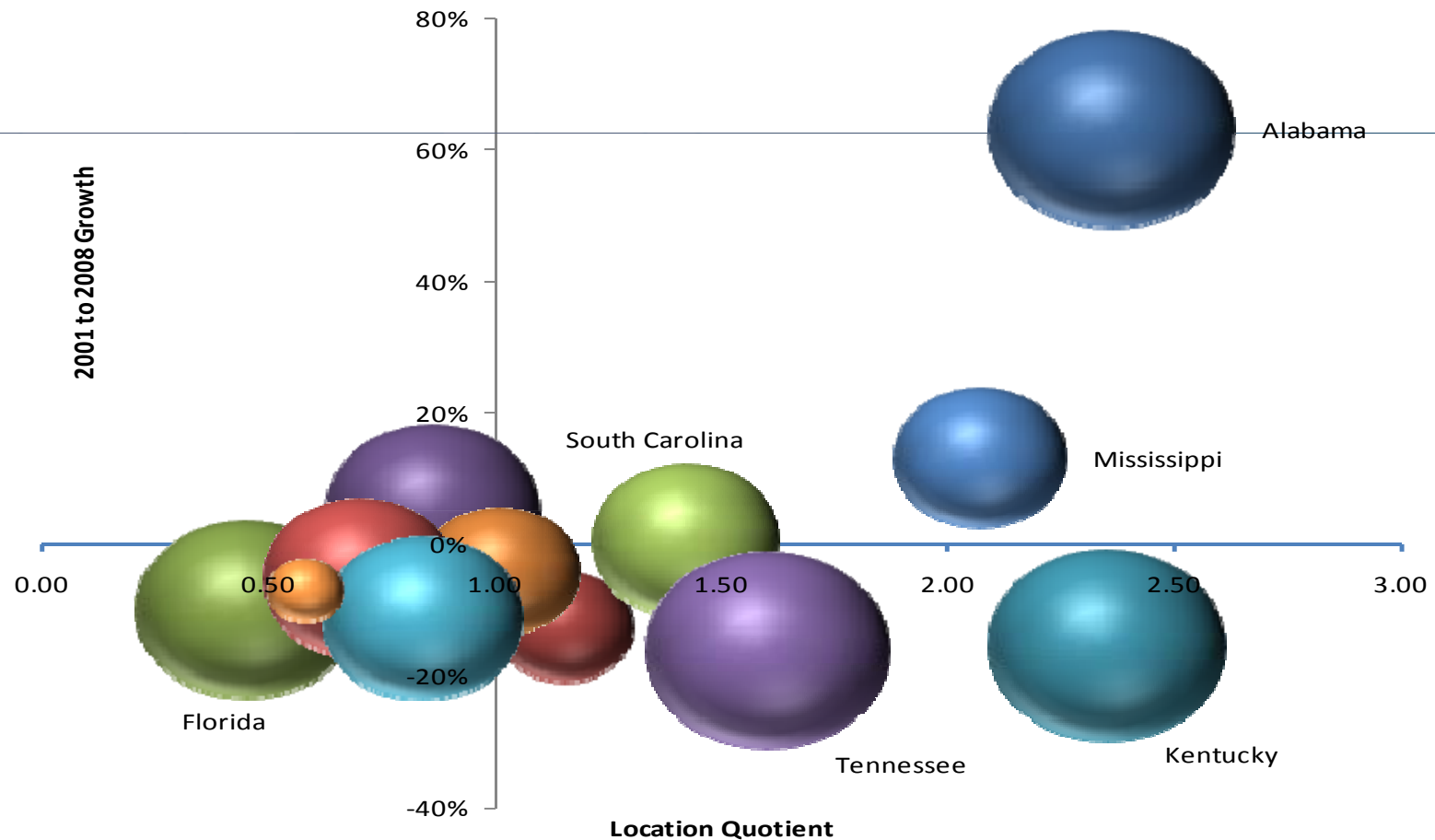
Employment Concentration in Certain States

Motor Vehicle Parts Manufacturing Employment (NAICS 3363)				
	Employment 2007	Percent Change from 2001-2007	% of U.S. Total	LQ (U.S. Average=1)
Alabama	17,263	41.9%	2.85%	2.04
Arkansas	6,086	-20.4%	1.01%	1.18
Florida	4,886	-22%	0.81%	0.13
Georgia	9,889	-16.8%	1.63%	0.55
Kentucky	33,905	5.3%	5.61%	4.26
Louisiana	807	-32.9%	0.13%	0.10
Mississippi	6,031	-27.5%	1.00%	1.27
North Carolina	17,029	-0.8%	2.82%	0.95
South Carolina	17,822	-4.9%	2.95%	2.15
Tennessee	37,039	6.1%	6.12%	2.99
Virginia	7,136	-22.5%	1.18%	0.45
West Virginia	1,758	-27.4%	0.29%	0.58
Southeast	157,893		26%	
U.S. Total	604,870	-21.2%	100.00%	1.00

Source: Bureau of Labor Statistics.

Employment Concentration & Growth in Certain States

Transportation Equipment Manufacturing (NAICS 336) Employment



Source: Bureau of Labor Statistics. Quarterly Census of Employment and Wages (QCEW).

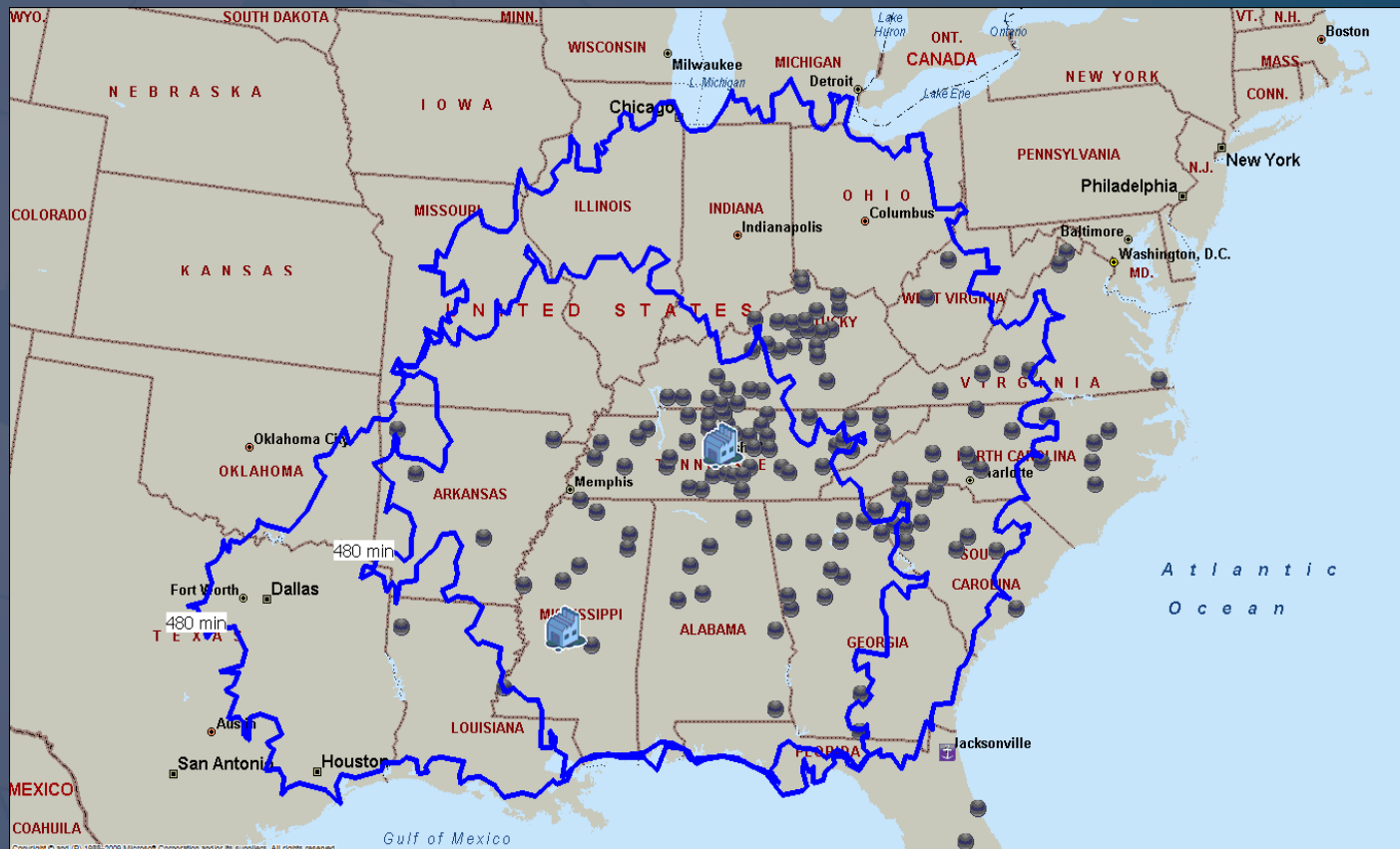
Dispersed Economic Impact

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Source: Klier 1995

Auto Supplier Location Criteria

Nissan and its US Based Tier One Suppliers
Most Suppliers within One Day Drive



Trends in Auto Logistics

- New 3PL Relationships & logistics operation management
 - Toyota Logistics Services, Inc., Nissan Logistics Corp. (NLC), Penske Logistics was awarded
 - Calibri (Body)BMW's
- From JIT to Just-in-Sequence (JIS)
- JIS model shifts the focus to building assemblies-to-order, bringing them to a staging location, and sequencing them to the manufacturing line
- Supplier Parks and "integrated suppliers"
- Some Tier 1 attempting to consolidate facilities



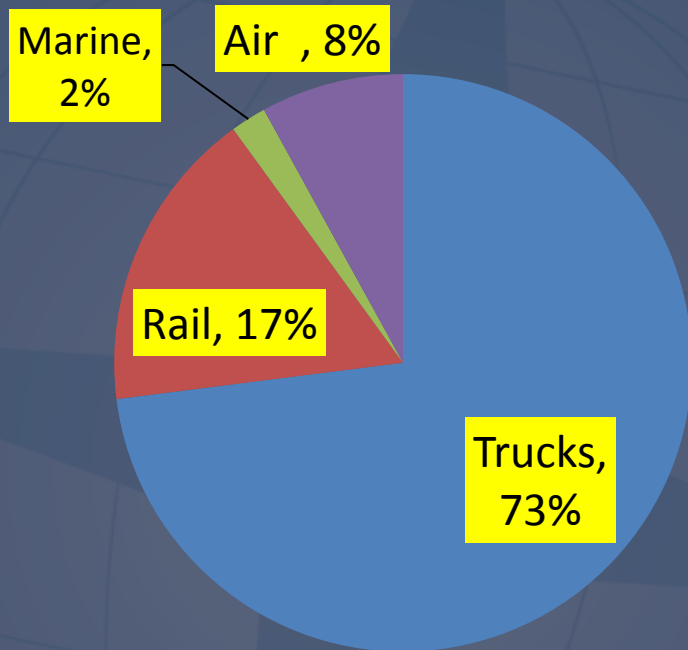
Athens/McMinn Interstate Industrial Park is one of many quality sites in rural Tennessee for auto suppliers. The park contains a total of 350 acres and is one-half mile from Interstate 75 in McMinn County.

Photo credit: Southeast Industrial Development Association.

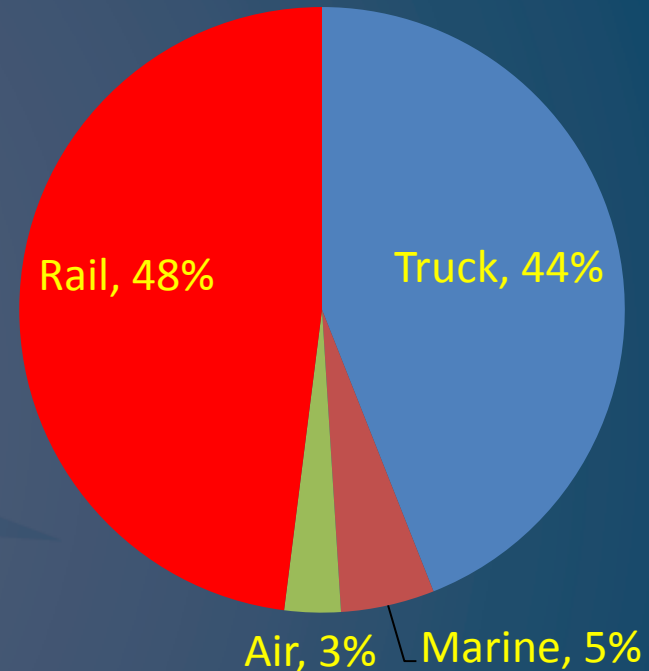
VW Supplier Park near Chattanooga

Modal Usage

Parts Logistics



Finished Vehicles Logistics



Source: Brazeau 2003

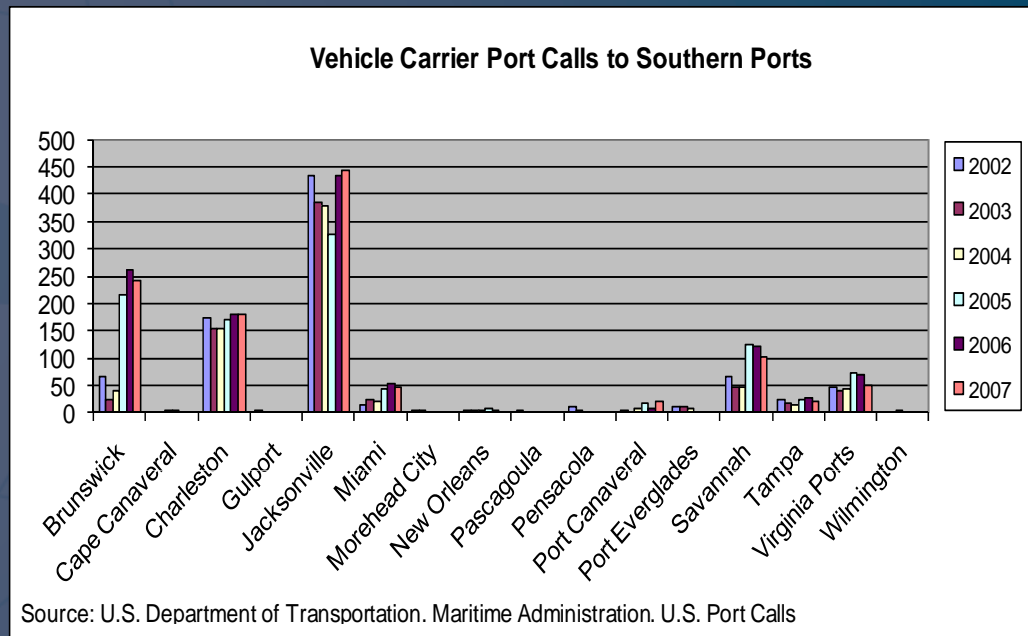
80-90% of parts arrive by truck and 70-80% vehicles leave by rail
(Vanuono 2004)

Ocean Ports and the Auto Industry

- A link to a deepwater port via rail and interstate highways is important.
- While the overall trade in automobiles has not become concentrated in fewer ports over the last 20 years, individual firms are concentrating the bulk of their import operations in fewer ports.
- Congestion at the ports and the priority given to container ships has been an issue with the automotive industry.

Port Requirements:

- Reliable and efficient
- Well served for the product market
- Adequate storage capability
- Roll on/roll off (RO/RO)
- Facilities to receive vehicles, hold them in inventory, and conduct post-production quality control

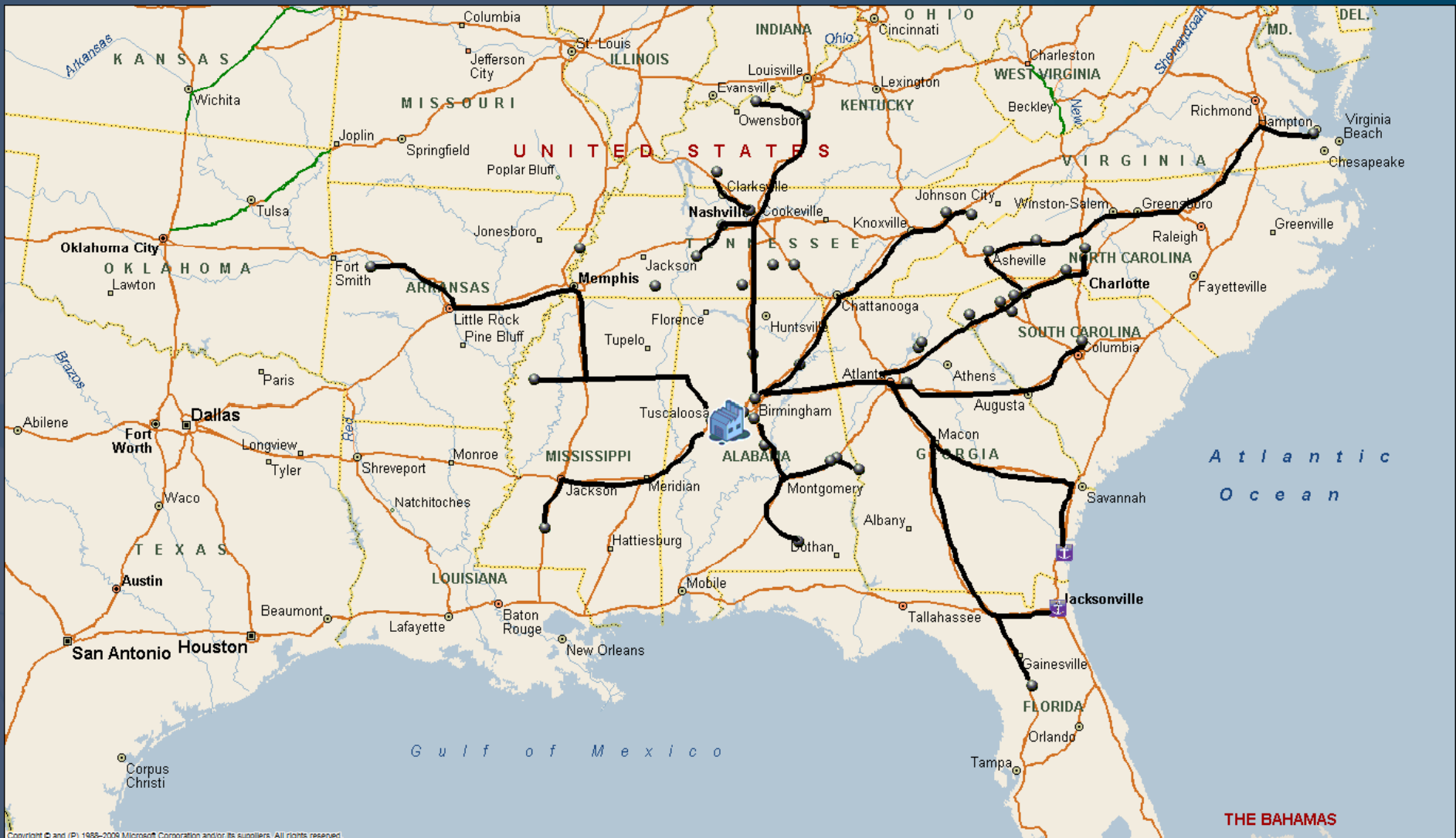


Port of Brunswick, Georgia

- Mercedes-Benz has opened a new vehicle preparation center (VPC) in which is estimated to be able to process approximately 50,000 vehicles annually.
- The VPC will also be capable of accessory installation, full body shop operations, homologation operations, and vehicle detailing and distribution operations.
- BMW is diverting some of its imported vehicles destined for U.S. dealers from Charleston's Union Pier to Georgia's Port of Brunswick, as part of a "rebalancing" of its East Coast operations.

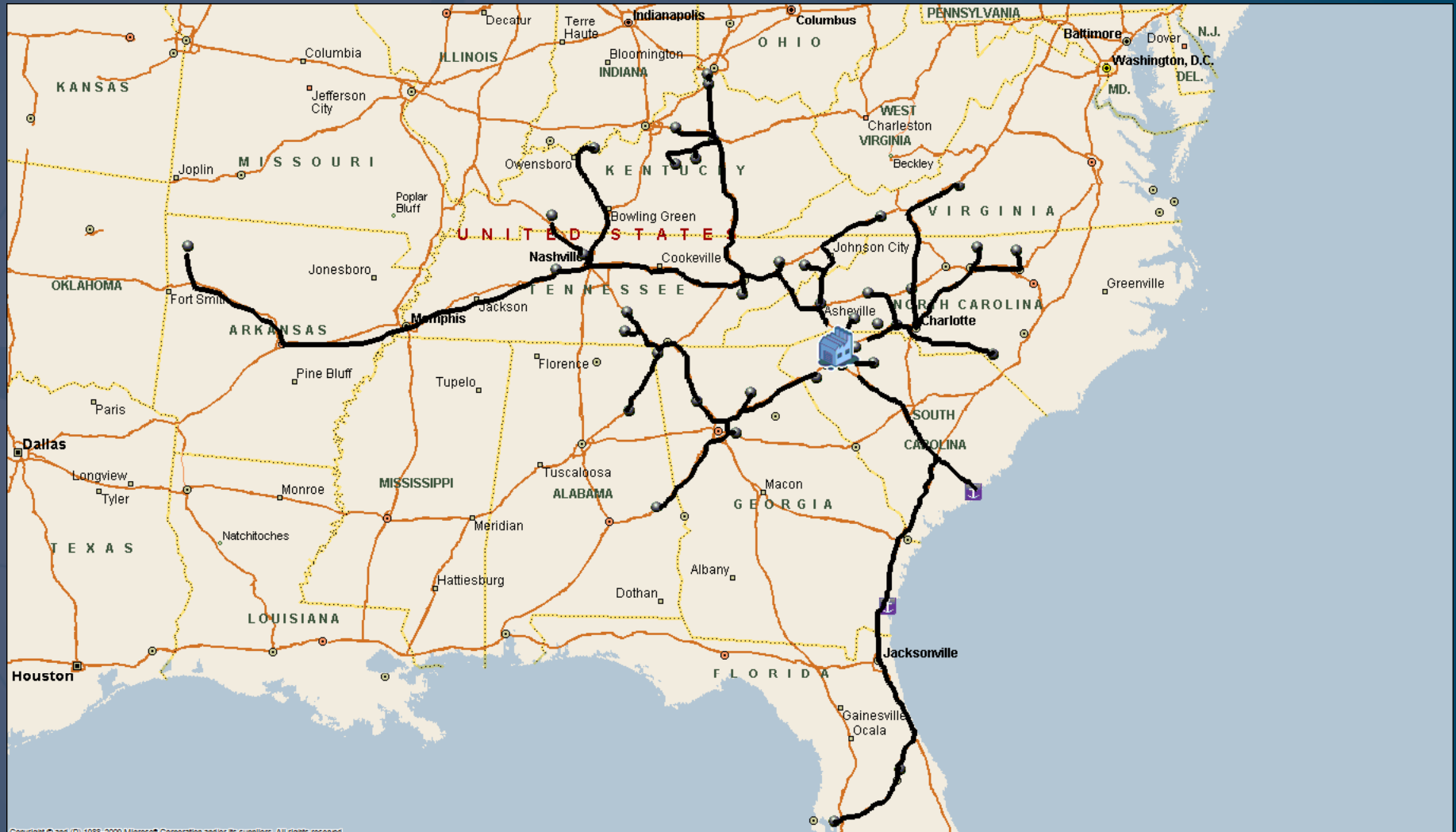


Mercedes-Benz Growth Pole Tier One Supplies and Shortest Highway Routes

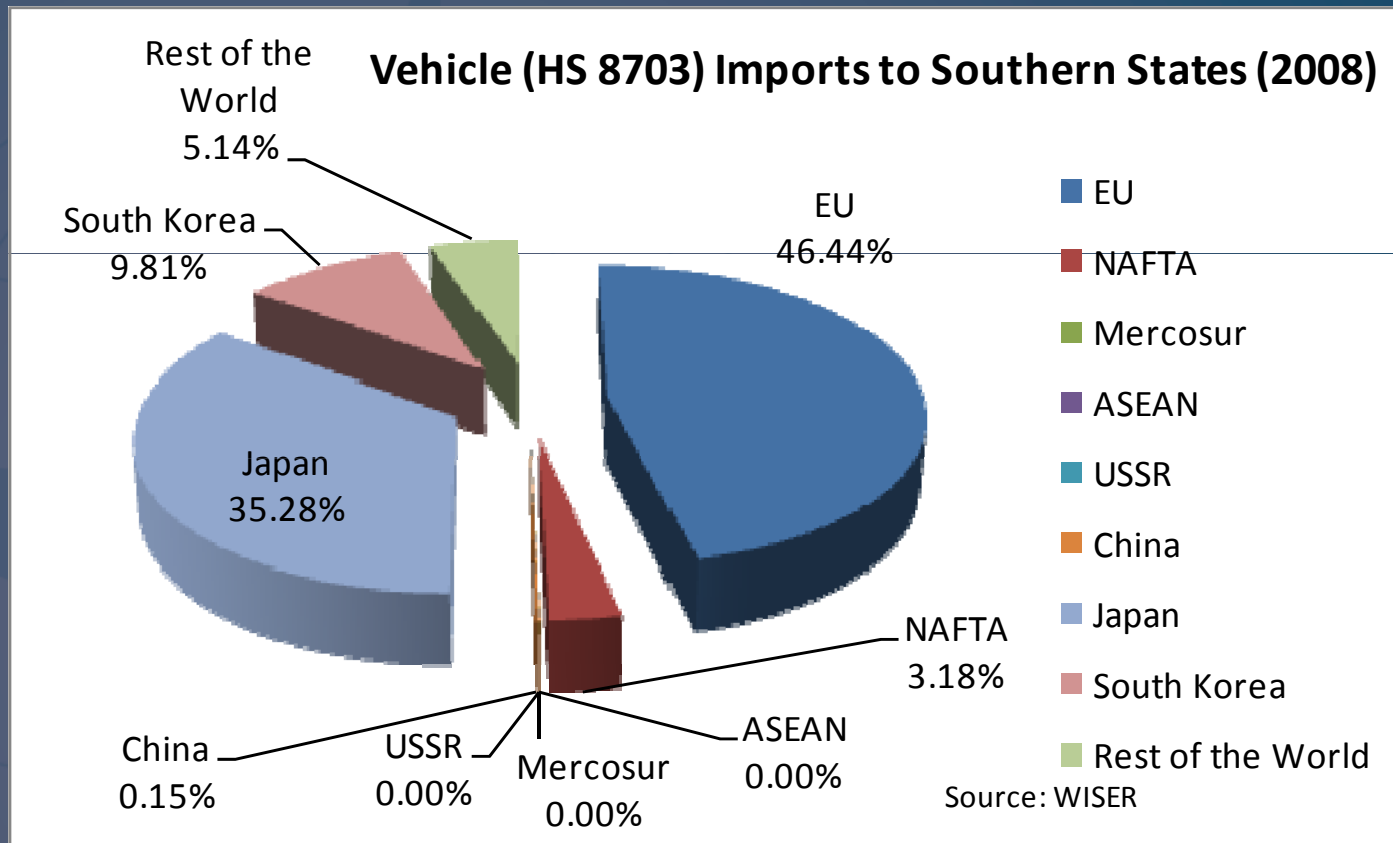


BMW Growth Pole of Tier One Suppliers

Logistical Impact Throughout the Region



Southern States Vehicle Imports does not indicated a nested geography



Note: Data collection likely skewed

Southern States Exports tend to Follow the Nested Pattern

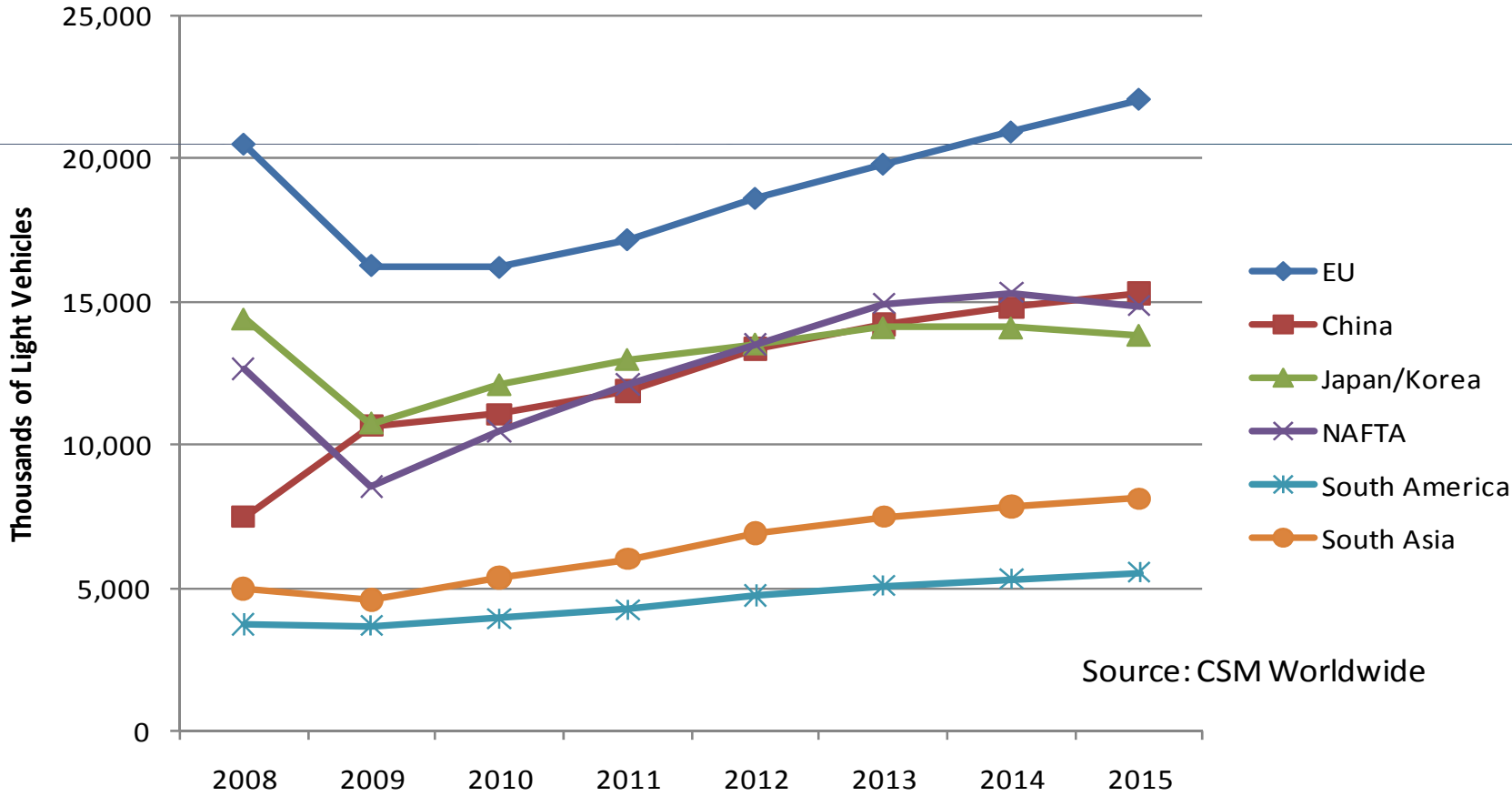
Southern States Trade with Global Automotive Regions

	Exports of Vehicles (HS 8703)		Exports of Auto Parts (HS8703)	
	<u>1998</u>	<u>2008</u>	<u>1998</u>	<u>2008</u>
	NAFTA	65%	40%	70%
MERCUSOR	2%	2%	5%	4%
EU 15	19%	30%	18%	17%
China	1%	2%	1%	3%
Japan	6%	1%	5%	3%
Korea	0%	1%	1%	1%
ASEAN	0%	1%	0%	1%
Former USSR	0%	5%	0%	1%
Rest of the World	6%	18%	1%	1%

Source: WISER

BRIC Markets Are Expected to Grow, but the US and EU Remain Large

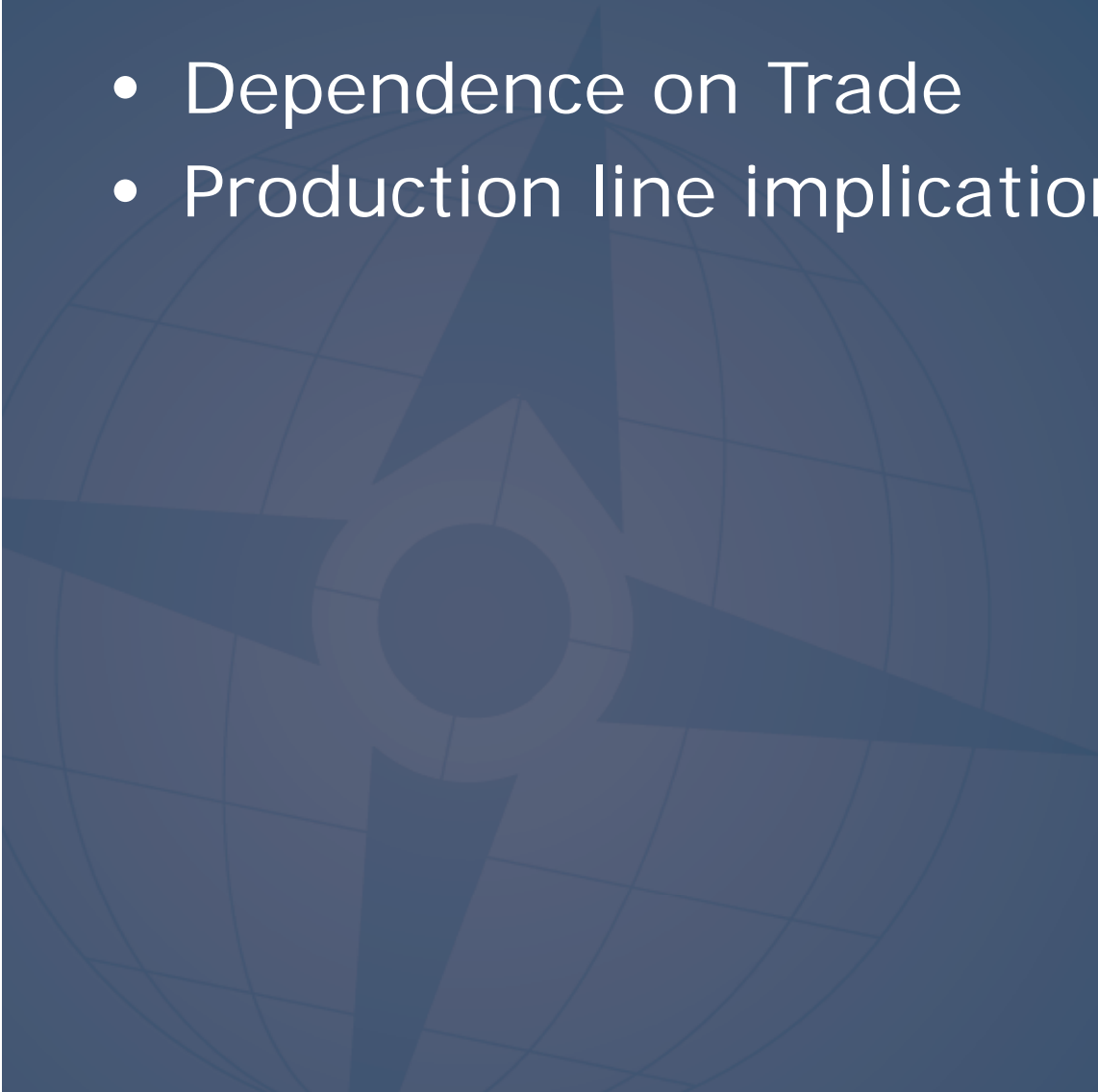
Global Light Vehicle Production Forecast



Source: CSM Worldwide

Japanese Supply Chains in the Southeast

- Dependence on Trade
- Production line implications



Thank you

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