

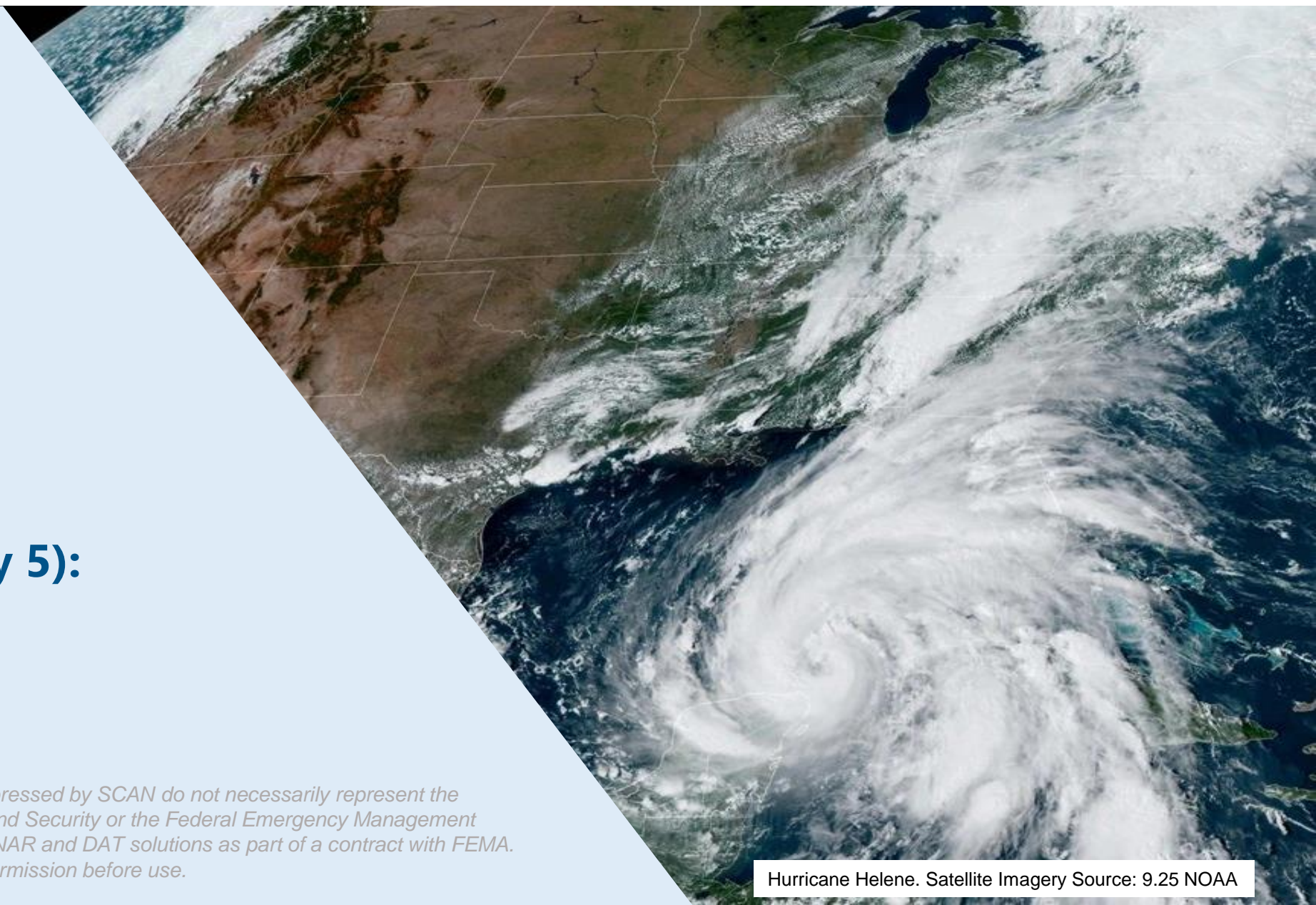
September 29, 2024



## Lifeline Analysis 2 (Day 5): TS/Hurricane Helene

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Hurricane Helene. Satellite Imagery Source: 9.25 NOAA





## Electric Power



# Sentinel Inputs

**Key Message: Potential impacts to supply chains and mutual aid due to high volume of outages and anticipated damage.**

## Carolinas and Tennessee

- **Input from Carolina Utilities initially expecting 400K out, now increased to 1.4M.**
- NC/SC/TN utilities are still performing damage assessments
- Severe flooding and road closures are making damage assessment slower and more difficult
- Appears to be damage to transmission infrastructure and lines, however full assessments are still on-going
- **Only ~20% (3 substations) in Asheville, NC are energized and have communication to the distribution control center**

## Florida

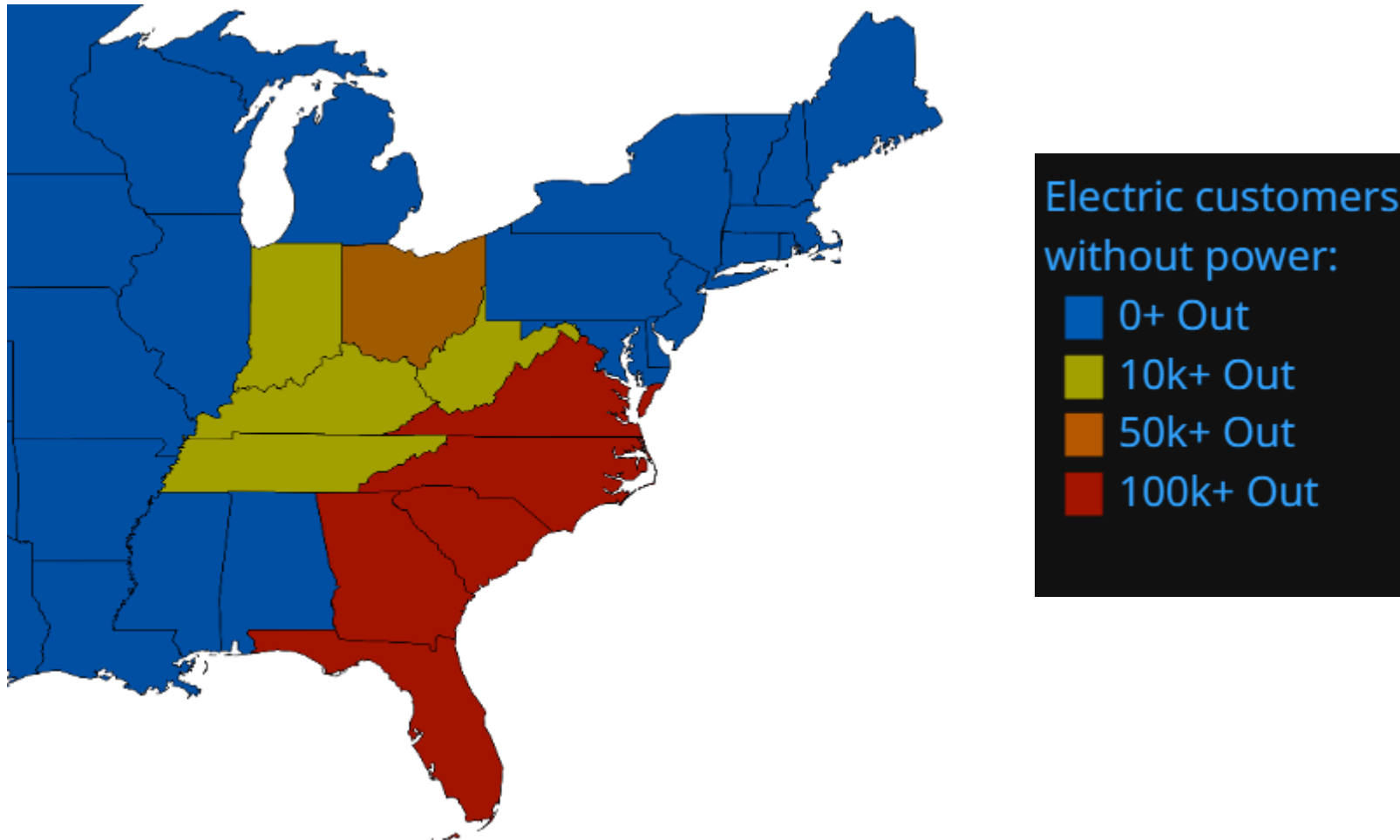
- **Currently 219K customers out of power as of 9/29 12:00PM**
- Officials opened access to beach community residents and emergency workers
- The substation affecting the Morgan-Kinder pipeline pumping station is actively being repaired
- The outage numbers are steadily coming down
- Highest percentage of outages focused near the direct storm path
- Flooding and high tide in Florida will delay restoration and evaluation efforts.
- FL utilities are still performing damage assessment.
- Down to 70K in Pinellas/Pasco County without power
  - Most people communicated with have their power restored so remainder is most likely small branch lines which are being addressed

## Overall

- Damage assessment is still on-going, but analysis and restoration estimates are steadily coming in from utilities.
- The high volume of outages and geographic dispersion is expected to cause supply chain impacts throughout the region and is limiting mutual aid.

# Current Outage Snapshot

PowerOutage.us as of 9/29 at 1pm



# Transmission Lines Out of Service

**Key Message: Multiple Transmission Lines have been damaged during this storm and are impacting outage numbers**

- Multiple lines have been impacted by this storm, this may increase recovery timelines
- These numbers do not include <100kV which could account for an additional large amount

Out-of-Service Transmission Lines									
As of 9/28/2024									
Region	Transmission Lines by Voltage (kV)								Sub-stations
	765	500	230	161	138	115	100	Total	
FRCC	-	-	-	-	1	16	-	17	60
SeRC	-	-	22	-	-	75	-	97	3
VACAR South	-	1	16	160				177	
PJM	1		-	-	20	-	-	21	
<b>Total</b>	<b>1</b>	<b>1</b>	<b>38</b>	<b>272</b>				<b>312</b>	<b>63</b>

Source: NERC

\*Sub-stations column represents the number of Transmission Substations out of service - Not necessarily damaged, but not in service.

**FRCC:** Florida Reliability Coordinating Council

**SeRC:** Southeastern Subregion (includes NC, SC, GA, some of FL, VA, TN and KY)

VACAR South: Virginia-Carolinas sub region

**PJM:** Includes Pennsylvania, New Jersey, Maryland but includes more than that, mostly northeast



## Food



"Publix donates water, ice as part of hurricane relief efforts". Fort Myers, FL. 2022  
([corporate.publix.com](https://corporate.publix.com))

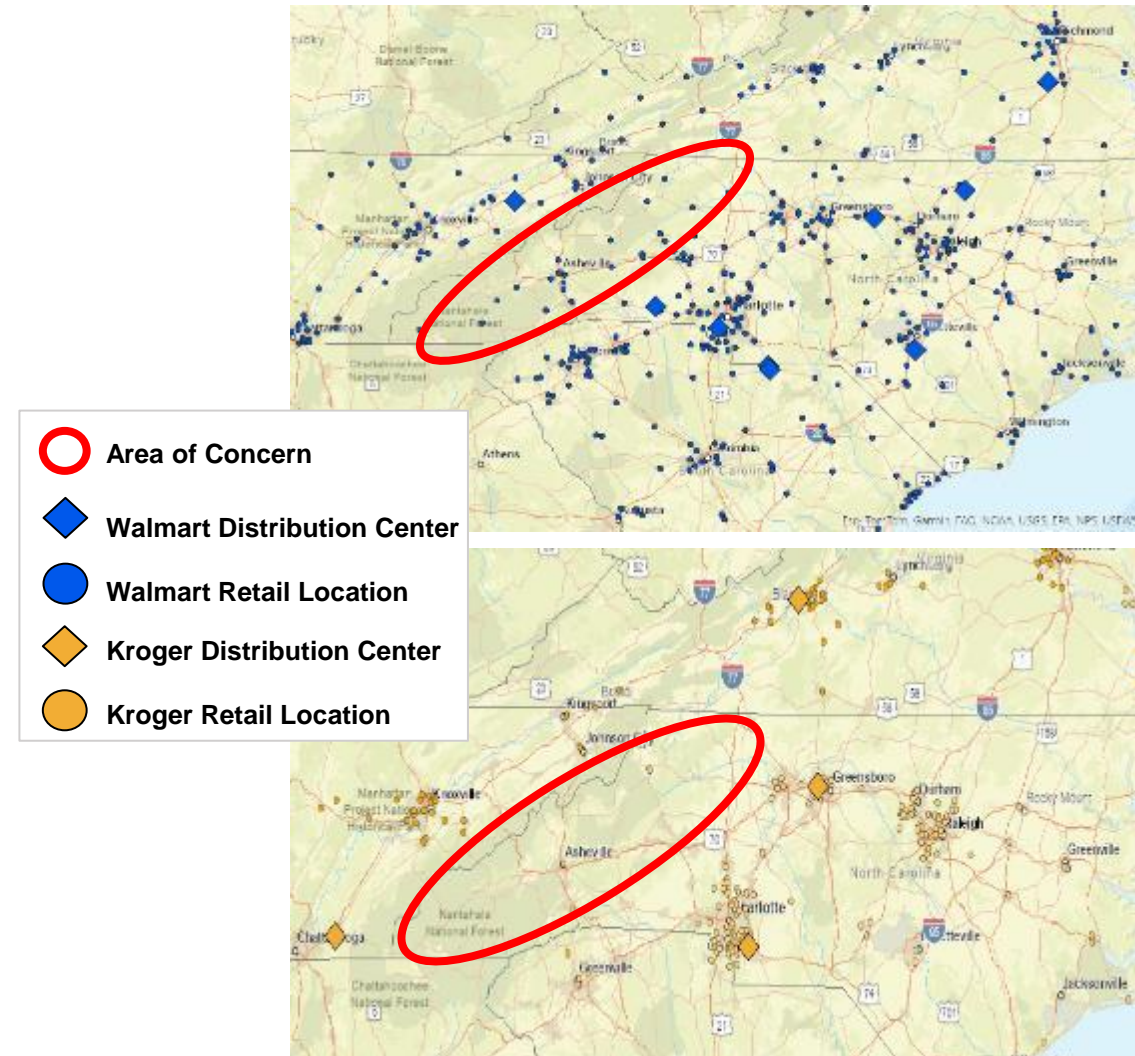
# Overview

- **North Carolina and South Carolina:**
  - Upstream and midstream capacity of major brands survived and is poised to flow into Asheville as roads reopen.
    - Restoration of power, water, and telecommunications to allow for digital transactions and efficient inventory management/ordering is critical.
  - Walmart and Publix locations in the region remain closed or are operating on modified hours (likely in response to local curfews).
  - We do not have insight into store status for other key players in the region (e.g., Kroger/Harris Teeter, Food Lion, Ingles Markets). Mobile device tracking supports media reports of continued disruption to food access in the hardest-hit areas.
- **Florida and Georgia:**
  - Upstream and midstream capacity of major brands in FL and GA have survived. The number of retail locations closed or operating on modified hours has reduced significantly, particularly in major metropolitan areas (e.g., Tampa, Tallahassee, Atlanta).
  - Retail closures persist on the barrier islands in FL, as well as central and eastern GA (including Valdosta and Augusta). Mobile device tracking suggests that rural areas of Georgia and the Florida Panhandle may also be experiencing continued disruption to food access.

# Upstream Impacts – North Carolina

**Key Message: Upstream and midstream capacity of most major brands survived and are poised to flow into Asheville.**

- According to available data-sources, most food and other freight flows serving the Asheville area originate from the south (Greenville-Spartanburg) and east (Charlotte, Raleigh-Durham).
- Approximately 82% of the grocery market share in North Carolina is held by three brands: [Walmart/Sam's Club](#), Kroger/Harris Teeter, and Food Lion.
- Additional, regionally important brands include Publix (Charlotte), Ingles Markets (west NC), Piggly-Wiggly (east NC, served by C&S Wholesale).
- Except for Ingles Markets (*see next slide*), no major grocery brand operates processing or distribution facilities within the Blue Ridge Mountains.

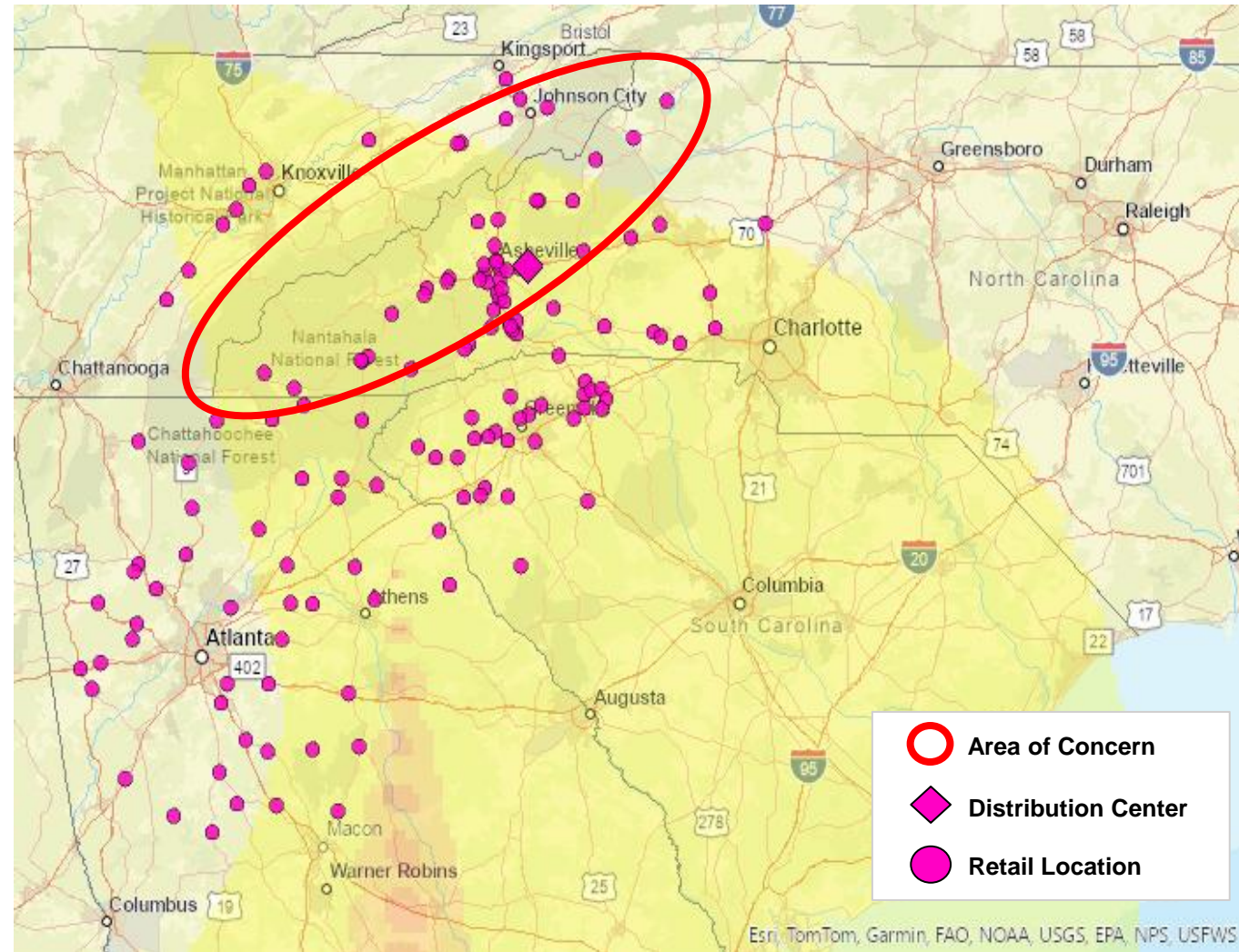




# Upstream Impacts – Ingles Markets

**Key Message: Status of Ingles Markets facilities in the region remains unclear.**

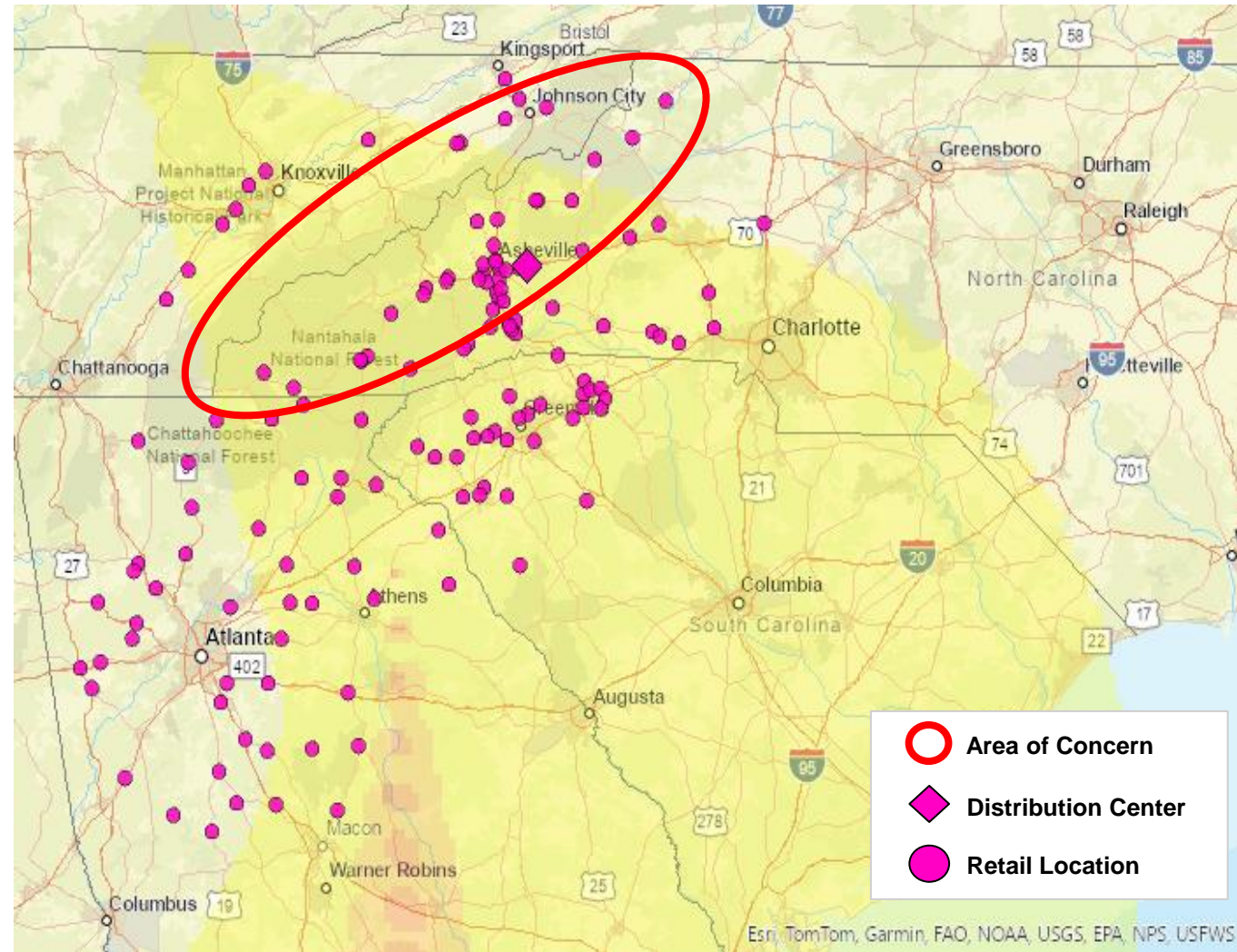
- Ingles Markets operates 194 retail locations in the southeastern U.S. and is one of the largest brands by market share operating in western NC.
- Its sole distribution facility is in Black Mountain, NC, 16 miles west of Asheville.
  - The 1.65 million sq foot facility supplies 57% of the goods sold at retail. The remaining 43% of goods are purchased from third parties and delivered directly to stores.
- Ingles Markets also owns and operates Milkco, Inc., the sole dairy plant in western NC. The Asheville, NC facility produces private label product lines for retail, wholesale, and food service customers in 17 states.



# Upstream Impacts – Ingles Markets (Cont.)

**Key Message: Status of Ingles Markets facilities in the region remains unclear.**

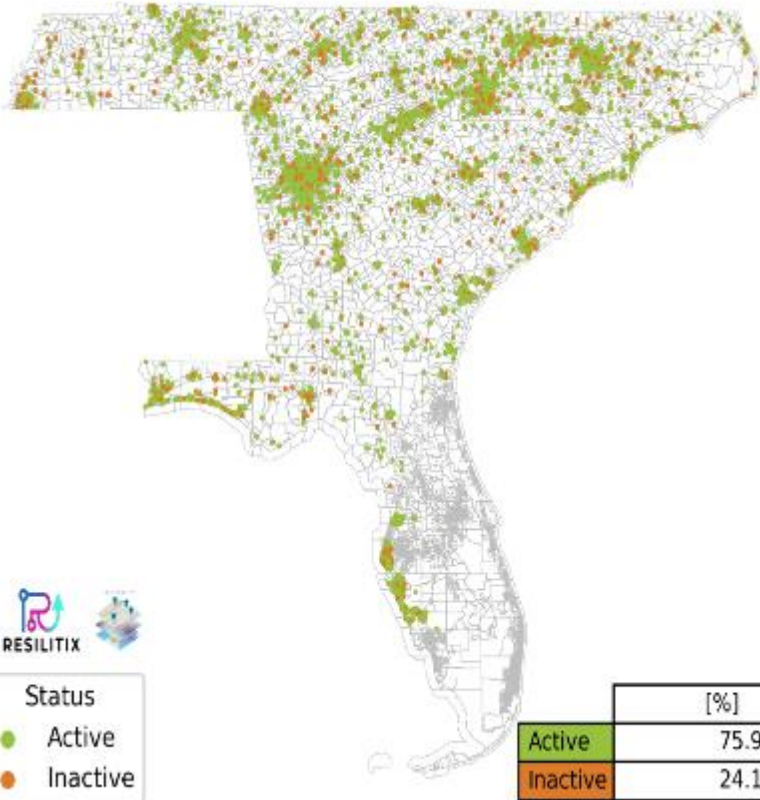
- The status of the distribution center, dairy plant, and retail locations in the region are **unknown**.
  - The reopening of I-26 to the south U.S. 70 to the east will allow for truck movement between the distribution center and Asheville-area stores.
  - However, widespread utility, cellular, and internet outages, as well as local road closures and heavy congestion on open routes. This will likely result in delays for delivery and store reopening.



# Downstream Impacts - Retail Access

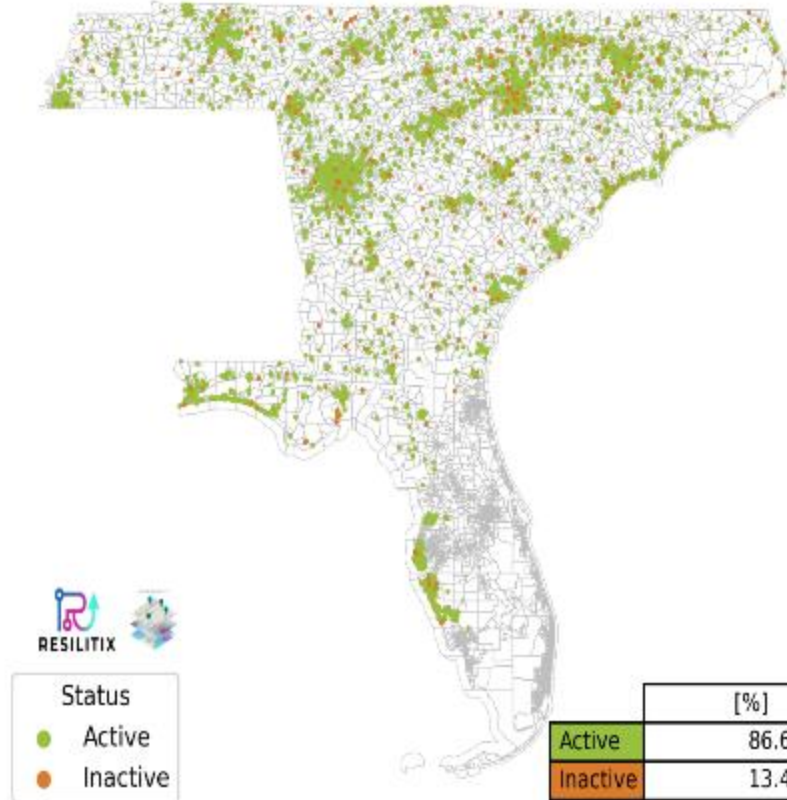
**Key Message: Population movement data indicates that retail grocery locations in major metropolitan areas, as well as within Florida and southwest Georgia, quickly reopened to the public after landfall (within 48 hours). However, closures in more rural areas persist.**

Food Lifeline Downtime Status



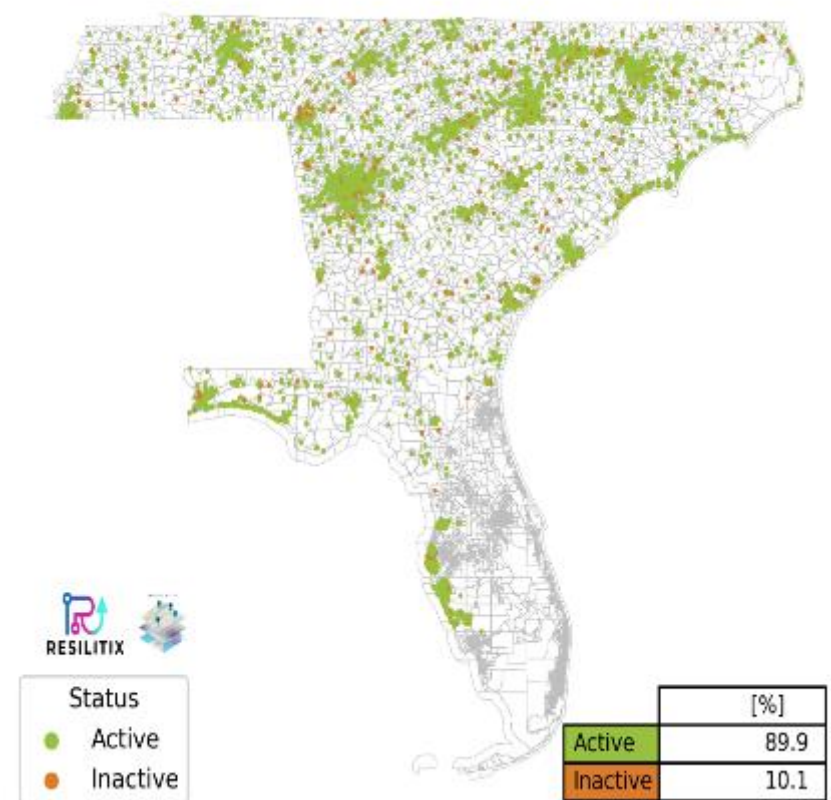
**9/26 (Day of Landfall)**

Food Lifeline Downtime Status



**9/27 (Day After Landfall)**

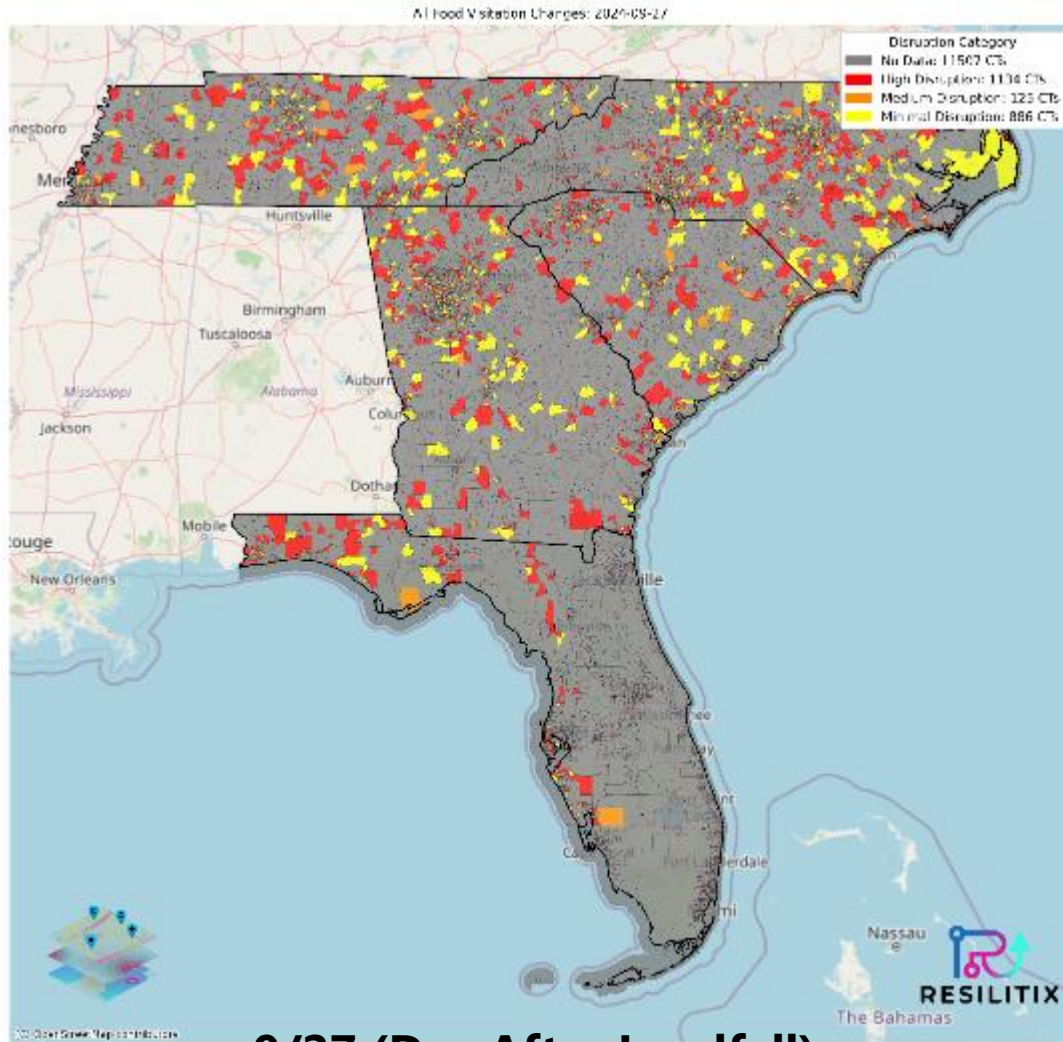
Food Lifeline Downtime Status



**9/28 (48 Hours Post-Landfall)**

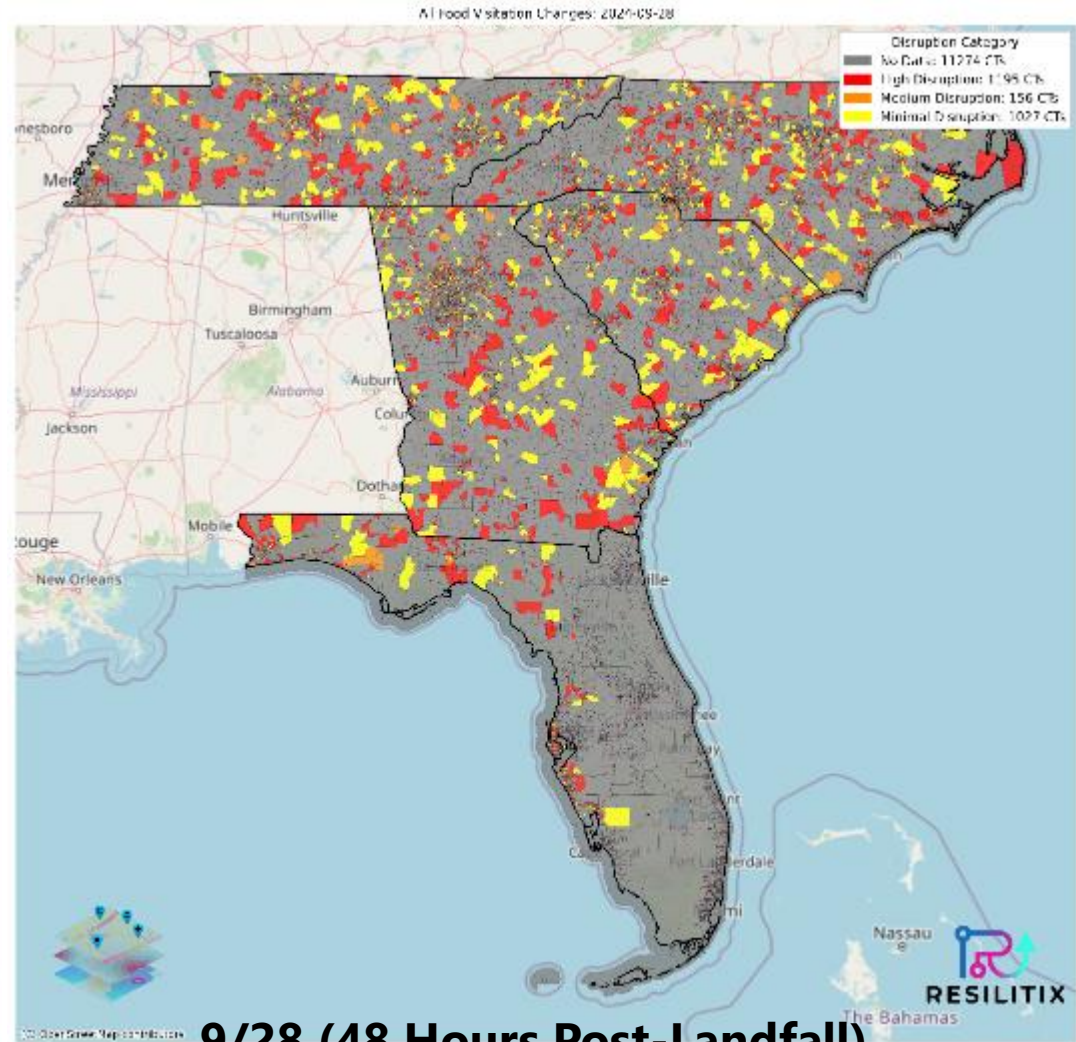
# Downstream Impacts - Retail Access

**Key Message: Areas with significant reductions in retail grocery visits (red) may represent priority zones for food and water relief efforts.**



**9/27 (Day After Landfall)**

Analysis reflects Grey Sky Conditions (2024)



**9/28 (48 Hours Post-Landfall)**

Current as of: 9/29/2024, 0900 ET

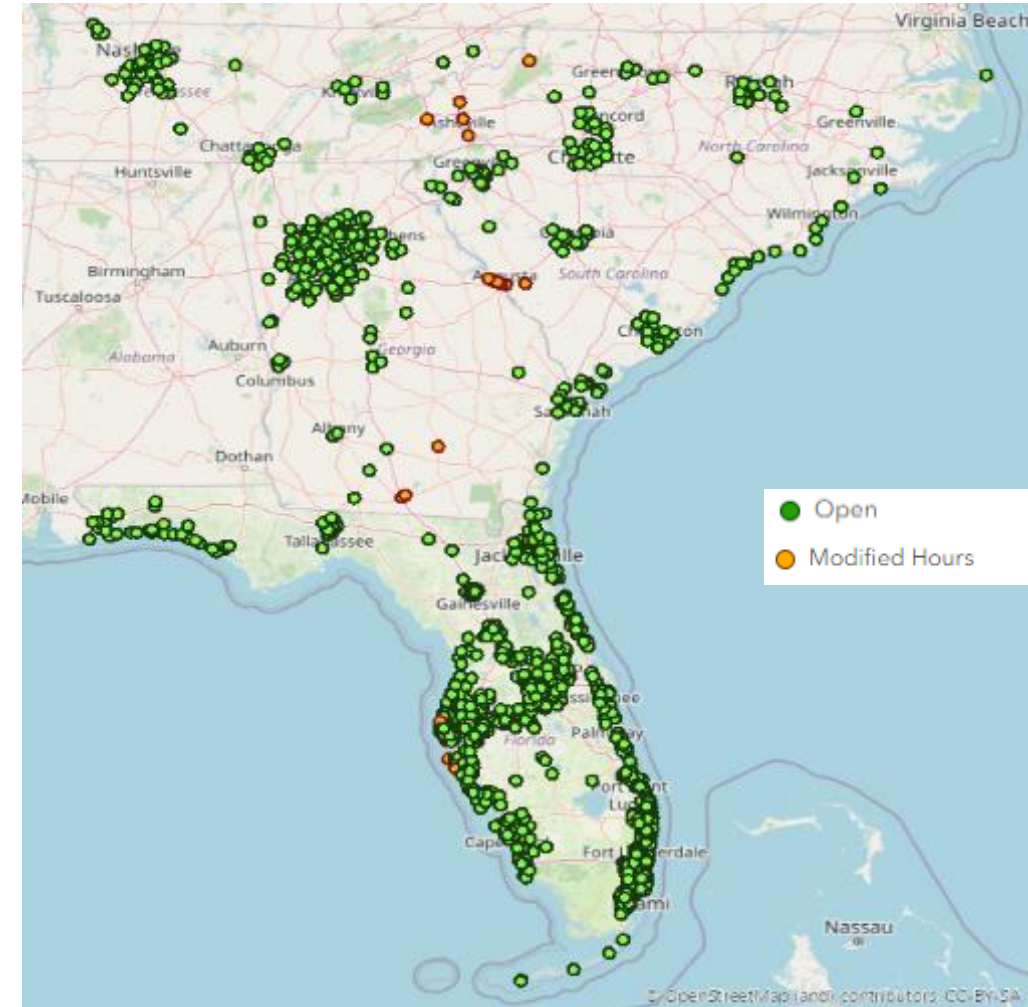
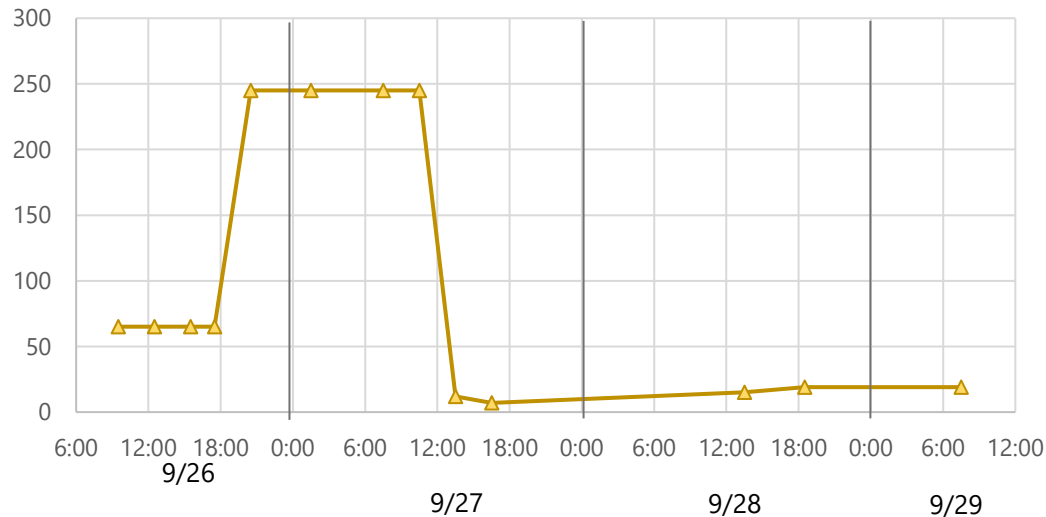
Source: Resilitix.ai

# Downstream Impacts - Publix

**Key Message: Localized closures and hour modifications continue in hard-hit areas.**

- As of 0800 ET, 19 Publix locations are reported as operating under modified hours.
- Retail locations on Florida's barrier islands remain closed, as residents are not yet able to return to their homes.
- Retail locations in Georgia (Valdosta, Augusta) and North Carolina (Asheville, Boone) continue to operate under modified hours, likely due to local curfews.

**Publix - Stores Operating Under Modified Hours**

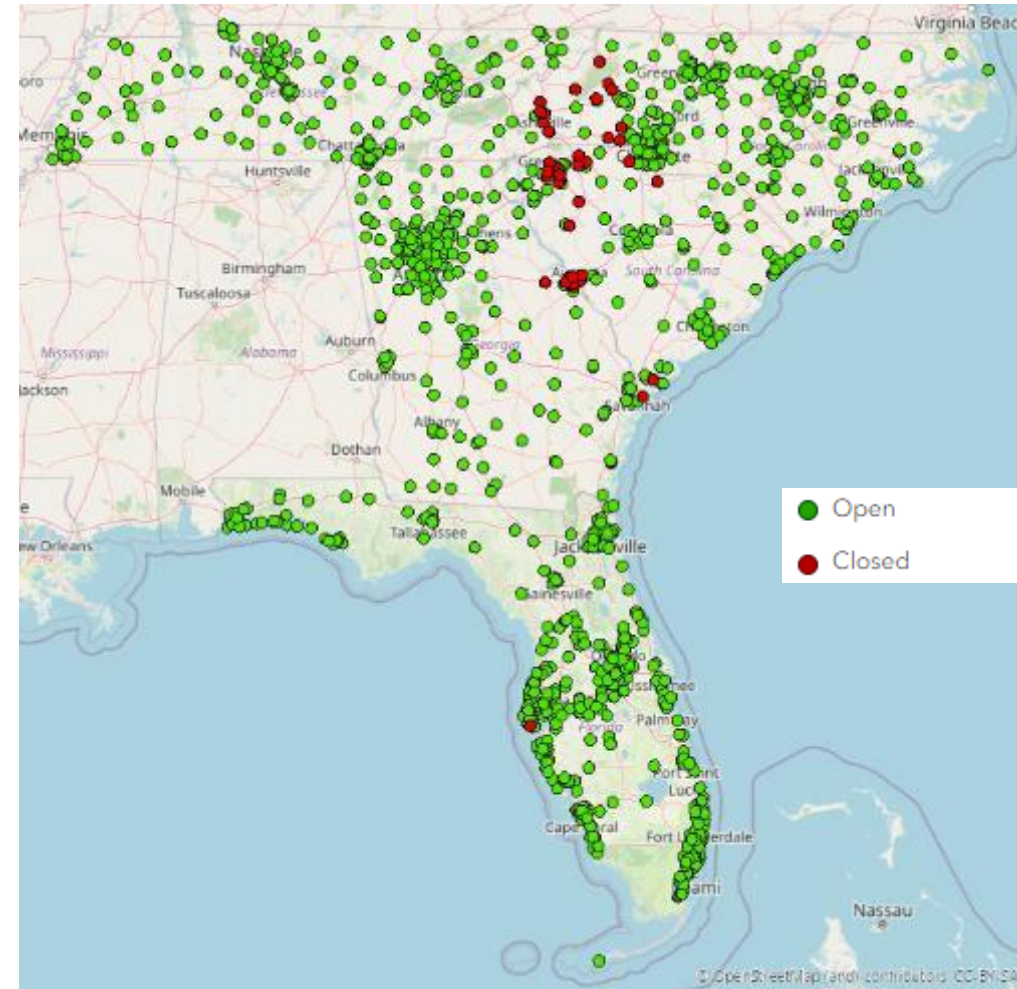
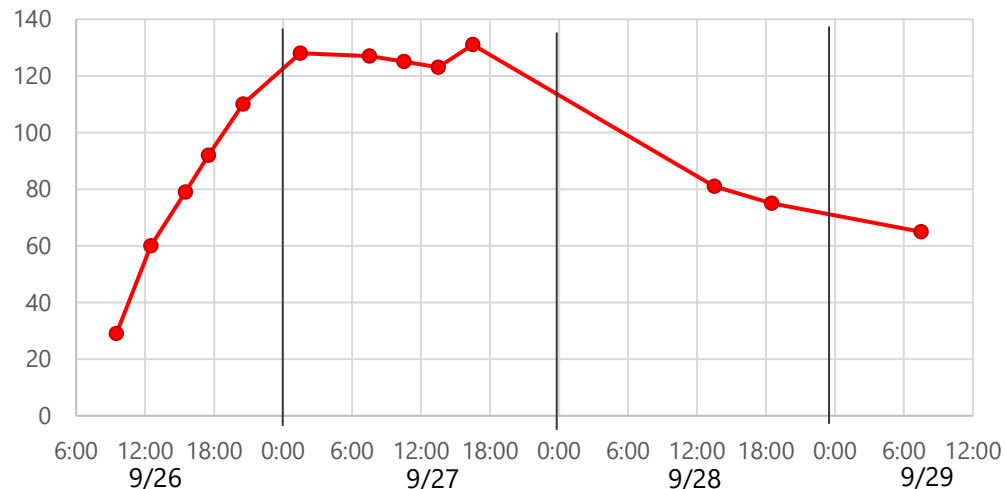


# Downstream Impacts – Walmart / Sam’s Club

**Key Message: Retail closures continue in hard-hit areas but are decreasing as utilities and road access are restored.**

- As of 1000 ET, 53 Walmart and Sam’s Club locations remain closed.
  - Retail locations have reopened in Valdosta, GA, but closures continue in August, GA; Greenville, SC, and throughout western NC.
- Sentinels are reporting that distribution facilities in the Southeast have reopened.
- On Saturday, 9/28 and Sunday, 9/29, Walmart provided hot meals to survivors in Perry, FL and Crawfordville, FL.

**Walmart / Sam’s Club - Stores Closed**

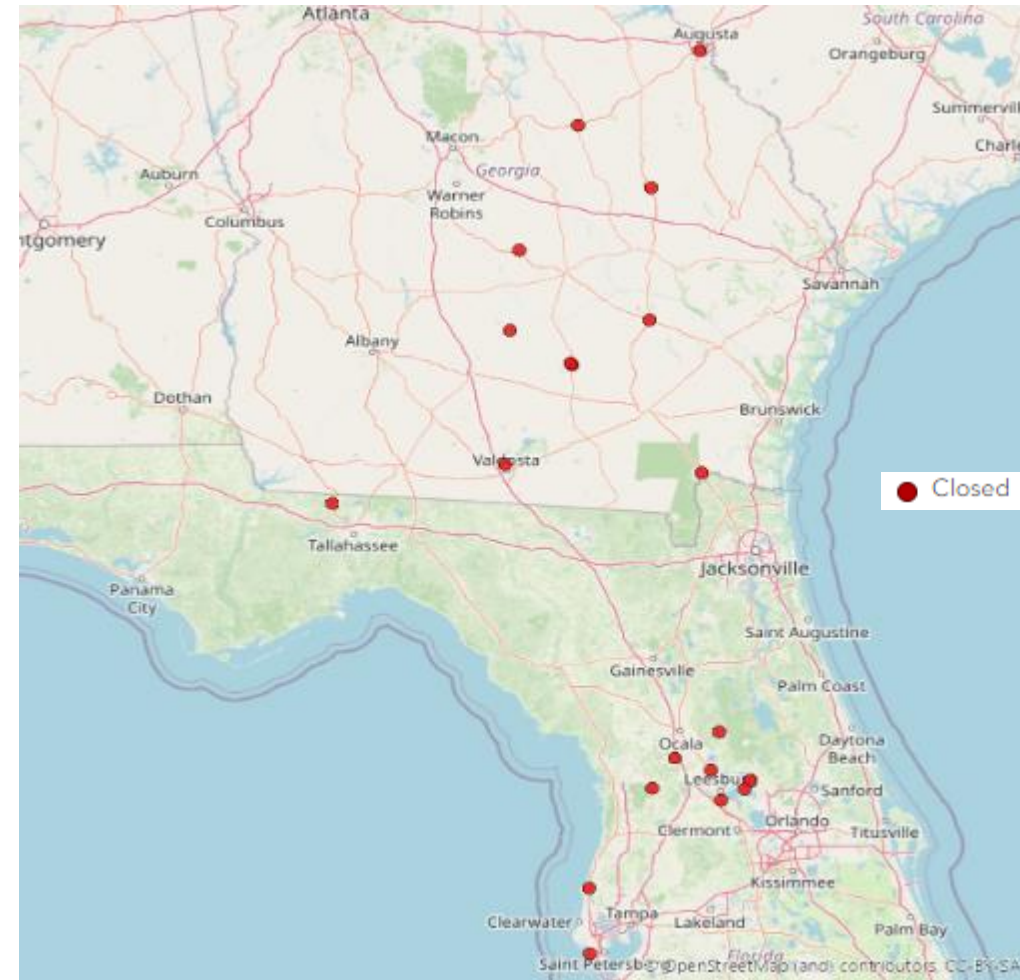
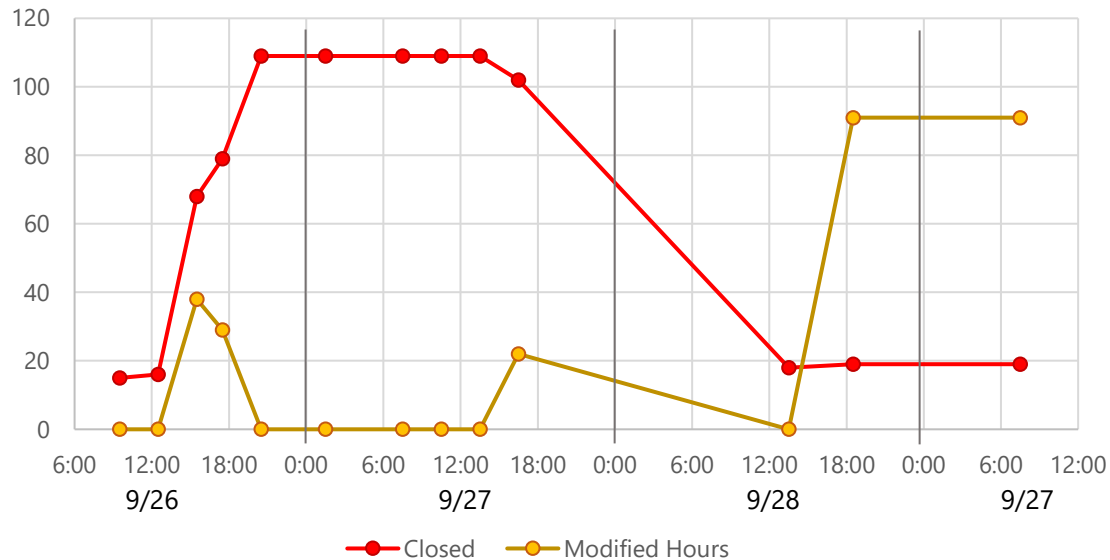


# Downstream Impacts – Southeastern Grocers (Winn-Dixie, Harvey's, Fresco y Mas)

**Key Message: Retail closures and hour modifications continue in hard-hit areas but are decreasing as utilities and road access are restored.**

- As of 0830 ET, 10 Southeastern Grocers locations remain closed, with an additional 91 operating on modified hours.
- Locations in the Florida Panhandle and Tampa Bay area have mostly reopened with modified hours.
- Closures persist in central Florida (Ocala, Leesburg) and throughout rural communities in central and eastern Georgia.

**Southeastern Grocers - Store Closures and Hour Modifications**



# Food Policy and Food Assistance

**Key Message: Benefit issuance is spread out over the month, limiting the impact of the late-month timing of the storm.**

Standard SNAP benefit issuance is spread out over the month for affected states (i.e. – no early month rush):

- **Florida:** Between the 1<sup>st</sup> and 28<sup>th</sup> of the month, based on case number.
- **Georgia:** Between the 5<sup>th</sup> and 23<sup>rd</sup> of the month, based on ID number.
- **North Carolina:** Between the 3<sup>rd</sup> and 21<sup>st</sup> of the month, based on the last digit of the recipient's SSN.

[USDA Food and Nutrition Service](#) (FNS) has approved the following waivers:

- **Florida:**
  - Child and Adult Care Food Program (CACFP) operators may serve meals in non-congregate settings and adjust meal service times.
  - National School Lunch Program (NSLP) and School Breakfast Program (SBP) operators may temporarily serve meals and snacks that do not meet meal pattern requirements. Operators may also allow multiple schools to utilize a single location and claim meals separately per program.
- **North Carolina:**
  - SNAP recipients may request replacement issuances if food purchased with SNAP benefits is lost due to disaster. Typically, recipients must make the request within 10 days of the loss. The 10-day reporting requirement has been waived for Brunswick County through October 16<sup>th</sup>.





## Ports and Intermodal Assessment



# Monitored Port Summary

Initial temporary closures for regional ports; ongoing issues with flooding and channel restrictions at Port Tampa

## Port of Tampa has reported the following terminal conditions:

- Term A - Operational and accepting trucks
- Term B - Operational and accepting trucks
- Term C - Operational and accepting trucks
- Term D - Not operational due to flooding
- Term E - Testing systems to open
- Term F - Limited power, update pending

Reported total loss of the pilot station that will present challenges for them logistically and a longer transit, to and from, vessels.

Landside operations continued for most terminals, even with channel restrictions

## UPDATE TO PORT CONDITION IV HURRICANE HELENE

Following HURRICANE HELENE, the Captain of the Port (COTP) will set **Port Condition IV** for the ports of Tampa, Manatee, and Ft. Myers effective on September 29, 2024 at 1300 (1:00 p.m.) with the following restrictions:

- Port St. Petersburg is open with no restrictions.
- Port Tampa and Manatee:
  - Vessel movements are restricted to daylight hours only.
- Port Ft. Myers is open with no restrictions.

The National Weather Service does not forecast sustained gale force winds to continue affecting the Tampa Bay area.

**Flooding of the terminals at Port Tampa is extremely unusual and disrupted the terminal operations.** The channels faced delays in reopening with restrictions placed on allowable drafts because large debris caused an obstruction to navigation.

About a dozen of the larger tanker and cargo vessels were required to anchor outside the channel Friday and Saturday before restrictions were lifted by 1:00PM ET on Sunday.



## Water



Tallahassee Water Tower. Source via Getty

# Water Systems – Key Messages

- **Widespread outage and boil water notices** – Initial indications are that dozens of water systems in FL, GA, SC, NC, and VA have declared boil water notices, and many more may follow (Note: SCAN's counts are incomplete and likely underestimate current outages.) In areas without power service, boiling water is difficult for many residents, increasing need for bottled water. Water outages will also prevent reopening of businesses, schools, and industry.
- **Private well user need** – Private well users without generators will lose water access during power outages. SCAN estimates that the population of private well users potentially needing bottled water exceeds 960,000, falling only slightly from 1.076 M on 09/28.
- **Trends to watch** – Distribution of bottled water is already occurring at many POD sites and by VOADs, but demand expression for bottled water in private sector channels may not yet be fully visible. Power restoration may restore water access for many private well users and public water supply, but many large water systems may need time to assess damage and make repairs.

# Current Issues– Boil Water Notices (BWN) North Carolina / South Carolina

**Key Message: More than fifty boil water notices (BWNs) have been issued across twenty-eight counties following TS/Hurricane Helene. Additional BWNs are anticipated as flooding and power outages persist.**

- **North Carolina:** Fayetteville (NC) Public Works issued a BWN on 9/26 unrelated to Helene, the BWN has since been rescinded. Other BWNs have been issued in at least four different counties, affecting roughly 39 systems (according to NC SERT call 9/28).
- **South Carolina:** Greenville (NC) Water Commission’s intake structure was enveloped by the Nolichucky River on 9/28, the pumps have been turned off leaving residents with a BWN. Due to flooding, the Belton-Honea Path Water Authority has issued a BWN for their service area.
- Currently tracked BWNs for North and South Carolina are the following:

State	PWSID	PWS Name	County	City	Population Served	Notice Issued	System Status
North Carolina	NC0326010	Fayetteville Public Works Comm	Cumberland	Fayetteville	214,405	09/26/2024	Rescinded BWN as of 9/27/2024
North Carolina	NC0112015	Morganton City of	Burke	Morganton	2,7221	09/28/2024	Outage/ Active BWN
North Carolina	NC0111010	Asheville City of	Buncombe	Asheville	156,720	09/28/2024	Outage/ Active BWN
North Carolina	NC0195010	Boone, Town of	Watauga	Boone	9,560	09/27/2024	Outage/ Active BWN
North Carolina	NC0145010	Hendersonville, City of	Henderson	Hendersonville	79,278	09/27/2024	Outage/ Active BWN
South Carolina	SC0410011	Belton-Honea Path WA	Anderson	Belton, Honea Path, Donalds	2,277	09/28/2024	Outage/ Active BWN

# Current Issues– Boil Water Notices (BWN) Florida

**Key Message: More than fifty boil water notices (BWNs) have been issued across twenty-eight counties following TS/Hurricane Helene. Additional BWNs are anticipated as flooding and power outages persist.**

- Florida:** Florida Health’s tracker lists four (4) BWN in Marion County due to lost power but has since regained power service. The following counties have issued BWN: Alachua County, Charlotte County, Citrus County, Clay County, Columbia County, Dixie County, Duval County, Hillsborough County, Lake County, Lee County, Leon County, Levy County, Madison County, Nassau County, Pasco County, Putnam County, and Sumter County. In total, forty-four BWN have been issued in Florida.
- The largest by population affected by the BWN include:

PWSID	PWS Name	County	City	Population Served	Notice Issued	System Status
FL2010612	Charlotte County Utilities	Charlotte	Port Charlotte	156,367	09/27/2024	Outage/ Active BWN
FL6084079	Madison Water Department	Madison	Madison	7,350	09/27/2024	Outage/ Active BWN
FL6080256	Water Oak Country Club Estates	Lake	Lady Lake	1,465	09/27/2024	Outage/ Active BWN
FL5084100	St. John’s Landing Apartments	Clay	Green Cove Springs	1,310	09/27/2024	Outage/ Active BWN
FL6090099	Dunnellon High/ Elem School	Marion	Dunnellon	1,256	09/27/2024	Outage/ Active BWN
FL6090523	Bocilla Utilities, Inc.	Charlotte	Englewood	1,064	09/27/2024	Outage/ Active BWN
FL6094656	Gator Waterworks Water System	Alachua	Gainesville	800	09/27/2024	Outage/ Active BWN
FL6094934	Celm/Aldermans Ford Park	Hillsborough	Lithia	800	09/27/2024	Outage/ Active BWN
FL6094957	Cax-Lakeshore LLC	Hillsborough	Tampa	590	09/27/2024	Outage/ Active BWN
FL6094956	Hermits Cove Water System	Putnam	Satsuma	558	09/27/2024	Outage/ Active BWN

# Current Issues– Boil Water Notices (BWN) Tennessee and Georgia

**Key Message: More than fifty boil water notices (BWNs) have been issued across twenty-eight counties following TS/Hurricane Helene. Additional BWNs are anticipated as flooding and power outages persist.**

- **Georgia:** Vidalia Works has issued a BWN due to power grid loss after Georgia Power and Altamaha Electric Membership Corporation (EMC) was destroyed by TS/Hurricane Helene.
- **Tennessee:** At least eight (8) water systems in five (5) counties have issued BWNs due to flooding in the area. These counties include Cocke County, Carter County, Johnson County, Houston County, and Unicoi County.
- Currently identified systems affected in Georgia and Tennessee include the following:

State	PWSID	PWS Name	County	City	Population Served	Notice Issued	System Status
Georgia	GA2790002	Vidalia	Toombs	Vidalia	14,909	09/28/2024	Outage/ Active BWN
Tennessee	TN0000500	Newport Utilities Board	Cocke	Newport	32,995	09/27/2024	Outage/ Active BWN
Tennessee	TN0000479	Mountain City Water Dept	Johnson	Mountain City	8,507	09/28/2024	Outage/ Active BWN
Tennessee	TN0000094	First U.D. of Carter Co.	Carter	Elizabethton	9,560	09/28/2024	Outage/ Active BWN
Tennessee	TN0000282	Hampton Utility District	Carter	Hampton	3,869	09/28/2024	Outage/ Active BWN
Tennessee	TN0000646	South Elizabethton U.D.	Carter	Elizabethton	6,154	09/28/2024	Outage/ Active BWN
Tennessee	TN0000231	Erwin Utilities Authority	Unicoi	Erwin	12,236	09/28/2024	Outage/ Active BWN
Tennessee	TN0000719	Unicoi Utility District	Unicoi	Unicoi	4,336	09/28/2024	Outage/ Active BWN
Tennessee	TN0000698	Tennessee Ridge Water System	Houston	Tennessee Ridge	4,038	09/28/2024	Outage/ Active BWN

# Possible Bottled Water Need for Private Well Users

**Key Message: SCAN estimates roughly 0.96 - 1.1M private well users in FL, GA, NC, SC, VA may need bottled water.**

- SCAN used geospatial analysis to get very rough estimates of the population that:
  - 1.) Uses a private well for water supply
  - 2.) lives in a county with power outages exceeding 50% of customers
- Estimates of well users by county (USGS, 2015) and census block group (EPA, 2020) were used as the data sources for the calculation. Power outage information provided by Poweroutage.us
- After applying an adjustment factor of 60% (to account for population that might have generators, had evacuated, or still has power) we calculated the following estimates of private well users without current water access (see right)
- *Note that this analysis is experimental and depends on the quality of the data. These numbers are expected to fall rapidly as power is restored in the affected areas.*

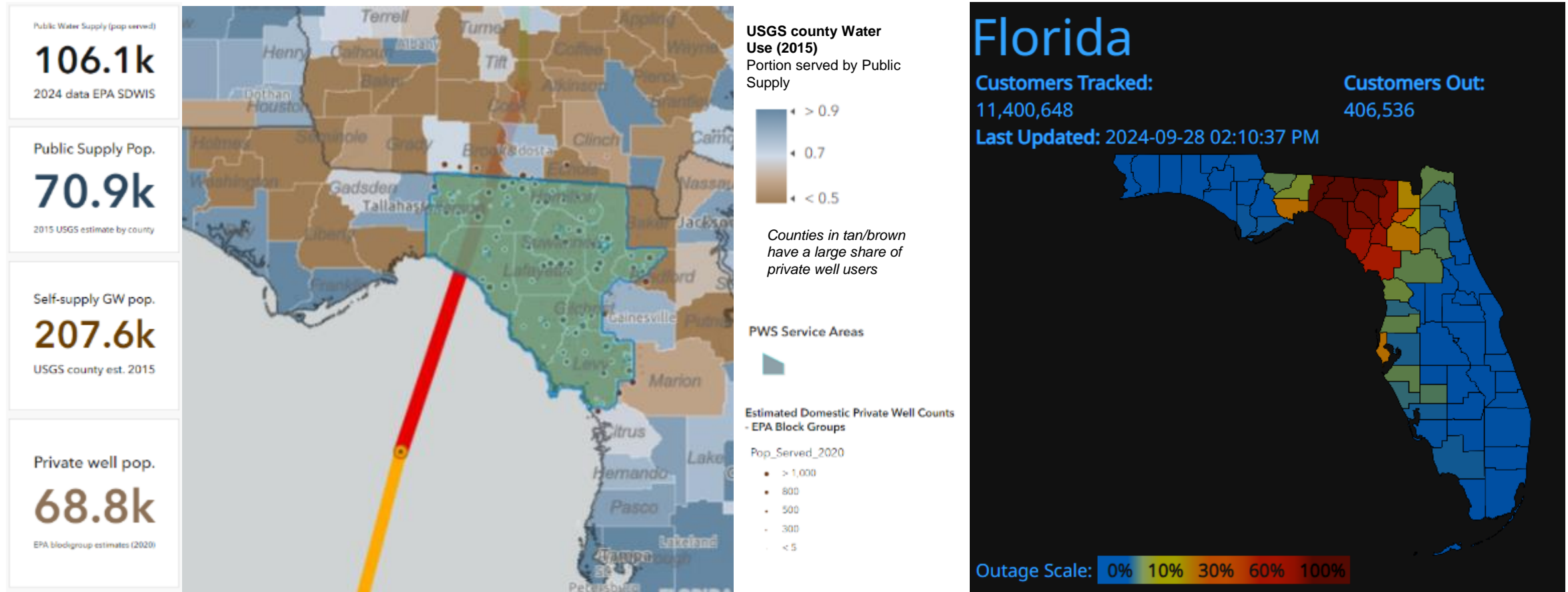
<i>Helene - Power outage effects on water access</i>			
<i>Private Well User Pop. w/o water access</i>			
State	Range	Estimate (9/28)	Estimate (9/29)
FL	35280 - 124560	80,000	78,000
GA	255000 - 336400	294,000	300,000
NC	242000 - 375180	323,000	273,000
SC	225000 - 396000	318,000	258,000
VA	45000 - 76200	61,000	51,000
<b>Total</b>		<b>1,076,000</b>	<b>960,000</b>

*as of 09-29-24 1300*



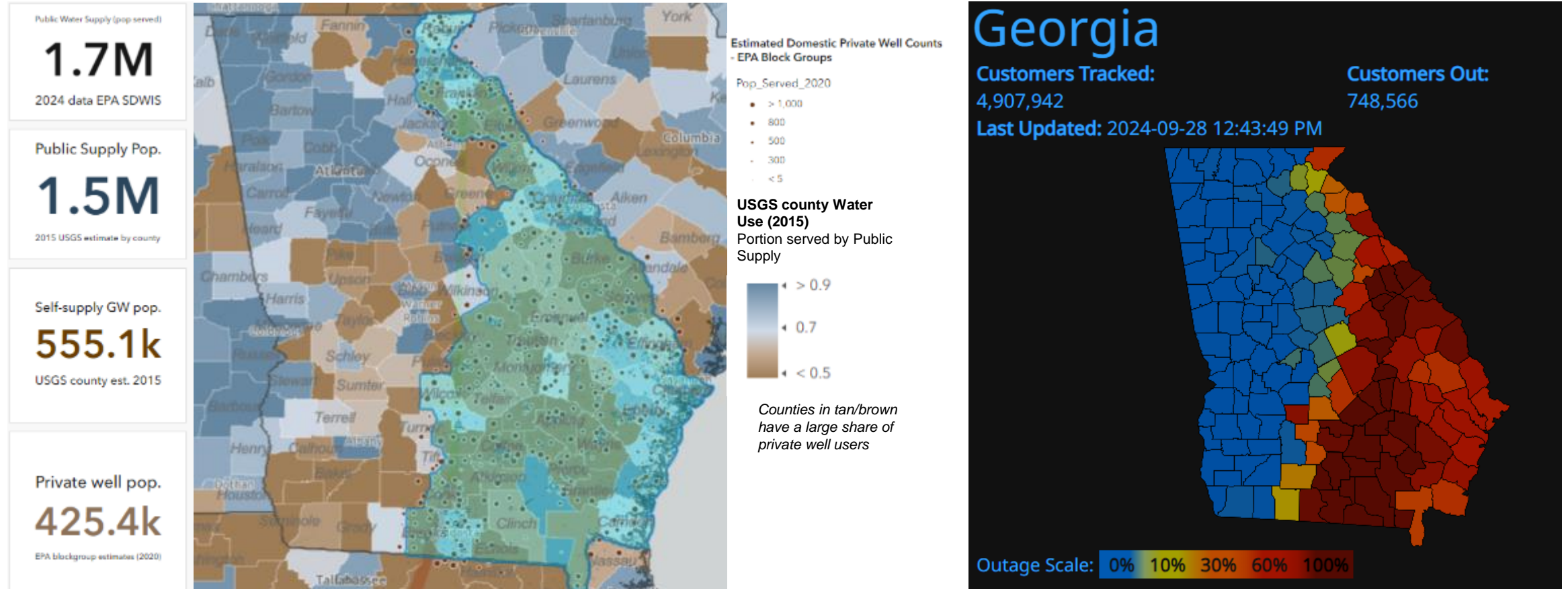
# Estimates of private well user population in power outage areas

**Key Message: Florida estimate of well users who might need bottled water: 80,000 (9/28), 78,000 (9/29)**



# Estimates of Private Well User Population in Power Outage Areas

**Key Message: A Georgia estimate of well users who might need bottled water: 294,000 (9/28), 300,000 (9/29)**



# Estimates of Private well user population in power outage areas

**Key Message: A North Carolina estimate of well users who might need bottled water: 323,000 (9/28), 273,000 (9/29)**

Public Supply Pop.

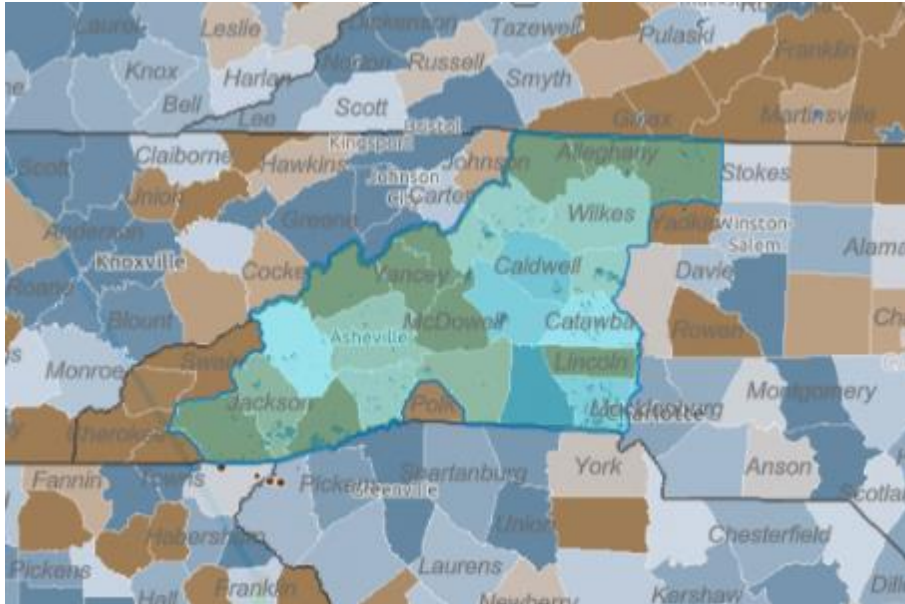
**1.1M**

2015 USGS estimate by county

Self-supply GW pop.

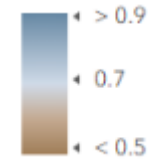
**625.3k**

USGS county est. 2015



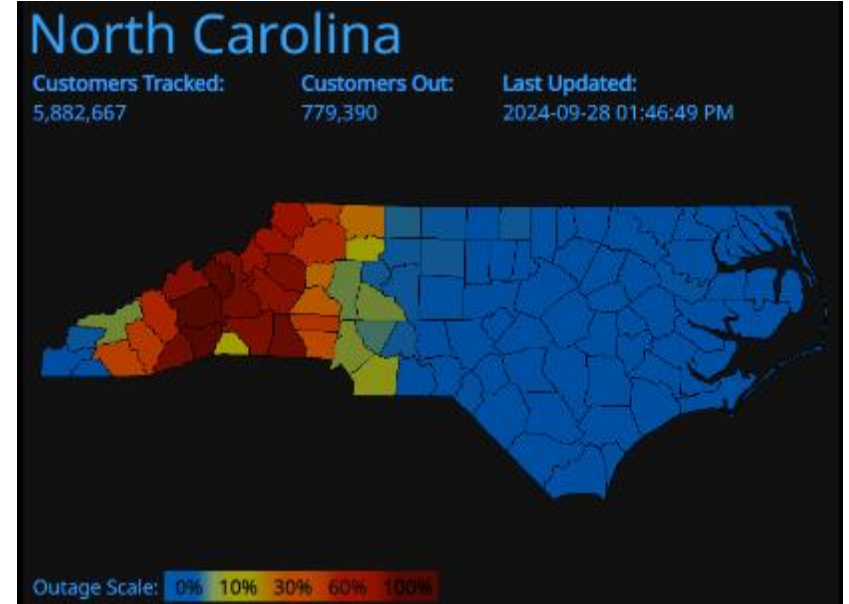
USGS county Water Use (2015)

Portion served by Public Supply



Counties in tan/brown have a large share of private well users

PWS Service Areas

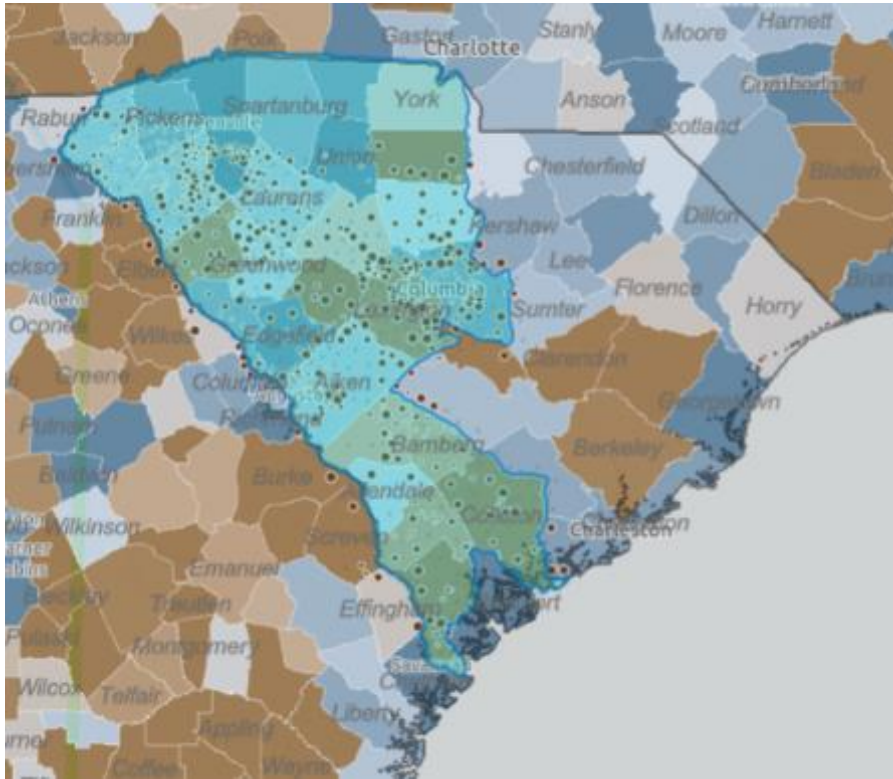


# Estimates of private well user population in power outage areas

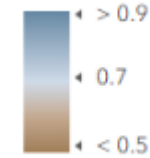
**Key Message: A South Carolina estimate of well users possibly needing bottled water: 318,000 (9/28), 258,00 (9/29)**

Public Supply Pop.  
**2.2M**  
2015 USGS estimate by county

Self-supply GW pop.  
**660.5k**  
USGS county est. 2015



**USGS county Water Use (2015)**  
Portion served by Public Supply



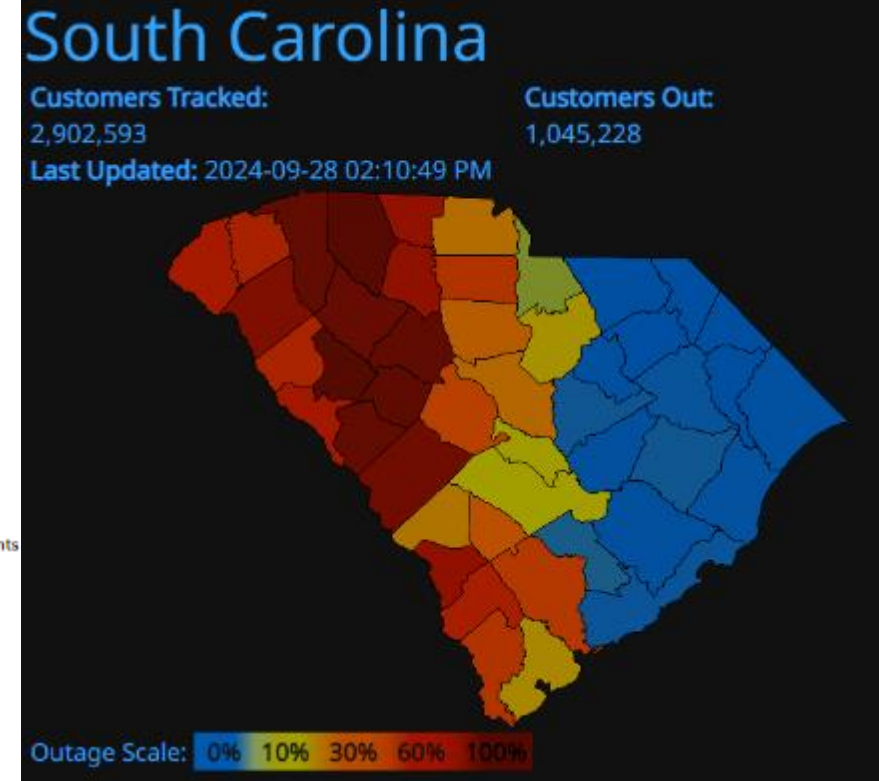
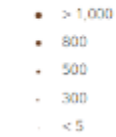
*Counties in tan/brown have a large share of private well users*

**PWS Service Areas**



**Estimated Domestic Private Well Counts - EPA Block Groups**

Pop\_Served\_2020





**Fuel**



View of Global Bainbridge in GA. Source: [www.globalp.com](http://www.globalp.com) 2024

# FL Terminal Service Areas and Potential Issues

**Key Message: CFL pipeline (Kinder Morgan) from Tampa to Orlando is not fully operational**

## **UPDATE:**

- Two terminals are still closed in Tampa [11:00AM ET]. One likely to be closed for *weeks*.
- The CFL pipeline from Tampa to Orlando was not operational for a period of time. Currently, the 10" line is up and running, but the 16" line is still in repair [11:00AM ET].
  - 16" pipeline transports gasoline and batched denature ethanol.
  - 10" pipeline transports diesel fuel and jet fuel.

**\*Fuel Appendix** describes relief lever guidance, CI details, and fuel stocks [begins slide 55]

Bainbridge is in GA – serves a large volume of the FL panhandle.

- If there is not coordination between FL and GA on waivers for HOS and Weight, then fuel delivery can be impaired
- Panhandle terminals are small and supplied via barge instead of the Colonial Pipeline.

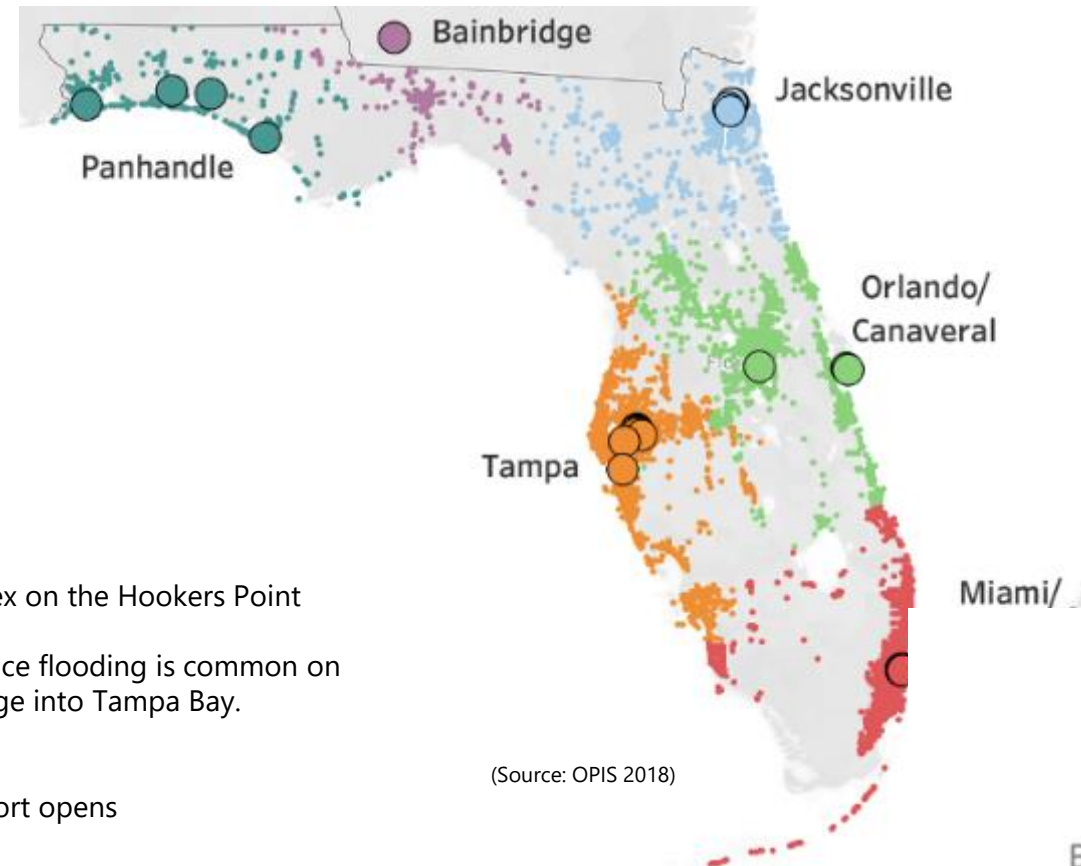
Orlando is supplied by pipeline from Tampa

- Fuel for the Central Florida Pipeline is sourced from providers within the Port Tampa Bay fuel complex on the Hookers Point peninsula and nearby Delaney Creek dock facilities.
- All of these resources are in a Zone AE high risk Flood Plain. High Tide Flooding and so-called nuisance flooding is common on the Hookers Point peninsula. There are also documented historical instances of significant storm surge into Tampa Bay.

Co-located ports and terminals

- When ports close, co-located terminals close. Landside fuel loading at racks can start again before port opens
- Fuel tankers from outside the region supporting fuel efforts:
  - Drivers need TWIC to access the port
  - Drivers need separate terminal credentials to fuel

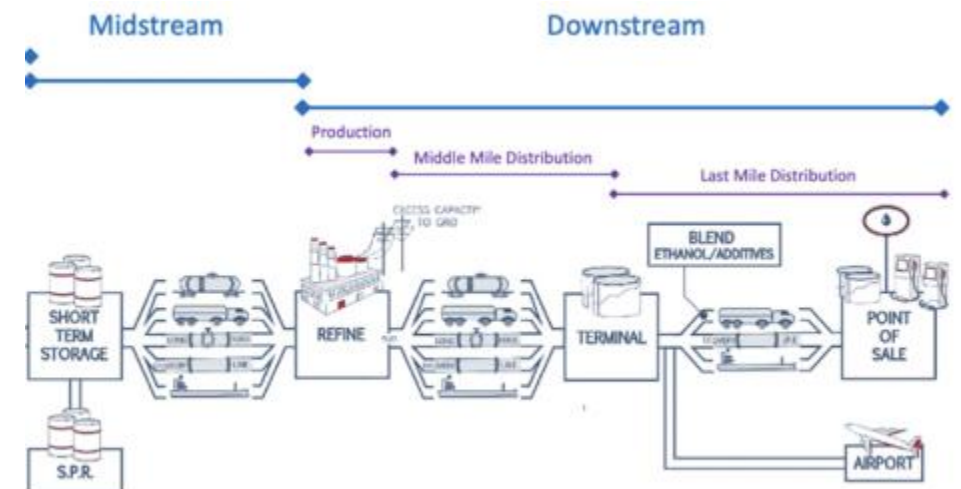
Blue Sky downstream gasoline distribution network of Florida:  
\*Colors how retail location server by each terminal group



# Western Carolinas Fuel Update

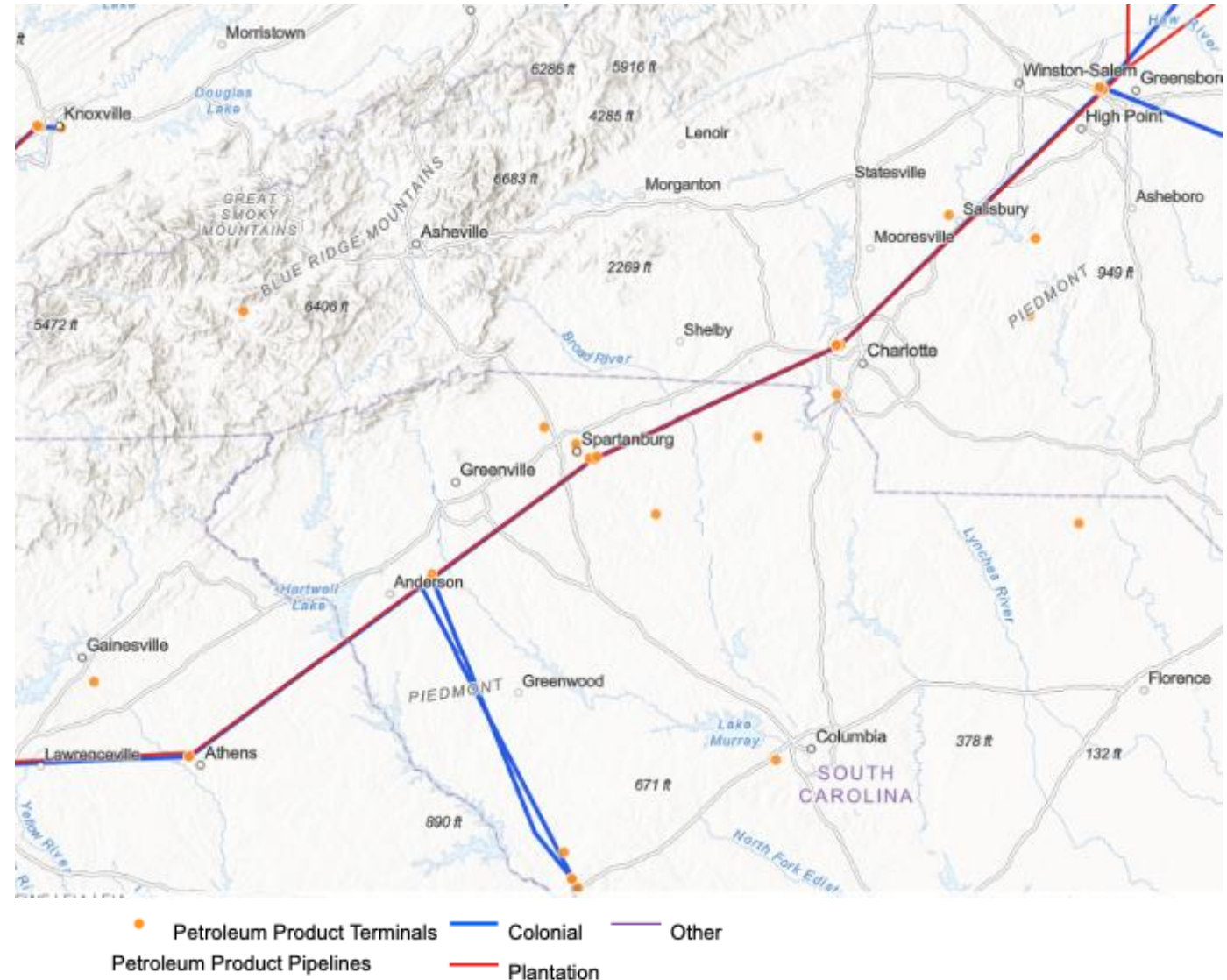
**Key Message: Fuel demand will increase as evacuees return and those with long power restoration timelines leave, putting additional pressure on last-mile fuel distribution capacity.**

- Sentinels report lines at the open gas stations in NC after the storm. Past storms saw demand grow two (2) to five (5) times normal. This increase in demand is difficult to meet even when roads are clear, and power is available.
- Production – no expected issues yet
  - No significant production in the region
  - East Coast (PADD 1) stocks were healthy ahead of Hurricane Helene (see slide below from 9/27 update)
- Middle Mile Distribution – power restoration is key
  - The Western Carolinas are primarily supplied with fuel from terminals along the Colonial Pipeline
  - DOE reported Colonial’s distillate pipeline operating at reduced rates due to commercial power loss in SC (see ES-12 DOE 9/28 SitRep)
  - Power outages may be affecting fuel terminal operations in Spartanburg, SC.
- Last Mile Distribution – most potential for public support
  - Highway access to stations in the western Carolinas is limited (see Traffic section of this report).
  - As access provides opportunity for operators (jobbers, company fleets) to serve stations, tanker truck queues may form at fuel terminals that are open
  - FEMA should reference the 2021 report for the list of public and private levers that can be deployed to help terminals “debottleneck” terminals
- Retail Station reopening – does not occur in a straight line
  - As debris removal and power restoration efforts continue, anticipate:
    - Impacts on fuel availability in the region in the coming days.
    - Lines at retail stations that are able to open with generators or power available.



# Western Carolinas - Middle Mile

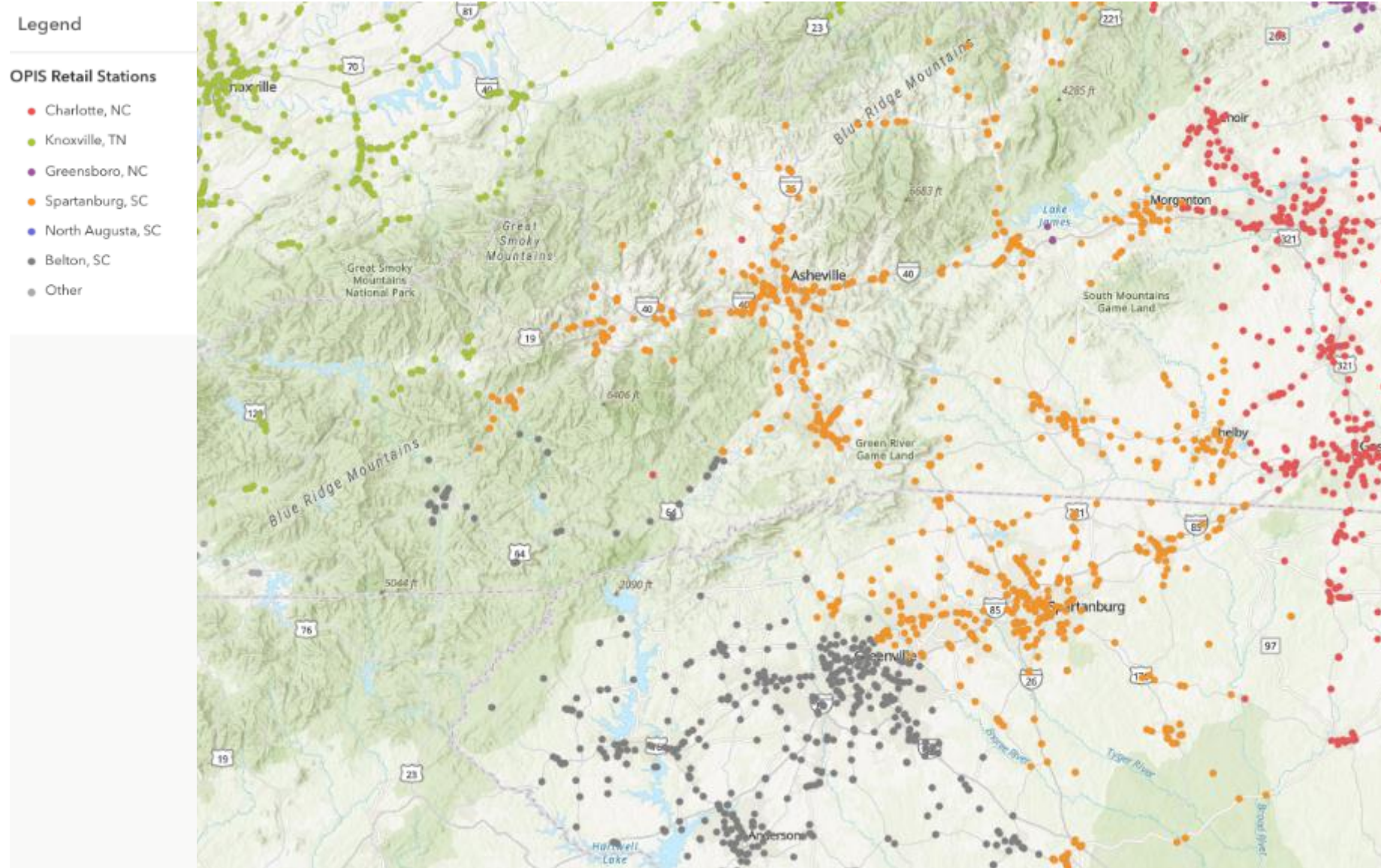
- Refinery capacity is primarily in the Gulf Coast (PADD 3).
- Currently, only 12% of production in the Gulf of Mexico remains shuttered following Hurricane Helene (down from 25% on 26 Sep).
- Fuel supply in the region relies on pipelines.





# Western Carolinas – Last Mile

- This map shows retail gas stations
  - Nationally, convenience stores make up 80% of fuel sales.
- The gas stations are colored by their primary fuel terminal or rack as determined by OPIS/IHS Markit. Stores between terminals often switch fuel sourcing based on pricing or availability.
- Reminder: Gas stations need power and telecom (for retail transactions) to operate. This storm may produce pockets of long-term service interruption.



# Retail Gasoline Station Restoration

**Key Message: For various reasons, one station can be closed while the station next door is open**

## Stations may be out of fuel or closed for several reasons

- Power: see below. Fuel shortages can be related to power and not inventory.
- Inspections: see below. Some post storm issues may require reporting to an inspector after discovery.
- Contracts: some stations have long-term contracts for branded fuel while other buy unbranded fuel from the “rack spot market”. When supplies are constrained, terminals often service their contractual obligations and allocate (or ration) fuel to the rack spot market.
- Margins: 58% of stations in the U.S. are single-store small businesses<sup>1</sup> who may choose to close when spot market prices rise, and they do not want to manage [price gouging requirements](#)

## Power restoration = fuel restoration

- While power alone is not sufficient, power is needed to pump fuel and process transactions.
- Power restoration may rely on the station’s ability to connect, procure and maintain a generator.

## Post-storm Inspections: flooded areas more likely to have issues given the inspection needs

- Check for spills, damage to tank covers and pumps, tank movement (propane tanks are also likely to move due to buoyancy during high water events), tank systems and water intrusion.
- Different fuels have different remedies – from pumping out water to disposing of the whole stock.
- Incident and discharge forms must be filed with appropriate agencies.



## Traffic



I-40 near TN/NC line.  
Source: NCDOT

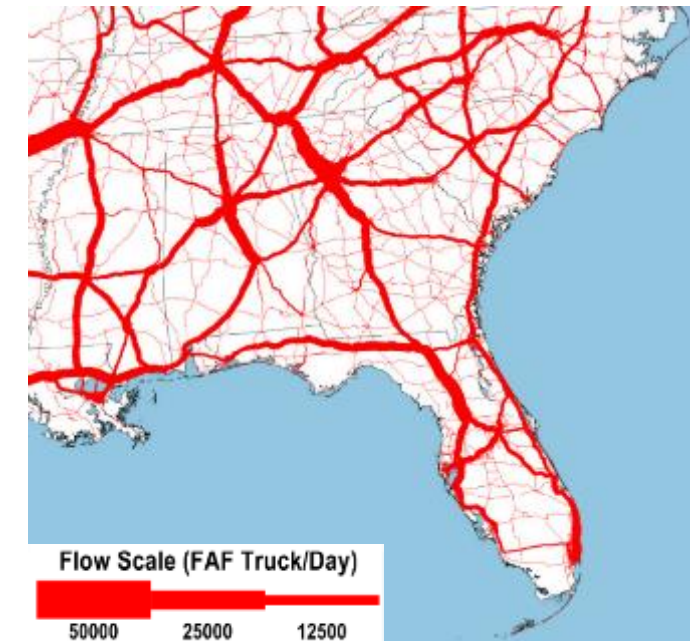
# Transportation: Freight and Traffic Dashboard

**Key Message: Interstates are open with exceptions of I-26 and I-40 in eastern TN and western NC. Most truck stops are open.**

Legend Code	
Significant Concern	
Moderate Concern	
Some Concern	
No Significant Concern	



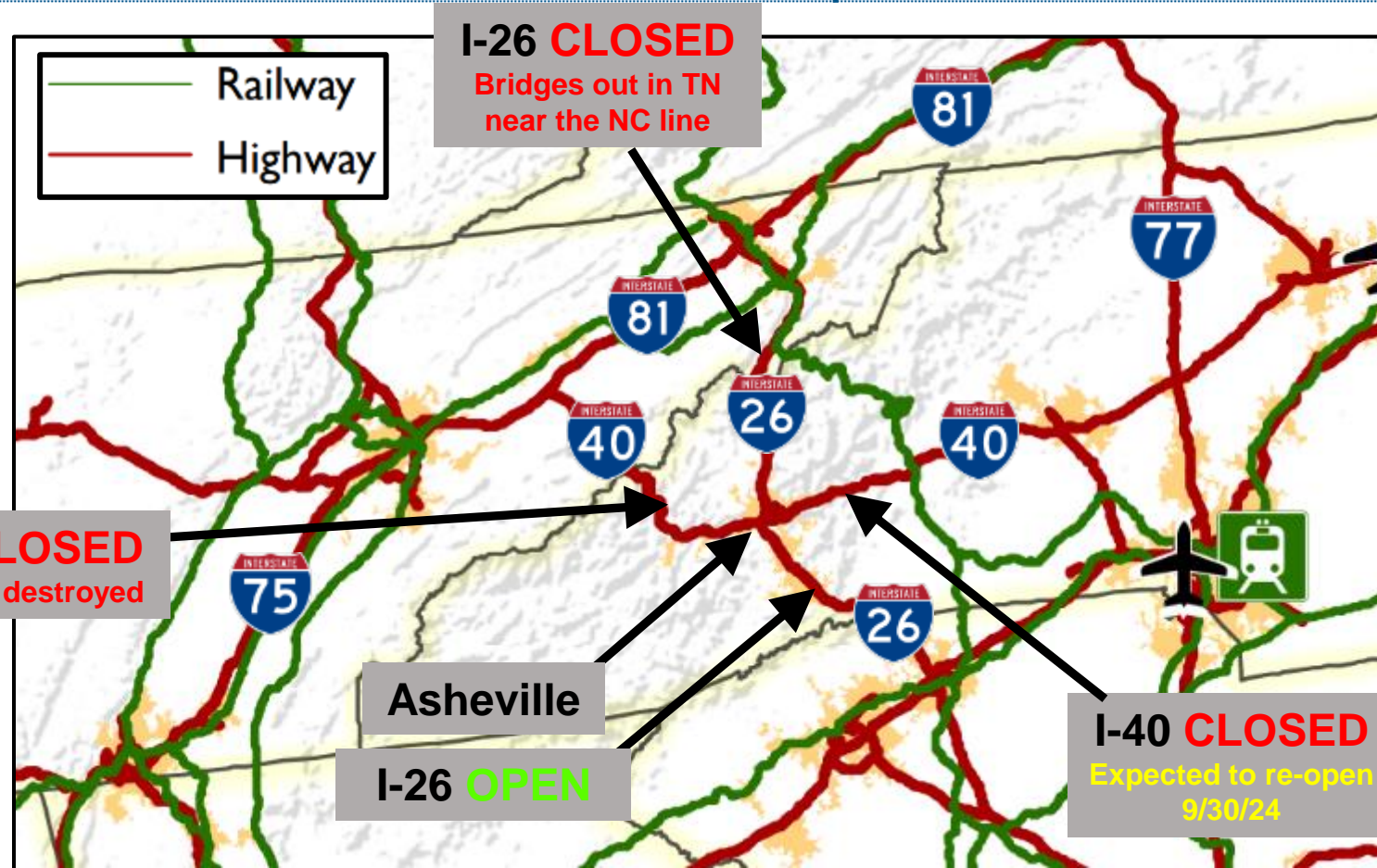
	Sunday 9/29
Roadway Infrastructure	
Roadway Operations	
Traffic Conditions	
Freight Trucking	



- Major Interstates in Southeast US are generally open and operational, except for I-26 and I-40 in eastern TN and western NC due to roadbed and bridge destruction.
- Asheville, NC is accessible via I-26 from SC and NCDOT anticipates opening I-40 east of Asheville by Monday 9/30/24
- Open interstates show no signs of congestion
- Major roads are open in SC, GA, FL
- Most monitored truck services centers (truck stops) are open & operational (some closed and some with limited services)

# Transportation: Road Status in Southern Blue Ridge Mountains

**Key Message:** I-40 (moderate truck volumes) and I-26 (low truck volumes) are closed between TN and NC. Asheville is accessible via I-26 from SC. I-75, I-77 and I-81 are all open.

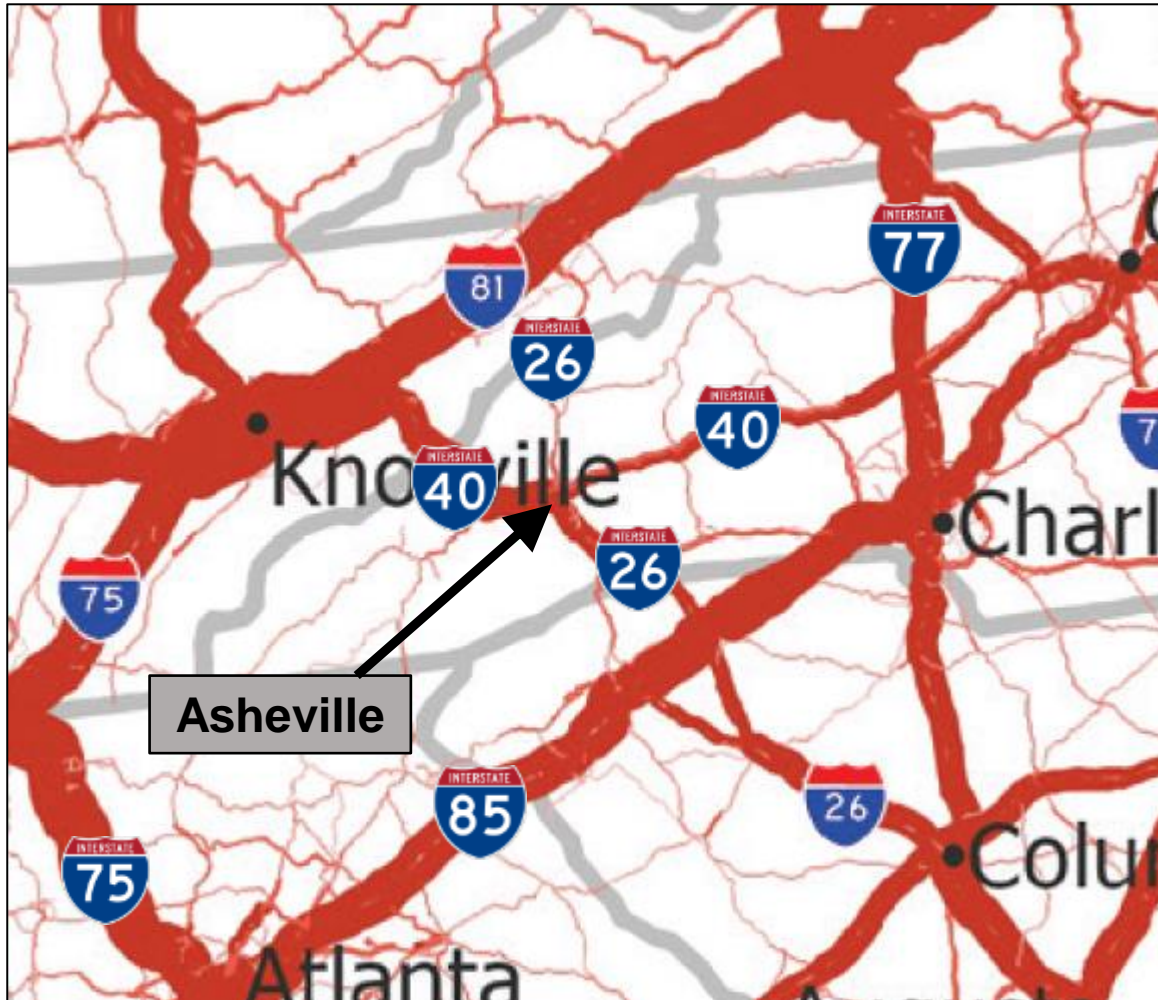


- Asheville is accessible via I-26 from SC, with no traffic congestion
- I-40 west of Asheville closed from MM 440 in TN to MM 3 in NC. In NC, I-40 has partially destroyed roadbed, washed out into Pigeon River. Likely closed for months.
- I-26 north of Asheville closed from MM 37 in TN to NC line. In Erwin, TN I-26 has pair of bridges destroyed. Likely closed for months but local workarounds may be available.
- I-40 east of Asheville may re-open by Monday 9/30/24, as reported by NCDOT.

Source: NCDOT and TDOT

# Transportation: Road Status in southern Blue Ridge Mountains

**Key Message: I-40 (moderate truck volumes) and I-26 (low truck volumes) are closed between TN and NC. Detours add 1-3 hours to trip**



- I-40 west of Asheville carried 7,600 trucks a day (moderate truck volumes)
- I-26 north of Asheville carried 1,200 trucks a day (low volumes)
- Detours around closures include:
  - Southern route: I-75 and I-85 via Georgia
  - Northern route: I-81 and I-77 via Virginia
- Detours will add 1-3 hours to trip

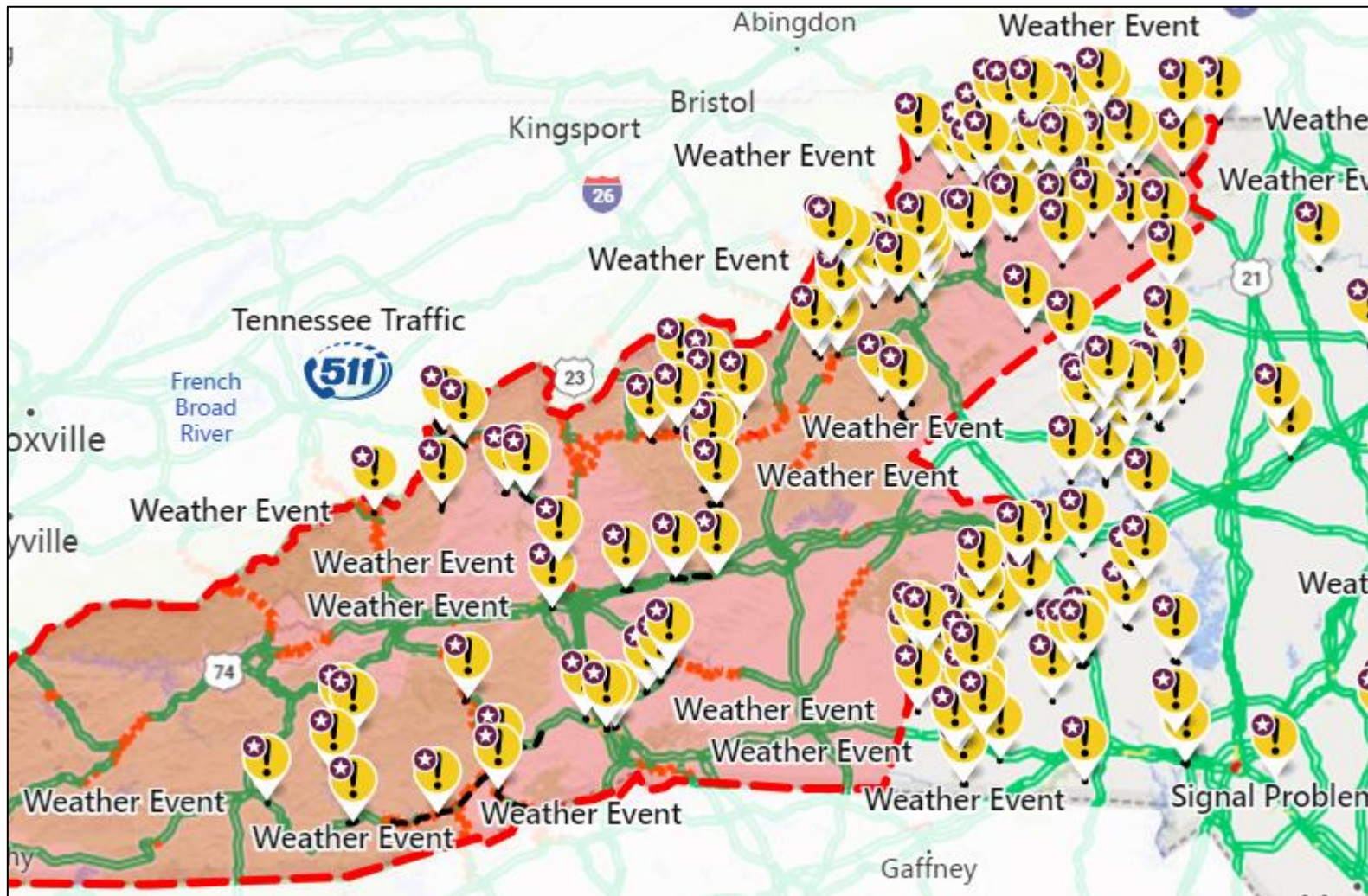
# Transportation: Road Status in southern Blue Ridge Mountains

Key Message: Images of I-40 washout in NC (left) and I-26 bridges destroyed in Erwin, TN (right)



# Transportation: Road Status in Impact Zone

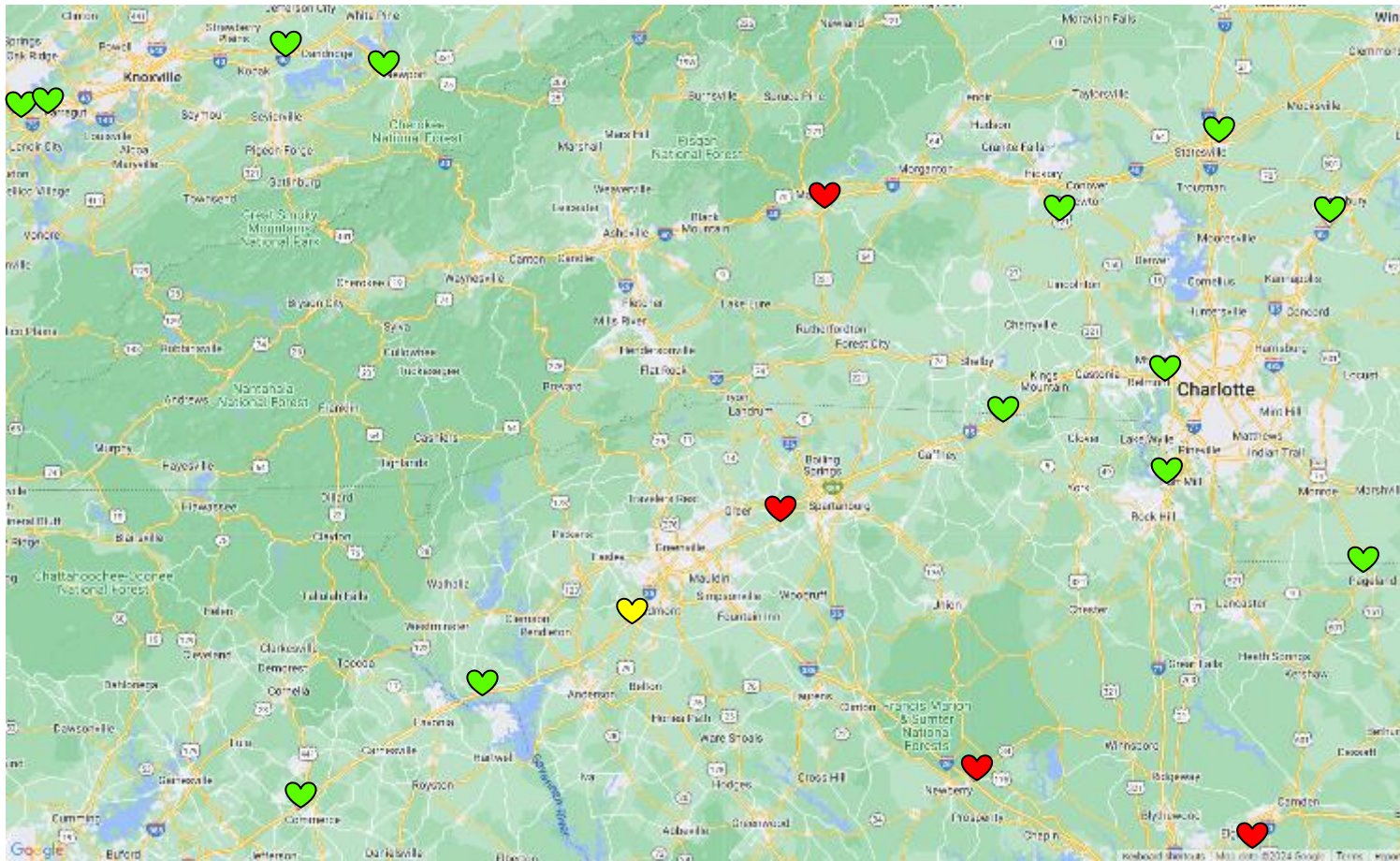
**Key Message:** Numerous roads closed in western NC and eastern TN due to flooding, road wash-outs, mudslides and debris in road (fallen trees, etc.). Road access to some communities and many residents is likely cut-off.



- Hundreds of closures in western NC
- Many communities may have no current road access
- Vast majority of road closures are local roads
- Receding floodwaters likely to reveal additional road wash-outs
- Realtime traffic info:
  - [DriveNC.gov](https://www.driveNC.gov)
  - [SmartWay.tn.gov/traffic](https://www.smartway.tn.gov/traffic)



# Transportation: Freight Trucking Update – Love's: Sept. 29, 2024, 1:00PM

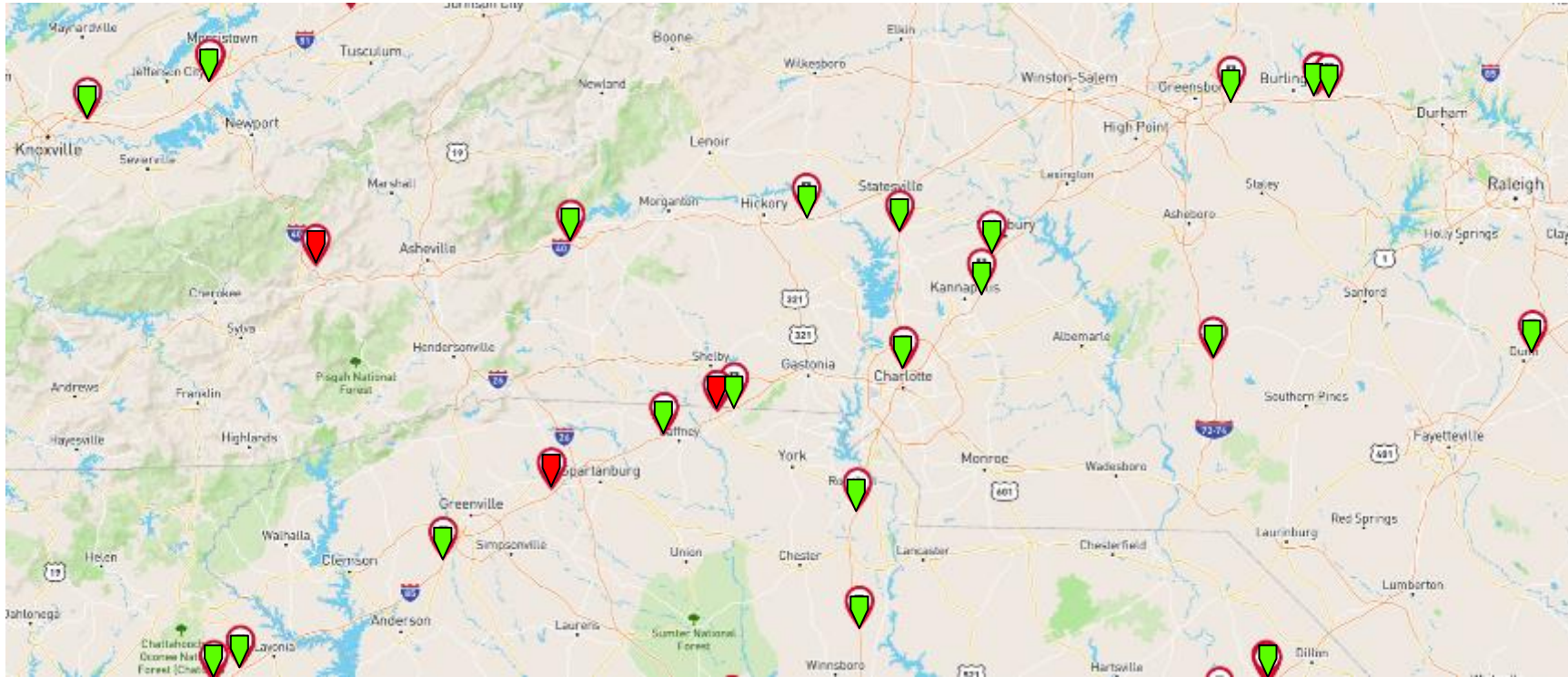


Three (3) SC and one (1) NC Truck Stop Closures Reported as of 1:00PM ET on 9/29/24



[Loves - Operation Status](#)

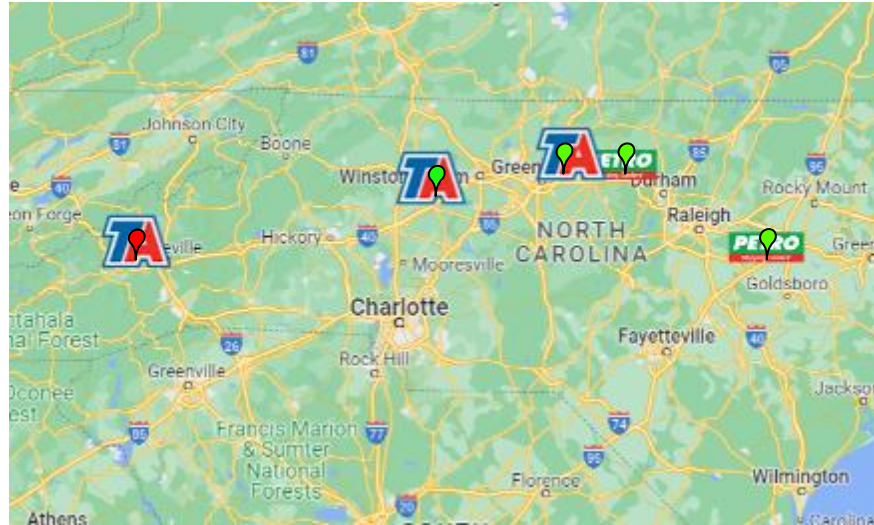
# Transportation: Freight Trucking Update - Pilot: Sept. 29, 2024 1:00PM



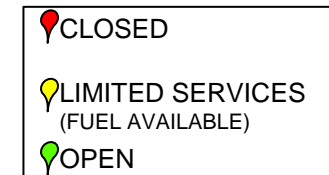
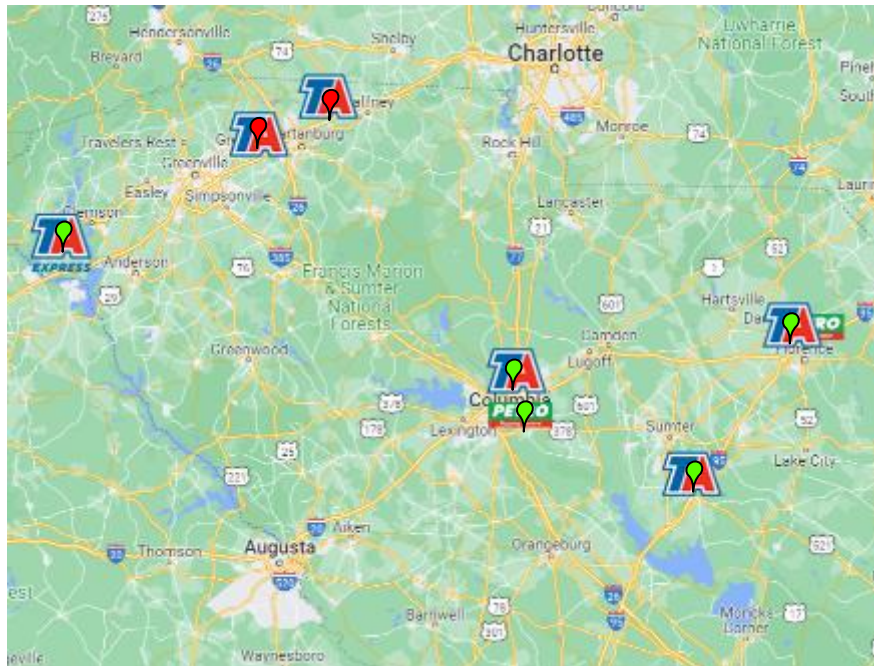
Two SC and one NC Truck Stop Closure Reported as of 1:00PM ET on 9/29/24



# Transportation: Freight Trucking Update – TA Petro: Sept. 29, 2024, 1:00PM

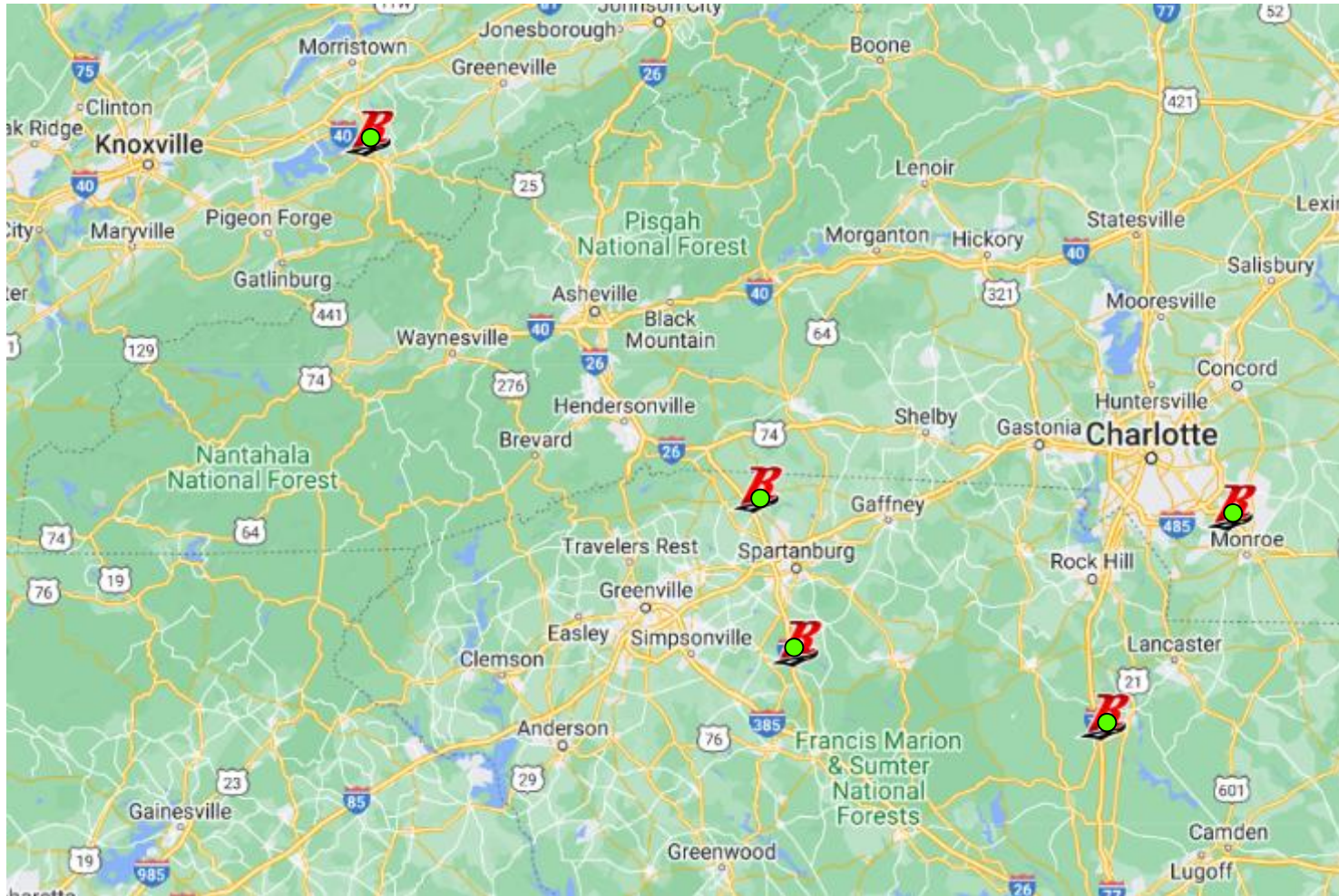


One (1) NC and two (2) SC Truck Stop Closures Reported as of 1:00PM ET on 9/29/24



[TA Petro - Operation Status](#)

# Transportation: Freight Trucking Update – Roady's: Sept. 29, 2024, 1:00PM



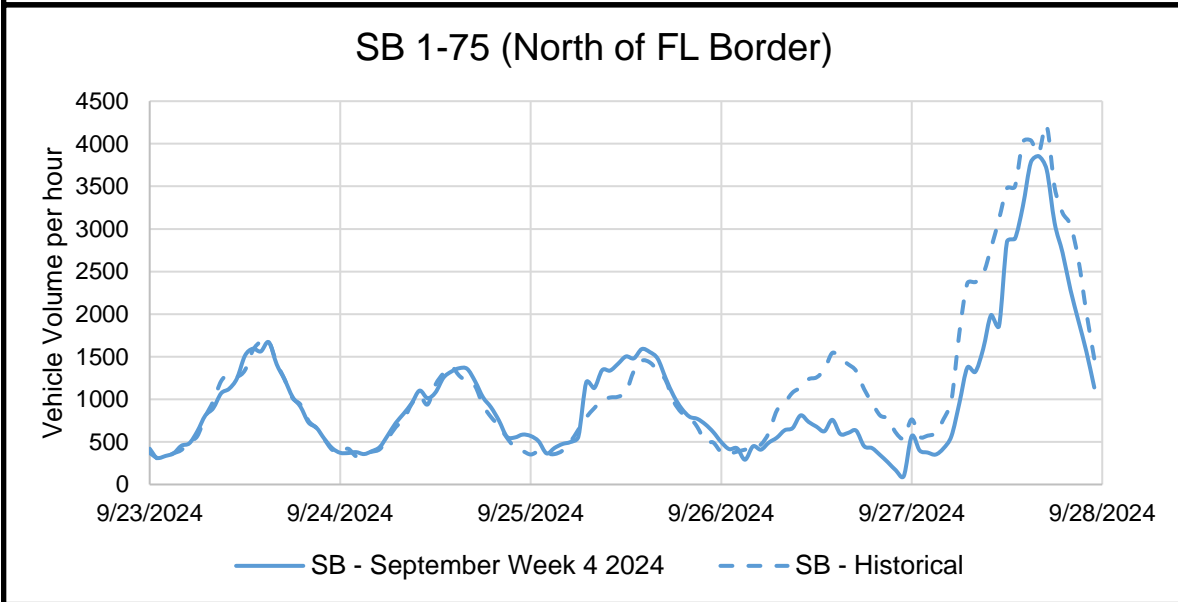
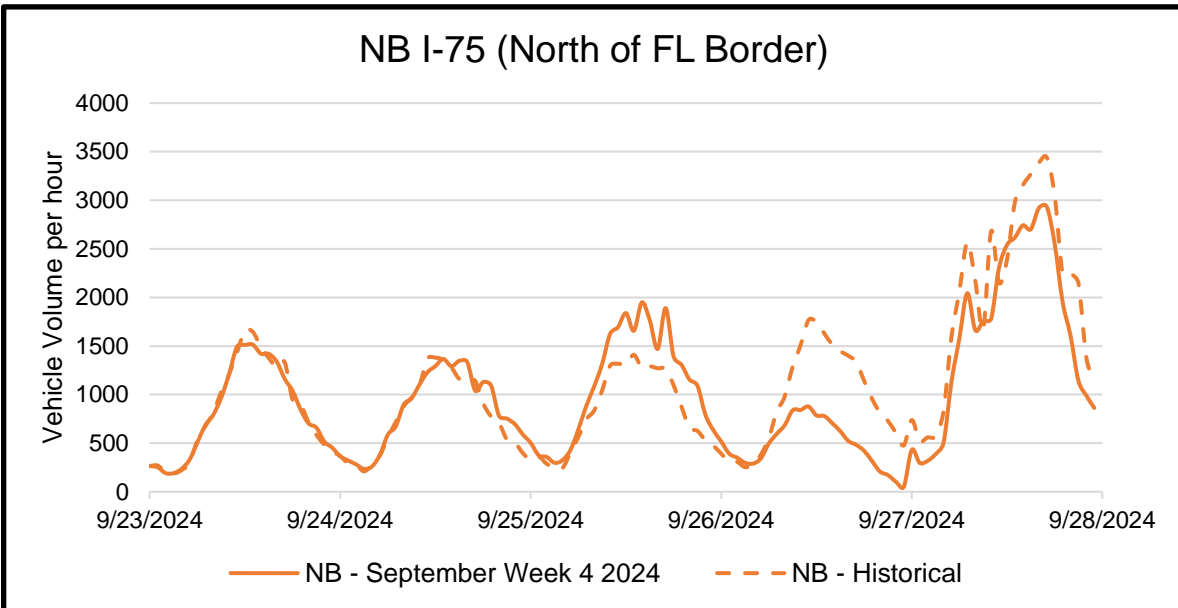
- CLOSED
- LIMITED SERVICES (FUEL AVAILABLE)
- OPEN

No Truck Stop Closures Reported as of 1:00PM ET on 9/29/24

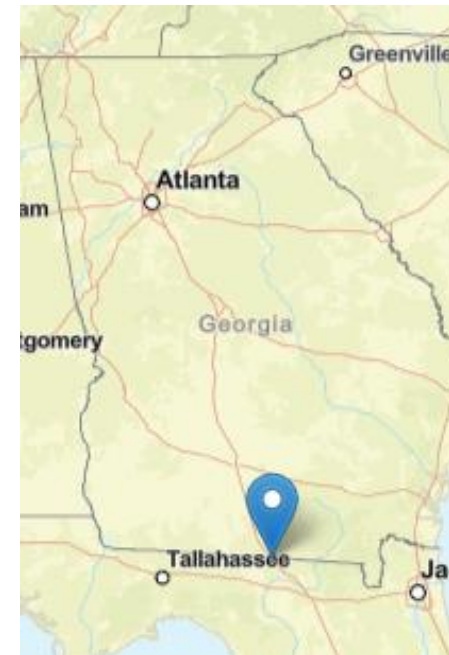


[Roady's - Operation Status](#)

# 24-Hour Traffic Data Count Location – I-75 North of FL Border



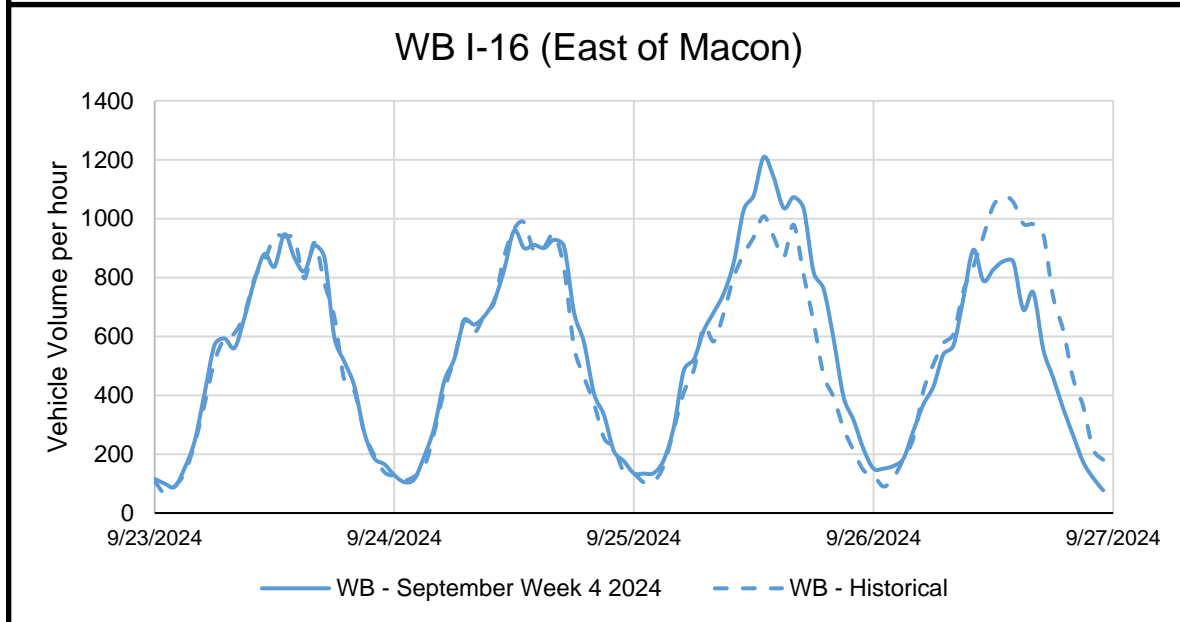
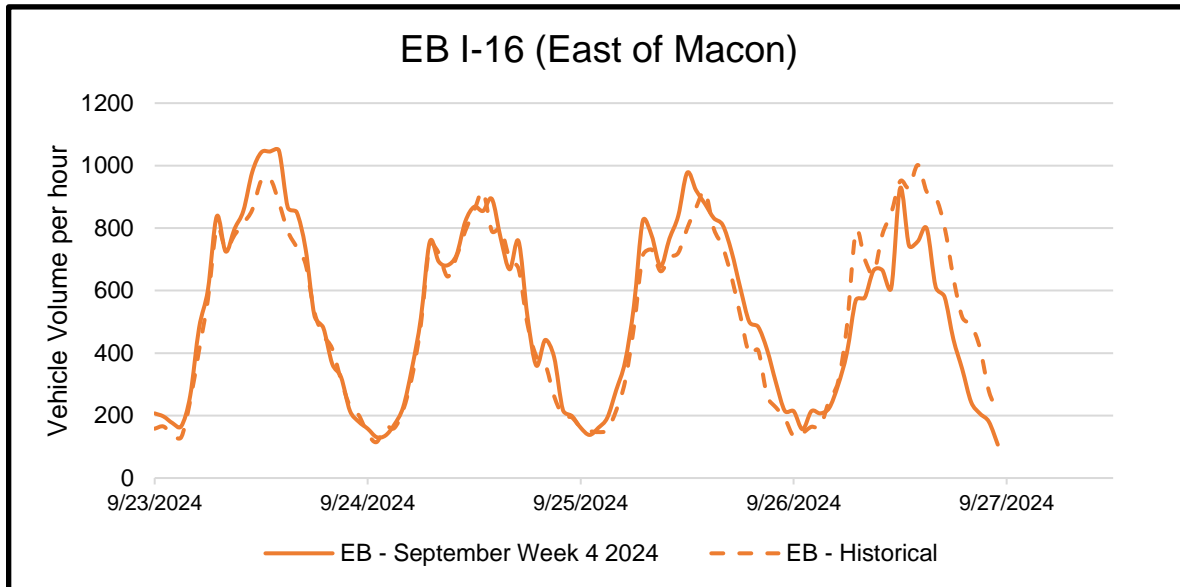
- Northbound (NB) and southbound (SB) graphs reflect all vehicles
- An expected large volume decrease between Thursday 9/26 and Friday 9/27 for both directions coincides with landfall Thursday night for this location near the center of the storm's track.
- Slight decrease in volume on Saturday 9/28 as traffic begins return to normal following the storm.



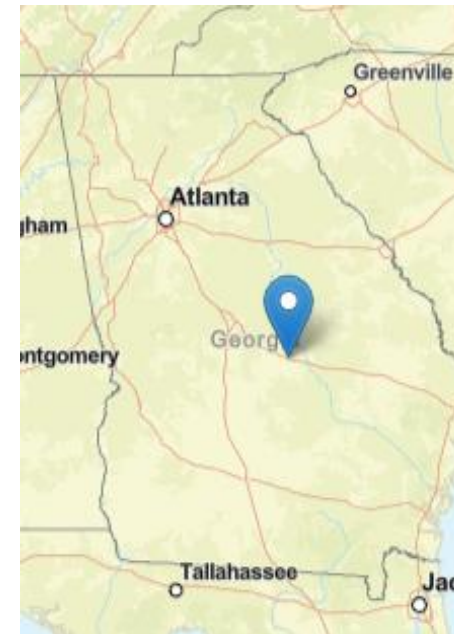
Note: Historical Volumes represent September Week 4 of 2023

Source: GDOT Station ID: 000001850227

# 24-Hour Traffic Data Count Location – I-16 East of Macon, GA



- Eastbound (EB) and westbound (WB) graphs reflect all vehicles
- The slight WB volume increase on Wednesday 9/25 may be just a normal volume fluctuation or could indicate a small evacuation movement.
- The slight WB volume decrease on Thursday 9/26 is expected as travel curtails with storm's approach.
- No data reported Friday 9/27 through Saturday 9/28



Note: Historical Volumes represent September Week 4 of 2023

Source: GDOT Station ID: 000001750427



## Appendix (Fuel)

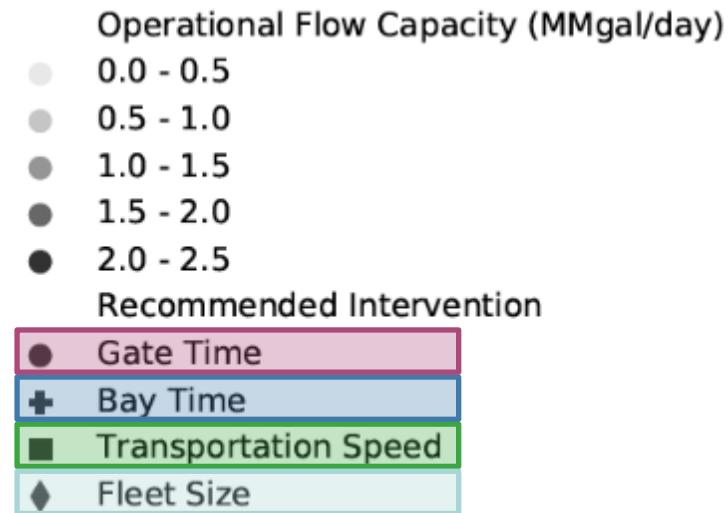
*The background, points-of-view, and opinions expressed by SCAN do not necessarily represent the positions or policies of the Department of Homeland Security or the Federal Emergency Management Agency. Content included from Freightwaves SONAR and DAT solutions as part of a contract with FEMA. Content is subject to copyright. Please request permission before use.*

Hurricane Helene. Satellite Imagery Source: 9.25 NOAA

# Lever guidance by terminal type

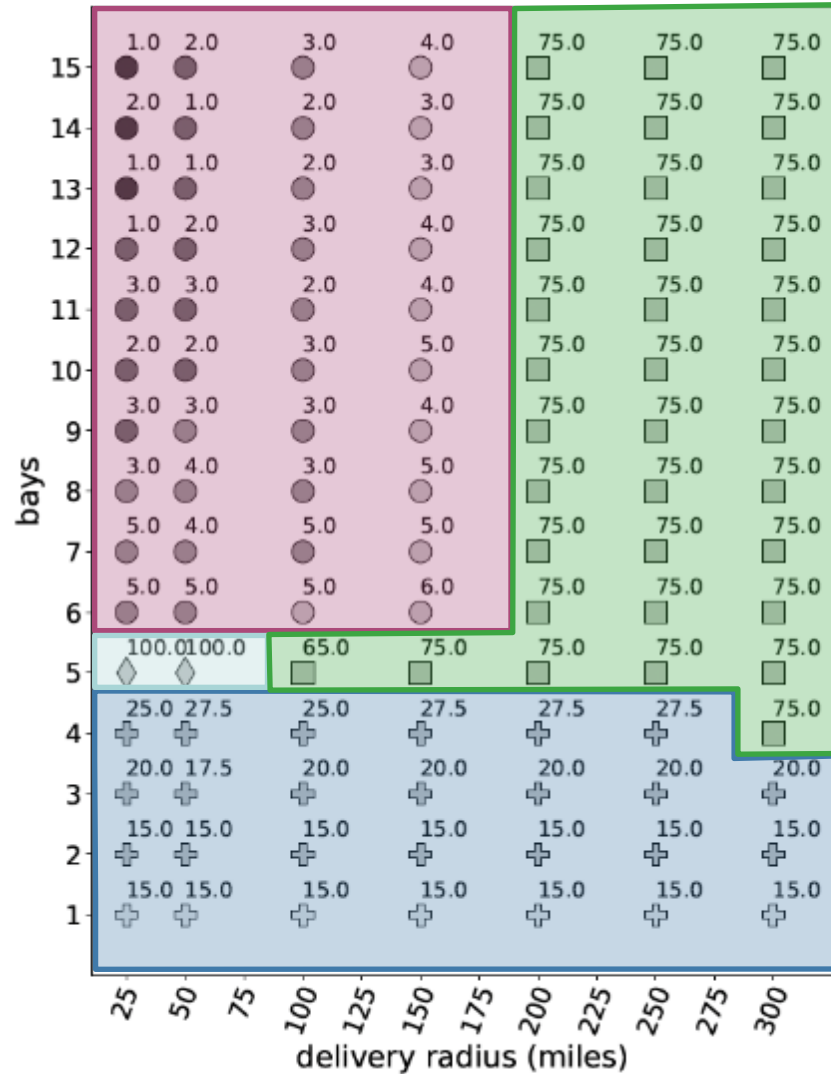
Source: Rana, S., Russell, T., Boutilier, J. J., & Goentzel, J. (2024). Modeling Operational Flow Capacity and Evaluating Disaster Interventions for Fuel Distribution. Production and Operations Management, 33(3), 682-700. Open Access at <https://doi.org/10.1177/10591478241231876>

Recommended interventions to prioritize for each terminal with different number of gates, number of bays, and station distances. Texts indicate the threshold value beyond which the corresponding intervention does not improve flow.

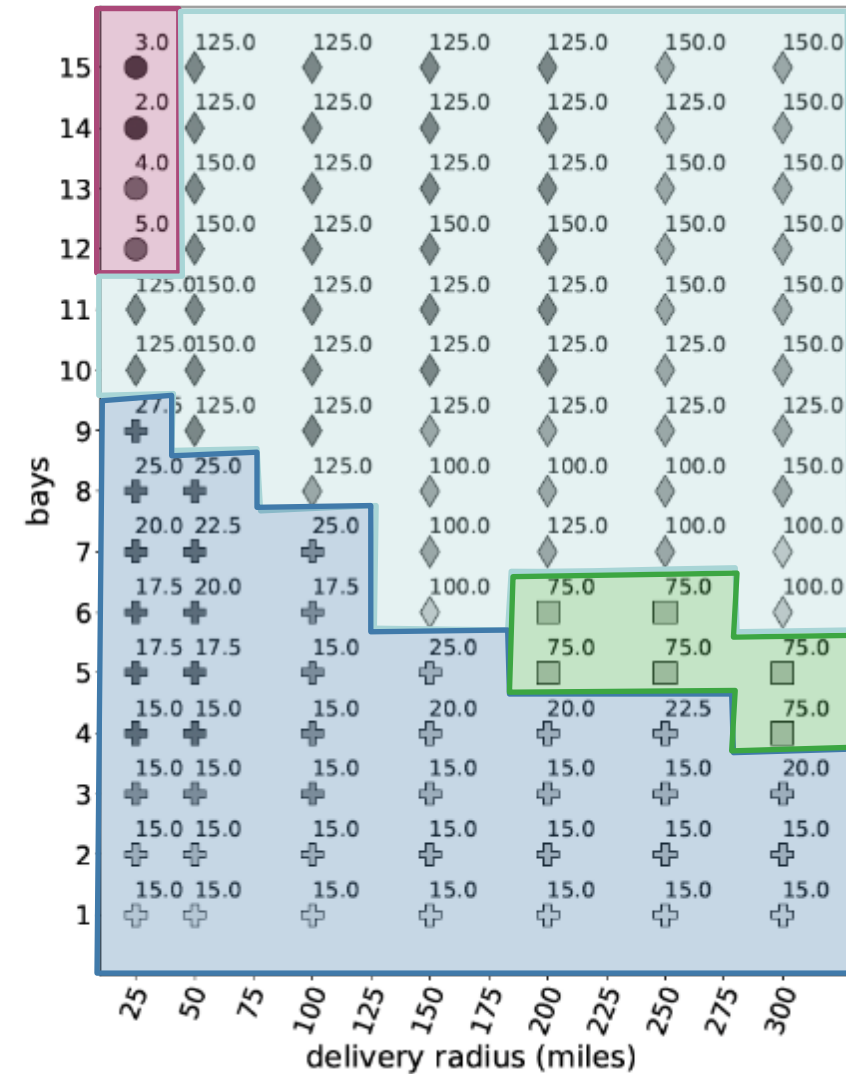


## Baseline values

Gate time	7.7 mins
Bay time	38.5 mins
Truck speed	49.5 miles/hr
Fleet size	50 trucks



(a) 1 gates



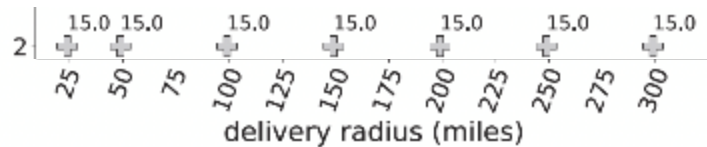
(b) 2 gates



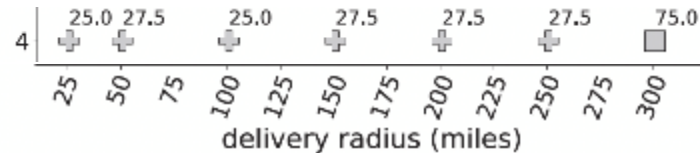
# Fuel Racks/Terminals: Spartanburg, SC



KinderMorgan, Spartanburg, SC  
Bays: 2 Gates: 1



CITGO, Spartanburg, SC  
Bays: 4 Gates: 1

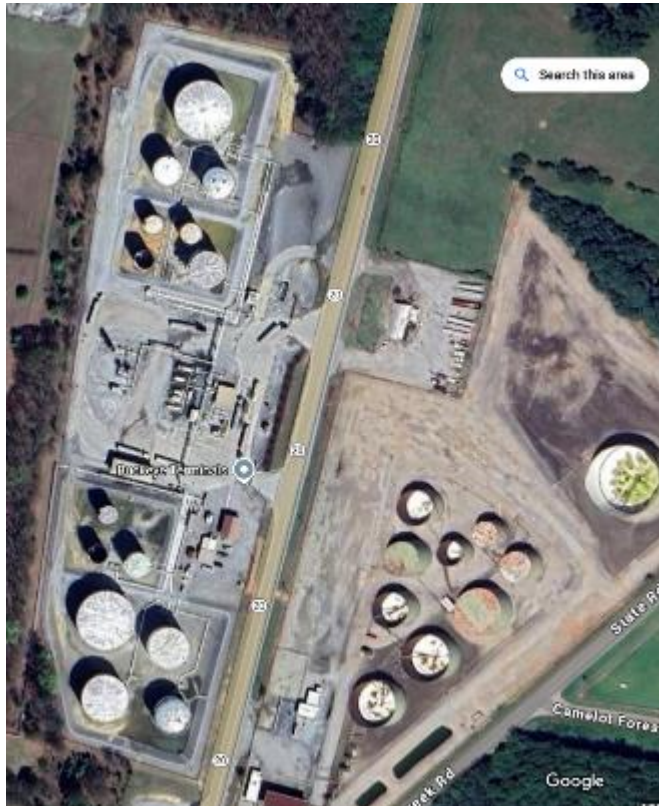
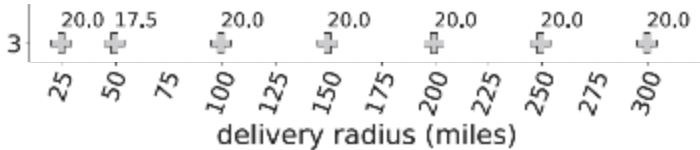


- Operational Flow Capacity (MMgal/day)
- 0.0 - 0.5
  - 0.5 - 1.0
  - 1.0 - 1.5
  - 1.5 - 2.0
  - 2.0 - 2.5
- Recommended Intervention
- Gate Time
  - + Bay Time
  - Transportation Speed
  - ◆ Fleet Size

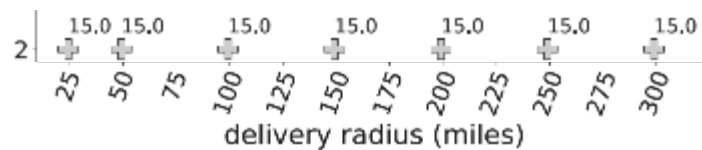
# Fuel Racks/Terminals: Belton, SC



Marathon, Belton, SC  
Bays: 3 Gates: 1



Buckeye, Belton, SC  
Bays: 2 Gates: 1

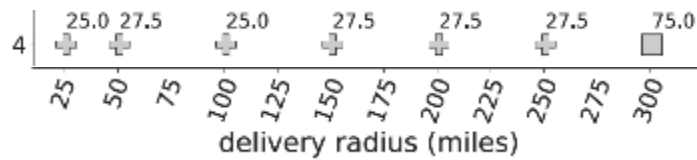


- Operational Flow Capacity (MMgal/day)
- 0.0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- Recommended Intervention
- Gate Time
- ⊕ Bay Time
- Transportation Speed
- ◆ Fleet Size

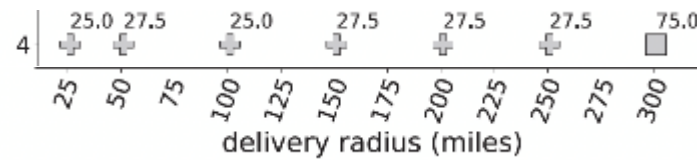
# Fuel Racks/Terminals: Spartanburg, SC



Magellan, Spartanburg, SC  
Bays: 4 Gates: 1



Buckeye Terminals, Spartanburg, SC  
Bays: 4 Gates: 1

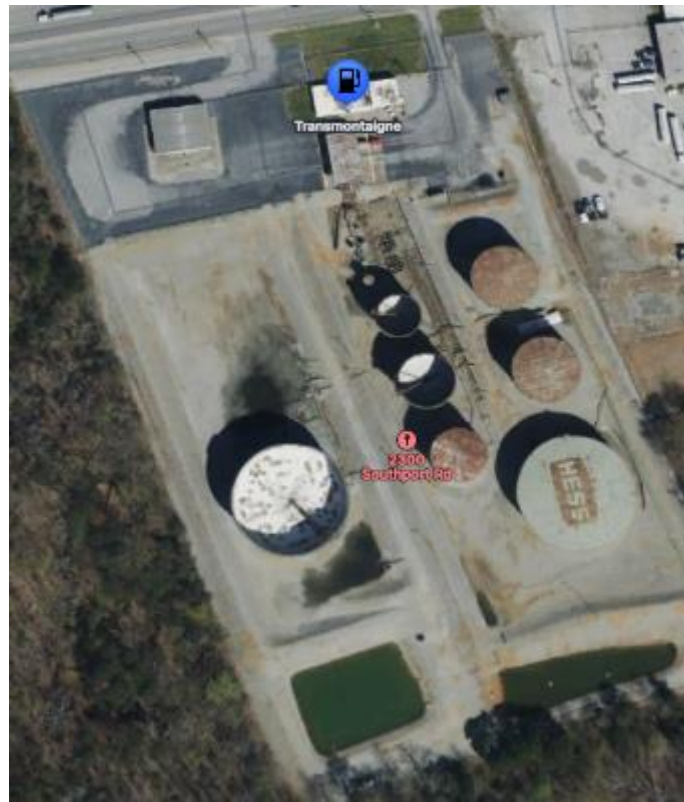
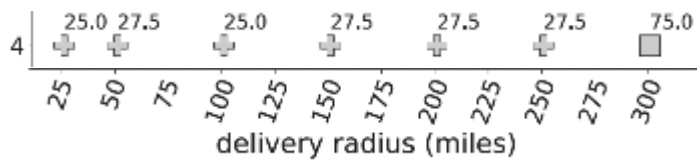


- Operational Flow Capacity (MMgal/day)
- 0.0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- Recommended Intervention
- Gate Time
- ⊕ Bay Time
- Transportation Speed
- ◆ Fleet Size

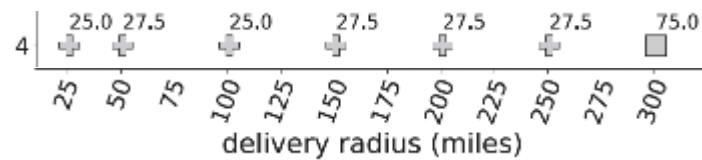
# Fuel Racks/Terminals: Spartanburg, SC



Motiva, Spartanburg, SC  
Bays: 4 Gates: 1



TransMontaigne, Spartanburg, SC  
Bays: 4 Gates: 1



- Operational Flow Capacity (MMgal/day)
- 0.0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- Recommended Intervention
- Gate Time
- ⊕ Bay Time
- Transportation Speed
- ◆ Fleet Size

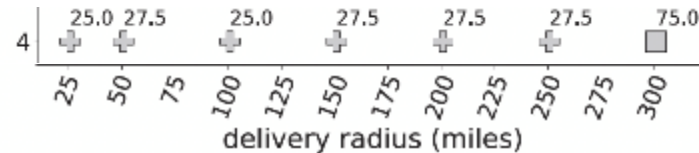
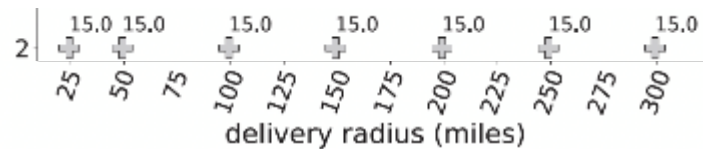
# Fuel Racks/Terminals: Charlotte, NC



Buckeye, Charlotte, NC  
Bays: 2 Gates: 1



Buckeye II, Charlotte, NC  
Bays: 4 Gates: 1

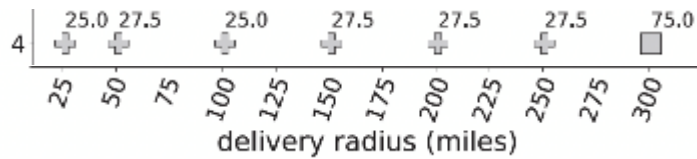


- Operational Flow Capacity (MMgal/day)
- 0.0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- Recommended Intervention
- Gate Time
- ✚ Bay Time
- Transportation Speed
- ◆ Fleet Size

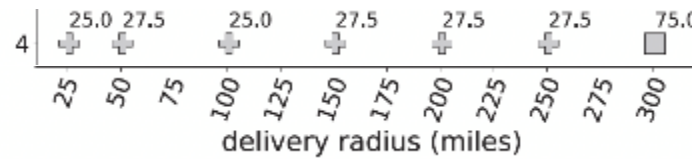
# Fuel Racks/Terminals: Charlotte, NC



Motiva, Charlotte, NC  
Bays: 4 Gates: 1



Motiva South, Charlotte, NC  
Bays: 4 Gates: 1

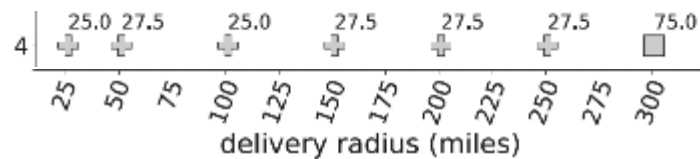


- Operational Flow Capacity (MMgal/day)
- 0.0 - 0.5
  - 0.5 - 1.0
  - 1.0 - 1.5
  - 1.5 - 2.0
  - 2.0 - 2.5
- Recommended Intervention
- Gate Time
  - ⊕ Bay Time
  - Transportation Speed
  - ◆ Fleet Size

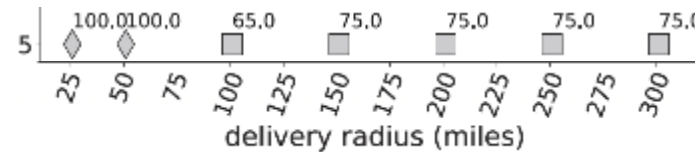
# Fuel Racks/Terminals: Charlotte, NC



CITGO, Charlotte, NC  
Bays: 4 Gates: 1



TransMontaigne, Charlotte, NC  
Bays: 5 Gates: 1

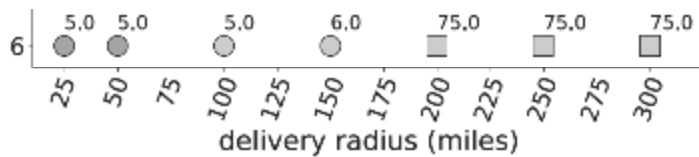


- Operational Flow Capacity (MMgal/day)
- 0.0 - 0.5
  - 0.5 - 1.0
  - 1.0 - 1.5
  - 1.5 - 2.0
  - 2.0 - 2.5
- Recommended Intervention
- Gate Time
  - ⊕ Bay Time
  - Transportation Speed
  - ◆ Fleet Size

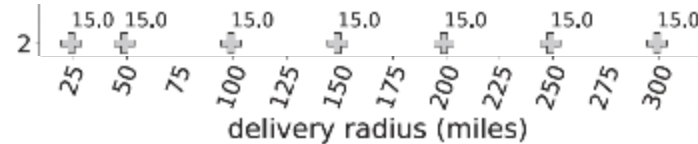
# Fuel Racks/Terminals: Charlotte, NC



Kinder Morgan, Charlotte, NC  
Bays: 6 Gates: 1



Kinder Morgan II, Charlotte, NC  
Bays: 2 Gates: 1



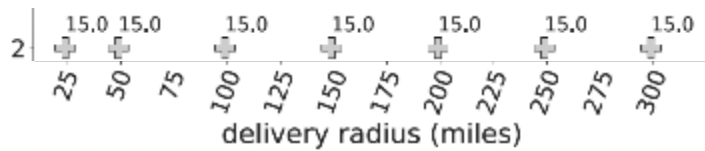
- Operational Flow Capacity (MMgal/day)
- 0.0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- Recommended Intervention
- Gate Time
- ⊕ Bay Time
- Transportation Speed
- ◆ Fleet Size



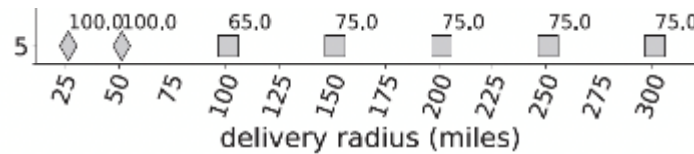
# Fuel Racks/Terminals: Charlotte, NC



Kinder Morgan III, Charlotte, NC  
Bays: 2 Gates: 1



Marathon, Charlotte, NC  
Bays: 5 Gates: 1



- Operational Flow Capacity (MMgal/day)
- 0.0 - 0.5
  - 0.5 - 1.0
  - 1.0 - 1.5
  - 1.5 - 2.0
  - 2.0 - 2.5
- Recommended Intervention
- Gate Time
  - ⊕ Bay Time
  - Transportation Speed
  - ◆ Fleet Size

# Fuel Stocks – Gasoline and Distillate

- National stocks are within the 5-year range.
- East Coast (PADD 1) stocks were healthy ahead of Hurricane Helene.

