



NC State Freight Plan

Board of Transportation,
ED & IR Committee Briefing

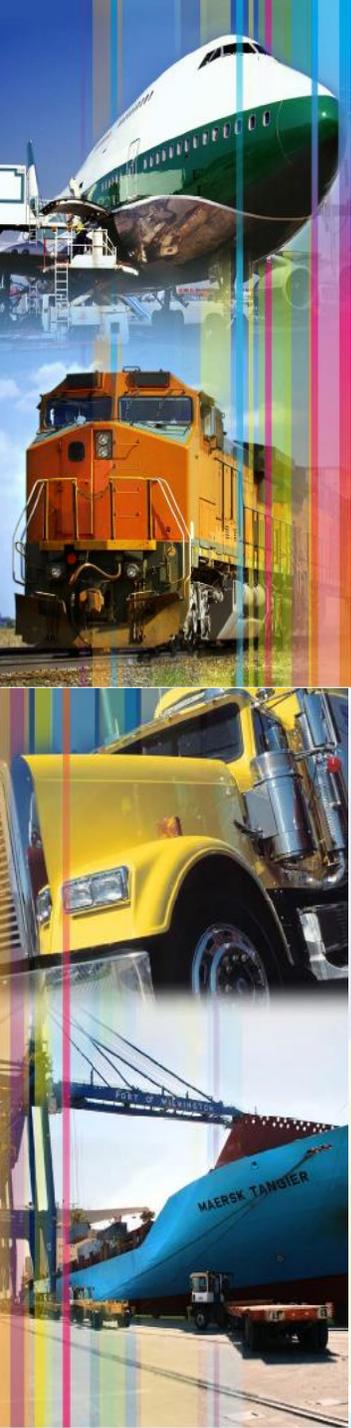
January, 2016



Agenda

- Freight transportation and the NC economy
- System performance and competitiveness
- Designating the state's critical network
- Next steps



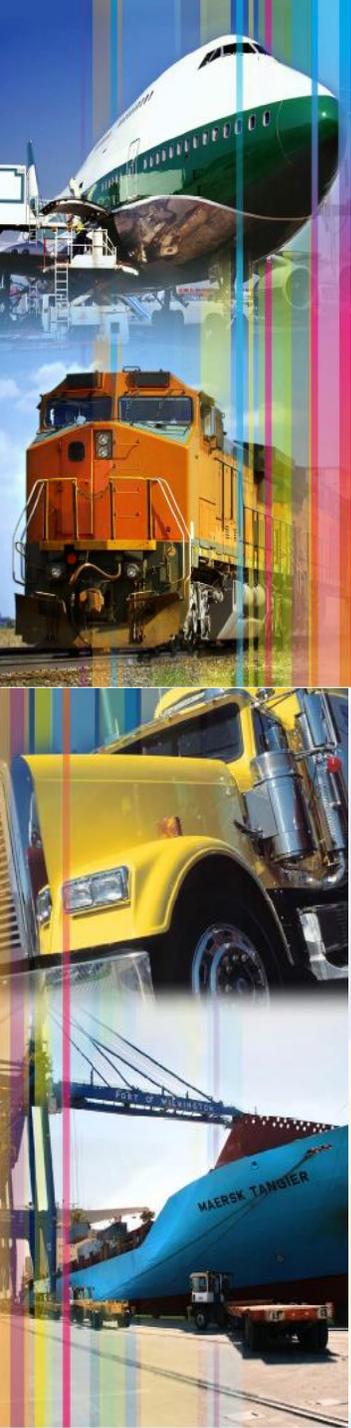


FREIGHT TRANSPORTATION AND THE NC ECONOMY

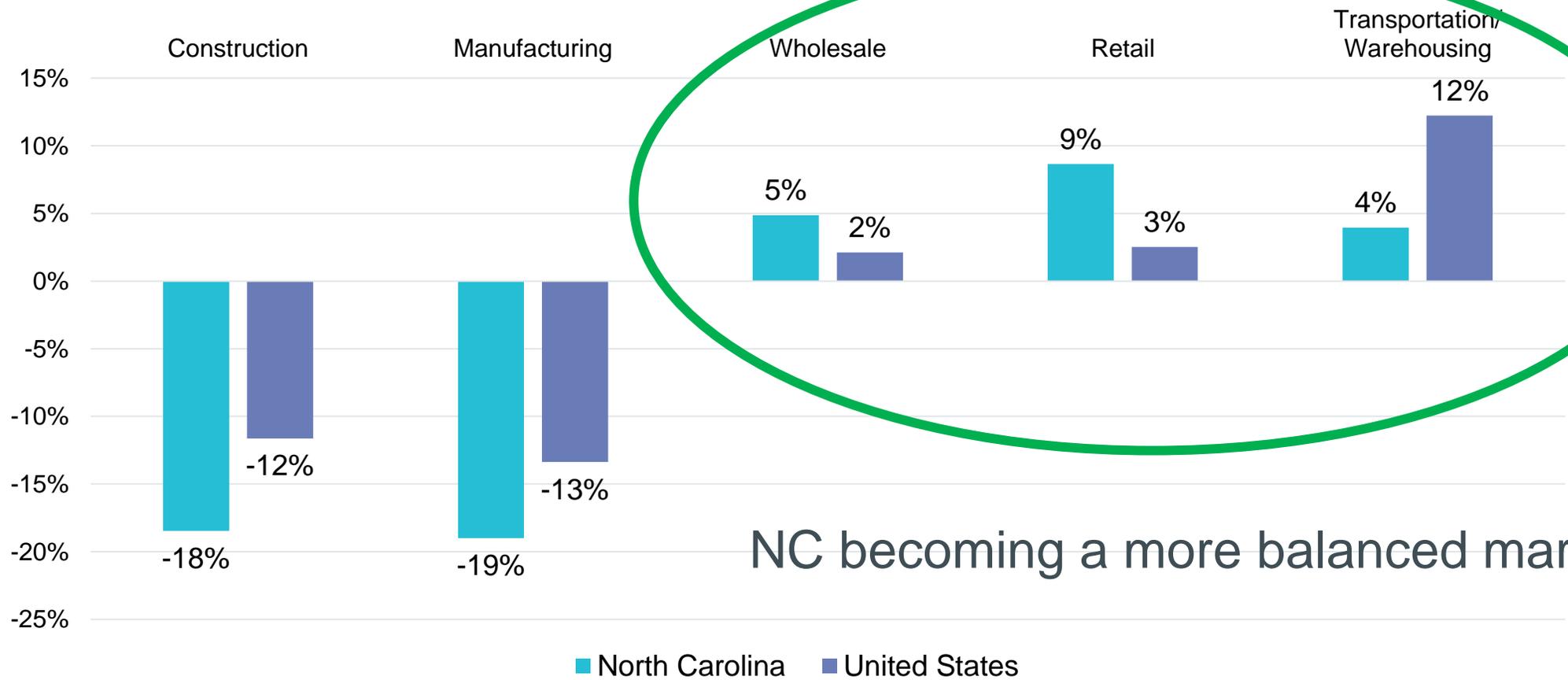
Top Employment Industries, 2015

Industry	Annual Employment	Percent of Total Employment
Health Care and Social Assistance	589,744	14.17%
Retail Trade	490,852	11.79%
Manufacturing	461,030	11.08%
Accommodation and Food Services	396,348	9.52%
Educational Services	370,790	8.91%
Administrative and Waste Services	290,762	6.99%
Public Administration	239,148	5.75%
Professional and Technical Services	221,950	5.33%
Construction	189,375	4.55%
Wholesale Trade	178,804	4.30%
Finance and Insurance	158,707	3.81%
Transportation and Warehousing	138,796	3.34%
All Other Industries	435,348	10.30%
Total Employment	4,161,654	100%
Source: Quarterly Census of Employment and Wages		

5 of top 12 Industries are freight intensive



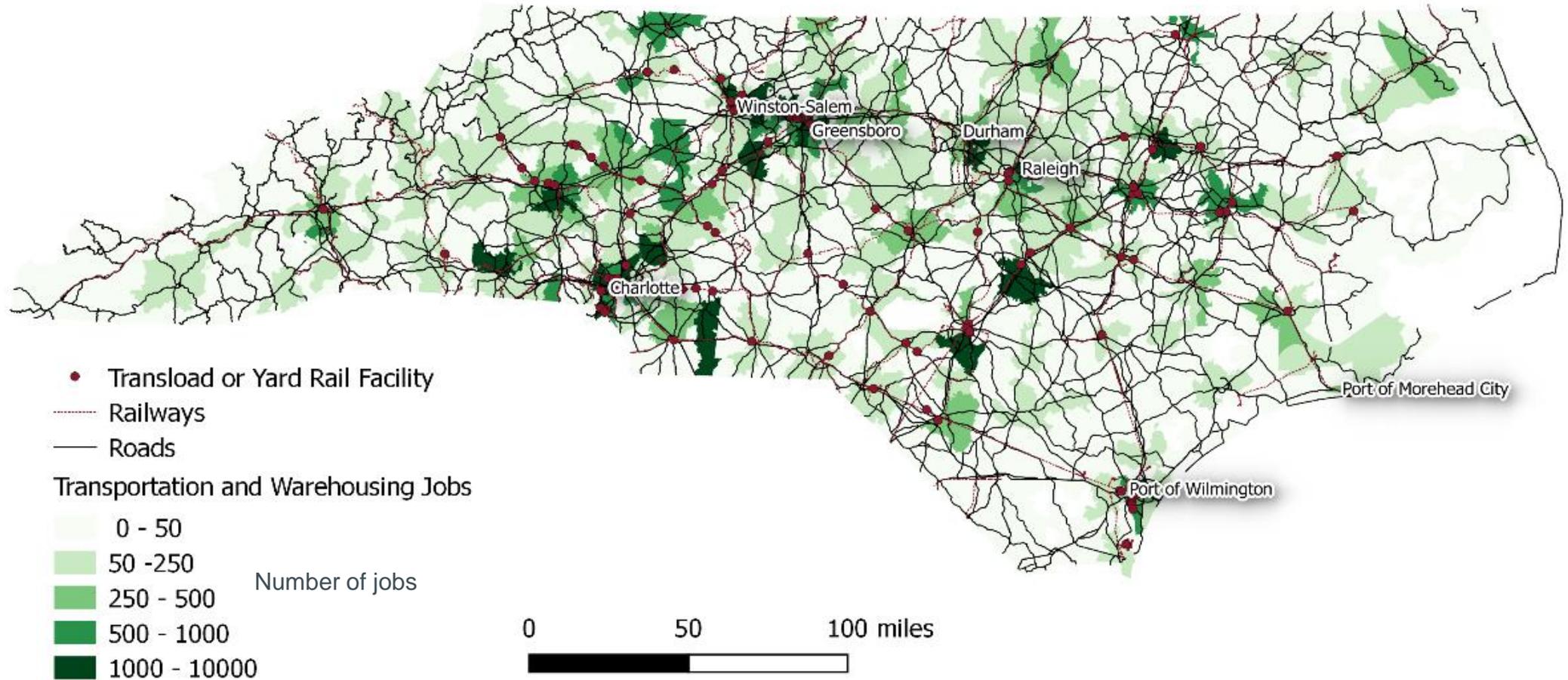
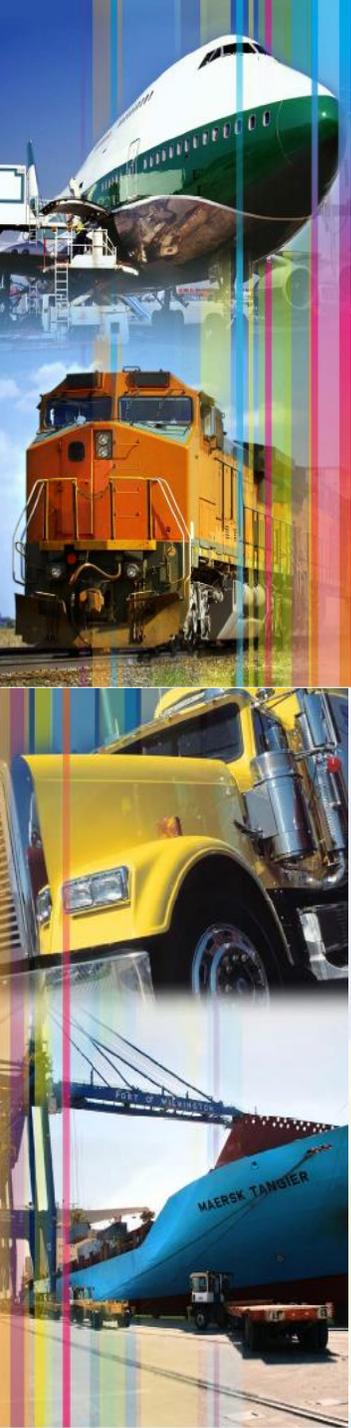
Employment Trends, 2005-2015



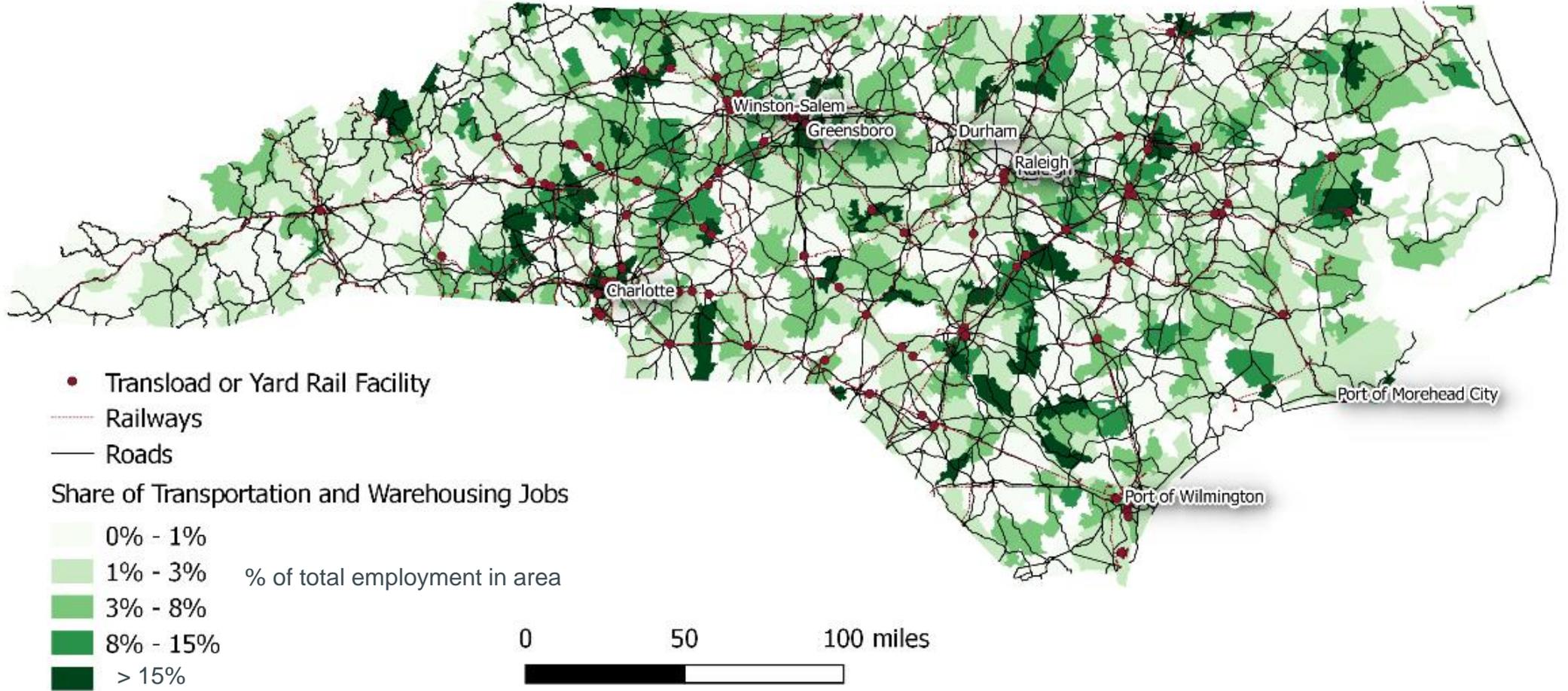
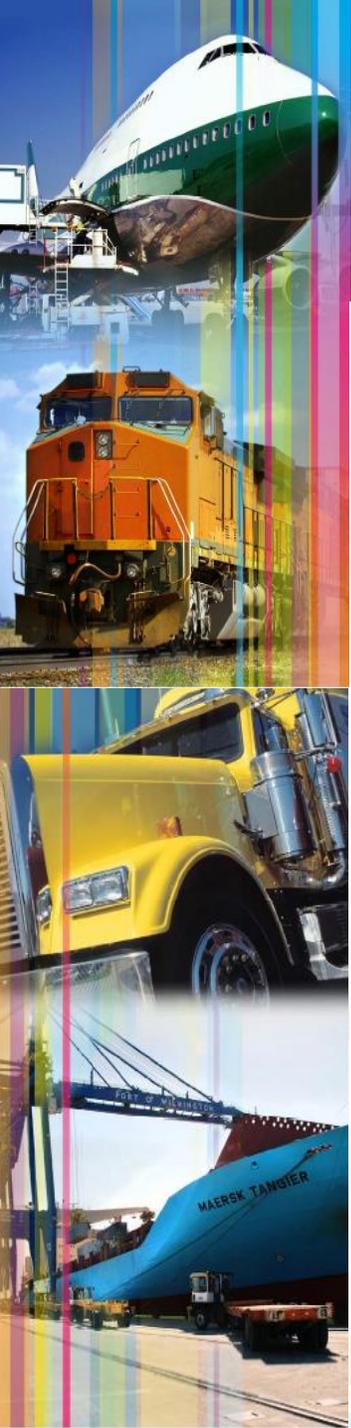
NC becoming a more balanced market

■ North Carolina ■ United States

Transportation and Warehousing Jobs, 2015

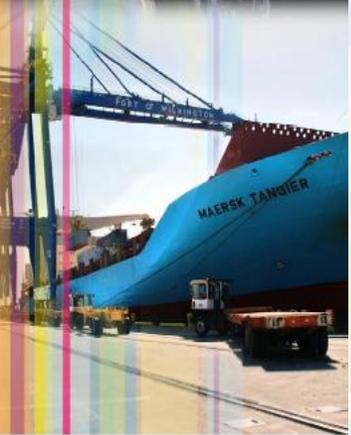


Share of Transportation and Warehousing Jobs, 2015



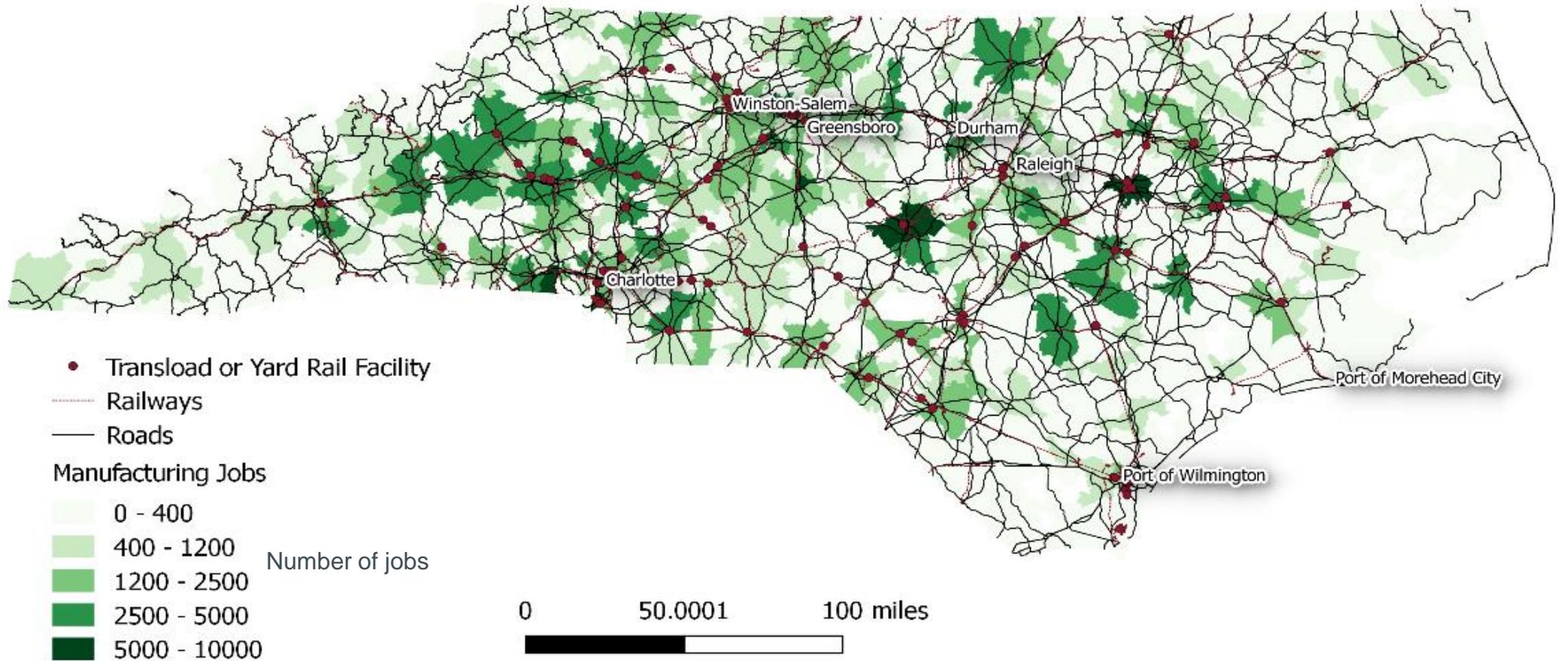


Trends in Warehousing and Distribution

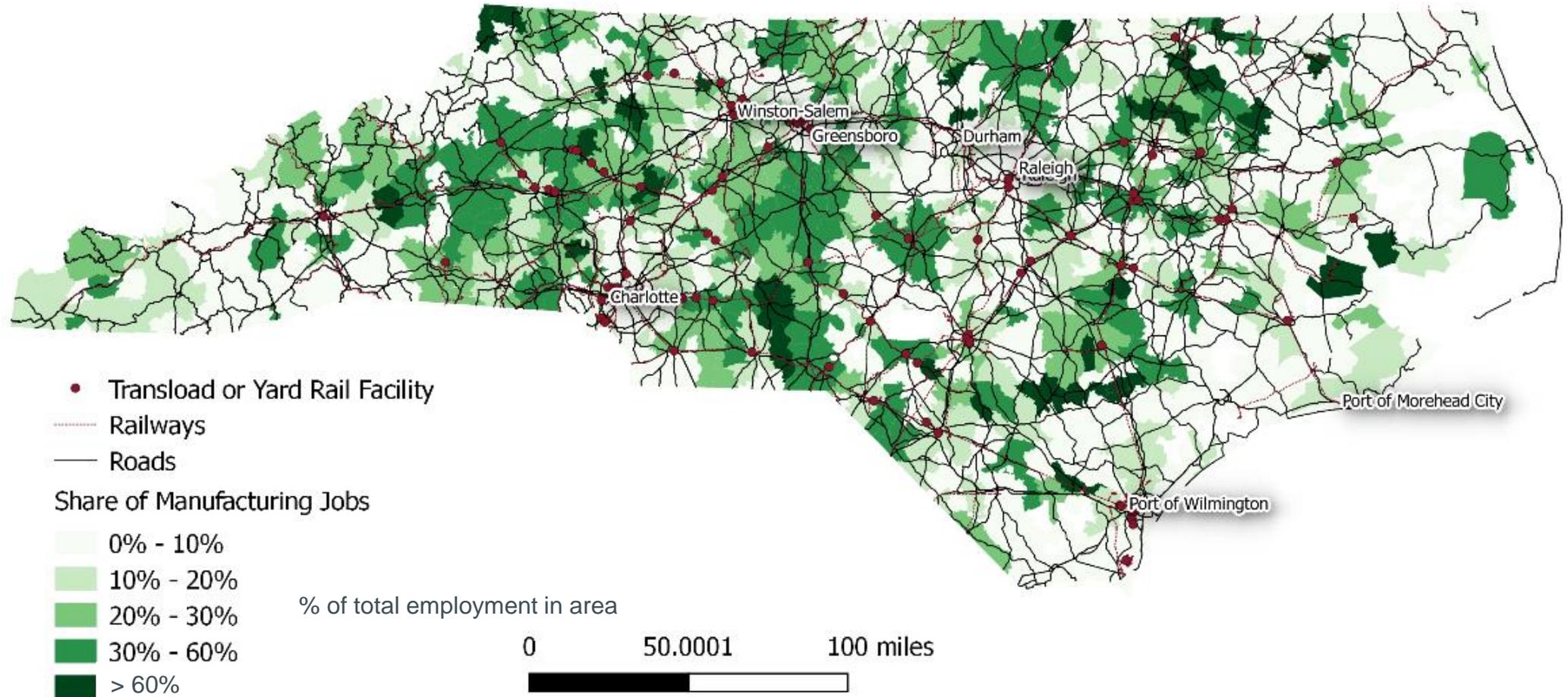


Prosperity Zone	Percent of Prosperity Zone Employment, 2014	2014 Location Quotient	Change in LQ, 2004 to 2014	LQ Category
Southwest Region	4.7%	1.19	-3%	Mature
Piedmont-Triad Region	4.6%	1.17	-7%	Mature
Sandhill Region	3.2%	0.83	+4%	Emerging
Western Region	2.8%	0.71	-12%	Transforming
Northeast Region	2.7%	0.69	-3%	Transforming
Northwest Region	2.7%	0.69	-23%	Transforming
Southeast Region	2.4%	0.61	-27%	Transforming
North Central Region	2.2%	0.56	-14%	Transforming
North Carolina	3.3%	0.84	-7%	Transforming

Manufacturing Jobs, 2015



Share of Manufacturing Jobs, 2015

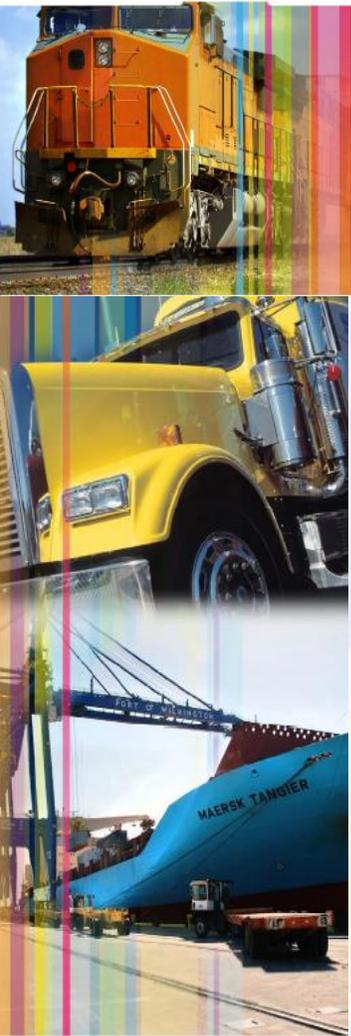


Trends in Manufacturing Industries

Manufacturing Industry Subcategory	Employment 2014	Percent of All Employment, 2014	2014 Location Quotient	Change in LQ, 2004 to 2014	LQ Category
Textile Mills	27,601	0.7%	7.96	-10%	Mature
Furniture and Related Products	33,949	0.8%	3.10	-12%	Mature
Electrical Equipment and Appliances	21,293	0.5%	1.89	-8%	Mature
Chemical	42,434	1.0%	1.78	+1%	Specialized
Plastic and Rubber Products	31,863	0.8%	1.59	+13%	Specialized
Food	52,283	1.3%	1.18	+3%	Specialized
Computers and Electronics	32,120	0.8%	1.03	+1%	Specialized
Machinery	31,359	0.8%	0.94	+2%	Emerging
Fabricated Metal Products	36,247	0.9%	0.84	-6%	Transforming
Transportation Equipment	31,663	0.8%	0.67	+1%	Emerging

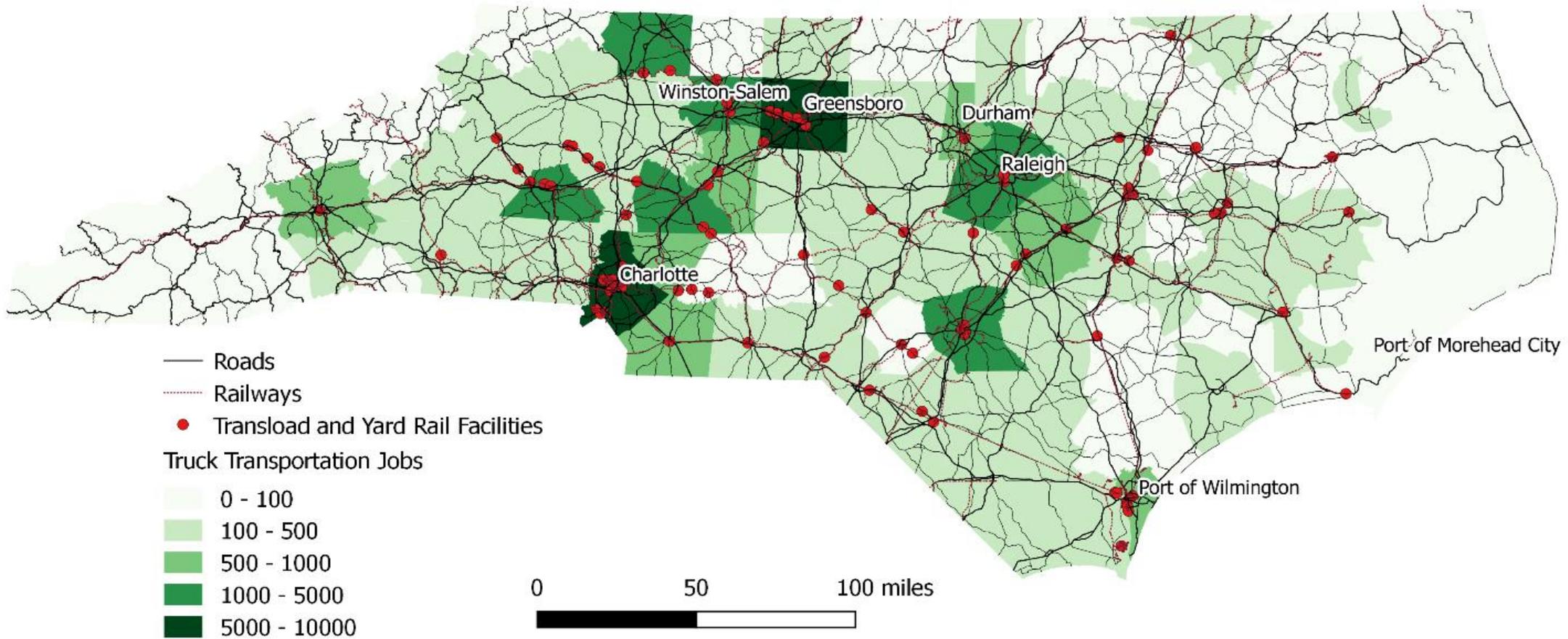


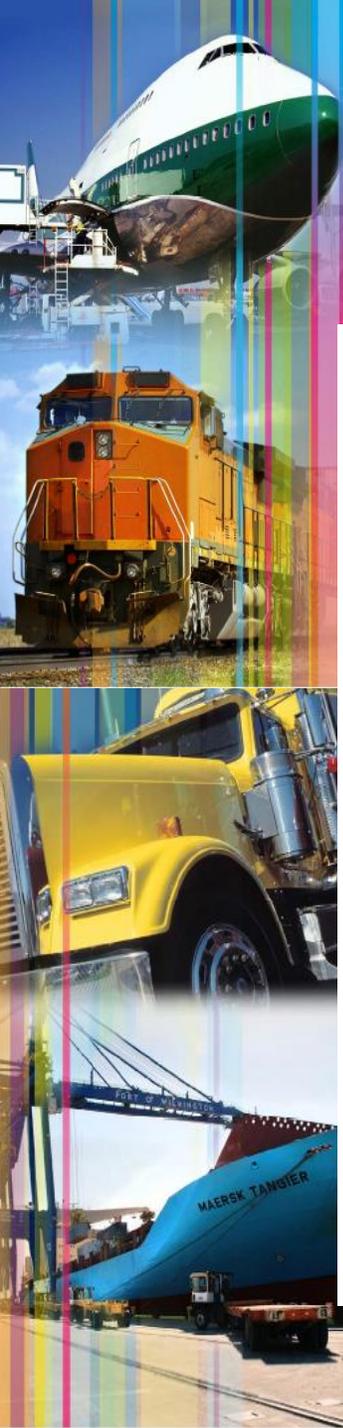
Trends in Freight Intensive Industries



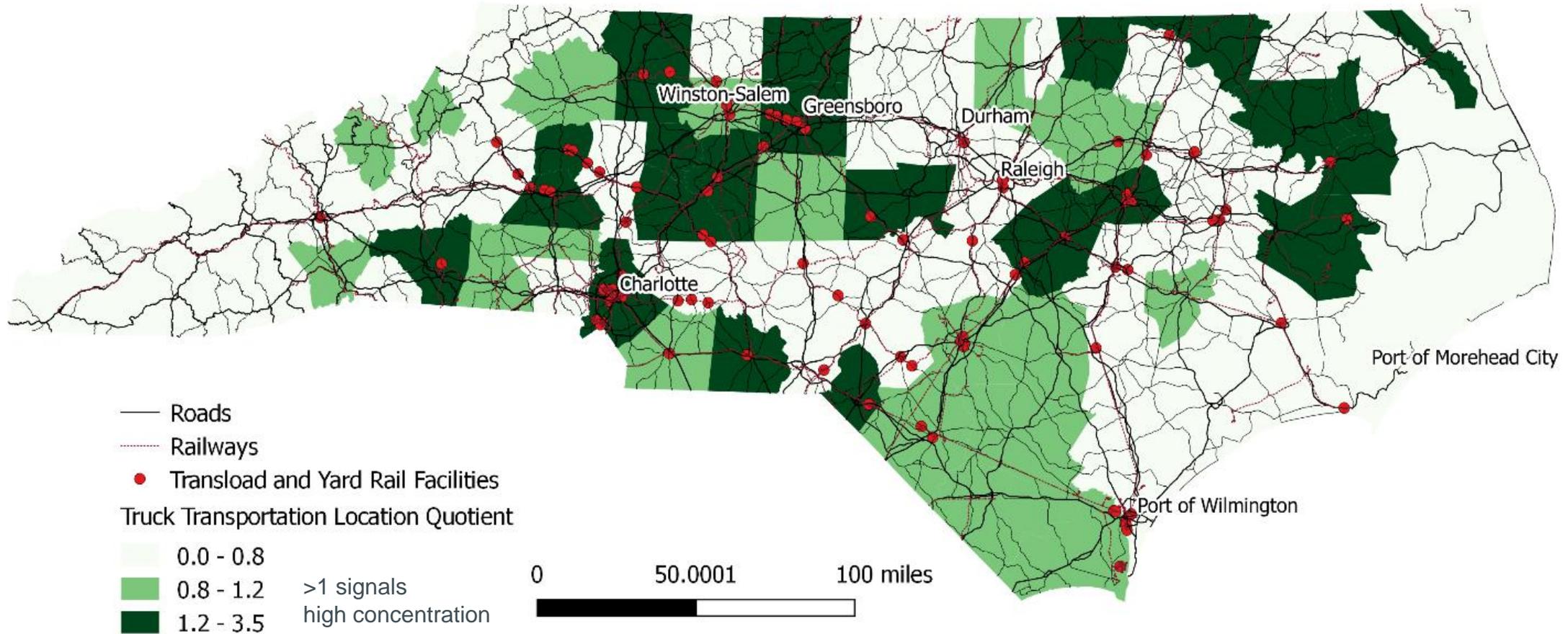
Prosperity Zone	Manufacturing	Construction	Wholesale Trade	Transportation and Warehousing
North Central	Mature	Mature	Transforming	Transforming
Northeast	Specialized	Transforming	Transforming	Transforming
Northwest	Mature	Transforming	Emerging	Transforming
Piedmont-Triad	Mature	Transforming	Specialized	Mature
Sandhill	Mature	Transforming	Transforming	Emerging
Southeast	Emerging	Mature	Transforming	Transforming
Southwest	Mature	Mature	Mature	Mature
Western	Mature	Transforming	Transforming	Transforming
North Carolina	Mature	Transforming	Mature	Transforming

For-Hire Trucking Jobs, 2015



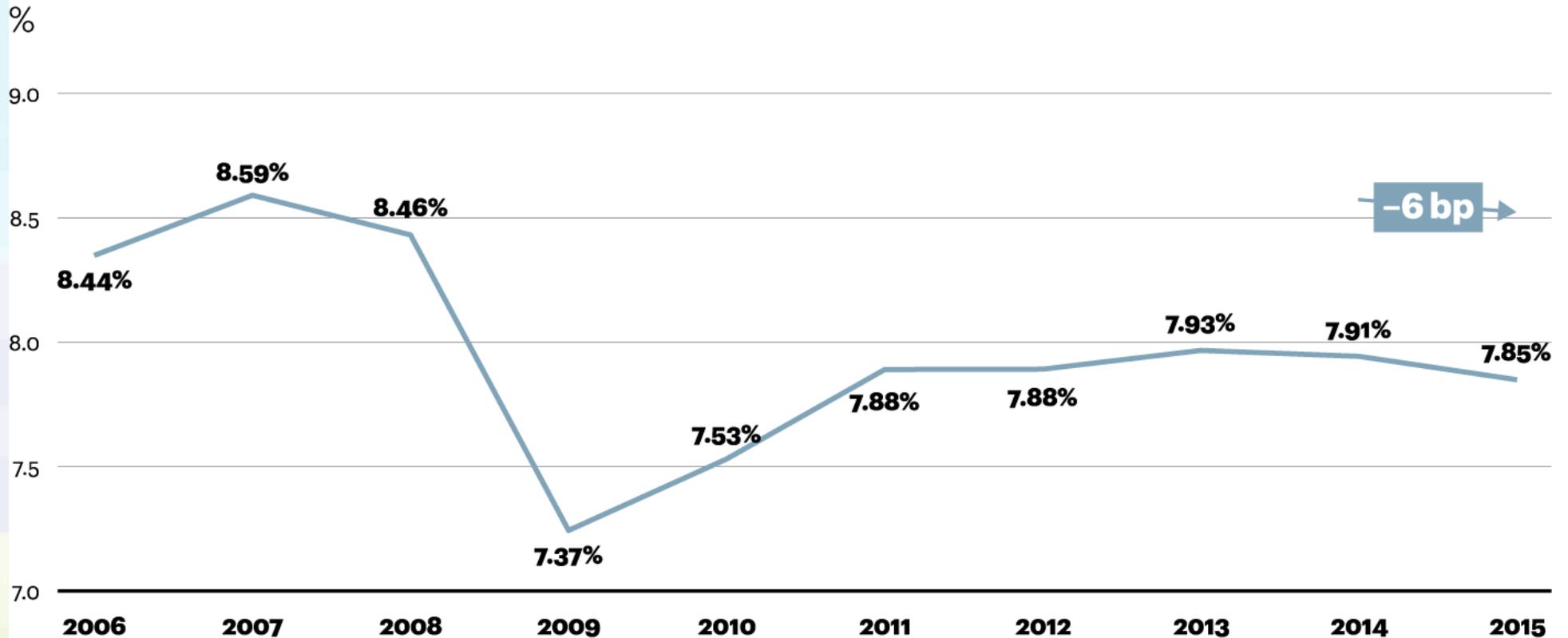


For-Hire Trucking Concentrations



Freight Transportation Impacts all Industries

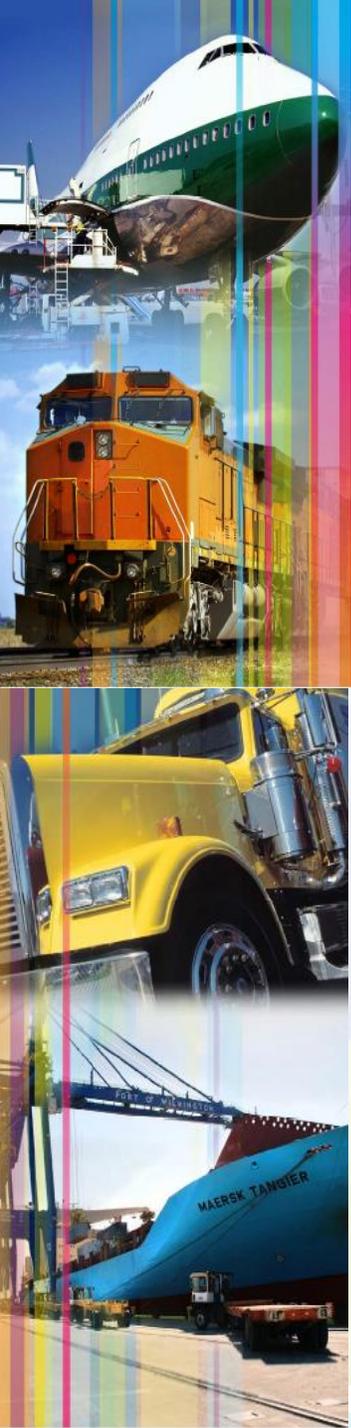
US business logistics costs as a share of nominal GDP



Note: bp is basis points.

Source: CSCMP's 27th Annual State of Logistics Report (see report appendix)





Transportation Costs Rising more than Inventory Carrying Costs

U.S. business logistics costs (\$ billion)

	2015	YoY 15/14	5 year CAGR
TRANSPORTATION COSTS			
Full truckload	278.8	3.0%	7.1%
Less-than-truckload	63.7	7.0%	3.4%
Private or dedicated	240.1	1.0%	5.3%
Motor carriers	582.6	2.6%	5.9%
Parcel and express	82.2	8.0%	6.7%
Carload	60.8	-12.0%	4.4%
Intermodal	19.9	2.0%	2.1%
Rail	80.7	-8.9%	3.8%
Airfreight (includes domestic, import, and export)	67.4	2.1%	4.6%
Water and ports (includes domestic, import, and export)	47.6	2.1%	3.9%
Pipeline	29.5	-11.8%	2.7%
SUBTOTAL	888.9	1.3%	5.5%
INVENTORY CARRYING COSTS			
Storage	141.0	2.5%	4.7%
Financial cost (WACC x total business inventory)	158.1	7.4%	0.9%
Other (obsolescence, shrinkage, insurance, handling, others)	128.2	5.1%	2.6%
SUBTOTAL	427.3	5.1%	2.6%

NC Freight Cost Data

Year	# Bills	Billed Weight	Pieces	Total Paid	Line Haul	Fuel	Accessorial Charge
2013	638,374	1,099,491,391	171,128,899	\$96,360,851	\$74,291,670	\$14,512,927	\$7,556,254
2014	638,570	783,141,611	25,295,668	\$89,683,371	\$70,843,822	\$11,703,316	\$7,136,233
2015	634,213	815,169,340	22,720,742	\$88,678,773	\$73,378,966	\$7,809,208	\$7,490,599
2016	332,727	396,621,705	12,945,580	\$40,288,917	\$34,533,719	\$2,239,054	\$3,516,144
Grand Total	2,243,884	3,094,424,046	232,090,889	\$315,011,911	\$253,048,177	\$36,264,505	\$25,699,229

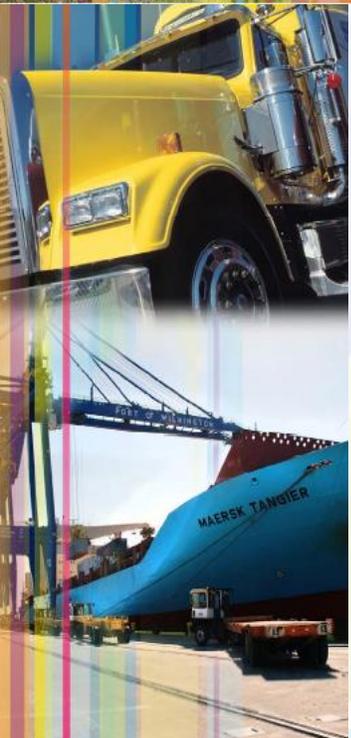
Companies	# Bills	Billed Weight	Paid Amount
176	2,183,635	3,000,449,638	\$303,195,684

NC Freight Bill Data

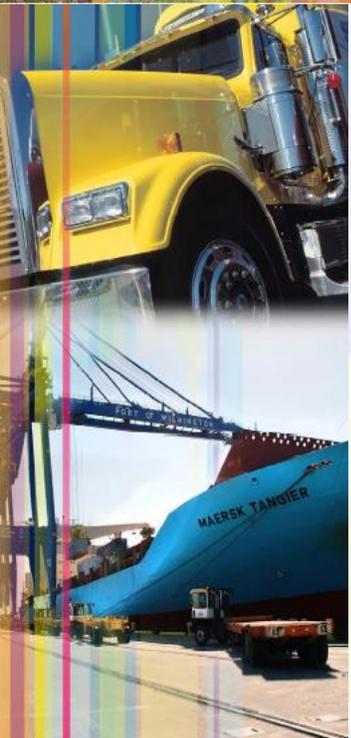
Commodity Type	Count of Company	# Shipments	Weight	Avg. Weight	Paid Amount	Avg. Paid
Consumer Goods	32	1,052,334	1,026,460,324.19	975.41	\$130,959,426.96	\$124.45
Industrial	121	623,055	1,148,923,495.57	1,091.79	\$112,969,825.04	\$107.35
Pharmaceuticals	8	454,141	327,981,849.08	311.67	\$26,742,937.33	\$25.41
Food	14	23,977	264,714,258.34	251.55	\$17,494,601.26	\$16.62
Agriculture	1	30,128	232,369,710.50	220.81	\$15,028,893.00	\$14.28
Grand Total	176	2,183,635	3,000,449,637.67	2,851.23	\$303,195,683.59	\$288.12

Commodity type	Avg cost per ton
Consumer Goods	0.127584
Industrial	0.098327
Agriculture	0.064677



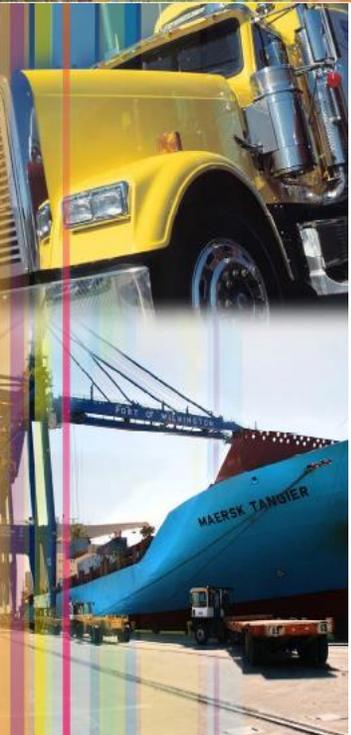


Mode	# Shipments	Billed Weight	Pieces	Paid Amount	Line Haul	Fuel Cost	Other Cost
PARCEL POST	1,012,417	52,321,995.44	3,712,611	\$26,718,706.10	\$21,355,220.59	\$1,141,344.37	\$4,222,141.14
LESS THAN TRUCKLOAD	698,431	705,821,818.36	31,827,101	\$112,050,014.74	\$92,693,140.89	\$11,701,873.75	\$7,655,000.10
TRUCKLOAD	164,753	2,106,037,907.83	190,444,750	\$125,152,458.47	\$100,147,787.85	\$18,169,704.17	\$6,834,966.45
DOMESTIC GROUND PARCEL	98,777	2,738,867.00	98,780	\$1,220,449.92	\$1,117,361.96	\$36,480.61	\$66,607.35
AIR	68,667	8,202,620.55	192,014	\$4,308,255.39	\$3,321,969.46	\$329,146.69	\$657,139.24
COURIER	59,882	6,303,185.67	80,770	\$1,755,840.30	\$1,323,142.59	\$164,668.55	\$268,029.16
HOME DELIVERY	55,642	8,697,556.70	308,272	\$10,138,281.21	\$7,638,486.74	\$574,091.44	\$1,925,703.03
FREIGHT FORWARDER	8,390	19,539,678.59	191,177	\$7,775,105.99	\$4,203,191.27	\$952,061.09	\$2,619,853.63
UNKNOWN	6,834	2,360,334.94	175,914	\$420,388.06	\$374,811.90	\$28,994.95	\$16,581.21
BROKER	3,935	14,204,696.59	491,897	\$4,605,208.29	\$3,911,187.37	\$242,636.57	\$451,384.35
INTERMODAL	2,044	54,843,114.45	3,120,537	\$4,374,770.28	\$3,507,830.86	\$809,795.17	\$57,144.25
INTERMODAL AIR	1,539	2,678,345.00	2,959	\$2,419,468.30	\$1,203,957.24	\$901,412.76	\$314,098.30
INTERNATIONAL PARCEL	1,256	7,858.00	1,309	\$33,496.39	\$30,095.71	\$1,061.58	\$2,339.10
INTERNATIONAL LCL	302	8,075,056.54	3,297	\$491,932.61	\$317,027.51	\$21,541.92	\$153,363.18
CONTAINERIZED OCEAN	248	7,656,501.00	322	\$489,431.52	\$267,582.34	\$122,743.93	\$99,105.25
EXPEDITED TRUCK	211	228,502.00	1,421	\$234,934.97	\$227,661.28	\$6,116.19	\$1,157.50
WHITE GLOVE	130	173,537.00	466	\$137,154.97	\$106,489.37	\$15,538.17	\$15,127.43
WAREHOUSE	48	34,934.00	2,460	\$726,112.73	\$631,921.01	\$0.00	\$94,191.72
OCEAN	42	124,056.00	2,079	\$76,736.87	\$10,039.71	\$1,340.21	\$65,356.95
CONTRACT CARRIER	33	35,161.00	54	\$6,926.33	\$5,757.35	\$1,168.98	\$0.00
MISC.	23	41,203.00	43	\$10,094.75	\$9,248.15	\$846.60	\$0.00
RAIL	16	1,645.00	1,690	\$9,039.60	\$9,039.60	\$0.00	\$0.00
TANK TRUCK	7	229,990.00	401	\$34,169.46	\$24,663.22	\$8,679.09	\$827.15
TOWAWAY SERVICE	3	22,630.00	6	\$1,300.00	\$1,125.00	\$0.00	\$175.00
EXPEDITED	2	0.00	2	\$462.54	\$0.00	\$0.00	\$462.54
MOTOR BULK	2	64,063.00	9	\$4,540.80	\$3,983.28	\$557.52	\$0.00
DRAYAGE	1	4,380.00	6	\$403.00	\$325.00	\$78.00	\$0.00
Grand Total	2,183,635	3,000,449,637.67	230,660,347	\$303,195,683.59	\$242,443,047.25	\$35,231,882.31	\$25,520,754.03



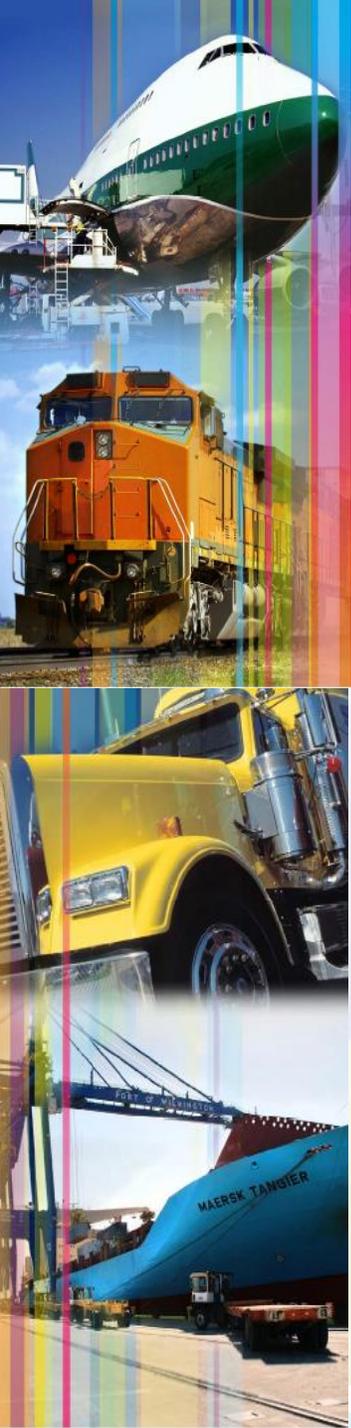
2016 Import Summary

Country	# Shipments	Billed Weight	Pieces	Paid Amount	Line Haul	Fuel Cost	Other Cost
Unknown	604	135,011.50	16	\$38,448.60	\$38,364.33	\$84.27	\$0.00
Great Britain	482	83,547.12	1,106	\$152,533.80	\$40,099.65	\$8,088.71	\$104,345.44
Canada	349	1,348,273.44	55,140	\$158,139.83	\$133,298.90	\$8,229.41	\$16,611.52
China	187	406,482.36	4,215	\$161,923.89	\$73,349.76	\$13,275.30	\$75,298.83
Mexico	169	8,987.52	168	\$3,399.33	\$2,141.49	\$55.69	\$1,202.15
Hong Kong	92	123,563.70	3,207	\$67,644.20	\$45,516.01	\$1,055.99	\$21,072.20
Germany	45	117,867.50	24,799	\$83,092.34	\$26,416.72	\$92.77	\$56,582.85
Switzerland	34	2,351.00	45	\$5,661.49	\$3,235.31	\$30.46	\$2,395.72
Czech Republic	29	3,156.40	64	\$10,840.05	\$1,931.71	\$1,525.82	\$7,382.52
South Korea	29	5,131.20	148	\$12,978.74	\$6,886.15	\$258.90	\$5,833.69
Belgium	21	1,663.17	21	\$2,211.61	\$1,090.38	\$14.28	\$1,106.95
Denmark	14	20,135.20	15	\$13,923.39	\$3,189.73	\$0.00	\$10,733.66
Taiwan	14	1,971.85	22	\$1,509.08	\$996.07	\$41.85	\$471.16
Finland	13	333.60	15	\$9,897.25	\$891.85	\$2.06	\$9,003.34
Japan	11	3,912.00	170	\$2,652.10	\$854.61	\$21.15	\$1,776.34
Malaysia	8	114,182.00	4,804	\$35,130.99	\$27,940.68	\$4,549.81	\$2,640.50
Russian Federation	7	31.50	7	\$1,955.55	\$168.38	\$0.00	\$1,787.17
Australia	6	4,292.40	19	\$6,234.92	\$4,839.48	\$2.03	\$1,393.41
Austria	3	231.34	3	\$283.10	\$172.83	\$7.27	\$103.00
Italy	3	494.80	4	\$662.73	\$378.76	\$0.00	\$283.97
Kuwait	3	15.80	3	\$417.24	\$368.04	\$18.02	\$31.18
Singapore	3	30.80	3	\$793.59	\$56.90	\$0.99	\$735.70
France	2	4,917.00	4	\$14,328.97	\$8,384.55	\$336.12	\$5,608.30
Hungary	2	33,473.00	7,205	\$11,511.74	\$5,005.00	\$0.00	\$6,506.74
Netherlands	2	401.40	2	\$593.27	\$236.09	\$3.08	\$354.10
Top 25 Importers	2,132	2,420,457.60	101,205	\$796,767.80	\$425,813.38	\$37,693.98	\$333,260.44
Other 9 Importers	10	1,317.00	24	\$5,403.17	\$4,413.72	\$104.98	\$884.47
Grand Total	2,142	2,421,774.60	101,229	\$802,170.97	\$430,227.10	\$37,798.96	\$334,144.91



2016 Export Summary

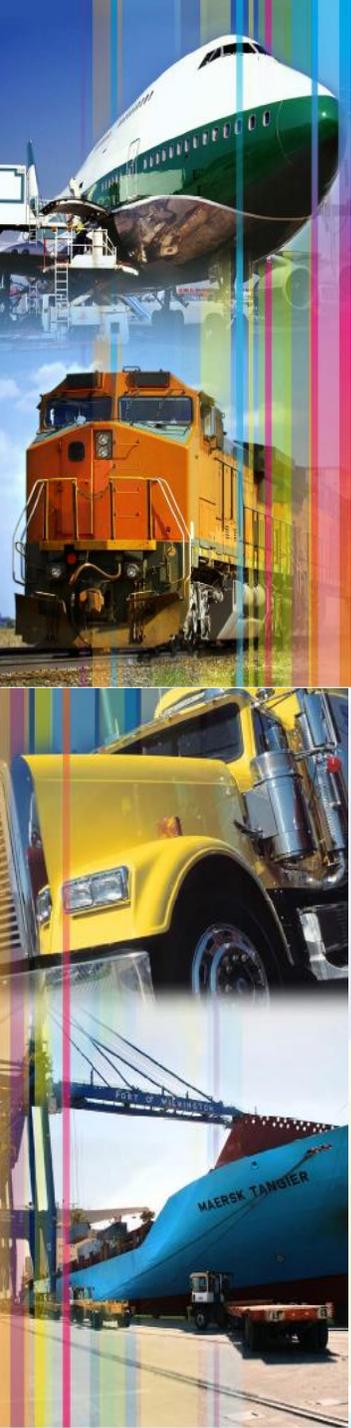
Country	# Shipments	Billed Weight	Pieces	Paid Amount	Line Haul	Fuel Cost	Other Cost
Canada	2,630	749,332.56	10,706	\$261,713.94	\$174,014.47	\$9,736.40	\$77,963.07
Great Britain	407	47,827.70	509	\$67,156.16	\$49,356.12	\$163.81	\$17,636.23
Singapore	69	203,067.30	872	\$21,180.03	\$11,280.15	\$1,706.15	\$8,193.73
China	66	382,775.00	149	\$27,231.97	\$13,733.48	\$5,316.85	\$8,181.64
Germany	65	61,858.88	296	\$36,729.08	\$10,978.94	\$11,090.81	\$14,659.33
Australia	64	521,508.20	1,118	\$76,098.13	\$59,009.26	\$3,861.43	\$13,227.44
Japan	59	1,478,650.40	2,591	\$98,947.16	\$43,745.36	\$29,751.27	\$25,450.53
Denmark	49	3,024.77	53	\$7,382.61	\$3,281.93	\$1,407.45	\$2,693.23
Mexico	47	350,780.60	157	\$39,537.07	\$35,710.96	\$3,327.65	\$498.46
Thailand	45	171,916.90	655	\$22,489.58	\$18,163.61	\$1,161.56	\$3,164.41
Taiwan	39	65,588.70	102	\$49,119.12	\$19,995.98	\$19,318.49	\$9,804.65
United Arab Emirates	38	6,957.00	80	\$13,374.19	\$11,174.21	\$1,061.34	\$1,138.64
Argentina	35	1,115,936.90	2,927	\$29,537.92	\$17,709.46	\$3,200.95	\$8,627.51
South Korea	33	375,741.80	482	\$30,809.95	\$11,608.87	\$12,069.50	\$7,131.58
Indonesia	30	112,995.80	1,265	\$14,915.56	\$9,575.18	\$3,124.95	\$2,215.43
Bahamas	24	12,984.00	36	\$22,954.32	\$14,039.81	\$536.37	\$8,378.14
France	24	12,362.80	29	\$13,805.17	\$724.21	\$5.58	\$13,075.38
Jamaica	22	42,103.00	37	\$34,426.30	\$19,165.58	\$951.48	\$14,309.24
Malaysia	22	158,394.90	62	\$6,312.02	\$5,120.80	\$416.80	\$774.42
Puerto Rico	21	9,710.30	58	\$11,324.24	\$9,369.11	\$953.52	\$1,001.61
Netherlands	19	229.80	31	\$1,107.59	\$900.06	\$7.71	\$199.82
Vietnam	19	125,584.70	55	\$7,651.85	\$6,464.86	\$833.09	\$353.90
Brazil	17	147,217.20	32	\$3,847.45	\$3,194.76	\$227.43	\$425.26
New Zealand	17	5,046.10	43	\$16,600.30	\$14,606.95	\$1,352.97	\$640.38
Top 25 Total	5,078	8,543,508.81	117,601	\$1,653,231.13	\$1,238,056.60	\$133,157.16	\$282,017.37
Other 53 Total	248	737,449.16	40,791	104333.24	64791.57	6470.09	33071.58
Grand Total	5,326	9,280,957.97	158,392	\$1,757,564.37	\$1,302,848.17	\$139,627.25	\$315,088.95



Next Steps for Freight Bill Data

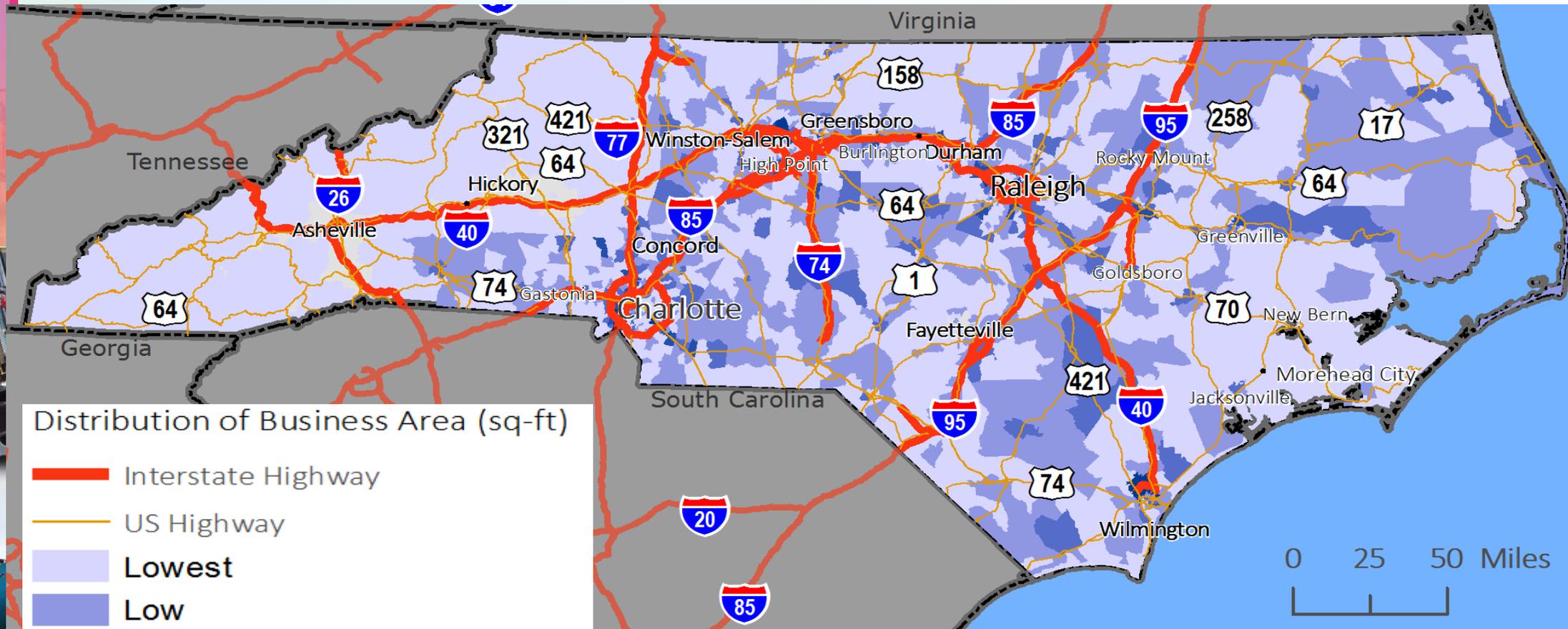
- Analyze costs by mode and benchmark against other states
- Compare costs to model share benchmarking
- Examine trends in rates by mode and O/D over time
- Compare costs to performance and needs/deficiencies



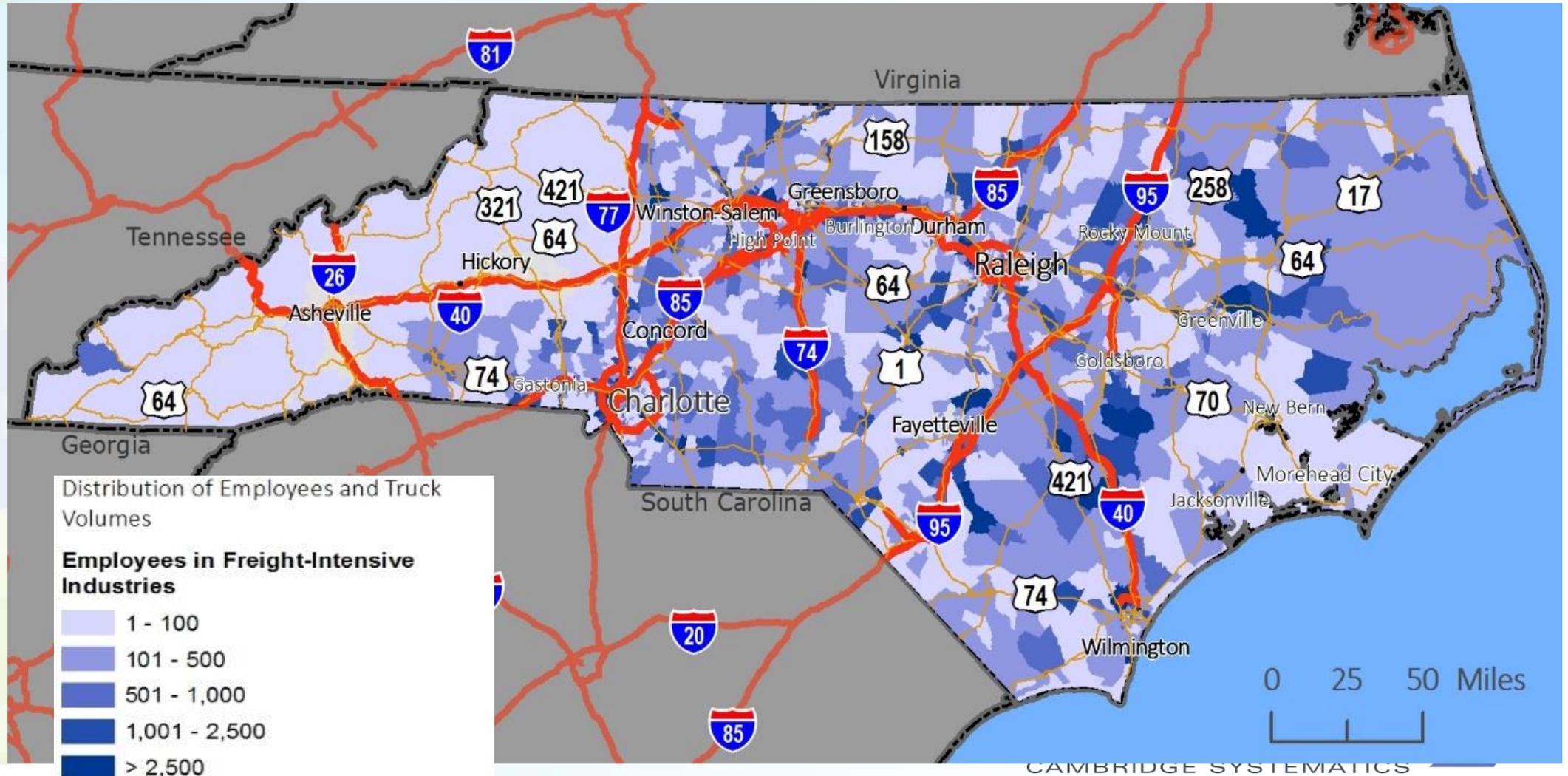
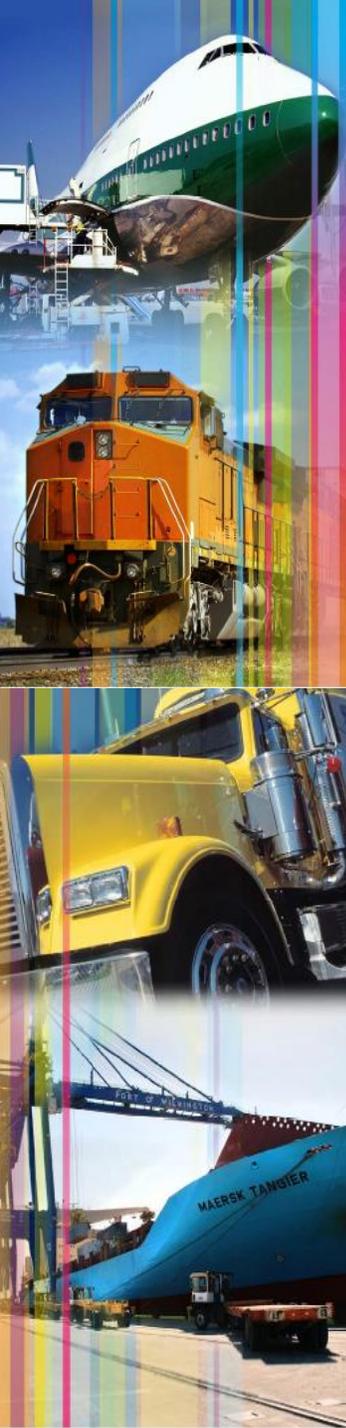


SYSTEM PERFORMANCE AND COMPETITIVENESS

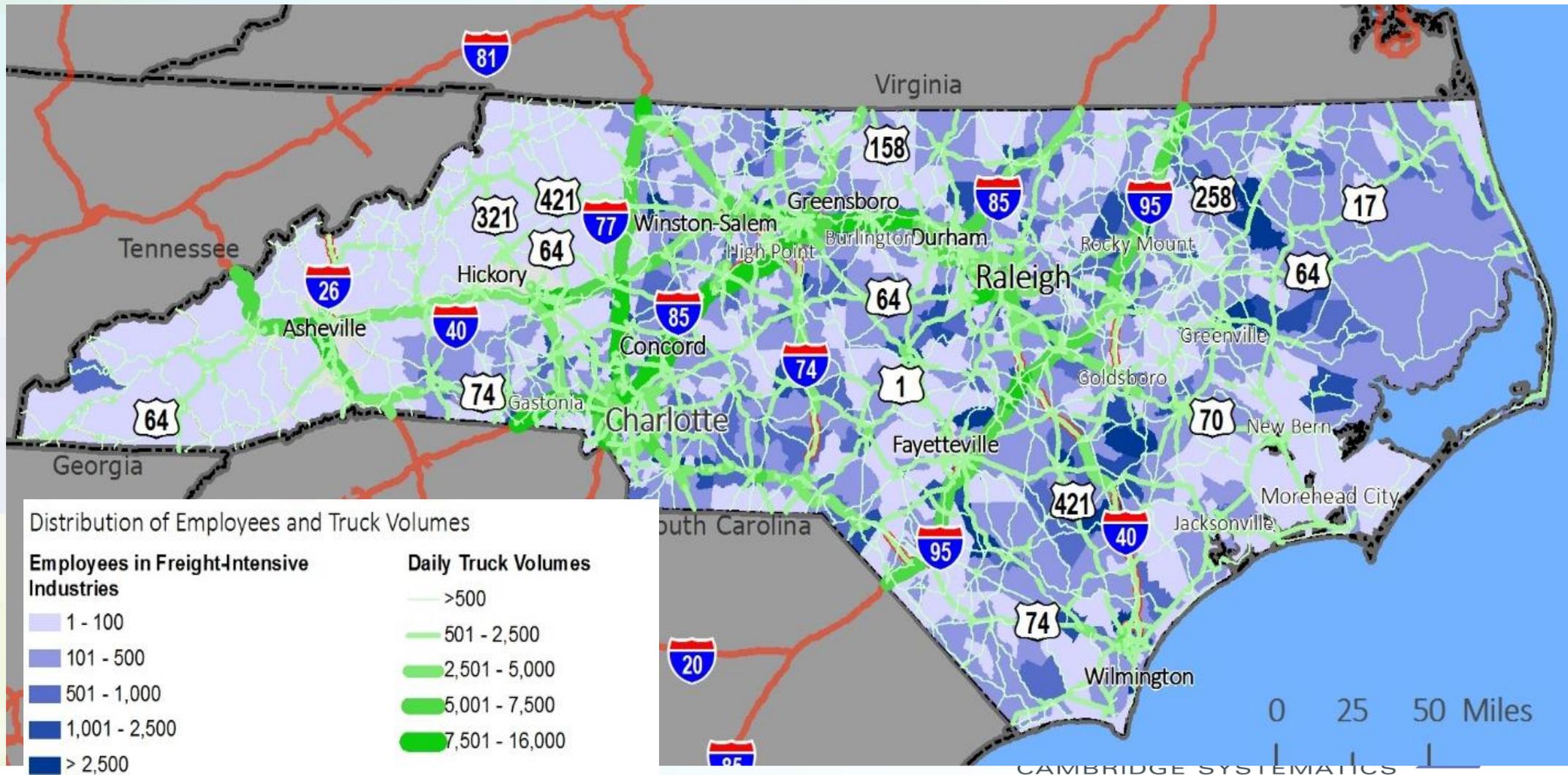
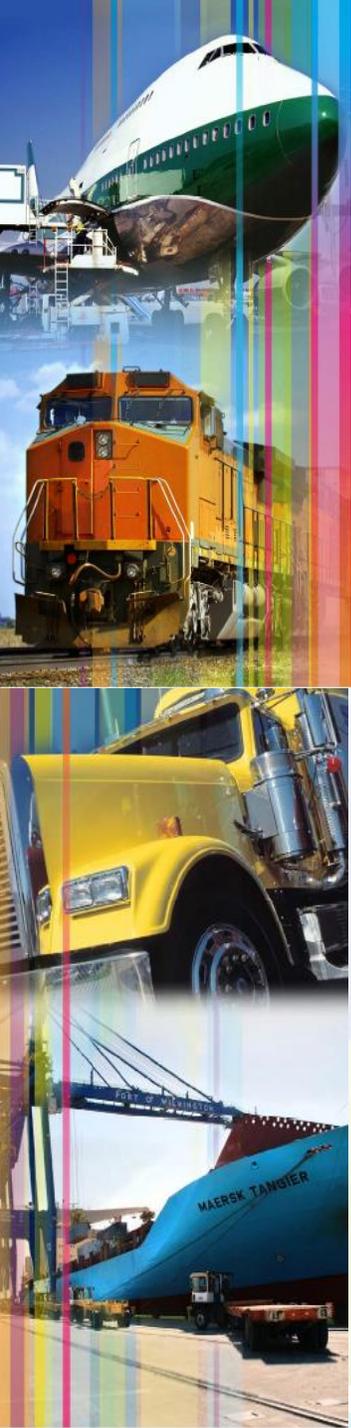
Freight Intensive Businesses, Sq Ft



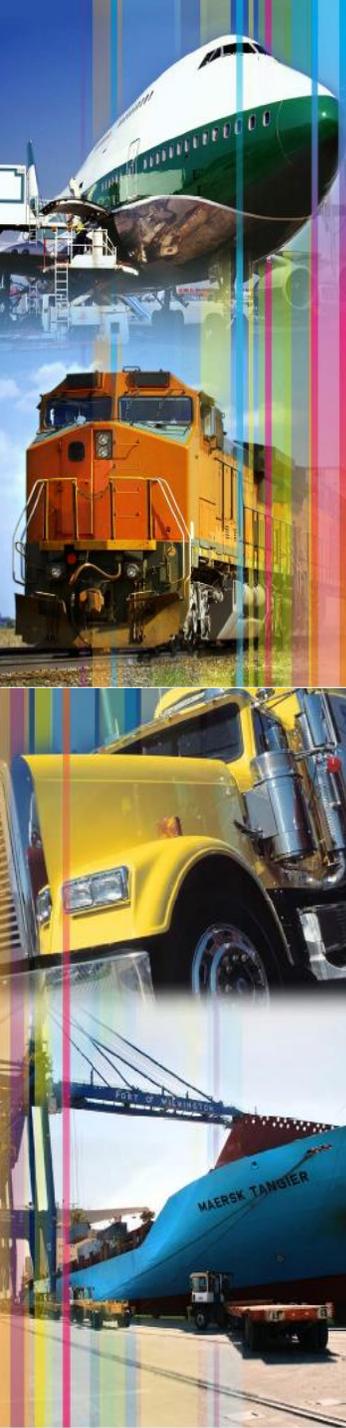
Freight Intensive Employment



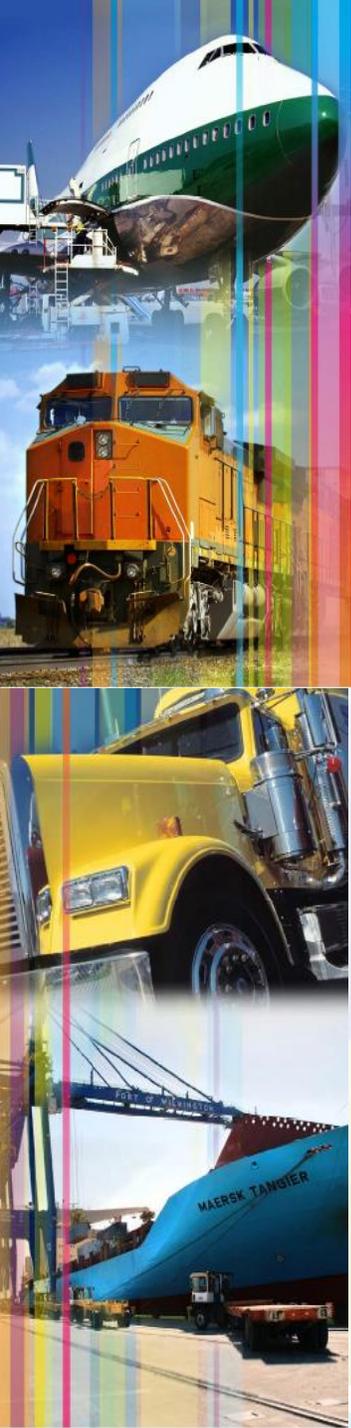
Freight Intensive Employment and Truck Counts



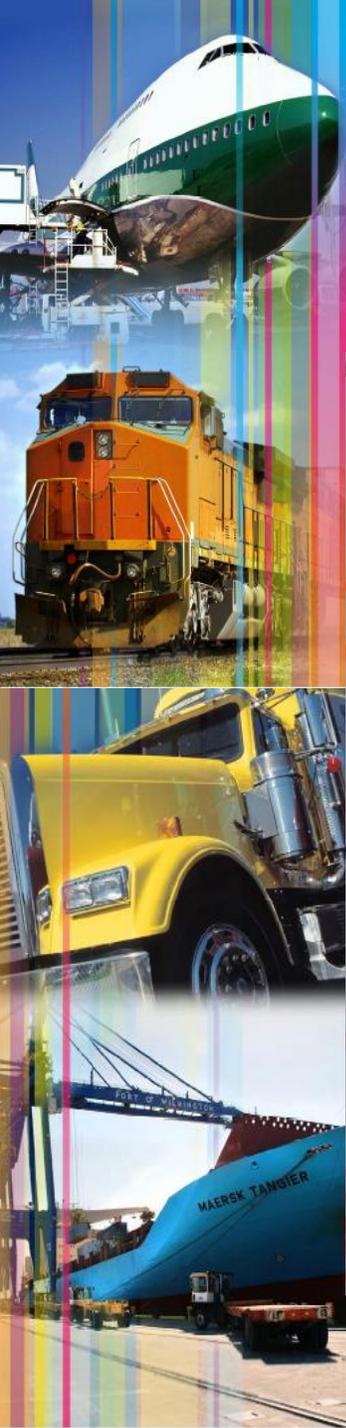
Interstate Average Truck Speeds, PM Peak



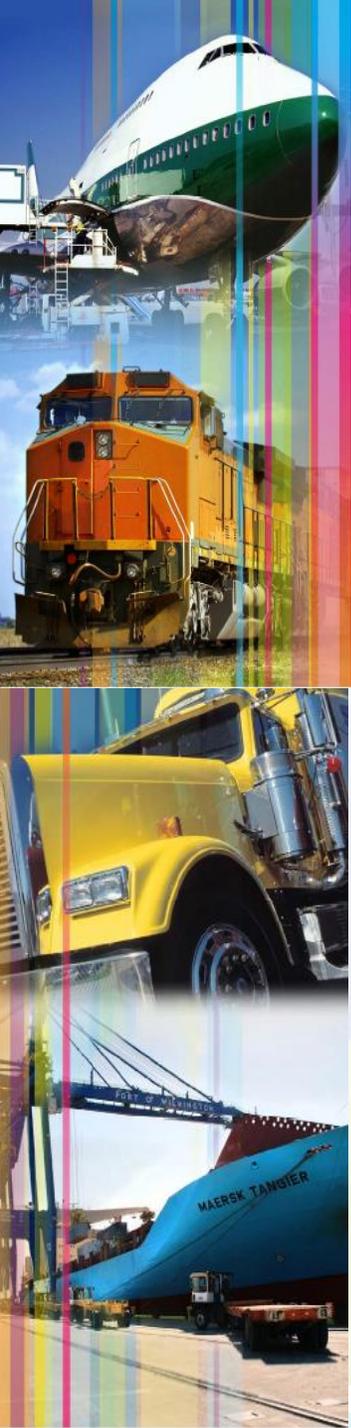
Interstate Truck Travel Time Reliability, PM Peak



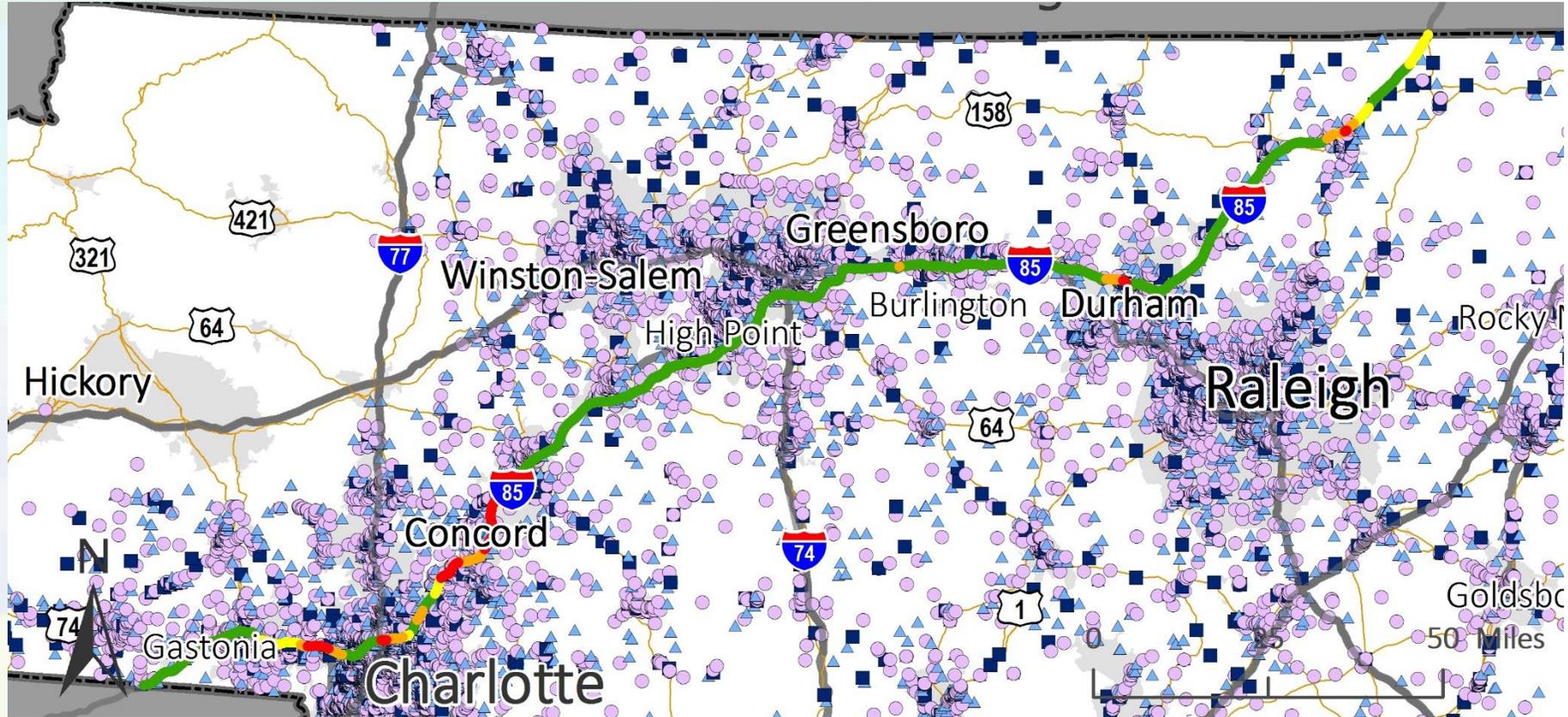
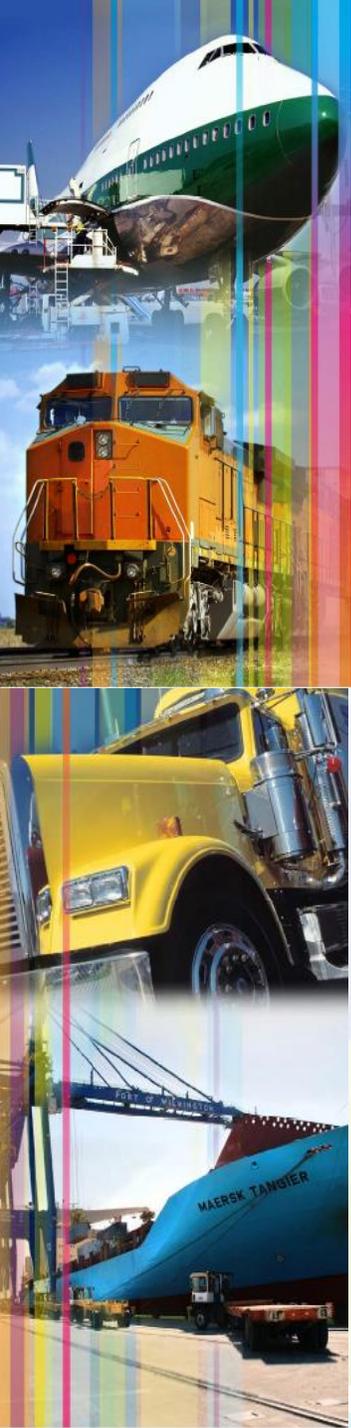
Non-Interstate Average Truck Travel Speeds, PM Peak



Non-Interstate Truck Travel Time Reliability, PM Peak



Truck Travel Time Reliability and Warehousing and Trade Businesses



Truck Travel Time Reliability During the Evening Peak and Distribution Industries

Distribution Industry Types

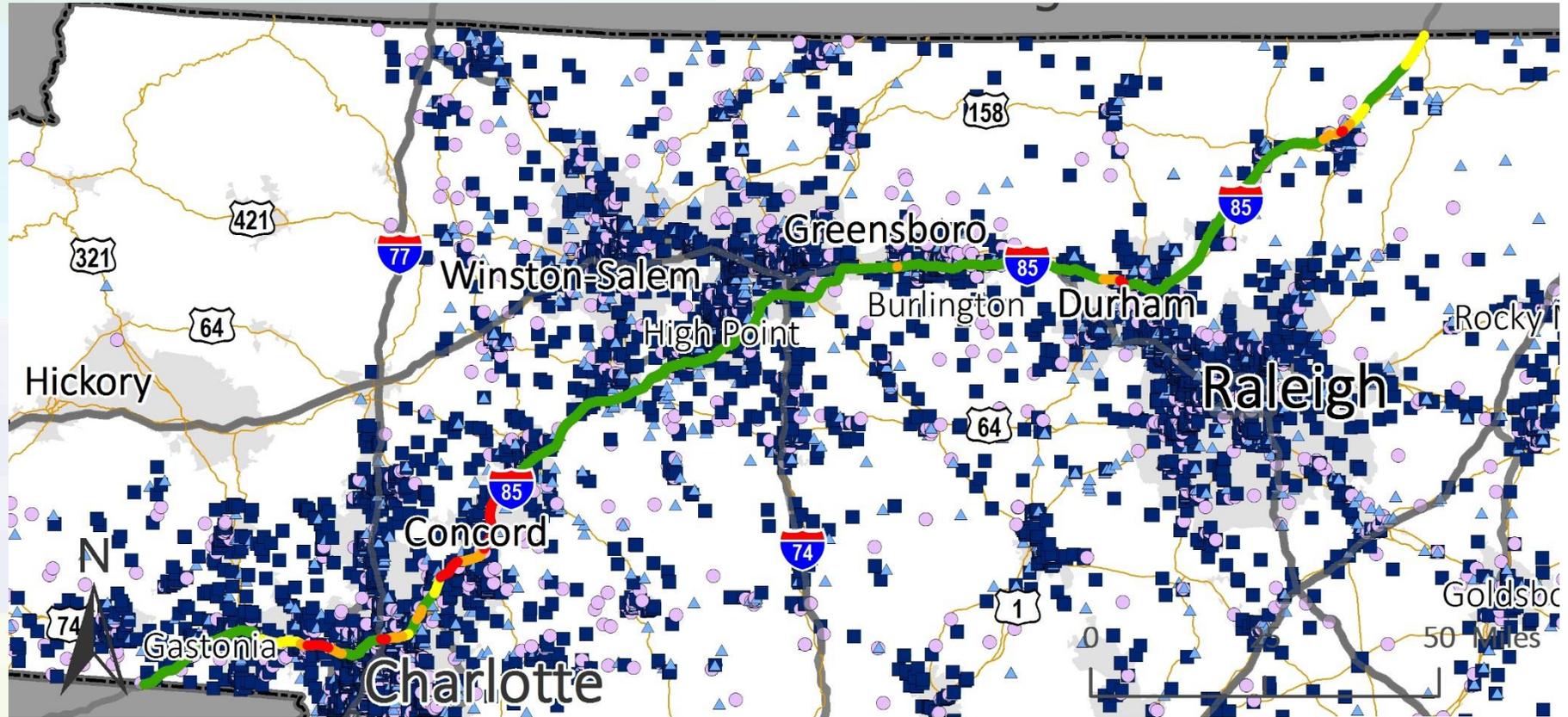
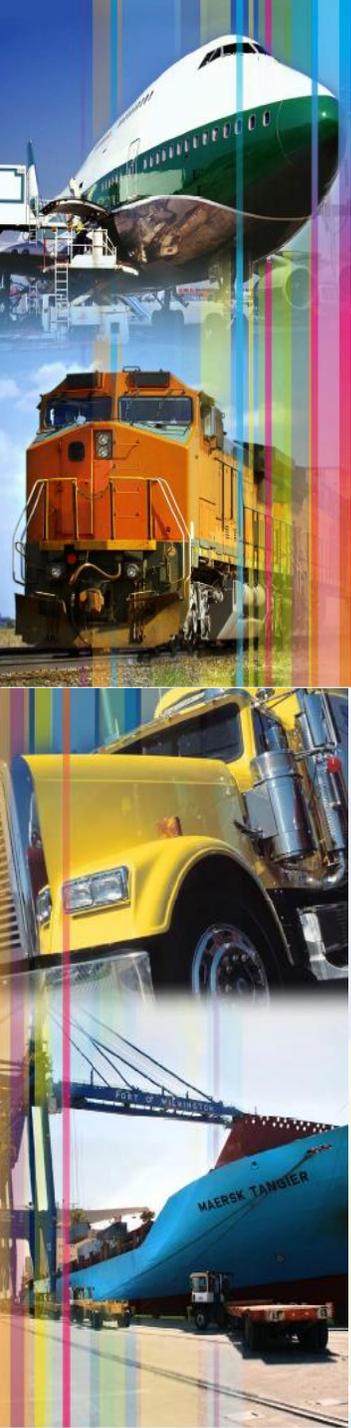
- Wholesale Trade
- ▲ Transportation
- Warehousing/Postal and Courier Service

Truck Buffer Time Index

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.0
- 1.0 - 2.0
- >2.0



Truck Travel Time Reliability and Manufacturing Firms



Truck Travel Time Reliability During the Evening Peak and Manufacturing Industries

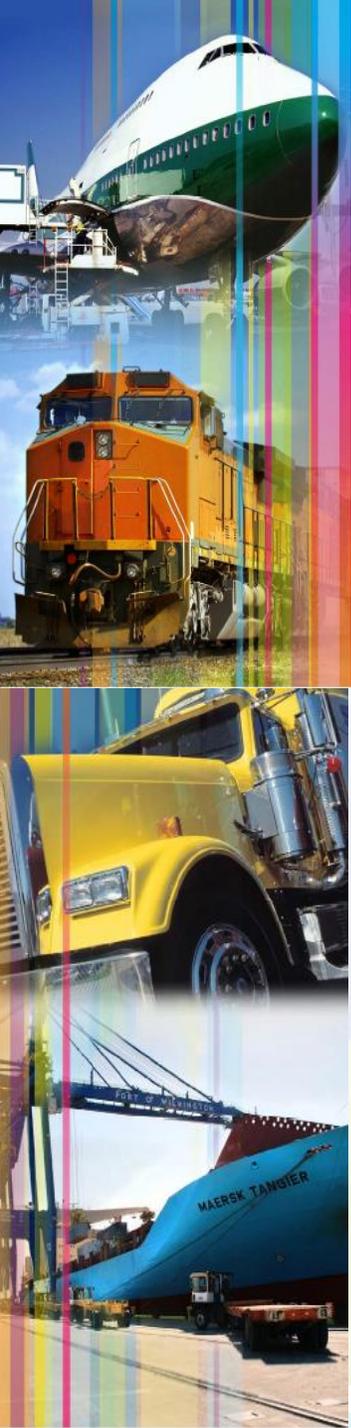
Manufacturing Industry Types

- Food/Apparel/Textiles
- ▲ Wood/Petroleum/Chemicals/Plastics
- Metals/Machinery/Electronics/Transportation

Truck Buffer Time Index

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.0
- 1.0 - 2.0
- >2.0





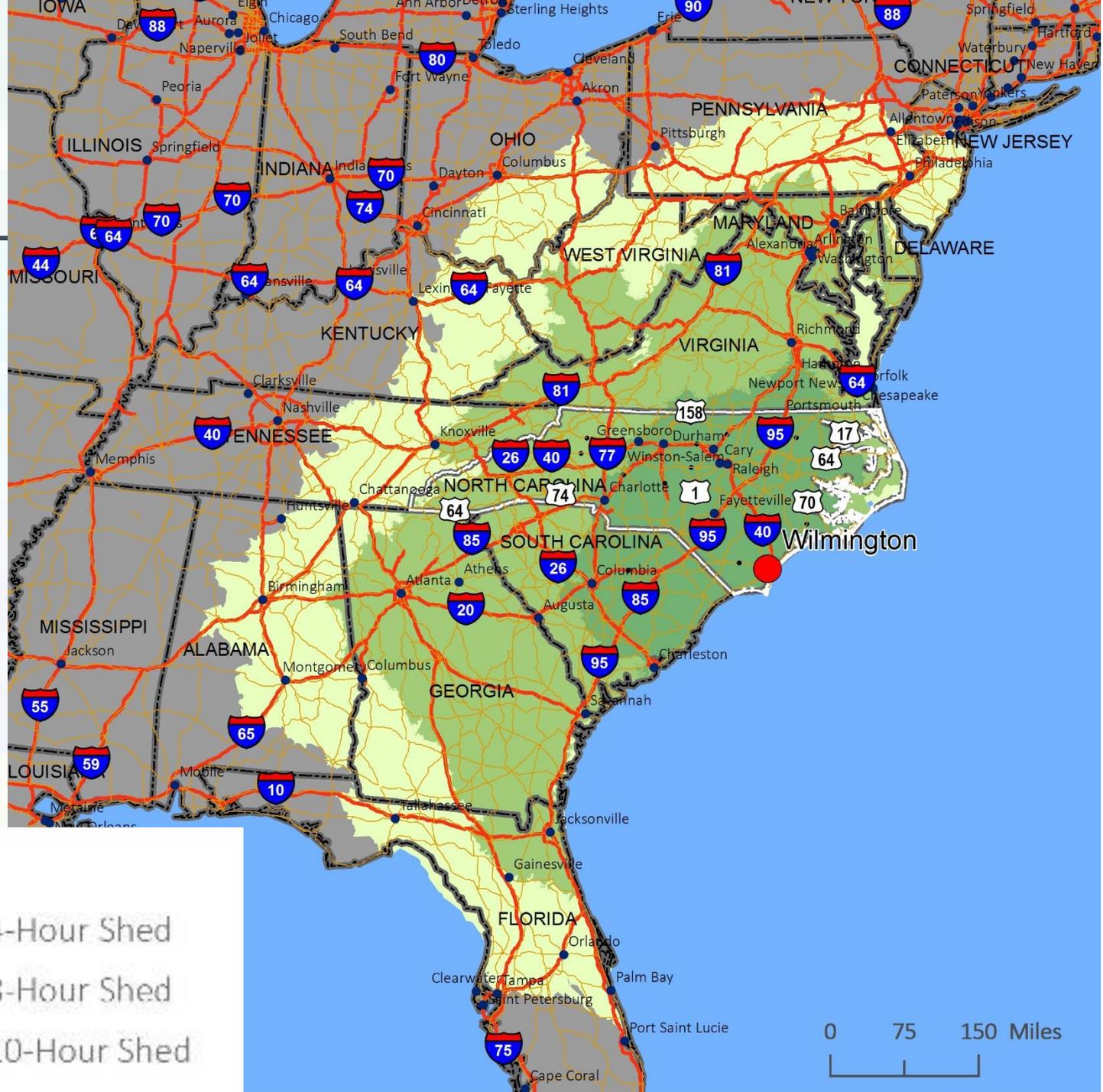
Travel Time Reliability Impacts

- Planning time
- Access to parking
- Truck parking demand
- Costs
- Market access



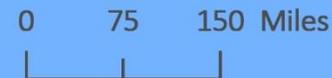


Port of Wilmington Travel Shed



WILMINGTON TIME PROFILE

- Cities $\geq 100,000$
- US Highway
- Interstate Highway
- 4-Hour Shed
- 8-Hour Shed
- 10-Hour Shed





Morehead City Travel Shed

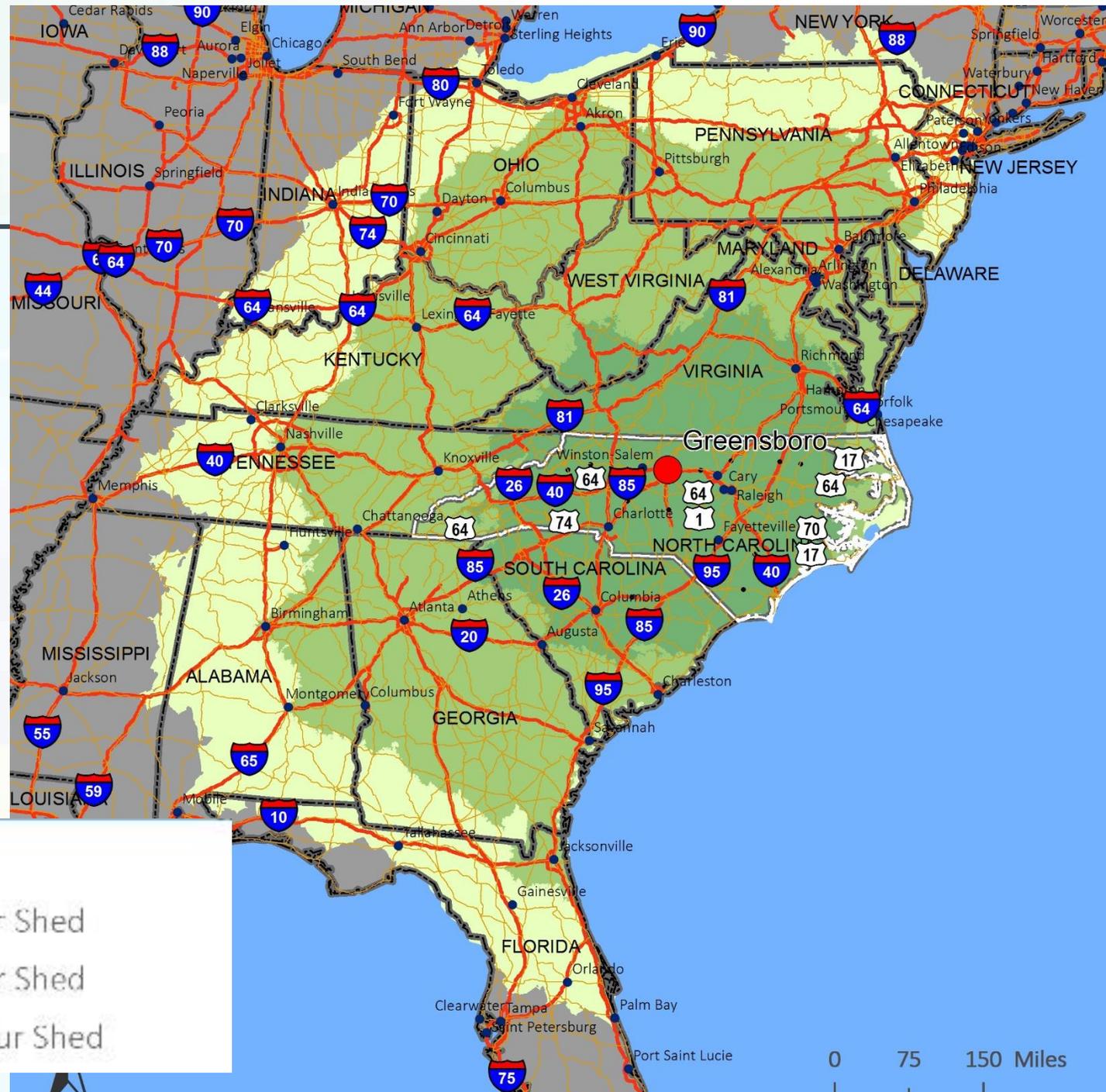
MOREHEAD CITY TIME PROFILE

- Cities ≥100,000
- US Highway
- Interstate Highway
- 4-Hour Shed
- 8-Hour Shed
- 10-Hour Shed





Triad Travel Market Shed





Charlotte Travel Market Shed

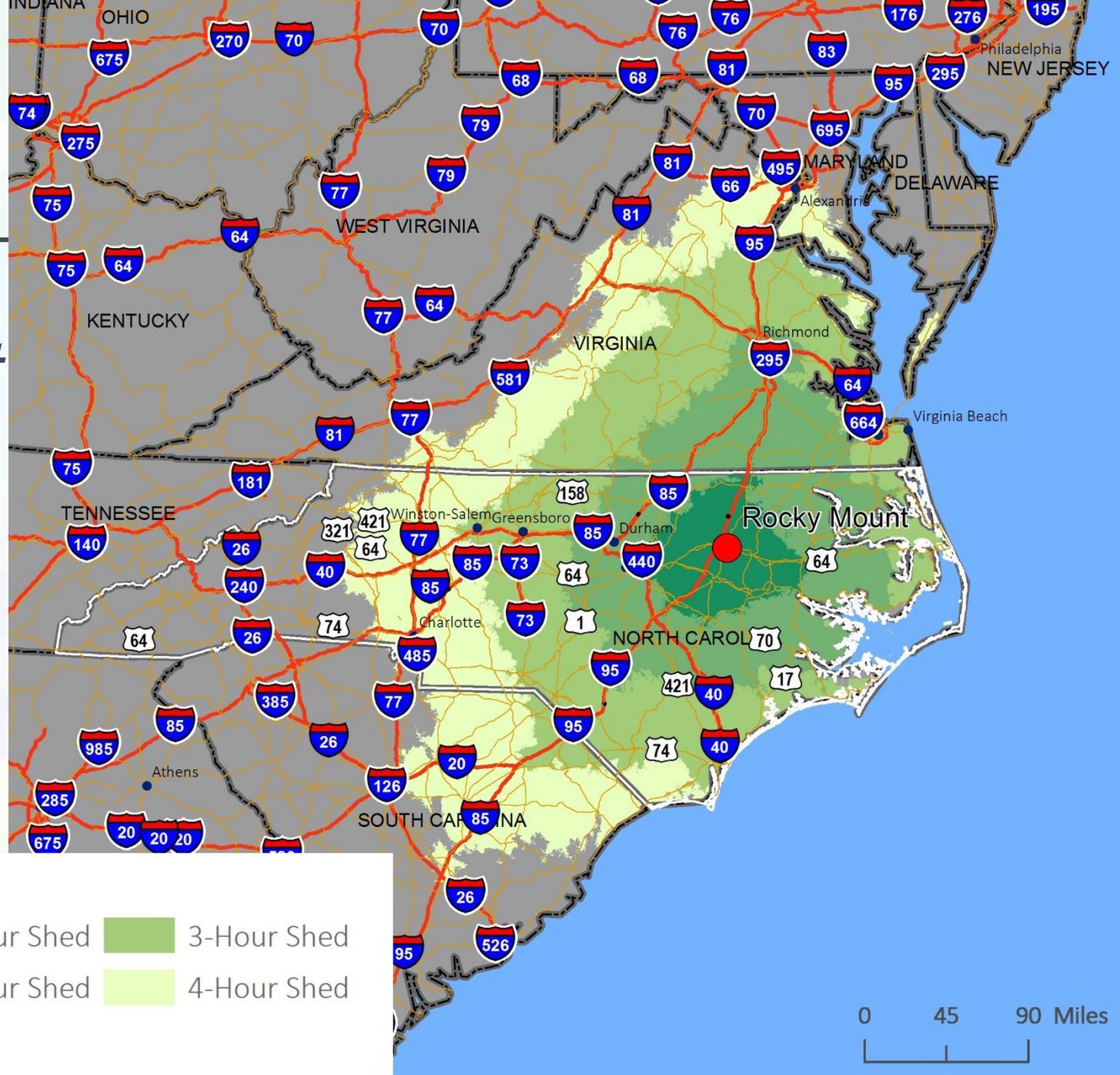




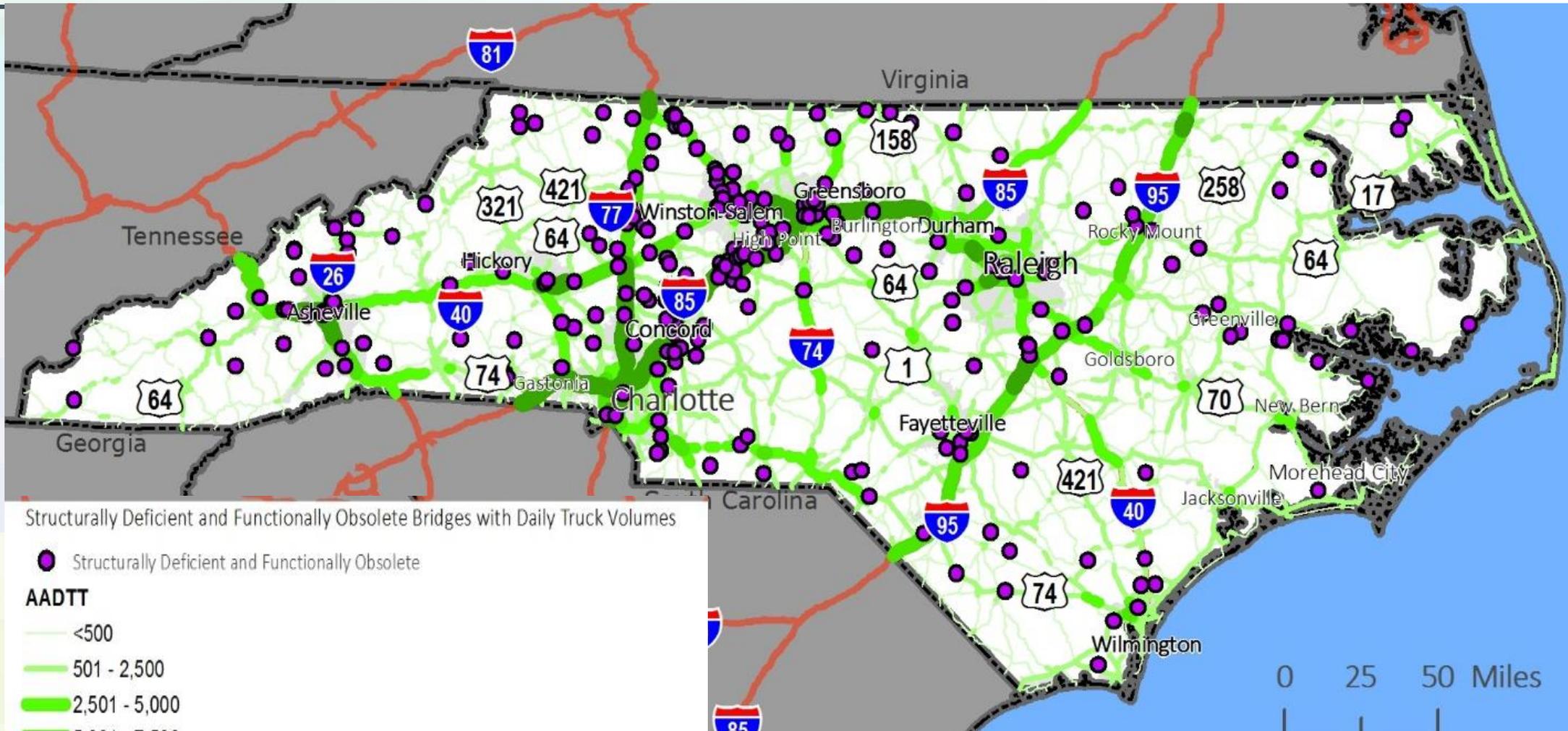
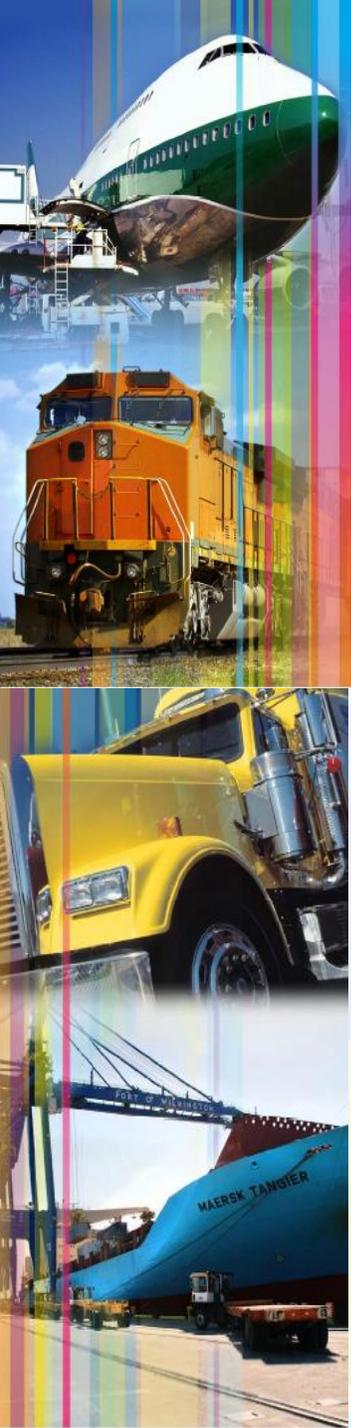
Rocky Mount Travel Shed

ROCKY MOUNT TIME PROFILE

- Cities $\geq 100,000$
- US Highway
- Interstate Highway
- 1-Hour Shed
- 2-Hour Shed
- 3-Hour Shed
- 4-Hour Shed

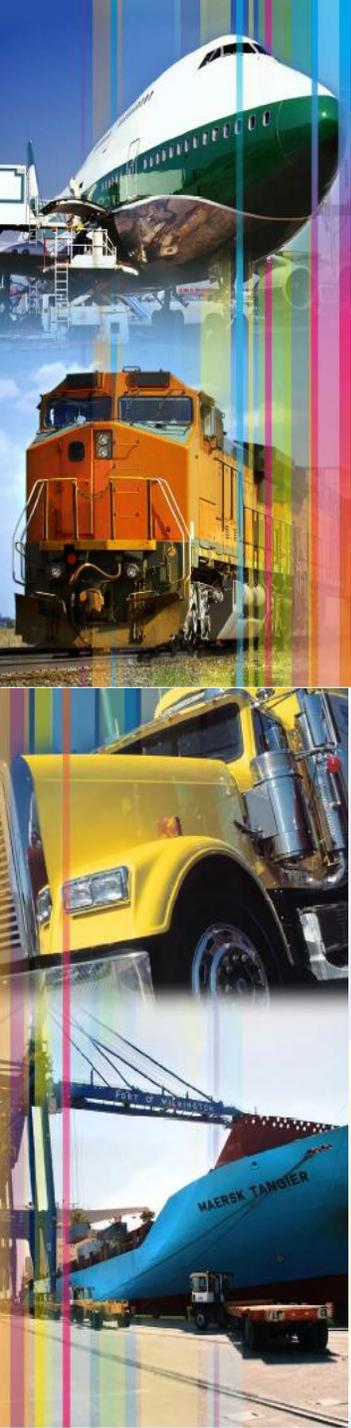


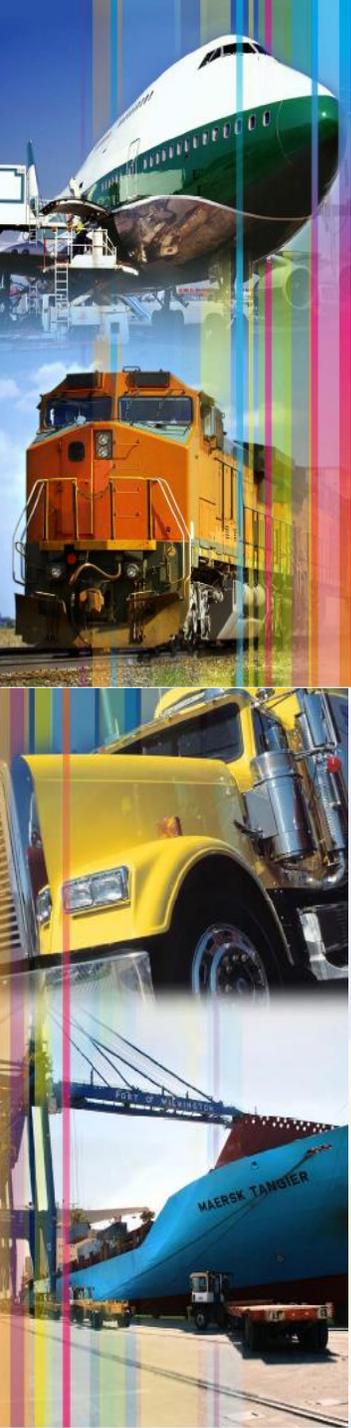
Structurally Deficient Bridges and Truck Counts



0 25 50 Miles

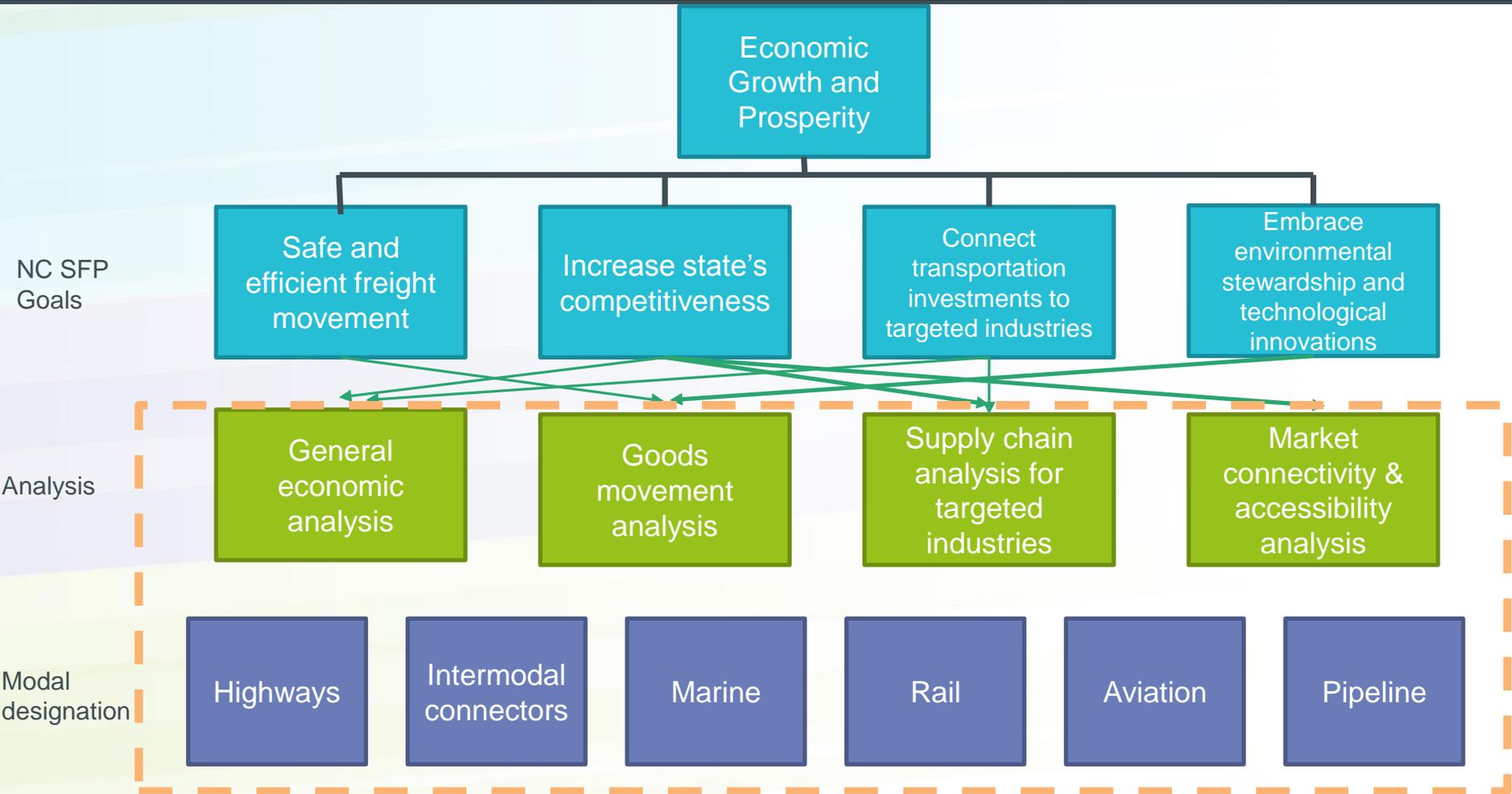
2040 Volume to Capacity Ratio

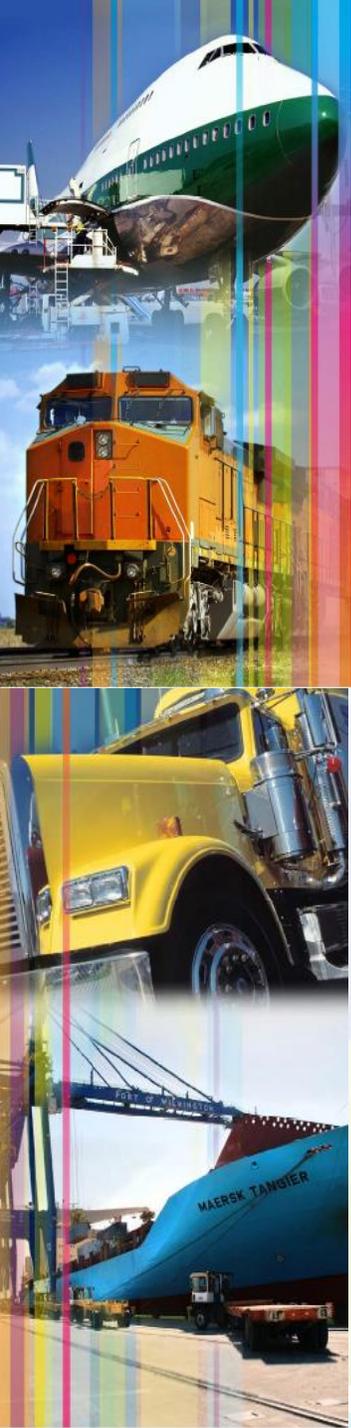




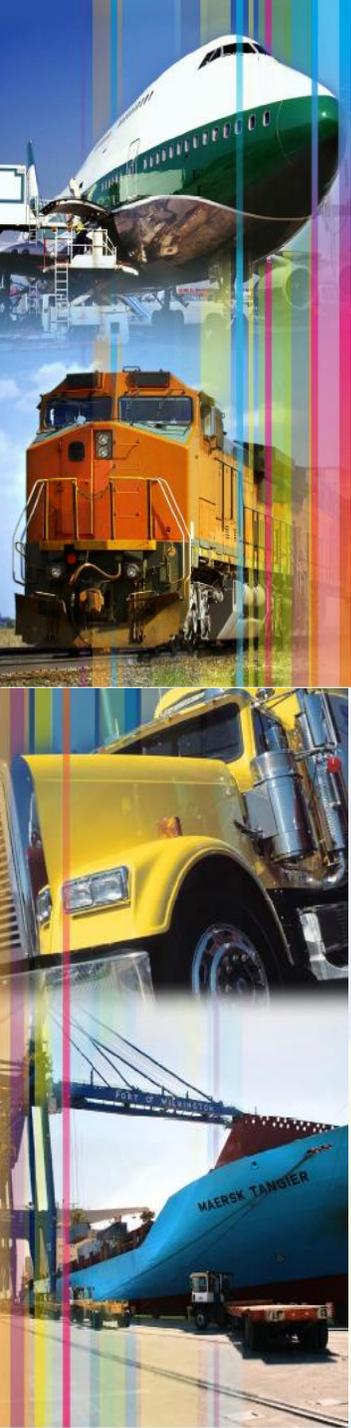
NC PRIMARY FREIGHT SYSTEM DESIGNATION

Analysis and Designation Process





NEXT STEPS



Next Steps

- Roll out NC Freight Data Tool
- Finalize needs assessment and system designation
- Complete supply chain and economic analysis
- Start developing and screening recommendations

