

North Carolina Commodity Flow Studies

(Specific chemical information available in the final report has been redacted from this presentation)

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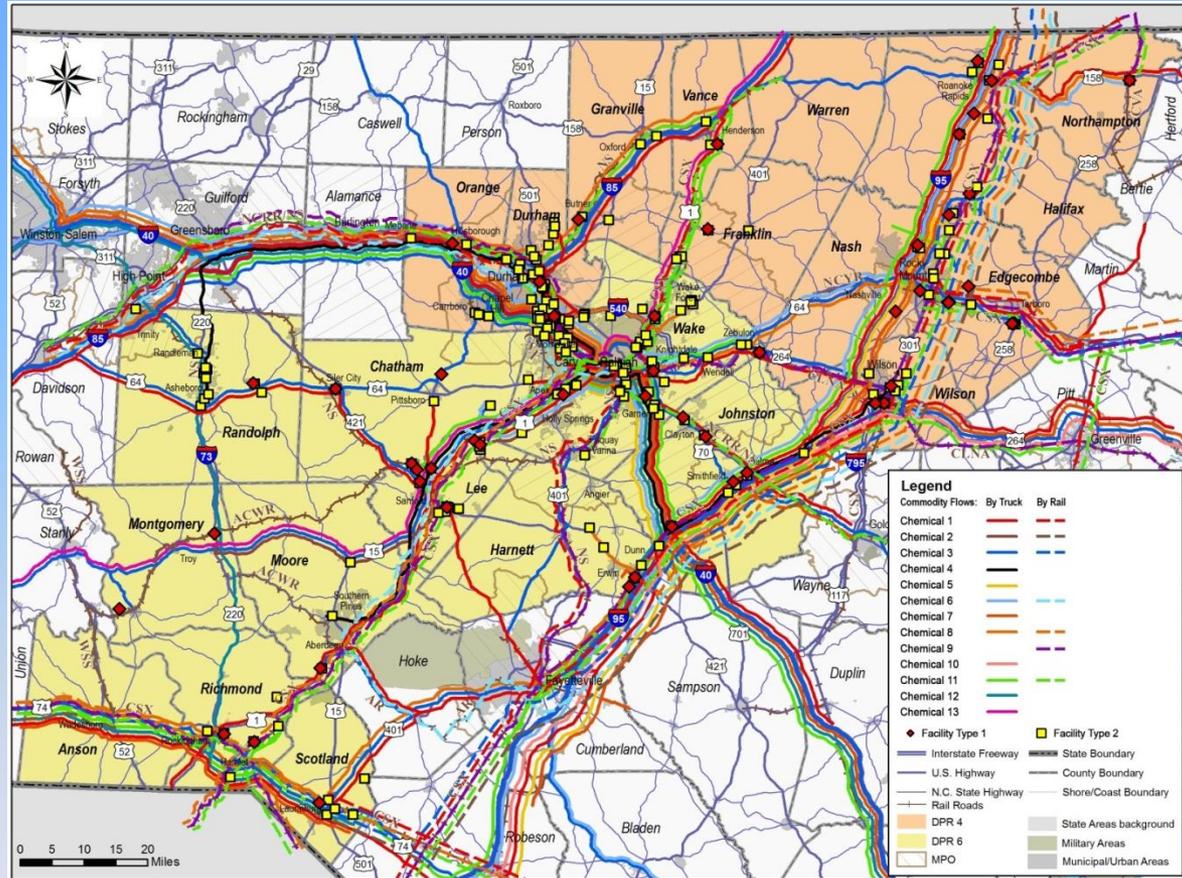
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NC Commodity Flow Study



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Background

- Leading U.S. agriculture production state
- 6th fastest growing state in the U.S.
- 3rd in U.S. chemical manufacturing behind Texas and Louisiana
- 8 military bases (USCG, Army, Air Force, Marines)



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It's the Law

Identification of facilities subject to the requirements of this subchapter that are within the emergency planning district, **identification of routes likely to be used for the transportation of substances on the list of extremely hazardous substances** referred to in section 11002(a) of this title, and identification of additional facilities contributing or subjected to additional risk due to their proximity to facilities subject to the requirements of this subchapter, such as hospitals or natural gas facilities.

- EPCRA



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Previous Studies

Traditional commodity flow surveys:

- Trucks loaded or unloaded?
- One time snap shot
- Geographically limited
- Expensive and time consuming
- No inter-study continuity



Source: Colorado DOT

A New Commodity Flow Study

Guiding members

- NC Emergency Management
- NC Department of Environment and Natural Resources
- NC Public Health
- NC Department of Transportation
- NC Department of Agriculture and Consumer Services

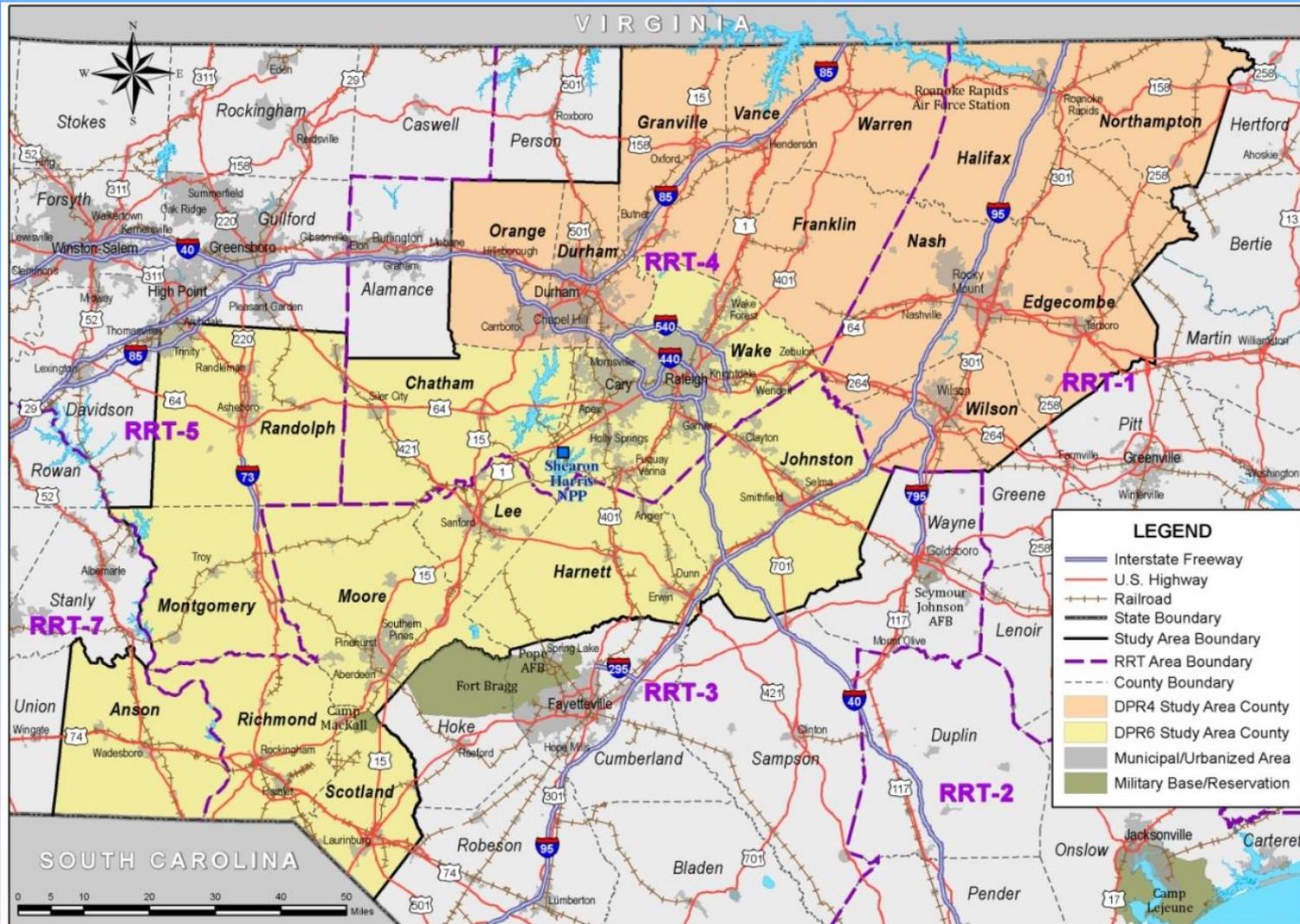
Goal: Document hazardous material facilities and shipment by motor carrier, rail, and pipeline and to develop a statewide, cyclical regional hazmat planning process.



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Example Study Area



Facility Identification

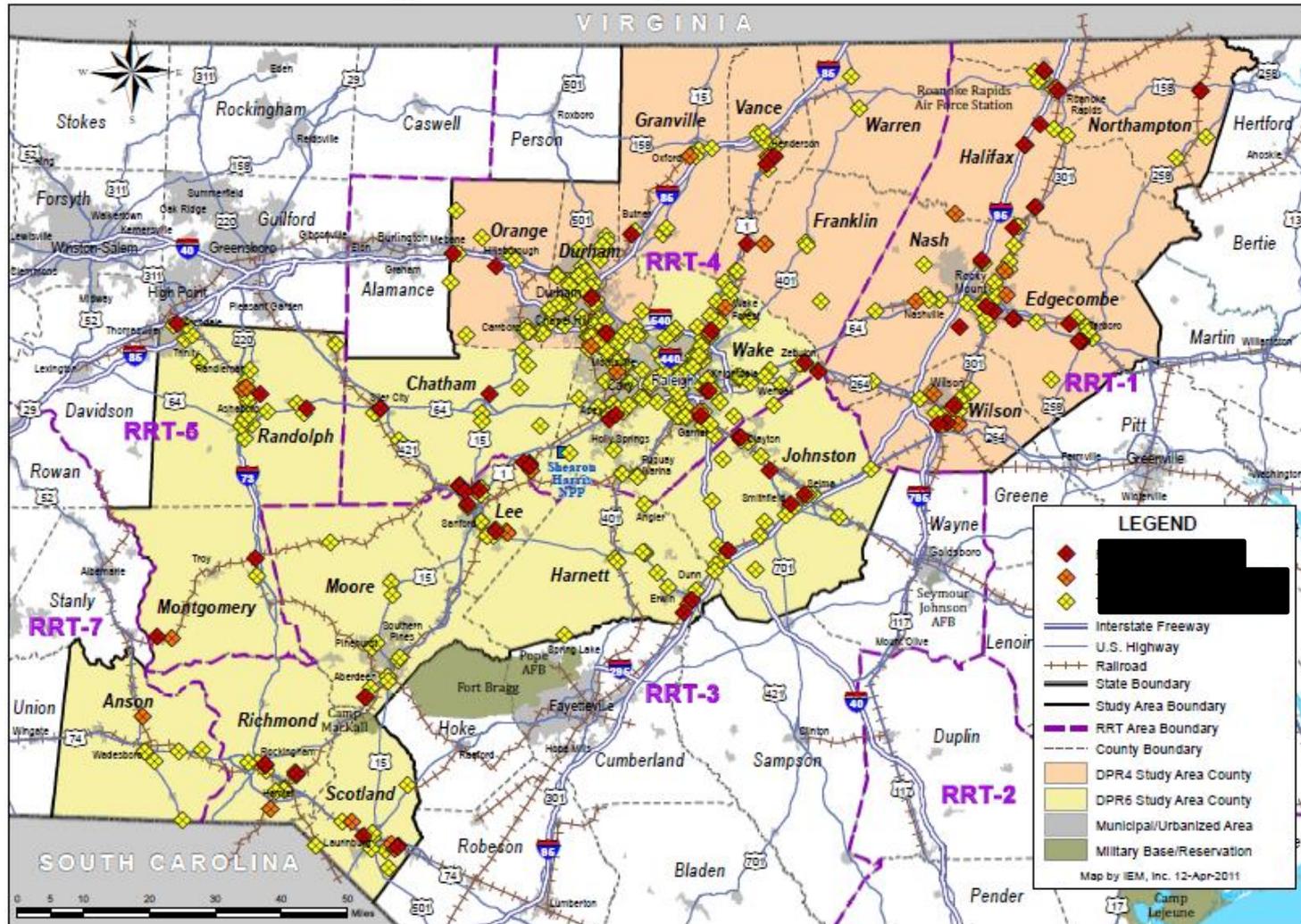
- Risk Management Plan (RMP) - CDX
- Tier II – E-Plan
- Toxic Release Inventory (TRI) – CDX



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Facility Plotting



Chemical Selection

- Radius of concern
- Isolation protective action distance
- Number and volume of chemicals
- Local input



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Chemical Selection

#	CAS #	Chemical Name ⁴⁷	EHS ⁴⁸	Worst Case ROC ⁴⁹	ROC Hazard Type ⁵⁰	Iso Dist ⁵¹	TPQ (pounds)	RQ (pounds)	TQ (pounds)	CFATS Release STQ (pounds)	CFATS Theft STQ (pounds)	CFATS Sabotage STQ	Tier II Quantity ⁵² (pounds)	RMP Quantity ⁵³ (pounds)	RMP ⁵⁴ Location	TRI ⁵⁵ Location	Tier II ⁵⁶ Location
6	7782-50-5	Chlorine	Y	1.3	Toxic Gas	2,000	100	10	2,500	2,500	500		1,043,246	152,000	17	4	19
7	10049-04-4	Chlorine Dioxide	N	8.1	Toxic Gas	100			1,000	1,000		APA		33,000	1		
8	999-81-5	Chlormequat Chloride	Y				100/ 10,000						99				1
9	108-91-8	Cyclohexylamine	Y	0.2	Toxic Liquid		10,000		15,000	15,000			1,000,499				2
10	60-51-5	Dimethoate	Y				500/ 10,000	10					130,685				7
11	82-66-6	Diphacinone	Y				10/ 10,000						3,600				1
12	298-04-4	Disulfoton	Y										162,118				6
13	115-29-7	Endosulfan	Y				10/ 10,000	1					37,169				11
14	50-00-0	Formaldehyde	Y	0.1	Toxic Gas/ Liquid		500	100	15,000	15,000			1,023,221	466,816	1	8	5
15	302-01-2	Hydrazine	Y	0.2	Toxic Liquid		1,000	1	15,000	10,000			1,380				1

Chemical Prioritization

Rank	Chemical Name	Uses	EHS	Chemical Facility
1	Chlorine	water treatment	Yes	RMP/TRI/Tier II
2	Hydrogen Fluoride	chemical catalyst	Yes	TRI/Tier II
3	Ammonia	refrigerant, fertilizer	Yes	RMP/TRI/Tier II
4	Sulfur Dioxide	water treatment	Yes	RMP/Tier II
5	Hydrogen Peroxide	food processing, bleaching textiles	Yes	TIER II
6	Sulfuric Acid	fertilizers, petroleum refining	Yes	TRI/Tier II
7	Ethylene Oxide	making fumigants	Yes	TRI/Tier II
8	Formaldehyde	preservative, for plastics	Yes	RMP/TRI/Tier II
9	Cyclohexylamine	making herbicides	Yes	RMP/Tier II
10	Vinyl Acetate Monomer	adhesives, plastics, paints	Yes	RMP/Tier II
11	Phenol	plastics, adhesives	Yes	TRI/Tier II
12	Ethylenediamine	fungicide	Yes	RMP/Tier II
13	Silicon Tetrafluoride	micro-electronics, optics	No	None
14	Bromomethane	insecticide	Yes	TIER II
15	Butane	fuel, aerosol propellant	No	RMP

Connecting the Dots

Shipment information requested from facilities:

- Origin zip code
- Destination zip code
- Mode
- Volume
- Container type
- Frequency



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Gaining Facility Participation

- Mutual benefit
- Informational meetings/calls
- Assurance of confidentiality
- Flexibility with facility requests
- EPCRA Law

“Upon request from the emergency planning committee, the owner or operator of the facility shall promptly provide information to such committee necessary for developing and implementing the emergency plan.” -EPCRA

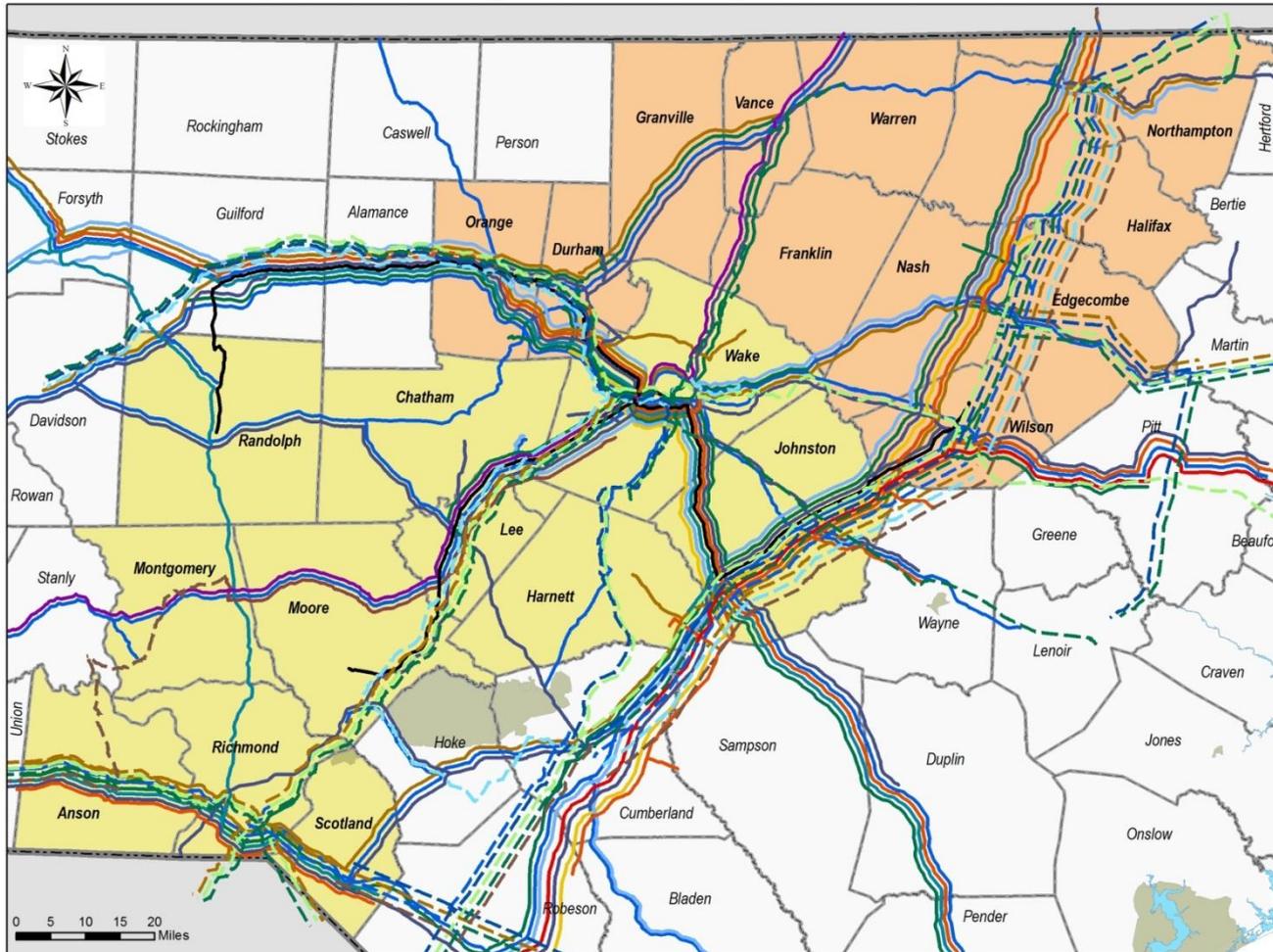


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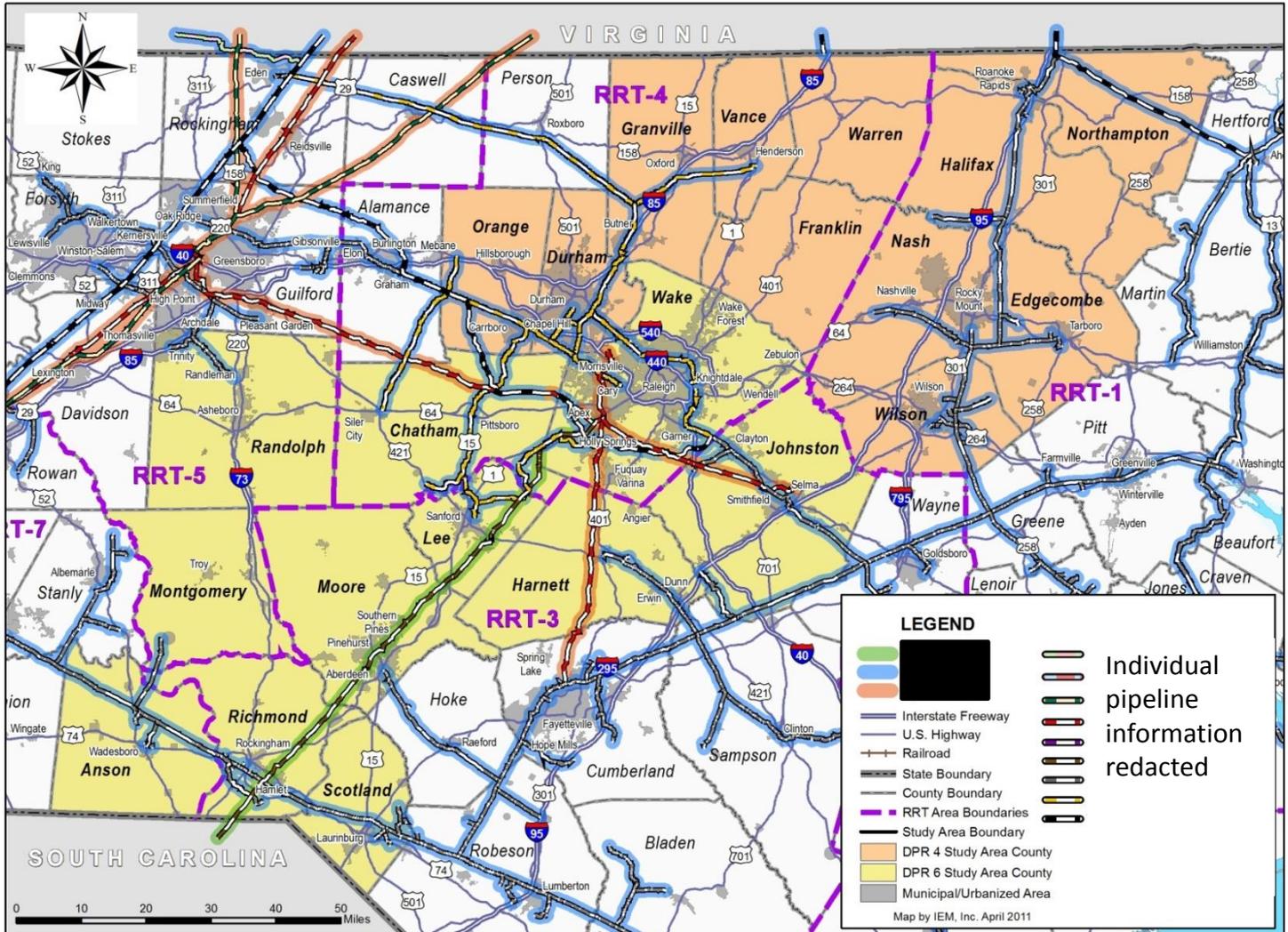


Determining Routes

NC Regional HazMat Study Part 3 - Commodity Flow: 13 Selected Chemicals



Pipelines



Other Data Sources

Further route information provided by:

- Pipeline operators
- Railroads
- Motor carriers
- Ports, when applicable
- LEPCs and government agencies

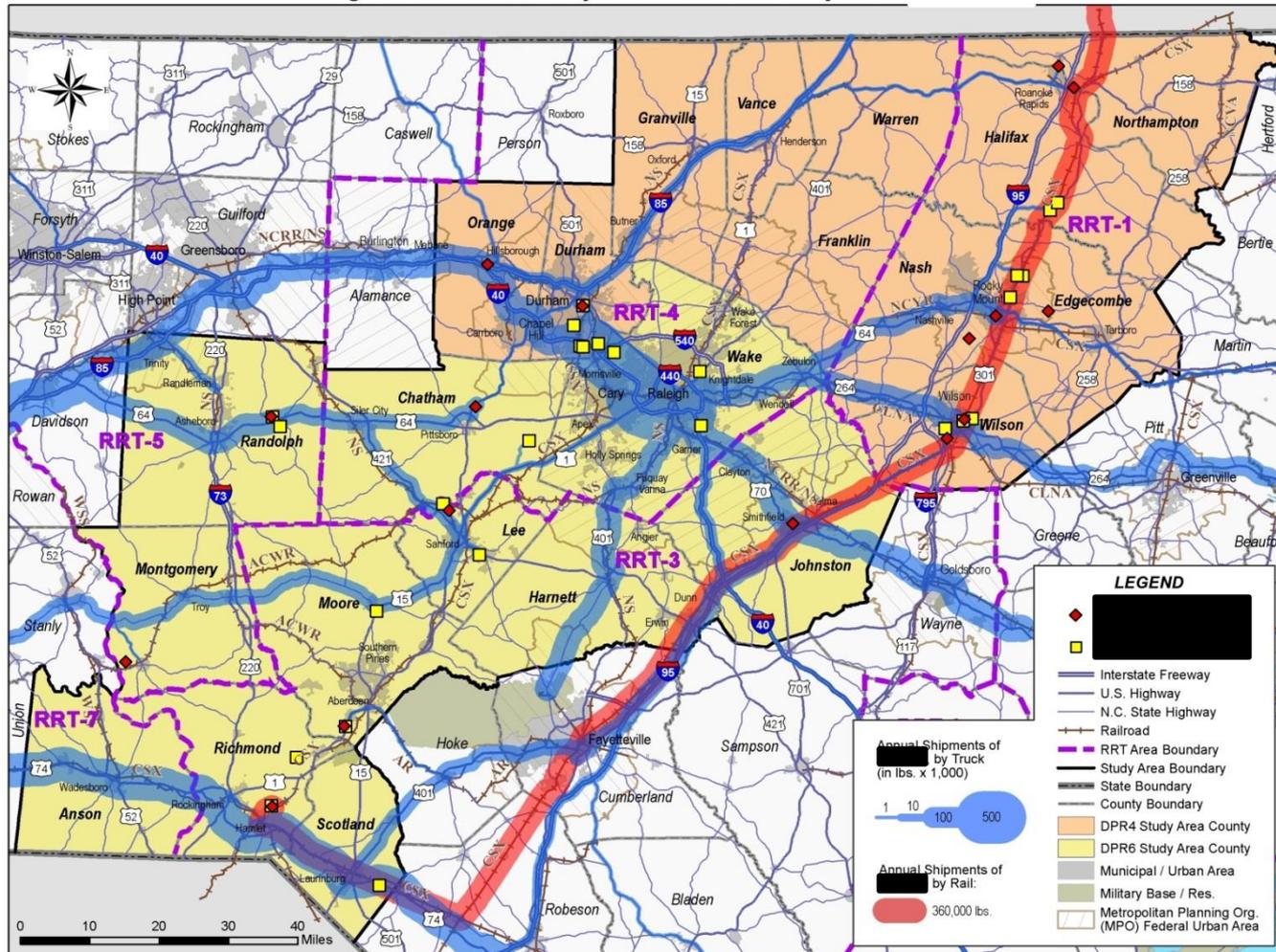


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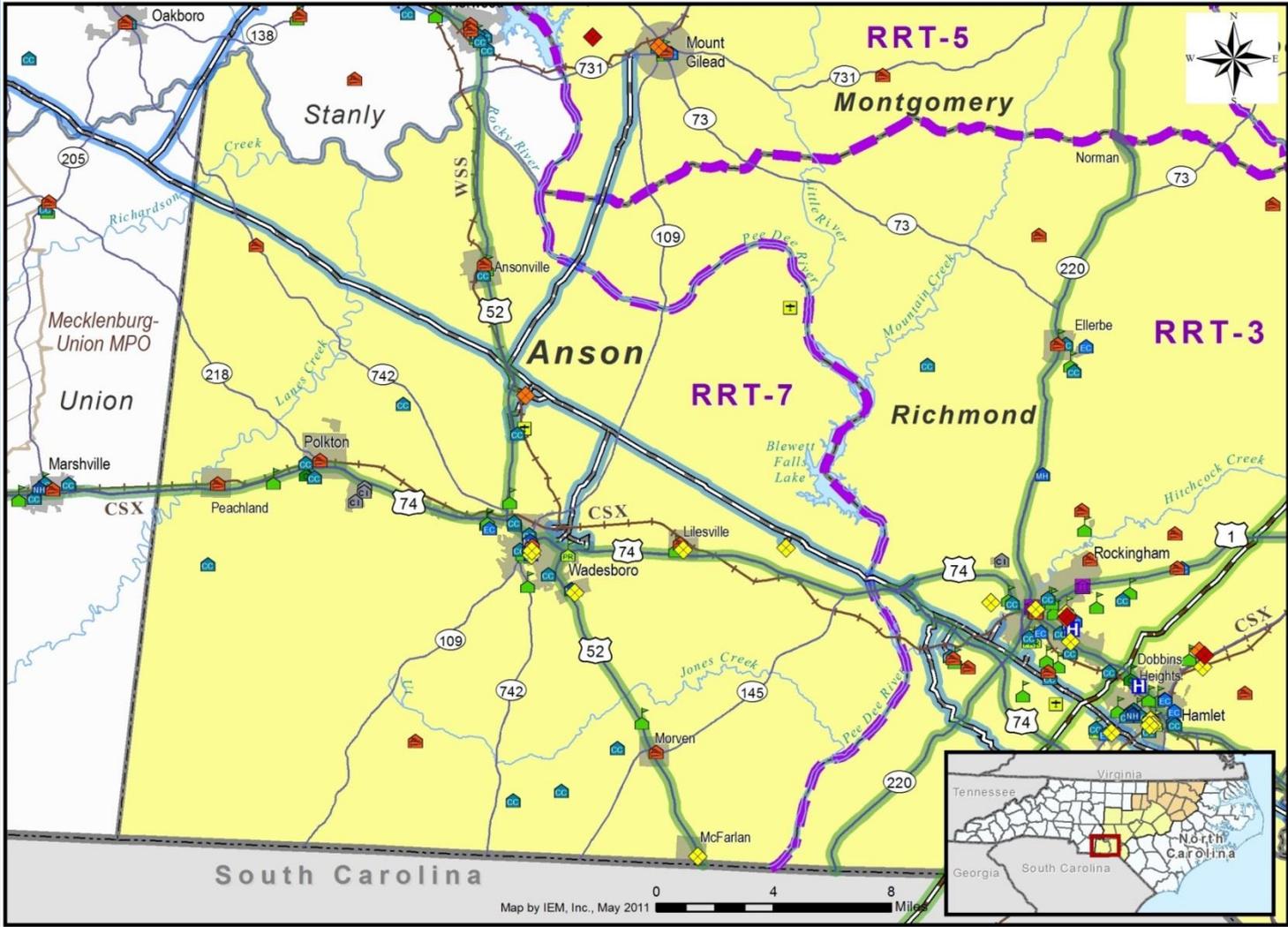


Volume of Flow

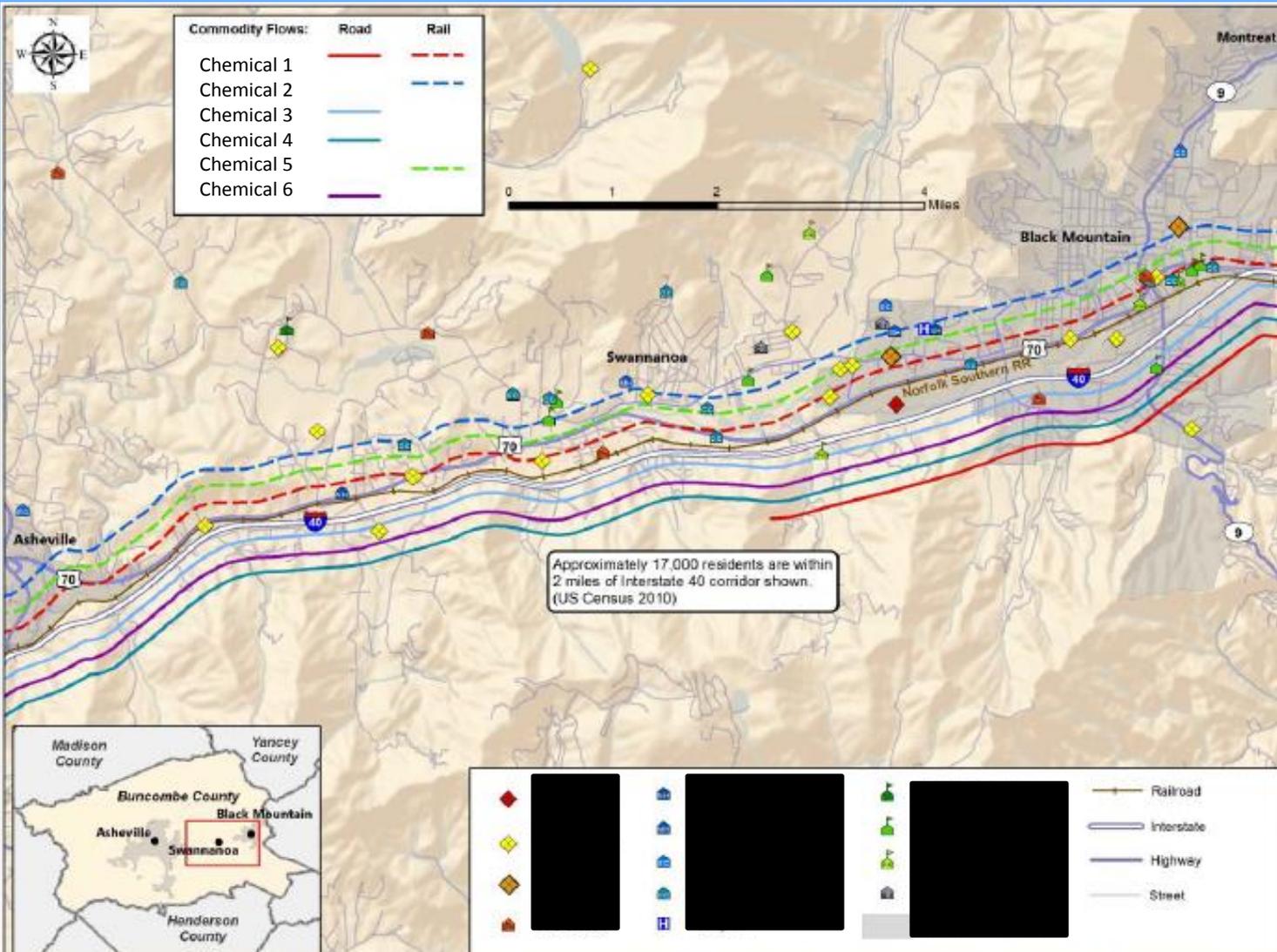
NC Regional HazMat Study Part 3 - Commodity Flow:



County Profile



Sensitive Receptors



Constraints

- Incomplete facility data sets (89% of data)
- Pass through highway traffic
- Limited insight into local roads
- RCRA facilities



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Information Security

- Not Protected Critical Infrastructure Information (PCII) or classified
- Shipping/receiving generalized to zip code and presented as an aggregate
- Risk assessments protected from records requests by NC law
- Studies hosted on secure portal



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Study Applications



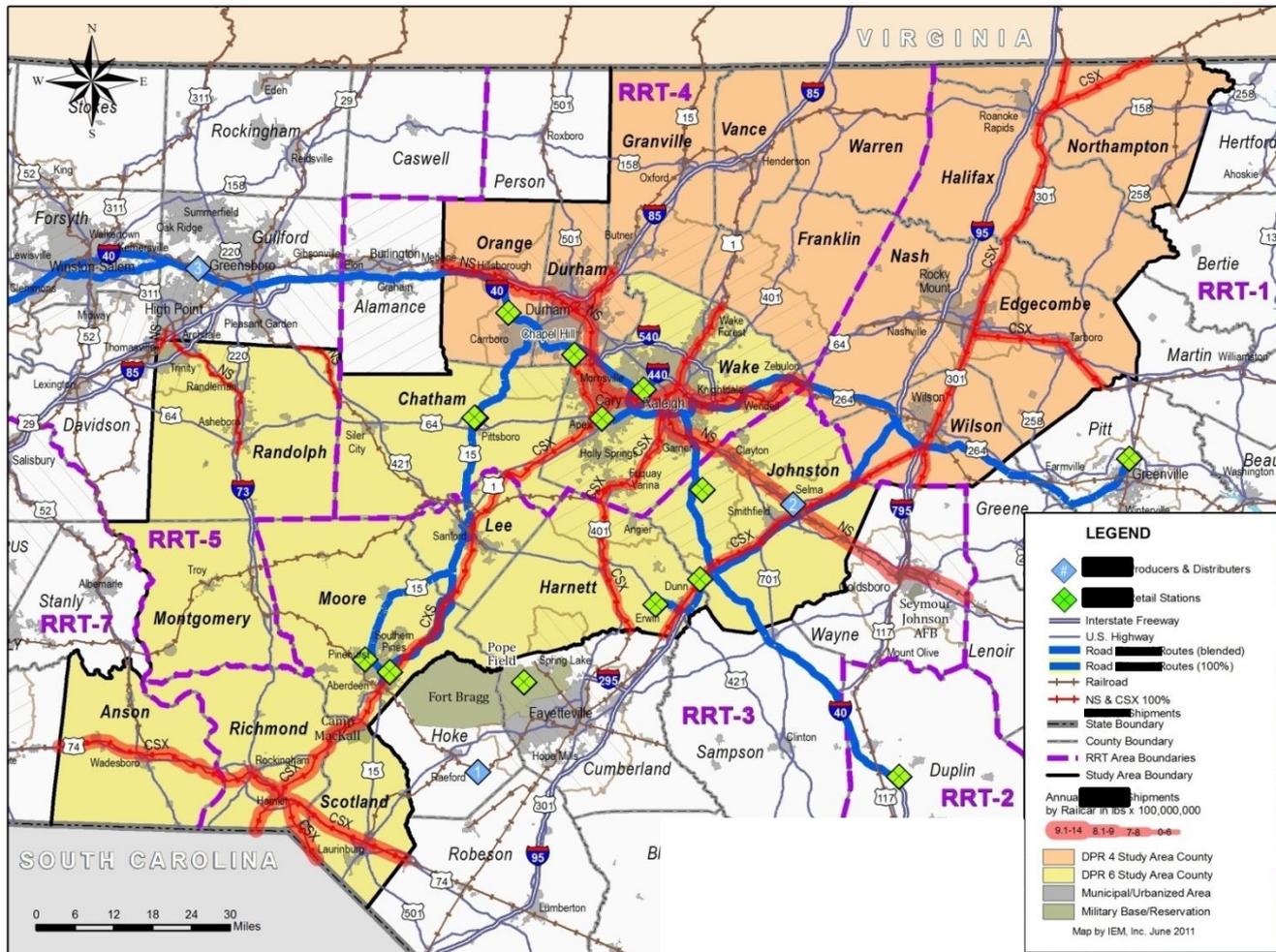
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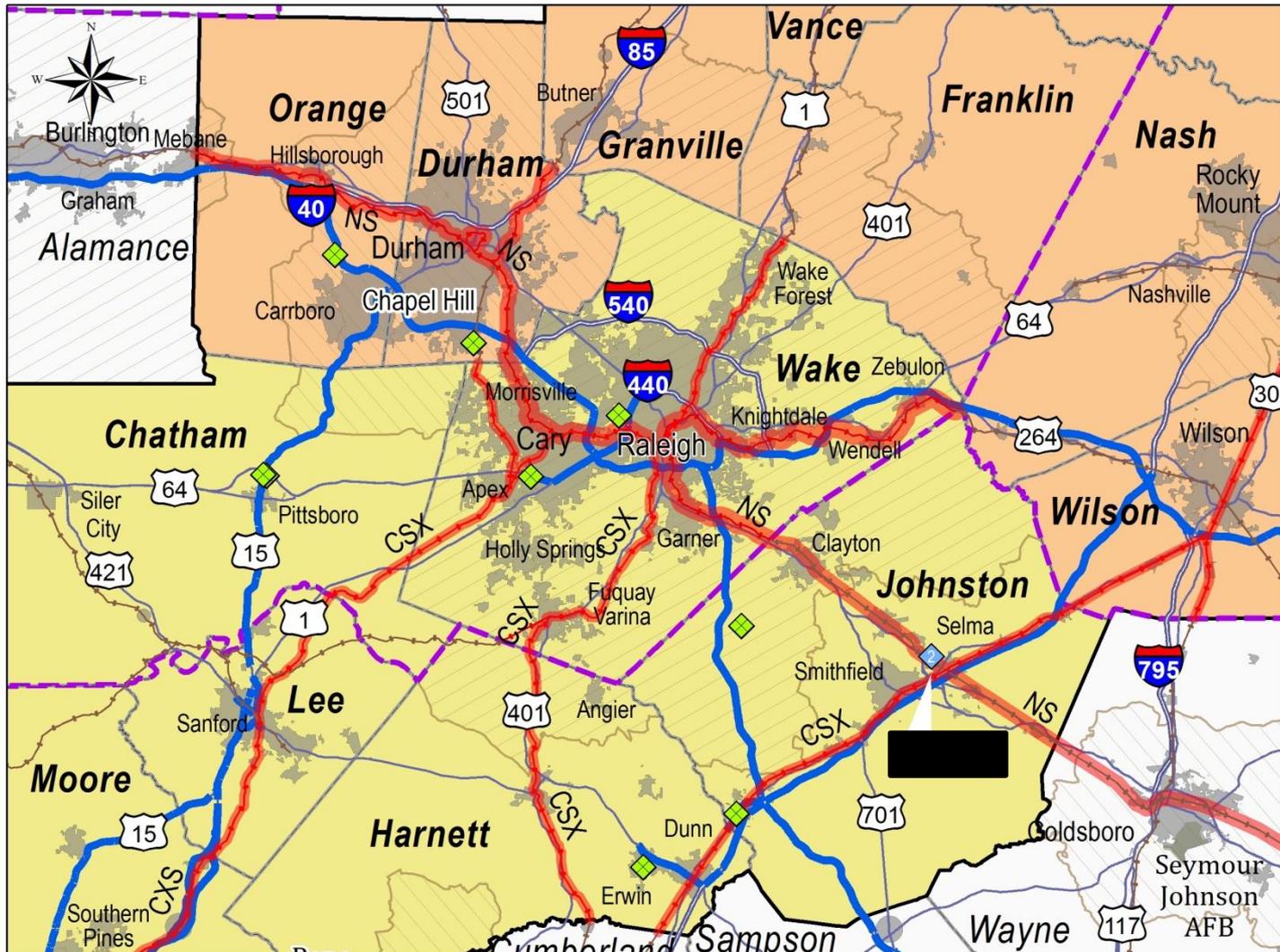
Chemical Route Alteration



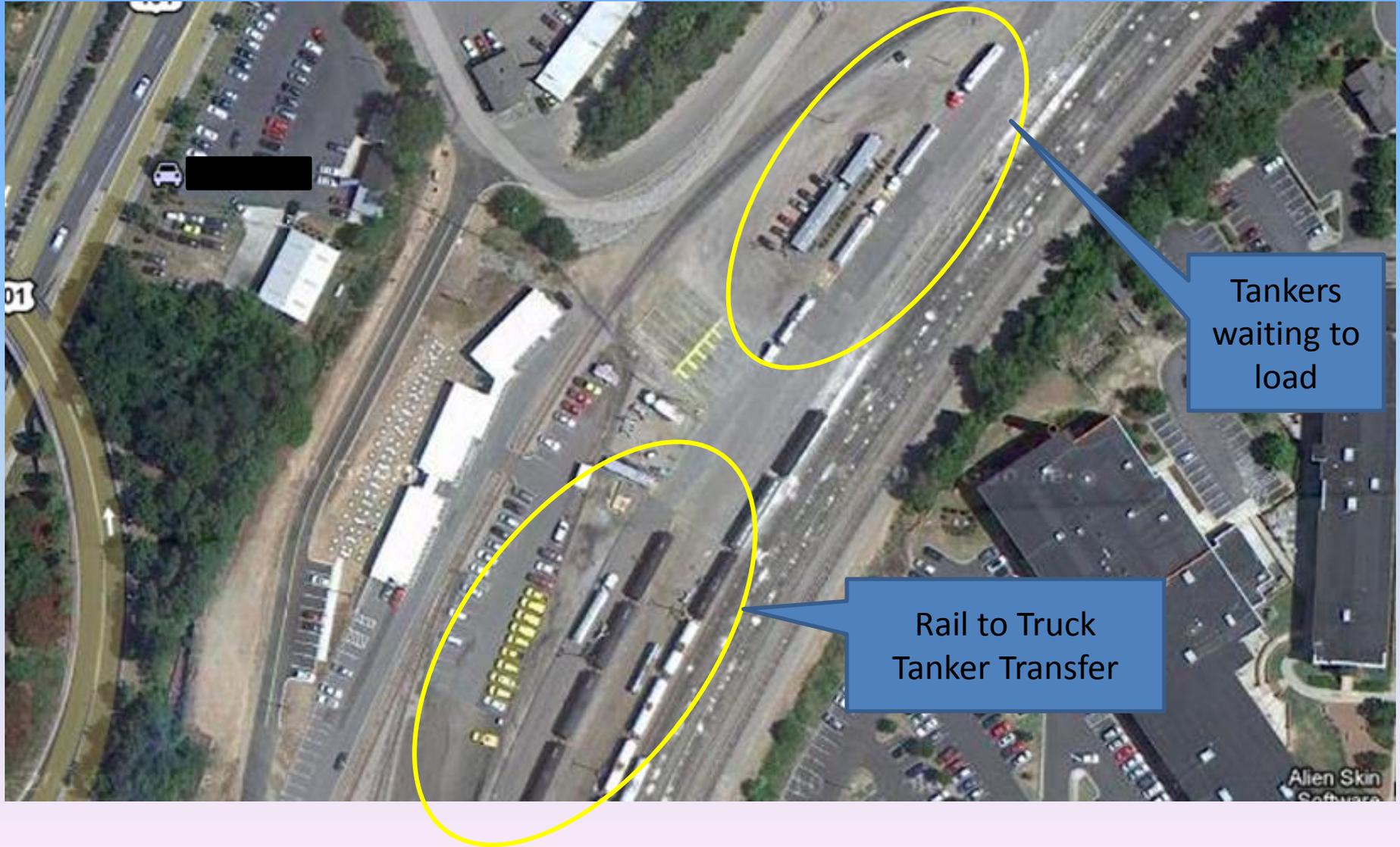
Chemical Transportation



A Closer Look



An Even Closer Look



Offloading in 2002



Offloading in 2010



Land Use Planning Lesson

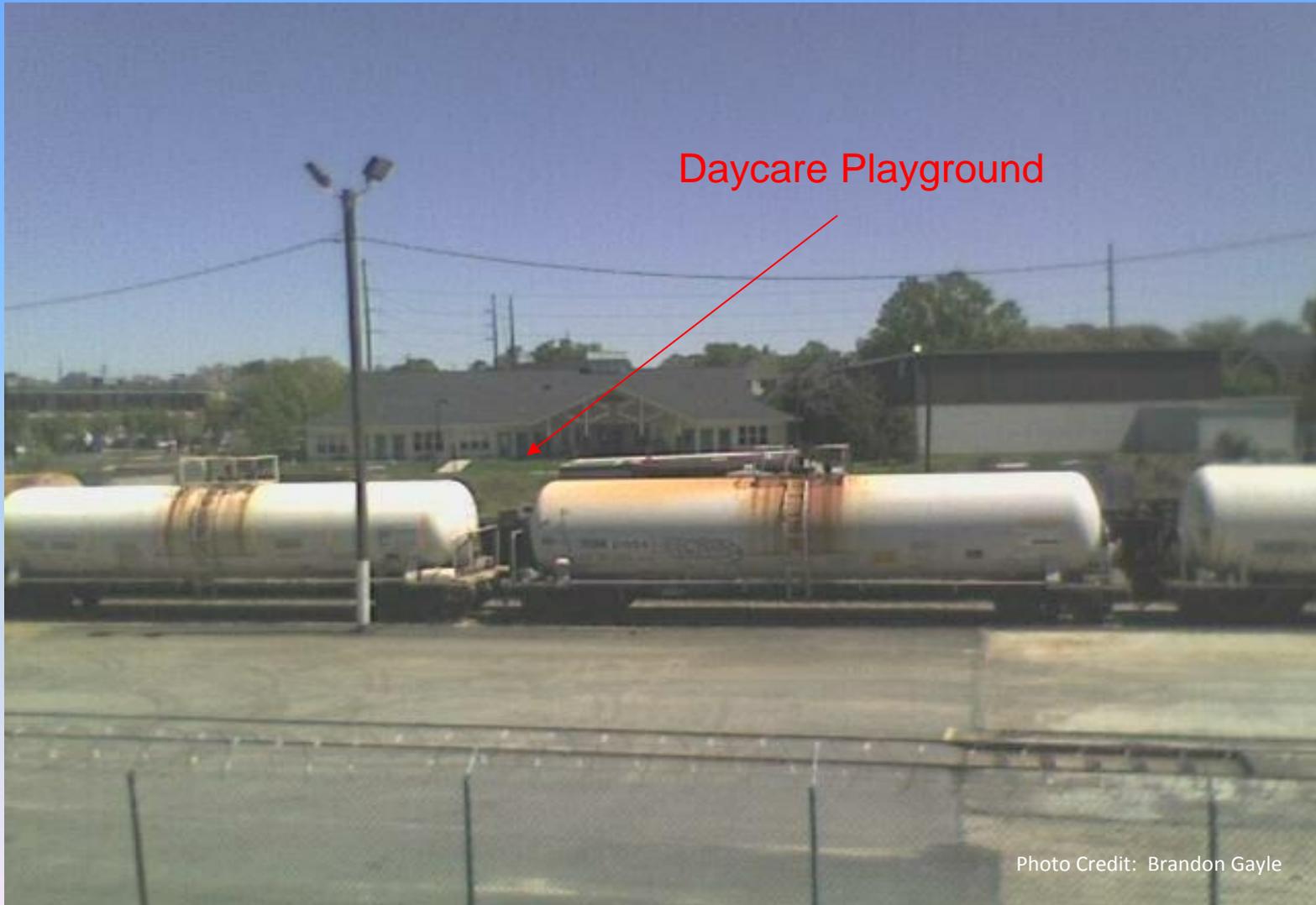
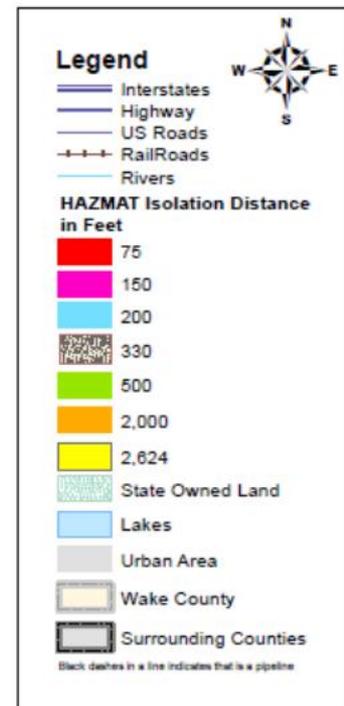
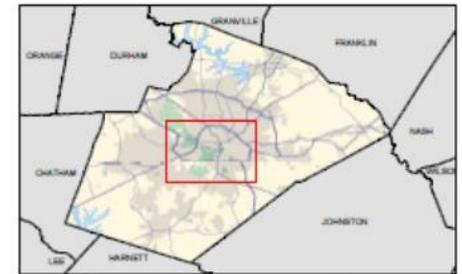
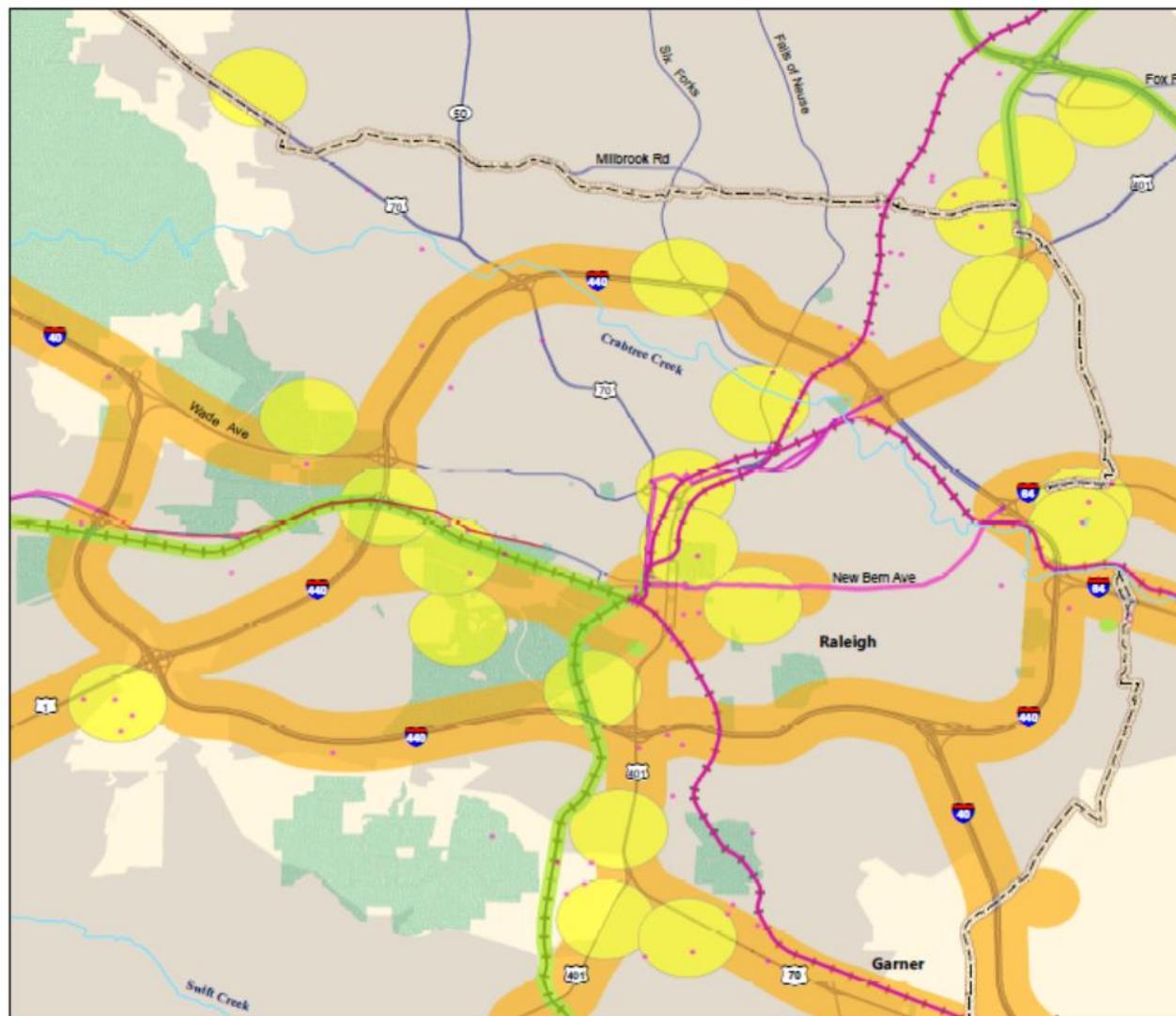


Photo Credit: Brandon Gayle

Land Use Planning



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