BCD REGIONAL FREIGHT MOBILITY PLAN

APPENDIX C

Technical Memorandum

Freight Network Assessment

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BCDCOG
BERKELEY-CHARLESTON-DORCHESTER
COUNCIL OF GOVERNMENTS

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1. INTRODUCTION

This technical memorandum provides a Freight Network Assessment for the BCD region focusing on the roadway and rail networks. This initial step provides baseline regional freight network conditions and performance which can then be used to identify freight-related issues and needs. The remainder of this memo is organized as follows:

- **State of Freight** provides an assessment of the three-county region's multimodal freight infrastructure, recent or planned projects affecting freight flows, and overall tonnage moving across the regional highway and rail networks.
- **Identification of the BCD Regional Freight Network** defines the regional freight network using a data-driven process that accounts for existing federal and state networks and identifies critical last-mile connections to intermodal terminals and major freight generators.
- **Freight Network Operational Analysis** assesses regional conditions on the previously identified network, looking specifically at freight safety, congestion and truck bottlenecks, and infrastructure as well as pavement and bridge conditions.

2. STATE OF FREIGHT

Charleston's economy has always been dependent on freight and trade, beginning with its founding as a colonial port city in 1670. The presence of a major seaport, international airport, freight rail connections, and Interstate highway trade corridors has ensured that freight continues to be a major part of the regional and statewide economy. Key regional freight infrastructure includes:

- **The Port of Charleston** is a major economic driver not only for South Carolina but for the entire Southeastern United States. Once the new Hugh Leatherman Terminal (described below) is complete, the Port will have 5 cargo terminals (Hugh Leatherman Terminal, Columbus Street Terminal, North Charleston Terminal, Veterans Terminal, and Wando Welch Terminal). In addition to containerized and bulk cargo, the Port handles shipments of automobile parts and finished cars, an industry sector that has contributed significantly to economic development in the BCD region and statewide. The Port also handles trade bound for Charlotte, Atlanta, and the rest of the Southeast. Until the COVID-19 pandemic, container volumes had been consistently growing at the Port since 2010.

- **Major highway freight corridors** include I-26 and I-526, which connect the region to the Upstate and other inland markets. These routes also connect to I-95, which is the primary highway trade corridor for the entire Eastern Seaboard.

- **Charleston International Airport** was the 78th busiest cargo airport in the United States in 2018, handling about 347 million pounds of freight.[1] Air cargo is not a large share of total regional freight movements by weight, but shipments that do move by air are usually highly perishable or very valuable. High quality landside connections are critical to air freight efficiency.

- **The CSX and Norfolk Southern (NS)** railroads are the major Class 1 freight railroads that serve the BCD region. Each railroad operates an intermodal yard in Charleston. The CSX Ashley Junction terminal contains four tracks with trackside storage areas for grounded containers as well as storage for intermodal chassis and containers on chassis. The NS 7-Mile intermodal yard includes a single loading track and storage for both grounded and wheeled containers and chassis.

- **Palmetto Railways** is a division of the South Carolina Department of Commerce. It provides rail switching services between the Port of Charleston and the CSX and NS railroads.

Recent and ongoing projects focused on freight mobility include:

- **Harbor Deepening –** Work began in February 2018 to deepen the main navigation channel to 52 feet and the entrance channel to 54 feet, as well as enlarge the turning basins. These improvements will allow the Port to handle the larger post-Panamax

[1] https://www.ttnews.com/top100/airports/2019

container vessels which now traverse the Panama Canal from the Pacific Ocean without having to wait for high tide.

- **Hugh K Leatherman Terminal (HLT) –** Construction is also underway on a new container terminal, which will increase the Port's container capacity by 50%. The Port is also modernizing its existing terminals to absorb the expected increase in container traffic.

- **Port Access Road –** This new road will provide for direct access between the HLT and I-26. This includes a new interchange on I-26, a Bainbridge Connector Road, extending Stromboli Avenue and various improvements to surface streets serving the HLT.

- **Interstate and Major Highway Improvements –** SCDOT continues to progress plans to add capacity and improve mobility in the I-26 and I-526 Corridors. Widening projects between Nexton Parkway (Exit 197) and Jedburg Road (Exit 194), between SC27/Ridgeville Road (Exist 187) and Jedburg Road (Exist 194), and between SC 27/Ridgeville Road (Exist 187) and I-95 (Exit 169) are in various phases of permitting, engineering, and construction. The I-526 Corridor, named the "Lowcountry Corridor" is under project development to add capacity to the full length of the existing I-526 Corridor.

- **Inland Ports** – The South Carolina Ports Authority operates two inland ports that process port-related intermodal traffic. While not located in the BCD region, these facilities support multimodal shipments of freight.

  - Inland Port Greer opened in 2013 and is located 212 miles inland from the Port of Charleston. NS provides overnight rail service to and from the Port of Charleston six days per week to the terminal, which operates 24 hours per day, 7 days per week. The Port recently received a $25 million USDOT grant to expand the 50-acre port to accommodate additional storage and processing tracks.

  - Inland Port Dillon opened in April 2018 and is located 162 miles inland from the Port of Charleston, off I-95 and US 501 near the North Carolina line. The inland port operates 24-hours per day, 7-days per week with CSX providing overnight rail service from the Port of Charleston six days per week (Monday-Saturday) and export service to the port five days per week (Monday-Friday). Recent nearby industrial developments include a $200 million Harbor Freight distribution center and a manufacturing center for KB Biotech Solutions, indicating the inland port has been a catalyst for new investment.[2]

  As of January 2020, the two inland ports reported nearly 106,000 rail moves in the fiscal year to date, an 18% increase over the prior fiscal year.[3] It is likely growth has slowed or even reversed since the COVID-19 pandemic, but longer term economic and trade growth suggests these facilities will continue playing an increasing role in container transshipment to/from the Port of Charleston.

- **Navy Base Intermodal Container Transfer Facility (NBIF) –** Palmetto Railways is developing a new intermodal rail terminal on 118 acres in the former Charleston Naval Complex. This terminal will also support the new HLT via the new Port Access Road and other improvements to surface streets. The facility will allow for additional port-generated

[2] Wren, David. 'Harbor Freight to expand Dillon distribution site next to Charleston port agency's inland facility,' November 17, 2017 (updated September 14, 2020). Retrieved October 12, 2020 from https://www.postandcourier.com/business/harbor-freight-to-expand-dillon-distribution-site-next-to-charleston-port-agencys-inland-facility/article_6a019d46-c3c7-11e7-82f3-57aa5a052581.html.

[3] http://scspa.com/news/sc-ports-sees-strong-volumes-in-january/

intermodal cargo to move via rail and provide an intermodal transfer hub in North Charleston. The proposed design will provide equal access to both CSX and Norfolk Southern. The final Environmental Impact Statement was approved by the U.S. Army Corps of Engineers in June of 2018, and Palmetto Railways is currently purchasing property and advancing the project. A sketch planning analysis for the I-26 Corridor Management Plan found that building the NBIF could reduce regional truck vehicle miles traveled (VMT) and vehicle hours of delay (VHD) by 2% and 2.6% respectively when the facility is fully built out.[4] However, new rail lines required for the project (the Northern and Southern Connections to the NBIF) along with increased train volumes will likely impact local communities in North Charleston.

- **Lowcountry Rapid Transit (LCRT) –** I-26 between Charleston and Summerville is a congested regional corridor and has been the subject of many transit proposals over the years. An alternatives analysis identified Bus Rapid Transit (BRT) primarily along US 78 (Rivers Ave) as the preferred transit solution for the corridor. The $361 million project is currently under development with construction expected between 2024 and 2026. This proposed alignment is also a key regional freight corridor. As plans for BRT service advance it will be necessary to consider impacts on freight movements and safety.

- **Potential Cross Harbor Container-on-Barge Service –** The Port of Charleston has applied to the U.S. Army Corps of Engineers to make various improvements, including dredging and a wharf extension at the Wando Welch Container Terminal, to support a proposed container-on-barge service.[5] These improvements would allow barges to move about 200 containers at a time between Wando Welch and the new HLT. Intermodal containers could then be transferred to the NBIF via the new Port Access Road for further distribution by rail. These loads currently must move across the Wando and Cooper Rivers via I-526, which has experienced worsening congestion over the years from continued regional population and economic growth. The South Carolina Ports Authority (SCPA) estimates the service could move up to 200,000 containers per year, thus reducing truck demand on the road network. By way of comparison, according to the regional travel demand model the Wando Welch and North Charleston terminals generated about 16,450 and 9,406 trucks per day in 2015.[6]

2.1 Regional Highway and Rail Flows

The IHS Markit TRANSEARCH database was queried to identify overall highway and rail freight tonnage moving to, from, within, and through the BCD region. TRANSEARCH is an origin-destination commodity flow database providing county-level estimates of freight flows by mode, direction, and commodity. This initial assessment focused on identifying tonnage density by major truck and rail corridors within the region and the share of such traffic consisting of through movements. Note that a through movement includes any move that originates and terminates outside the three-county study area.

[4] SCDOT, I-26 Corridor Management Plan Freight Mobility Technical Memorandum, November 2019.
[5] https://www.sac.usace.army.mil/Portals/43/docs/regulatory/publicnotices/Dec2018_PN/SAC-2018-00865_Charleston_%20SCPA_Wando_Welch_Terminal_Container_Barge_Operation.pdf?ver=2019-01-02-092543-470
[6] Wando Welch and North Charleston are container terminals and hence more likely to handle the type of cargo that might be diverted to a container on barge service.

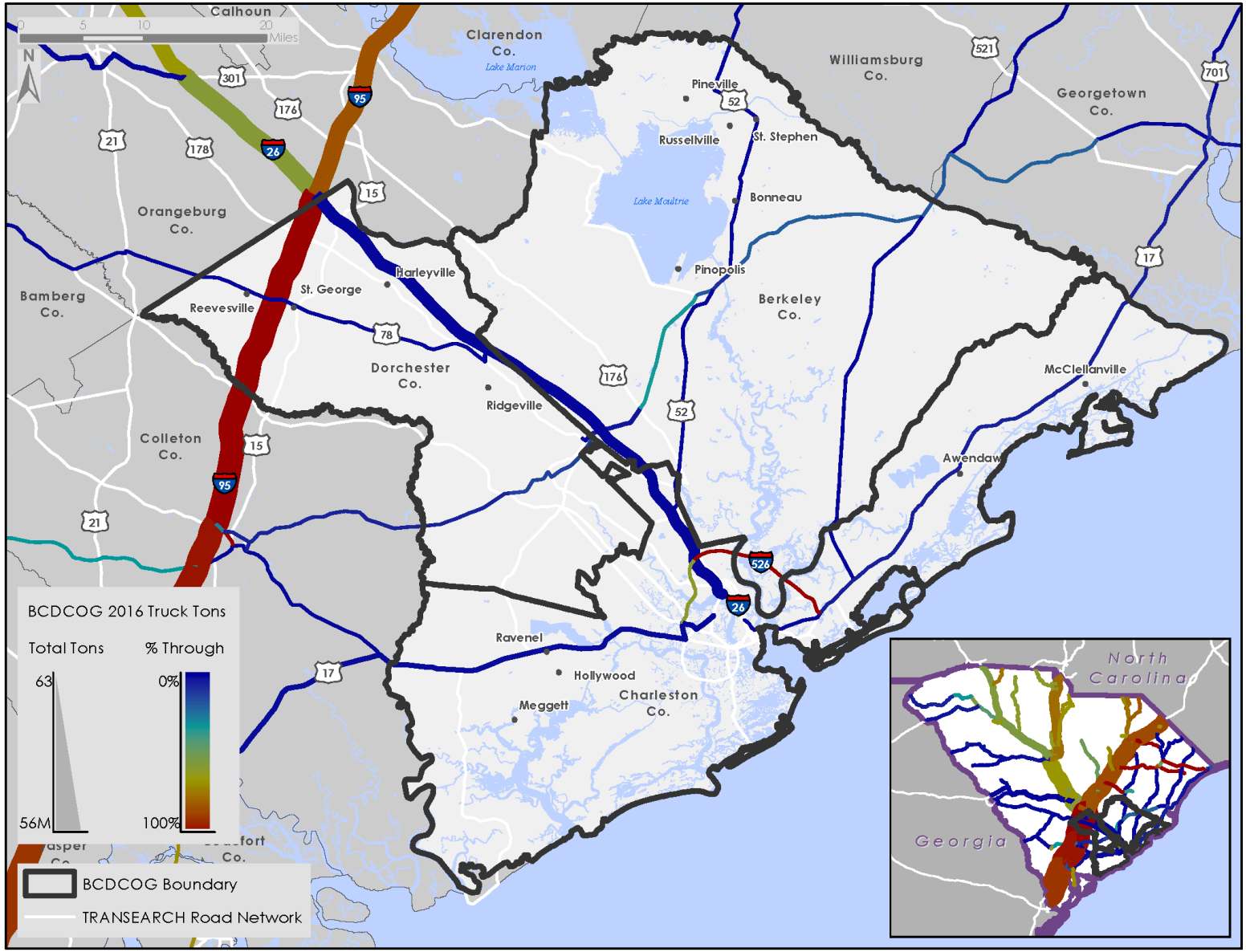
Figure 2-1 shows truck tonnage density in 2016 per TRANSEARCH data. Unsurprisingly, I-95 and I-26 are the major regional trade corridors. I-95 handles the largest amount of truck freight, and most of it is through traffic. I-26 and I-526 accommodate port-generated truck traffic, including significant flows between the Charleston region and the Upstate.

Figure 2-2 provides similar data for the rail network. The NS and CSX lines handle most of the regional rail freight. As with the highway mode, through movements make up a considerable share of this traffic. There is significant rail intermodal traffic moving between the port terminals and the Upstate. According to SCPA representatives who attended the July 16th Freight Advisory Committee Meeting, approximately 25% of inbound marine freight at Charleston leaves the Charleston region by rail. This split has grown over time; in 2018, the Port of Charleston's rail share was just over 22%.[7] Much of this freight is transferred to truck in Greer or Dillon.

Additional detail on regional commodity flows including tonnage, value, directionality, mode splits, and origin-destination analysis is provided in the supplemental Freight and Economics Technical Memorandum (Appendix E).

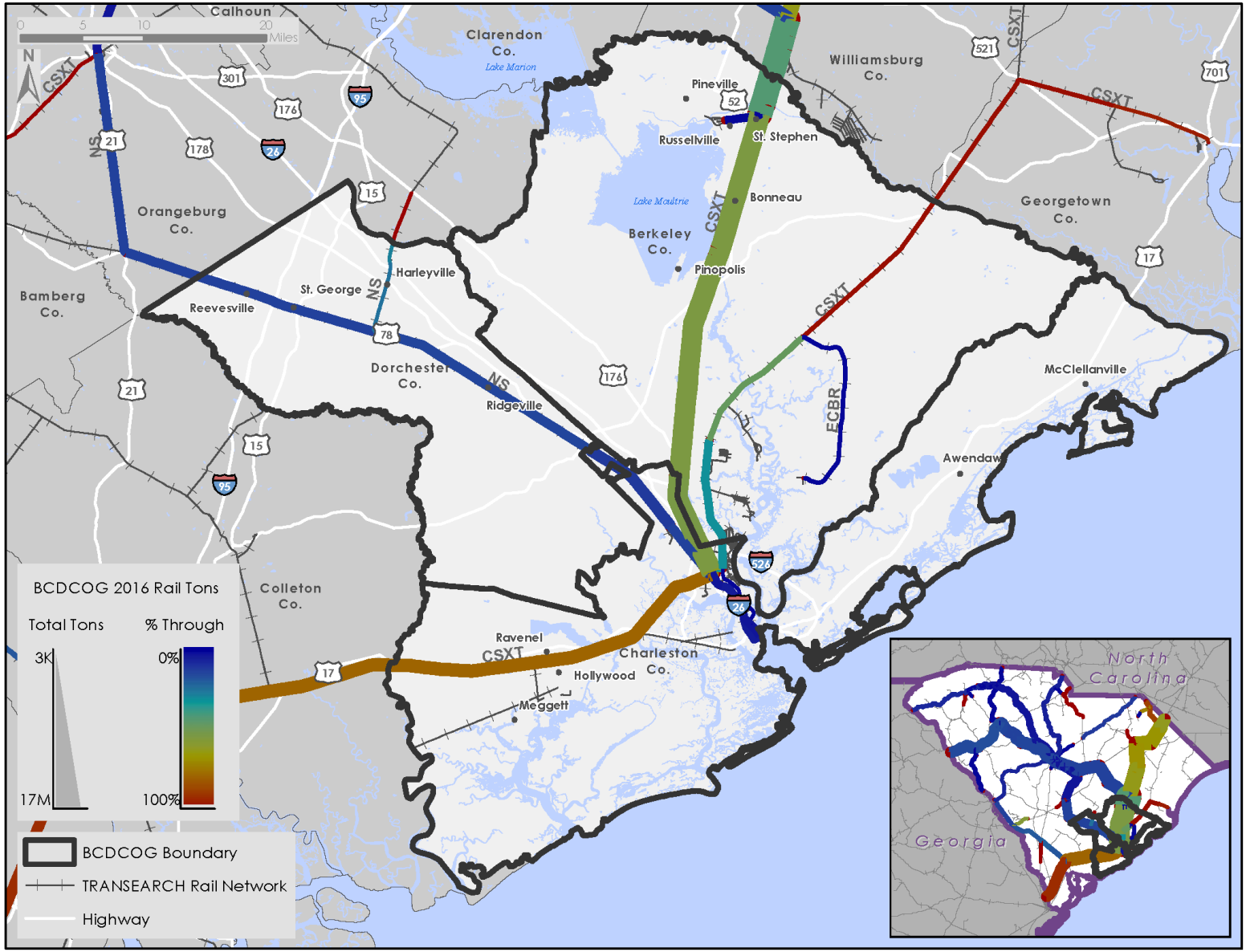
[7] Ashe, Ari, and Hugh R. Morley; 'US East Coast ports investing to capture more intermodal cargo,' Journal of Commerce, January 27, 2020.

Figure 2-1: BCD Truck Tonnage Density and Percent Through Traffic, 2016



Source: TRANSEARCH

Figure 2-2: BCD Rail Tonnage Density and Percent Through Traffic, 2016



Source: TRANSEARCH

3. IDENTIFICATION OF THE BCD REGIONAL FREIGHT NETWORK

A key first step in evaluating freight operations is to identify the regional freight network. This provides a baseline surface transportation infrastructure network for use in identifying needs and monitoring performance over time. The regional freight network should incorporate existing state and national designations while also drilling down to include important local freight corridors and first/last mile connections. This section establishes a BCD regional freight network. The identified network is then used for regional freight network performance mapping.

Designating a regional freight network is important since freight often doesn't observe the same travel patterns as passenger traffic. For instance, freight frequently crosses jurisdictional boundaries and doesn't follow the same time of day distribution as passenger trips. Moreover, defining a freight network allows a region to develop strategic solutions that meet freight needs while preserving regional quality of life. The freight network identified herein will be used to measure infrastructure performance for freight, identify needs, and compare the needs against BCDCOG's planned projects to define gaps and new projects.

The following methodology was used to develop a BCD regional freight network:

- Existing state and federal network designations provided the first level of identification. These include the National Multimodal Freight Network, the South Carolina Strategic Freight Network,[8] the South Carolina Strategic Corridor Network,[9] designated Critical Urban and Critical Rural Freight Corridors in the region,[10] and National Highway System Intermodal Connectors serving freight facilities.

- Key freight-generating businesses from the TRANSEARCH Freight Finder database[11] were overlaid on the highway and rail networks to understand location patterns of regional freight generators and their relationship to the surface transportation network. Other major freight generating facilities such as Volvo Camp Hall, Palmetto Commerce Park, intermodal terminals, Port of Charleston marine terminals, the Ridgeville Industrial Campus, and Charleston International Airport were also mapped.

- Truck volumes from the 2040 CHATS regional travel demand model and the SCDOT 2045 statewide travel demand model were mapped to assess which roadways carry the most truck traffic and the highest percentage of truck traffic. Network links were identified using a cross classification system based on volume class and percent truck estimates. Roadways with a total volume of less than5,000 vehicles per day and 10% or greater daily truck volumes and roadways with total volumes greater than 5,000 vehicles per day and

[8] The South Carolina Strategic Freight Network is defined in the South Carolina Statewide Freight Plan and consists of routes the state deems critical to goods movement to, from, within, and through South Carolina.

[9] The South Carolina Strategic Corridor Network was defined by SCDOT "to provide a connected, continuous network that serves the traveling public and movement of freight.'

[10] Since Critical Urban and Critical Rural Freight Connectors are periodically updated by SCDOT and MPOs, this freight network can be used to identify candidate routes for inclusion on those networks in the future.

[11] TRANSEARCH Freight Finder is supplemental to the TRANSEARCH commodity flow data set and includes geo-referenced locational data for freight producing and generating businesses categorized by industry and inbound/outbound tonnage.

15% or greater truck volumes were considered for inclusion in the regional freight network. Based on this GIS screening of the corridor and land use context, the roadways meeting that criteria with appropriate context were added to the regional freight network as Tier 3 segments, accounting for local deliveries and first-and-last mile connections.

- The resulting network was visually assessed, in combination with land use data, to ensure connectivity between major freight generators or industry clusters and key road/rail facilities and to add overall network continuity.

- Additional routes (e.g., SC 41) that are emerging freight corridors were added based on stakeholder feedback.

The resulting regional highway and rail network is shown in **Figure 3-1**. All freight railroads are included given their importance in moving cargo within the region and throughout the United States.

In the screening process described, highway segments were placed into tiers for the purpose of documentation of this identification process. These tiers are to be considered classifications, not prioritization or significance. Tiers 1 and 2, by definition, carry more significance at either the national or statewide level. Tier 3 includes additional roadways that are not only of national or statewide significance but also important to freight mobility at the regional level. The identified freight road network was further sorted and tiered as follows:

- **Tier 1 – Interstate Highways and Nationally Designated Routes.** These routes are nationally significant and are either designed for long-distance travel and trade (e.g., Interstates) or are on another nationally designated freight network (e.g., National Highway System Intermodal Connectors).

- **Tier 2 – Non-Interstate South Carolina Freight Network and South Carolina Strategic Corridor Network.** These facilities include routes like US 78 and US 52 that are strategically important to the state of South Carolina but are not part of the Interstate Highway system or other national networks.

- **Tier 3 – Local freight routes.** These roads provide critical last-mile connections to key freight facilities, or between freight-generating land uses and the rest of the state/national highway network.

Figure 3-2 shows the freight network with the tiering described above.

As noted above, all freight railroads are included in the freight network due to their importance in moving cargo to, from, and through the region and state..

Figure 3-1: BCD Regional Freight Network

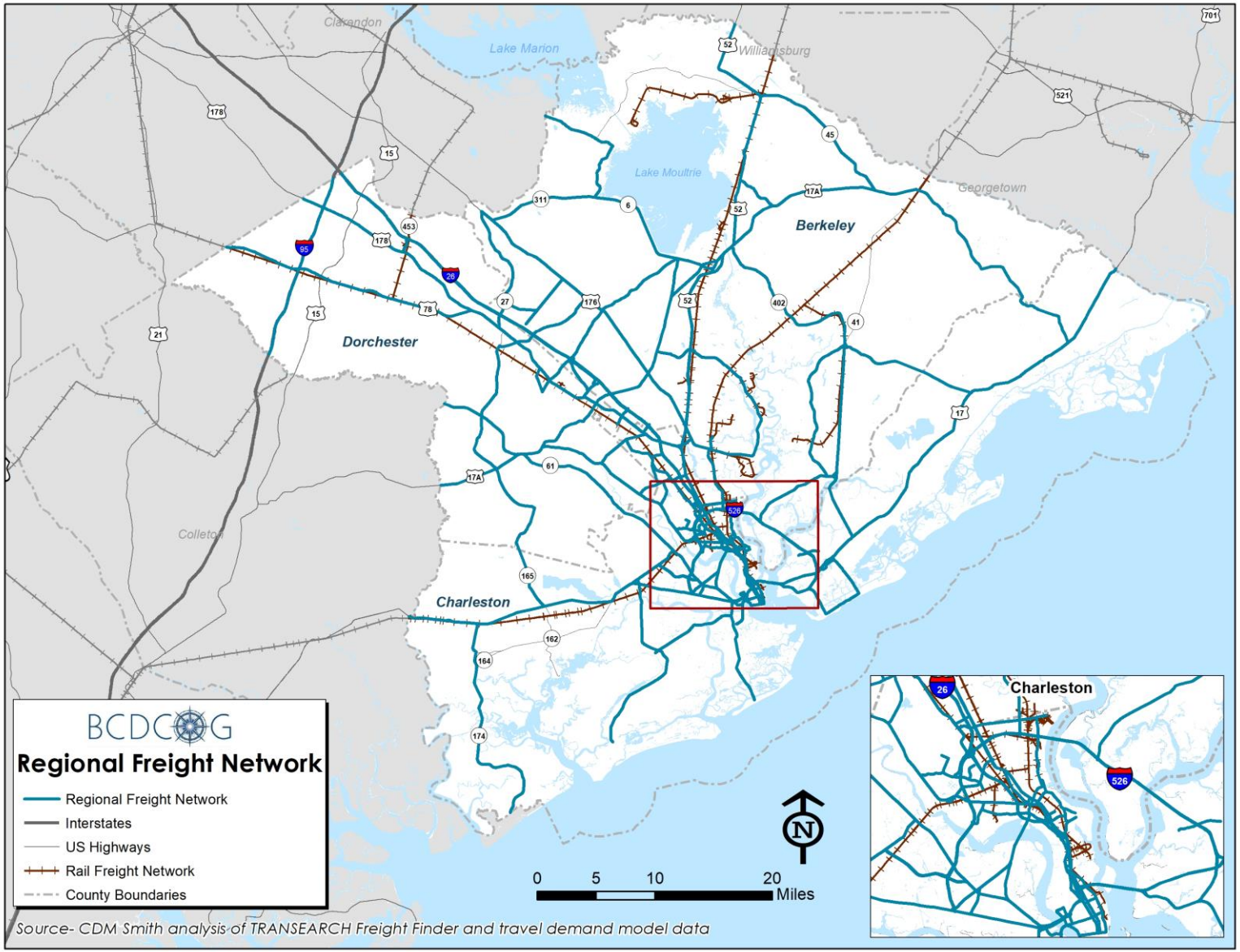
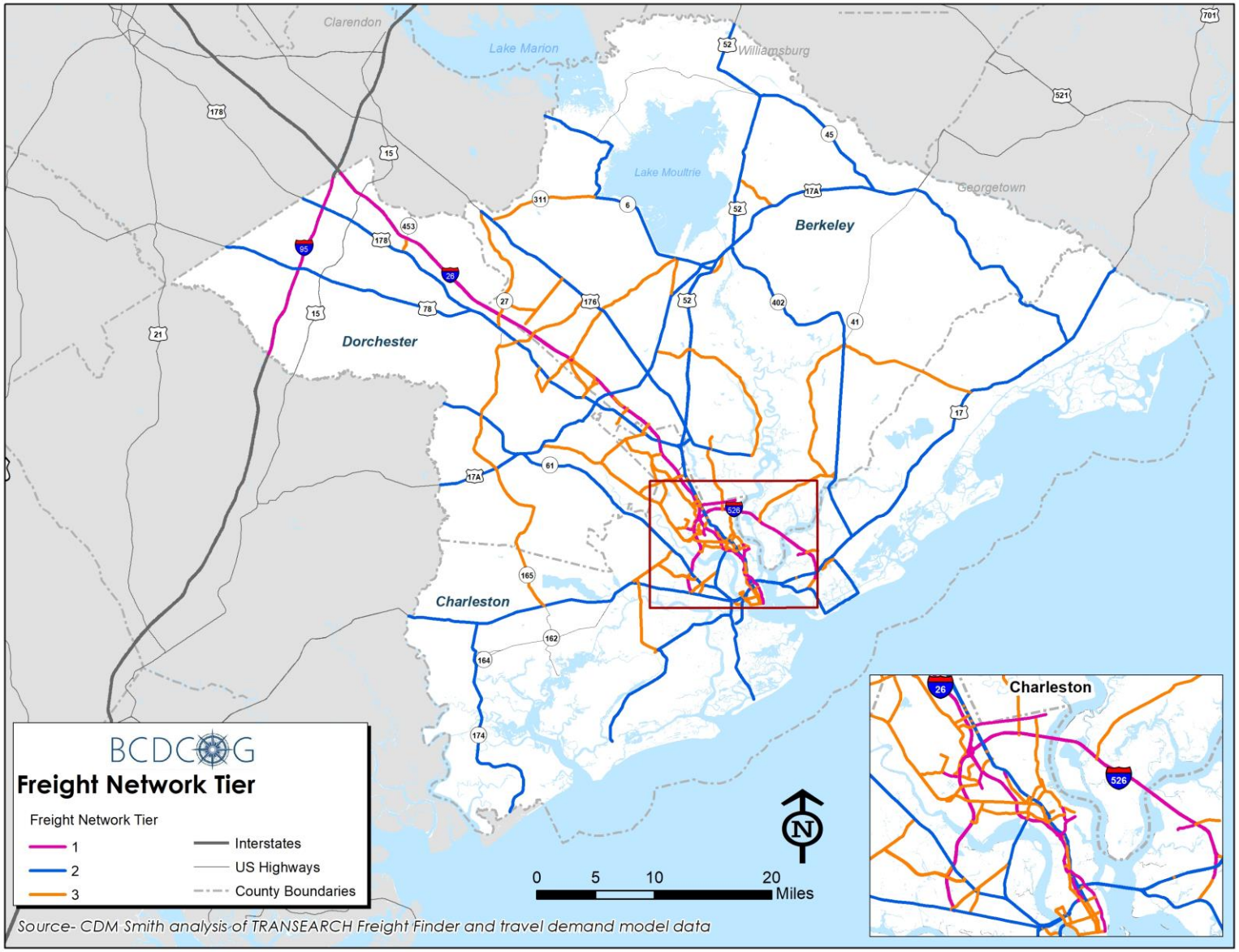


Figure 3-2: BCD Freight Network with Tiers



The resulting multimodal freight network is shown in **Figure 3-3** with freight generators overlaid on the network. Note that 'non-freight generators' refers to a category within the Freight Finder data set for businesses that have only inbound cargo, whereas 'freight generators' have both inbound and outbound freight.

Regional freight stakeholders provided feedback on the network at a Freight Advisory Committee meeting on July 16th. Besides recommending the inclusion of SC 41, participants noted that the new Port Access Road, I-526, connections between port terminals and the Interstate highway network, and the first-mile connection between the Wando Welch terminal and the rail ramps were all critical first/last mile routes.

Table 3-1 provides summary information about the tiered network including roadways by tier, corridor mileage, total traffic and truck volumes (minimum and maximum), and intermodal facilities accessed.

Additional analysis and data describing network performance (safety, congestion, and infrastructure conditions) is provided in Section 4, followed by a summary high-level needs assessment in Section 5. Section 6 offers conclusions and next steps.

Figure 3-3: BCD Regional Freight Network with Freight Generators

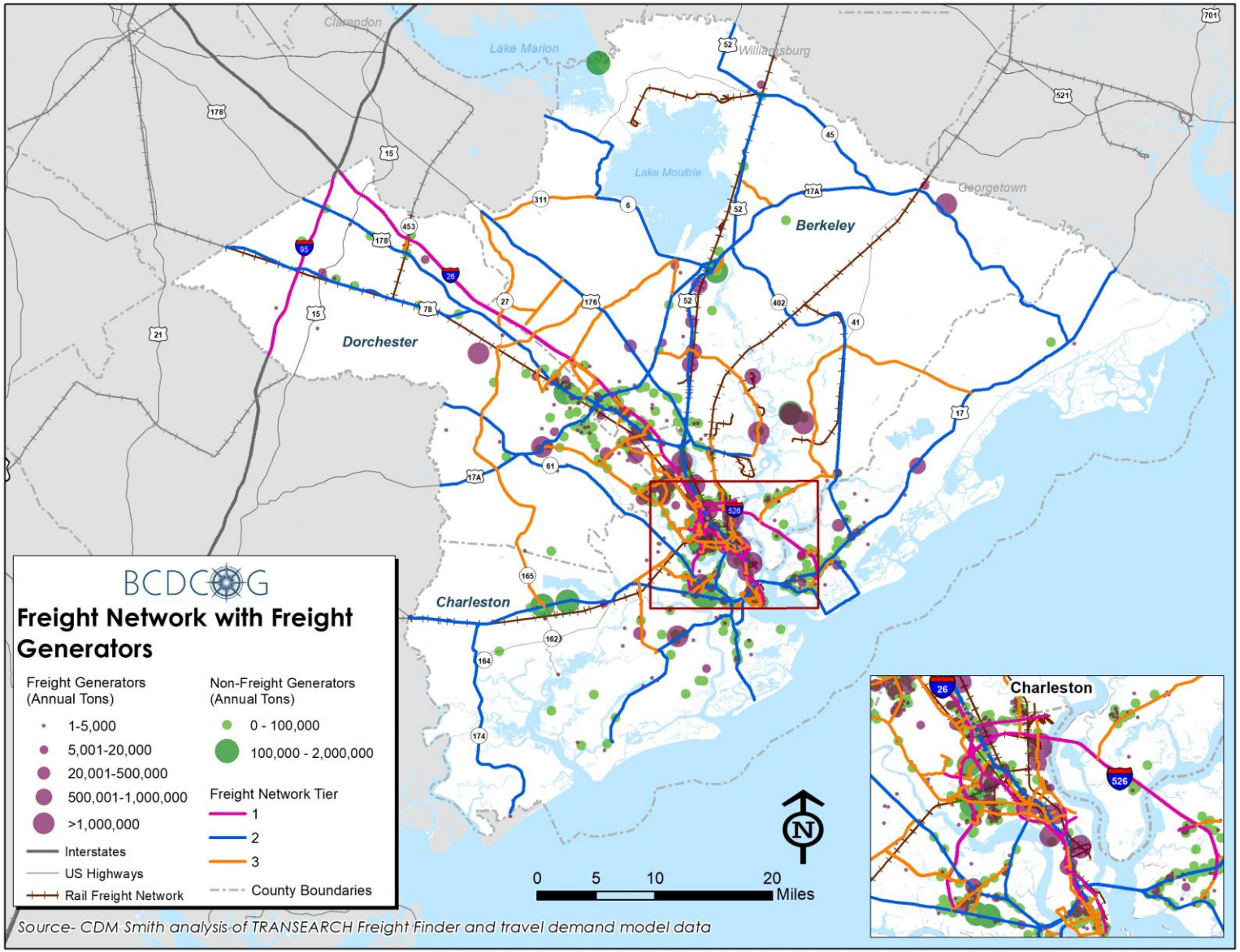


Table 3-1: Summary Freight Network Data by Tier

Tier	Road Name	Mileage	Min AADT (2015)[1]	Max AADT (2015)[1]	Min AADTT (2015)[1]	Max AADTT (2015)[1]	NHS Intermodal Connector	Intermodal Facilities Served
1	Banco Rd.	0.38	11,185	33,676	5,583	8,583		
1	Chuck Dawley Blvd.	0.07	19,200	19,200	1,121	1,121		
1	East Bay St.	1.96	2,942	15,388	27	598		Columbus Street/Union Pier Terminals, Navy Base Intermodal Facility
1	I-26	111.65	12,627	68,923	1,012	8,685		
1	I-526	24.17	5,605	46,880	175	11,629		Wando Welch Container Terminal
1	I-95	18.82	20,000	20,000	5,000	6,000		
1	International Blvd.	0.86	27,425	36,278	2,213	2,671	YES	Charleston International Airport
1	Long Point Road	0.90	13,172	31,943	7,053	12,844	YES	Wando Welch Container Terminal
1	Meeting Street	0.36	2,914	2,914	2,125	2,125	YES	CSX Ashley Junction
1	Montague Avenue	0.54	22,490	36,015	3,612	5,552		Norfolk Southern 7-Mile Yard, CSX Ashley Junction
1	Morrison Drive	1.55	7,176	16,540	317	2,115		Columbus Street Terminal
1	Mount Pleasant Street	0.14	9,829	10,838	847	1,135		
1	Port Access Road	1.73	N/A	N/A	N/A	N/A		
1	RAMP I-26/I-526	5.48	23,221	28,080	3,993	4,384		
1	RAMP to I-526 from US-17	0.47	11,487	11,487	1,687	1,687		
1	Remount Road	3.52	8,307	26,774	2,454	10,073		North Charleston Terminal
1	Septima Clark Pkwy.	0.19	32,775	32,775	2,007	2,007		
1	US-78	0.04	34,940	34,940	4,059	4,059		
2	Arthur Ravenel Bridge / US-17	3.76	10,411	41,938	794	2,733		
2	Ben Sawyer Blvd.	3.25	9,546	19,867	321	1,424		
2	Bohicket Road	12.37	10,356	21,454	390	1,112		
2	Carner Avenue	0.98	1,358	3,771	295	829		

Tier	Road Name	Mileage	Min AADT (2015)[1]	Max AADT (2015)[1]	Min AADTT (2015)[1]	Max AADTT (2015)[1]	NHS Intermodal Connector	Intermodal Facilities Served
2	Coleman Blvd.	2.74	20,422	25,883	1,177	1,742		
2	Folly Road	11.16	5,783	54,441	359	5,294		
2	Goose Creek/NAD Road	1.85	15,058	23,373	2,142	3,185		
2	Isle of Palms Connector / SC-517	4.57	13,349	19,145	670	1,006		
2	James Island Expwy / SC-30	2.71	11,117	27,888	1,064	1,752		
2	Jasper Blvd.	1.99	6,148	6,148	176	176		
2	Maybank Highway	8.52	14,290	31,280	660	2,699		
2	Meeting Street	4.71	444	28,512	157	4,433		
2	Old Folly Road	0.12	789	789	40	40		
2	Old Town Road	2.23	1,491	22,903	23	2,232		
2	Palm Blvd.	1.98	6,148	6,148	176	176		
2	RAMP to US-17	1.79	12,607	29,331	827	1,906		
2	Red Bank Road	7.94	4,151	28,412	1,620	3,867		
2	Rivers Avenue	11.95	527	34,650	111	3,297		Norfolk Southern 7-Mile Yard, CSX Ashley Junction
2	Sam Rittenberg Blvd.	2.18	21,448	48,358	2,067	4,769		
2	SC-174	24.15	3,737	5,055	101	336		
2	SC-402	18.72	4,971	9,499	312	441		
2	SC-41	20.58	2,756	29,278	91	1,897		
2	SC-45	40.57	594	6,769	20	374		
2	SC-6	29.08	1,272	9,842	186	701		
2	SC-61	37.26	3,075	39,010	130	2,817		
2	SC-7	0.17	29,042	29,042	3,421	3,421		
2	Septima Clark Pkwy.	1.01	9,069	56,965	650	3,808		
2	US-17	58.33	3,189	73,995	58	5,120		
2	US-17 / Savannah Hwy	34.15	14,798	52,977	573	6,999		
2	US-176	30.86	2,924	33,096	62	2,727		
2	US-178	20.93	266	6,064	28	404		

Tier	Road Name	Mileage	Min AADT (2015)[1]	Max AADT (2015)[1]	Min AADTT (2015)[1]	Max AADTT (2015)[1]	NHS Intermodal Connector	Intermodal Facilities Served
2	US-17A	61.22	N/A	54,247	N/A	7,643		
2	US-52	46.70	278	26,085	97	2,984		
2	US-78	53.94	794	40,551	70	4,440		
2	Wesley Drive	0.23	40,160	40,160	4,207	4,207		
3	Albemarle Road	0.10	73	509	8	21		
3	Ashley Crossing	0.88	1,799	1,799	16	16		
3	Ashley Phosphate Road	5.18	25,211	75,908	2,936	11,782		
3	Autonomous Road	3.57	N/A	N/A	N/A	N/A		
3	Aviation Avenue	0.81	4,436	15,363	834	2,085		Charleston International Airport
3	Azalea Drive	3.53	2,909	9,880	367	4,099		
3	Bainbridge Avenue	0.62	2,574	2,574	504	504		
3	Bees Ferry Road	5.39	3,506	25,967	159	1,440		
3	Brigade Street	0.07	1,152	1,152	205	205		
3	Broad Street	1.17	2,404	9,140	17	127		
3	Burton Lane	0.34	1,468	1,468	258	258		
3	Bushy Park Road	8.82	1,714	3,245	380	1,676		
3	Cainhoy Road	16.12	3,252	7,777	320	1,662		
3	Calhoun Street	1.55	6,199	37,286	415	2,534		
3	Centre Pointe Drive	0.84	7,857	7,857	848	848		
3	Chuck Dawley Blvd.	1.34	14,848	17,296	944	1,082		
3	Clements Ferry Road	9.96	10,264	32,670	1,259	12,177		
3	College Park Road	1.23	16,366	44,195	3,238	4,441		
3	Columbus Street	0.63	1,061	3,157	48	141		
3	Cooper Store Road	9.47	795	1,254	3	20		
3	Cosgrove Avenue	1.37	8,947	18,067	1,043	1,874		
3	Courtenay Drive	0.50	6,991	9,558	680	773		
3	Cross County Road	2.58	12,374	15,086	1,413	2,380		
3	Cypress Campground Road	8.78	1,038	1,792	86	258		
3	Cypress Gardens Road	9.94	2,322	7,003	333	849		

Tier	Road Name	Mileage	Min AADT (2015)[1]	Max AADT (2015)[1]	Min AADTT (2015)[1]	Max AADTT (2015)[1]	NHS Intermodal Connector	Intermodal Facilities Served
3	Delemar Highway	4.19	5,623	5,623	144	144		
3	Dorchester Road	22.83	6,853	45,798	710	4,271		
3	Drop Off Drive	2.76	1,496	2,498	515	769		
3	E.Church Street	4.42	967	1,194	93	93		
3	Farmington Road	2.50	2,403	5,890	752	2,956		
3	Fielding Connector	0.61	19,595	20,154	545	550		
3	Fishburne Street	0.31	491	3,803	20	46		
3	Givhans Road	7.43	8,423	10,115	102	121		
3	Glenn McConnell Pkwy.	15.11	7,740	19,250	687	1,229		
3	Hagood Avenue	0.41	2,585	3,566	5	16		
3	Heriot Street	0.24	303	2,337	5	138		
3	Hobson Avenue	1.94	700	3,221	175	850		
3	Huger Street	0.62	2,938	4,195	97	154		
3	Hungry Neck Blvd.	2.60	4,059	13,732	208	775		
3	International Blvd.	2.08	6,524	24,769	330	3,108		Charleston International Airport
3	James Island Expressway / SC-30	0.54	6,937	25,705	227	1,825		
3	Jedburg Road	9.10	3,971	20,786	228	6,034		
3	King Street	3.72	1,912	13,986	16	408		
3	King Street Extn.	2.98	1,566	5,001	295	755		
3	Ladson Road	5.57	14,983	39,131	1,055	5,987		
3	Leeds Avenue	1.36	5,221	14,094	630	1,765		
3	Lockwood Drive	1.62	622	14,783	30	305		
3	Long Point Road	1.22	17,789	25,277	1,203	7,136		
3	Main Road	8.31	3,911	17,571	264	2,024		
3	Mallard Road	1.40	5,991	7,707	453	509		
3	Maybank Highway	0.39	5,574	5,574	90	90		
3	McMillan Avenue	0.29	1,589	3,699	233	318		
3	Meeting Street	5.14	292	27,203	71	1,542		CSX Ashley Junction
3	Michaux Pkwy.	1.16	17,827	17,827	790	790		Charleston International Airport

Tier	Road Name	Mileage	Min AADT (2015)[1]	Max AADT (2015)[1]	Min AADTT (2015)[1]	Max AADTT (2015)[1]	NHS Intermodal Connector	Intermodal Facilities Served
3	Montague Avenue	0.83	18,510	27,825	3,376	4,004		Norfolk Southern 7-Mile Yard, CSX Ashley Junction
3	N. Maple Street	2.14	2,215	2,215	933	933		
3	N. Rhett Avenue	6.66	15,988	36,042	1,860	8,291		North Charleston Terminal
3	Noisette Blvd.	1.31	1,063	2,142	60	265		
3	Old Dairy Road	3.78	2,215	8,989	933	5,613		
3	Old Orangeburg Road	2.60	2,911	3,668	188	219		
3	Old Whitesville Road	3.95	1,514	3,307	14	57		
3	Palmetto Commerce Pkwy.	13.27	1,555	9,224	167	2,329		Charleston International Airport
3	Paul Cantrell Blvd.	1.45	4,755	26,114	186	1,670		
3	Pomflant Access Road	1.36	103	103	103	103		
3	Red Bay Road	3.67	3,551	3,551	2,623	2,623		
3	Reflectance Drive	0.69	1,949	1,949	247	247		
3	Remount Road	0.86	4,664	18,091	450	2,433		Charleston International Airport
3	Reynolds Avenue	0.81	781	3,302	117	633		
3	Ridgeville Road	3.73	3,029	17,620	203	1,234		
3	Rivers Avenue	0.54	962	2,886	91	294		
3	Royle Road	1.00	5,419	6,187	327	347		
3	Sam Rittenberg Blvd.	3.87	13,009	30,535	1,331	3,856		
3	Sandlapper Pkwy. Extn.	2.14	N/A	N/A	N/A	N/A		
3	SC-165	7.25	2,655	6,263	156	192		
3	SC-27	11.98	3,146	14,502	112	264		
3	SC-311	11.04	4,246	5,259	177	201		
3	SC-453	1.43	3,901	3,901	288	288		
3	SC-61	0.49	6,741	7,184	152	159		
3	SC-7	0.31	19,461	36,762	2,837	4,781		
3	Steed Creek Road	14.26	2,176	3,074	77	88		
3	Stromboli Avenue	0.78	263	263	154	154		
3	US-17	0.38	143	4,389	19	122		

Tier	Road Name	Mileage	Min AADT (2015)[1]	Max AADT (2015)[1]	Min AADTT (2015)[1]	Max AADTT (2015)[1]	NHS Intermodal Connector	Intermodal Facilities Served
3	US-52 Bypass	2.47	6,471	9,110	419	740		
3	Virginia Avenue	2.13	2,269	4,898	848	2,834		
3	Volvo Car Drive	5.94	N/A	N/A	N/A	N/A		Volvo Camp Hall
3	Von Ohnsen Road	0.94	3,978	4,098	155	255		
3	W.Montague Avenue	1.98	7,975	22,898	890	2,601		
3	Wappoo Road	1.33	6,032	7,750	282	488		
3	Weber Drive	1.00	4,908	4,908	1,439	1,439		
3	Wesley Drive	0.12	21,361	21,361	2,440	2,440		
3	Wright Road	3.53	N/A	N/A	N/A	N/A		

Sources:
[1] CHATS/SCDOT Travel Demand Model (2015)
[2] SC Department of Public Safety (2015-2019)

4. FREIGHT NETWORK OPERATIONAL ANALYSIS

To progress the analysis of the operational performance of the identified BCD freight network, the network identified in the previous section was evaluated on the following metrics:

- **Safety –** Locations of severe truck-involved crashes, rail-highway grade crossing safety hotspots, and potential truck parking shortages
- **Freight congestion –** Truck vehicle hours of delay, level of service (LOS), and truck bottlenecks
- **Infrastructure condition –** Bridges in poor condition or with low vertical clearance, and pavement condition ratings

4.1 FREIGHT SAFETY

Freight-related crashes occur less frequently than many other types of crashes but can be more severe due to the size and weight of the vehicles involved. It's therefore important to understand where such crashes tend to occur as well as the infrastructure conditions that may contribute to them. The following sections assess CMV-involved crashes in the region, rail grade crossing safety hotspots, and truck parking capacity.[12]

4.1.1 Truck-Involved Crashes

Figure 4-1 is a heat map showing the density of severe truck-involved crashes in the three-county region from 2015 to 2019. Any crash that includes one or more fatalities or incapacitating injuries is considered severe. High crash concentrations are represented in the red and yellow areas on the map. Commercial vehicle-involved crash hotspots are mostly found along I-26 and parallel routes like US 78 that serve industrial land uses. There are also localized clusters along US 17 west of the Ashley, Palmetto Commerce Parkway, and US 17 Alt.

Table 4-1 describes the top truck-involved crash hotspots by freight network tier. Hotspots were identified by dividing the network into 1-mile segments, summing severe truck-involved crashes on each segment, and calculating the CMV-involved crash rate (per 100 million vehicle miles traveled, or VMT) and the ratio of severe CMV crashes to all CMV crashes on each segment. If more than one segment had the same number of crashes, each such segment is listed. As shown in the table, I-26 segments from Jedburg Rd/SC 16 to Omni Industrial Blvd, Eagle Drive to Aviation Avenue, and near SC 27/Old Gilliard Road have a high number of CMV crashes (42, 67, and 29 respectively) as well as higher crash rates (89.3, 54.7, and 85.7 per 100 million VMT respectively). However, the ratio of severe crashes to all CMV crashes is relatively low on these segments, probably due to the volume of truck traffic they handle. Other locations have lower crash rates but higher ratios, potentially indicating truck safety hotspots that should be targeted for improvement.

[12] Truck parking is included with safety since truck drivers must park periodically to comply with federal hours of service safety regulations.

Figure 4-1: Severe Truck-Involved Crashes on the Regional Freight Network, 2015-2019

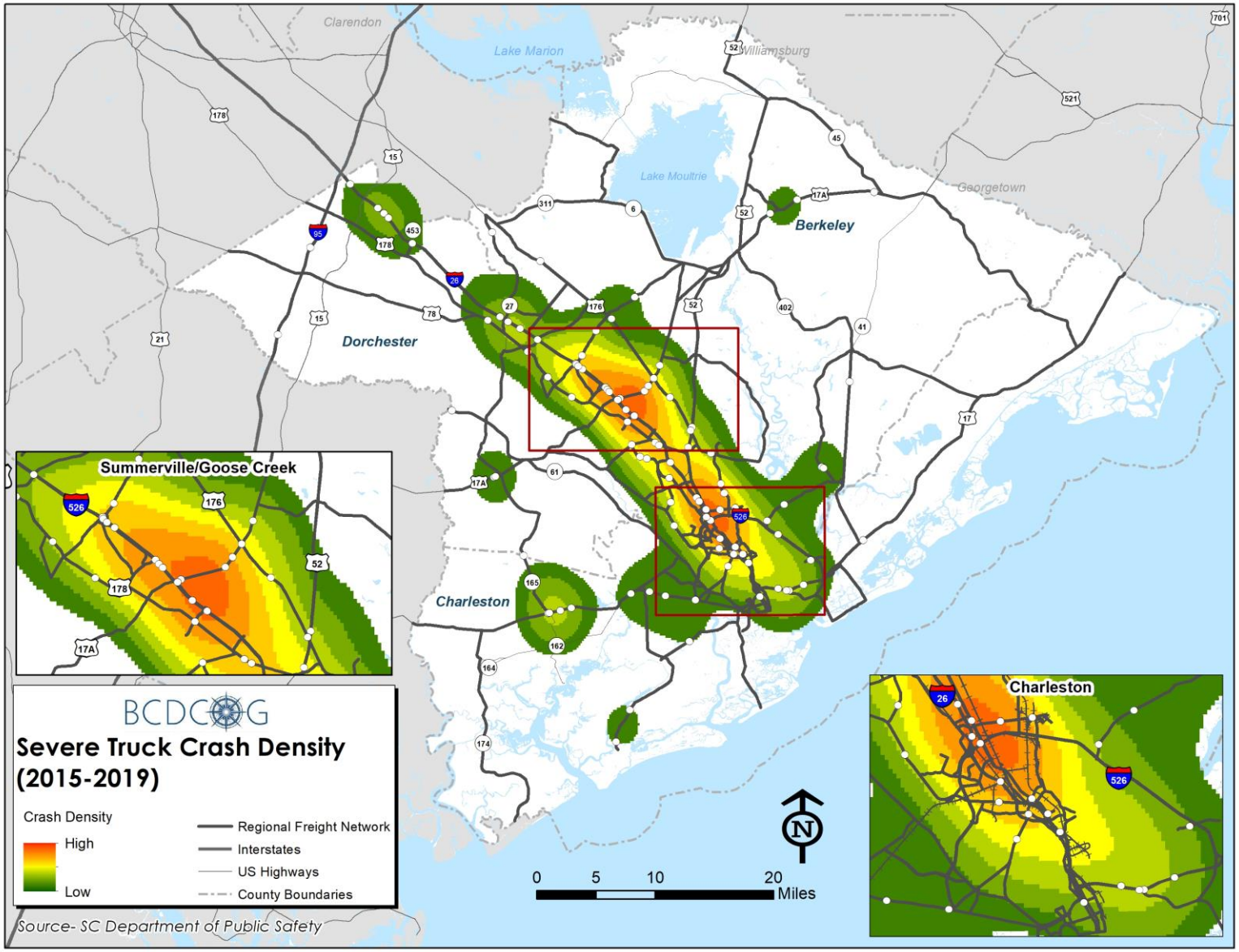


Table 4-1: Top Truck-Involved Crash Hotspots by Tier, 2015-2019

Tier	Roadway Name	Location	Begin Milepoint	End Milepoint	Average Total Daily Traffic	Average Total Daily Truck Traffic	Number of CMV Crashes	Number of Severe CMV Crashes	CMV-Involved Crash Rate (per 100 mil VMT)	Ratio of CMV Severe Crashes to All CMV Crashes
1	I-26	I-26 (South of Exit 194)	194.1	195.1	25,771	6,124	42	4	89.3	9.52%
	I-26	I-26 (Exit 197 at Nexton Parkway)	197.6	198.6	26,620	6,395	15	3	30.9	20.00%
	I-26	I-26 (North of Exit 211A)	209.8	210.8	67,120	8,567	67	2	54.7	2.99%
	I-26	I-26 (South of Exit 199A/B)	200.2	201.2	38,690	8,125	11	2	15.6	18.18%
	I-26	I-26 (Exit 187 at Ridgeville Rd/ Old Gilliard Road)	186.5	187.5	18,551	3,836	29	2	85.7	6.90%
	I-26	I-26 (South of Exit 172 A/B near White Lemon Road near weigh stations)	173.5	174.5	20,000	5,000	5	2	13.7	40.00%
	I-26	I-26 (South of Exit 172 A/B near White Lemon Road near weigh stations)	172.5	173.5	20,000	5,000	13	2	35.6	15.38%
2	US-17	US-17 and SC-165 Intersection	11.7	12.7	17,348	2,912	17	3	53.7	17.65%
	US-17	US-17and W Coleman Blvd Intersection	33.4	34.4	28,871	1,810	23	2	43.7	8.70%
	US-78	US-78 (Commercial Center Drive to Shipley Street)	4.5	5.5	38,732	4,008	29	2	41.0	6.90%
	US-17A	US-17A (In Clubhouse Road Intersection)	4.3	5.3	11,227	997	4	2	19.5	50.00%
	US-17A	US-17A (College Park Road to St James Ave)	4.1	5.1	31,847	2,822	27	2	46.5	7.41%
	US-17A	US-17A (College Park Road to St James Ave)	3.1	4.1	33,759	2,959	16	2	26.0	12.50%
3	S-98	Cainhoy Road	11.7	12.7	7,777	1,662	3	2	21.1	66.67%
	S-136	Harry E Brown Jr Blvd (Tanner Ford Blvd to Yeamans Hall Road)	4.5	5.5	34,875	3,132	9	2	14.1	22.22%
	SC-642	SC-642 (W Hill Road to Lake Ashley Park)	1.5	2.5	39,919	3,020	11	2	15.1	18.18%
		Palmetto Commerce Pkwy (Around Daimler Vans Manufacturing)			8,417	1,638	3	2	19.5	66.67%

Sources: SC Department of Public Safety (2015-2019), BCD and SCDOT Travel Demand Models (2015)

4.1.2 Grade Crossing Safety

Safety is also a concern at rail-highway grade crossings. To assess grade crossing safety, the project team collected Federal Railroad Administration grade crossing crash statistics from 2009-2019 for each crossing in the three-county region, totaling over 500 crossings. There were 71 grade crossing accidents at 48 crossings during this period, an average of about six crashes per year. However, few crashes resulted in injuries or fatalities, as shown in **Table 4-2** and **Table 4-3**, respectively (**Table 4-2** lists the top two injury crash locations by number of injuries; **Table 4-3** shows all fatal crashes that occurred since each crashed produced one fatality).

Since severe crashes are comparatively rare, overall grade crossing safety risk was assessed based on the total number of accidents at each crossing, including those that only resulted in property damage. The results are shown in **Table 4-4** and mapped in **Figure 4-2**. The NS crossing at Ashley Phosphate Road near Southrail Road in Charleston County had the most crashes during the 11-year period, including one that resulted in three injuries. The CSX crossing at Red Bank Road near US 52 in Berkeley County had the second most crashes, one of which was fatal.

Table 4-2: Top 2 Rail Crossing Injury Crash Hotspots, 2009-2019

Crossing ID	Rank	Railroad	Street Crossing	Near	County	Number of Crashes	Total Injuries
721448L	1	NS	Ashley Phosphate	Southrail Road	Charleston	1	3
720811L	2	NS	Schuman Drive	US 78	Dorchester	1	2

Source: Federal Railroad Administration, 2009-2019

Table 4-3: Rail Crossing Fatal Crashes, 2009-2019

Crossing ID	Railroad	Street Crossing	Near	County	Number of Crashes	Total Fatalities
631974A	CSX	Red Bank Road	US 52	Berkeley	1	1
631979J	CSX	Hanahan Road	Railroad Ave	Berkeley	1	1
632405X	CSX	Highway 162	McCombs Road	Charleston	1	1
720806P	NS	Ann Street	Railroad Avenue SW	Dorchester	1	1
721475H	NS	Dearing Drive	W. 5th North Street	Dorchester	1	1

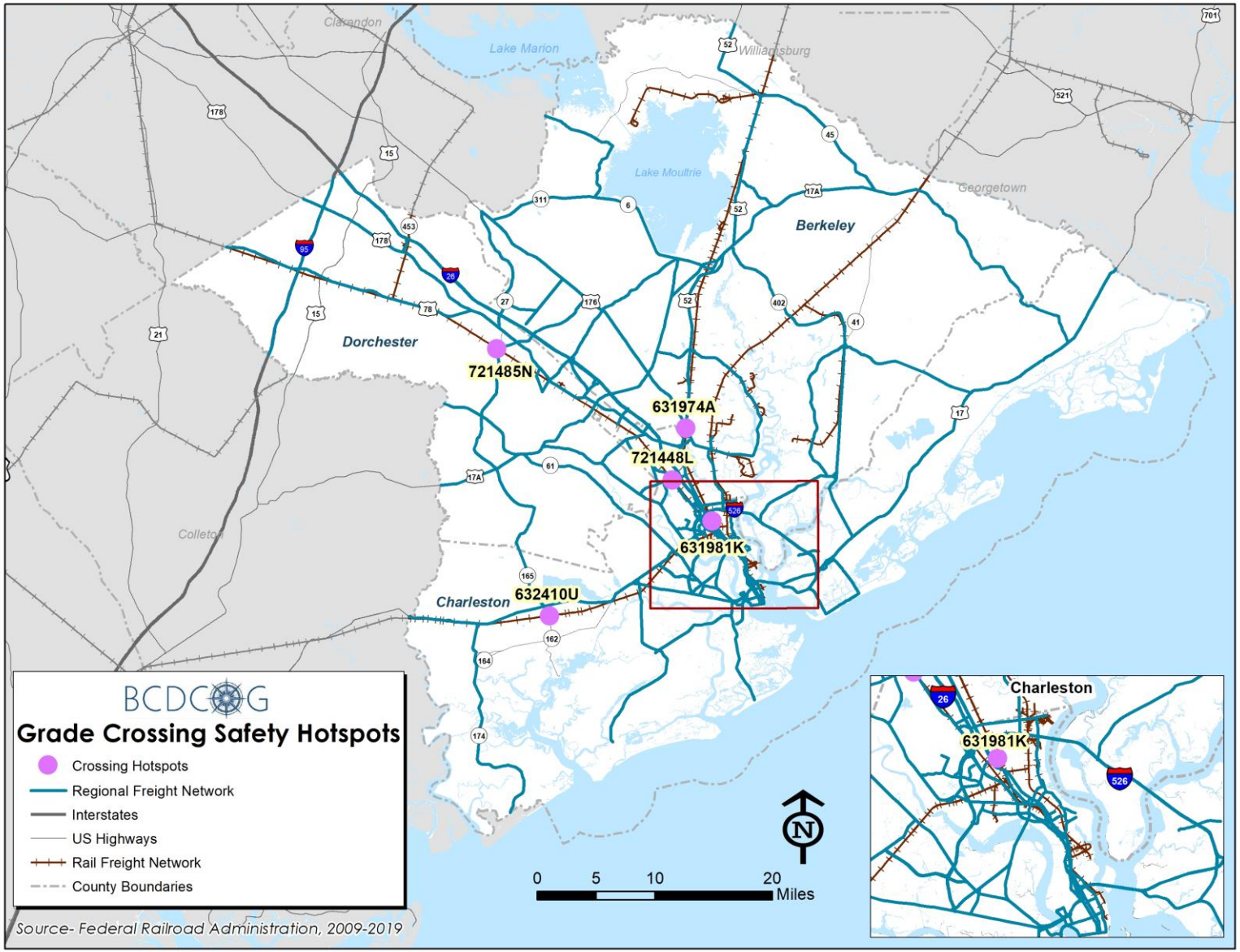
Source: Federal Railroad Administration, 2009-2019

Table 4-4: Rail Crossing Crash Hotspots, 2009-2019

Crossing ID	Rank	Railroad	Street Crossing	Near	County	Number of Crashes
721448L	1	NS	Ashley Phosphate	Southrail Road	Charleston	6
631974A	2	CSX	Red Bank Road	US 52	Berkeley	4
631981K	3	CSX	East Montague Avenue	Gaynor Avenue	Charleston	3
632410U	3	CSX	SC 165	Drayton Street	Charleston	3
721485N	3	NS	North Main Street	South Railroad Avenue	Dorchester	3

Source: Federal Railroad Administration, 2009-2019

Figure 4-2: Grade Crossing Hotspots, 2009-2019



4.1.3 Truck Parking

Truck drivers have two legal options for parking, public or private facilities. Public facilities can be rest areas, truck weigh stations, or truck rest stops. Private facilities usually include truck stops/fueling stations (sometimes with amenities like showers and food), lodging establishments or shopping centers. Drivers will decide what options they have for parking depending on the haul length, movement type and staging requirements.

Truck drivers are subject to hours of service regulations which govern how long they may drive before stopping for rest. Legislation mandating the use of electronic hours of service logging devices prohibit drivers from exceeding their hours of service limits. Hence, when drivers run out of hours of service, they must pull over whether there is a safe place to park or not. Sometimes drivers are forced to park on highway shoulders or other unauthorized locations, creating safety, infrastructure deterioration, and community quality of life issues. Drivers accessing port terminals and warehousing/distribution facilities in the BCD region also require staging areas when picking up or dropping off shipments.

Figure 4-3 and **Table 4-5** show the location of public and private truck parking in the three-county region obtained from SCDOT and Allstays.com. Of the truck parking identified, about 81% is privately supplied and lies on or near I-95 in Dorchester County or along I-26 in Berkeley County. There is comparatively little supply near the Port of Charleston terminals or the major freight generators closer to Charleston. However, participants in the July 16th steering committee meeting indicated some parking is being provided outside the gates of the new HLT. As planned, HLT is expected to accommodate up to 12 tractor-trailers with 40' containers (20-24 if the trucks double park). In addition, private logistics firms sometimes provide parking for company owned trucks near the port or along major freight corridors like I-26 and US 78. These facilities meet at least some of the demand for regional truck parking, although they are not accessible to all drivers.

SCDOT is creating a Corridor Management Plan for I-26 in the Charleston region. The study is evaluating strategies to better manage corridor traffic, including freight traffic. Although the study boundaries don't extend to all the BCD region, it does examine parking demand and capacity along I-26 closer to Charleston. The study looked at existing conditions on I-26 between Exit 194 and Exit 218, and on I-526 at Exit 18. Demand was evaluated by counting trucks during the overnight peak truck parking period (12:45 a.m. to 2 a.m.) at six locations – five private and one public. Most of the locations assessed were at or above capacity at the time of the survey:

- The Flying J on Jedburg Road in Summerville was at 200% capacity;
- The Kangaroo Express on Main Street in Summerville was at 109% capacity;
- The public rest area at I-26 Mile 204 was at 100% capacity; and
- The Pilot Travel Center at I-26 Exit 199 was at 210% capacity.[13]

These results suggest that the BCD region is not immune to the nationwide truck parking shortage. Regional trends like a growing metro area, increasing land values, industrial expansions, and Port of Charleston cargo growth will contribute to ongoing truck parking shortages.

[13] I-26 Corridor Management Plan Freight Mobility Technical Memorandum (CDM Smith), 2018.

Figure 4-3: BCD Region Truck Parking Supply

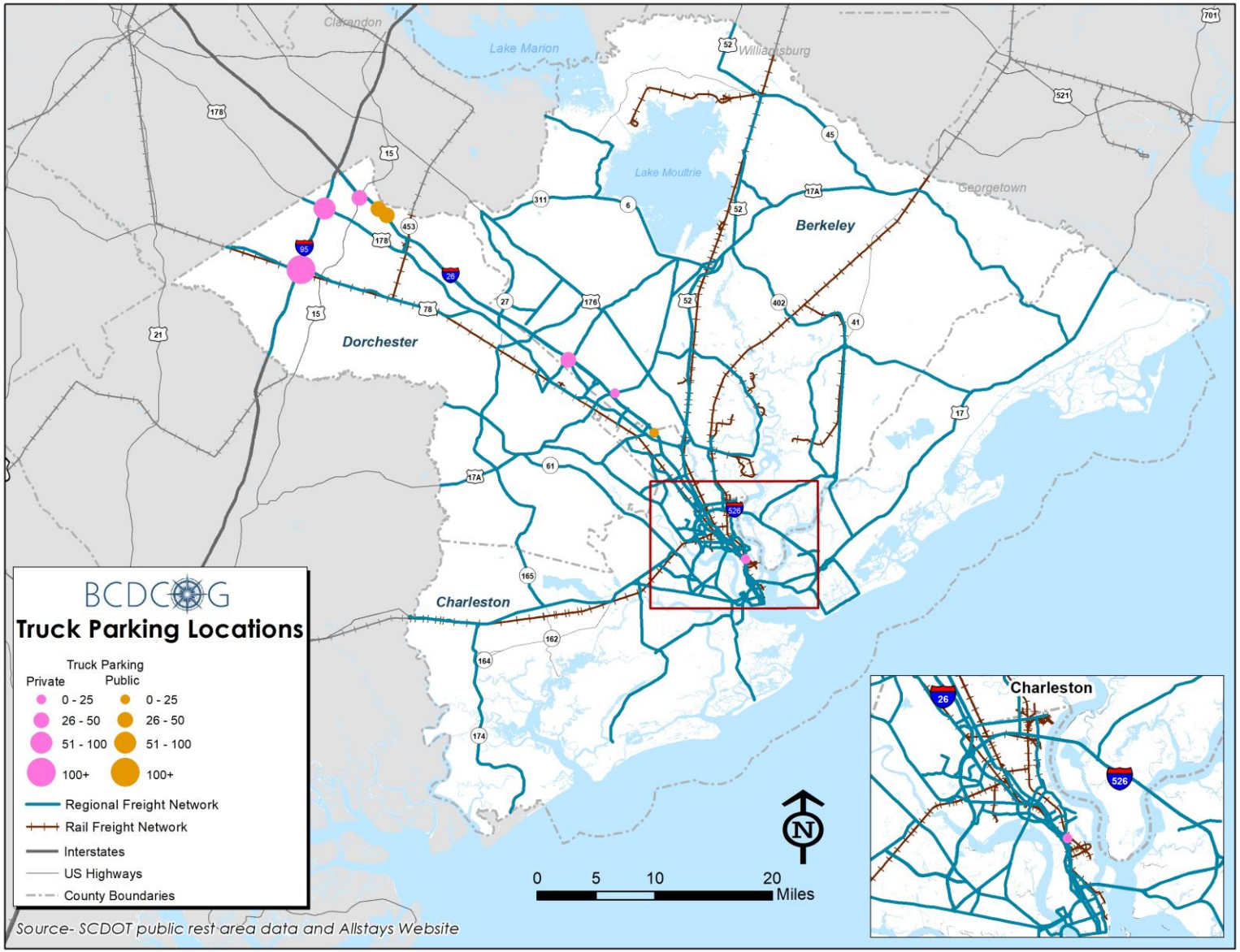


Table 4-5: BCD Region Truck Parking Facilities

Name	Location	Number of Spaces	Public/ Private
Flying J	799 Jedburg Rd, Summerville, SC	49	Private
Kangaroo Express	1571 N Main St, Summerville, SC	49	Private
Pilot	1521 N Main St, Summerville, SC	10	Private
Kangaroo Express	1968 Meeting Street Rd, Charleston, SC	10	Private
En Market	2722 US 15, Harleyville, SC	50	Private
Pilot	9587 Charleston Highway, St George, SC	100	Private
Shell	6131 W Jim Bilton Blvd, St George, SC	5	Private
Flying J	113 Motel Drive, St George, SC	118	Private
Rest Area	I-26 Eastbound at Mile Marker 204	19	Public
Weigh Station	South Carolina WB Weigh Station	35	Public
Weigh Station	South Carolina EB Weigh Station	35	Public

Source: CDM Smith desktop review of data from SCDOT, Allstays.com, and Google Earth imagery, 2020

Phone interviews were conducted to collect additional truck parking data from three truck stops in the region. The interviews gathered information about parking capacity, utilization, amenities, and operational patterns. The three stops were the Flying J at 799 Jedburg Road in Summerville, the Kangaroo Express at 1968 Meeting Street Road in Charleston, and the Flying J at 113 Motel Drive in St. George.

Data extracted from each interview are provided in **Table 4-6**. The survey confirms the 49 spaces available at the Flying J on Jedburg Road (also inventoried in the Corridor Management Plan). It also identified capacity at two locations not assessed in the Corridor Management Plan – the Kangaroo Express at 1968 Meeting Street in Charleston, and the Flying J at 113 Motel Drive in St. George. (Note that the desktop review identified 10 spaces at the Kangaroo Express and 118 at the Flying J, both of which differ from capacity reported by interviewees.)

None of the respondents reported any changes in utilization due to the COVID-19 pandemic. All three truck stops reported that their peak occupancy occurs mostly during daylight hours – noon for the Flying J on Jedburg, 5 a.m. to 8 a.m. for the Kangaroo Express, and 7 a.m. to 12 noon for the Flying J on Motel Drive. This could indicate staging activity for trucks waiting to access the port terminals or distribution centers in the area.

Table 4-6: Truck Parking Interview Responses (2020)

Question	799 Jedburg Rd, Summerville, SC 29483	1968 Meeting Street Rd, Charleston, SC 29405	113 Motel Drive, St. George, SC 29477
What is the Facility Name?	Flying J	Kangaroo Express	Flying J
Can you please confirm your physical address is _____?	Yes	Yes	Yes
What are the hours of operation?	24/7	24/7	24/7
How many truck parking spaces are currently at your facility?	49 spaces	26 spaces*	20 spaces*
What is the typical cost of renting a space?	$15/night	No rentals	$15/night
What types of trailers can your facility accommodate?	All	All	All
What types of amenities does your facility have?	Laundry, truck wash, scale, showers, bathrooms	Public bathroom	Laundry, scale, showers, bathrooms
What was the estimated occupancy rate Pre-COVID? Currently?	Unaware	Unaware	Unaware
What hour ranges typically see the highest occupancy? Is there a typical length of stay?	Noon	5 A.M. - 8 A.M.; 1 hour	7 A.M. - 12 P.M.
Do you have plans to add additional spaces or amenities in the future?	No	No	No

**Survey response differs from data gathered via desktop review.*
Source: CDM Smith, July 2020

4.2 FREIGHT CONGESTION

Highway congestion impacts shippers' ability to deliver cargo to destinations within time window commitments. Unreliable travel conditions create inefficiencies and increase costs that are often passed on to the customer and ultimately to consumers. Highway bottlenecks therefore impact not only area traffic conditions and quality of life, but also regional economic competitiveness.

The CHATS regional travel demand model was used to assess freight congestion by calculating truck vehicle hours of delay (VHD) and roadway Level of Service (LOS).[14] In addition, data from the National Performance Management Research Data Set (NPMRDS) were used to identify truck bottlenecks and calculate truck travel time reliability. The following sections describe overall congestion in the region and identify potential truck bottlenecks using the NPMRDS truck travel time data.

[14] LOS is a qualitative measure describing operational conditions in a traffic stream based on measures such as speed and travel time. LOS is categorized into letter grades with A being free-flow conditions and F being gridlock.

4.2.1 Truck Vehicle Hours of Delay and Roadway Level of Service

The project team used the CHATS regional travel demand model and the SCDOT statewide model to evaluate truck delay and daily LOS on the freight network. Note that the models don't allow for calculating truck LOS, so this measure is provided for all traffic.

Figure 4-4 shows the model results for truck VHD in 2015. The model shows extensive truck delays in the segments of I-526 near Clements Ferry Road, which provide truck access to the Wando Welch Terminal and nearby freight-related businesses. The intersection of I-526 and Clements Ferry experiences truck delays of up to nearly 1,300 hours per day. Other segments experiencing significant truck delay include I-526 west of Clements Ferry to the I-26 interchange, I-26 north of I-526, and Ashley Phosphate Road west of I-26.

There are many more segments of the freight network that have poor LOS, see **Figure 4-5**. Although this metric is not specific to trucks, the fact that these slowdowns occur on the regional freight network (which has generally higher truck volumes) implies they are freight bottlenecks. In addition to I-526 and Clements Ferry Road, I-26, US 78, SC 41, Septima Clark Parkway, SC 61 and SC 7 in West Ashley, SC 700, US 17A, and SC 642/Dorchester Road all show daily LOS of E or F.

4.2.2 National Performance Management Research Data Set

Freight bottlenecks in the BCD region were identified using the Federal Highway Administration's National Performance Management Research Data Set (NPMRDS) vehicle probe data. The NPMRDS is a national data set of average travel times for use in analyzing highway system performance. The data provided are actual travel times. No estimates or historical data substitutions for missing data are included. The data used in this analysis cover truck speed data from March 2019 through February 2020, aggregated in 15-minute time periods. The NPMRDS data includes distinct average travel time information for each fifteen-minute-interval for freight and all traffic on the entire National Highway System, organized by Traffic Message Channel segments on roadways to enable mapping of the data.

The FHWA Truck Freight Bottleneck Reporting Guidebook provides an analytical framework for identifying and analyzing truck bottlenecks.[15] This analysis follows the FHWA methodology by defining multiple parameters to better understand traffic congestion patterns in the BCD region:[16]

- **Free-flow Speed** – This measure indicates the travel time on a roadway under free-flow conditions, with little to no interaction from traffic. To calculate this measure, the 85th percentile travel times during weekday overnight hours (10:00 p.m. to 6:00 a.m.) are considered because of low traffic volumes. If data are insufficient (less than 50 percent coverage), the midday data (11:00 a.m. to 4:00 p.m.) are added to the sample and the 95th percentile is considered. This measure was calculated based on all vehicles, not only trucks.

[15] https://www.fhwa.dot.gov/tpm/guidance/hop18070.pdf
[16] SCDOT also monitors freight performance for statewide planning purposes. The 2040 Metropolitan Transportation Plan update uses a Truck Travel Time Reliability Index for Interstates only using a similar methodology.

Figure 4-4: Daily Truck Vehicle Hours of Delay, 2015

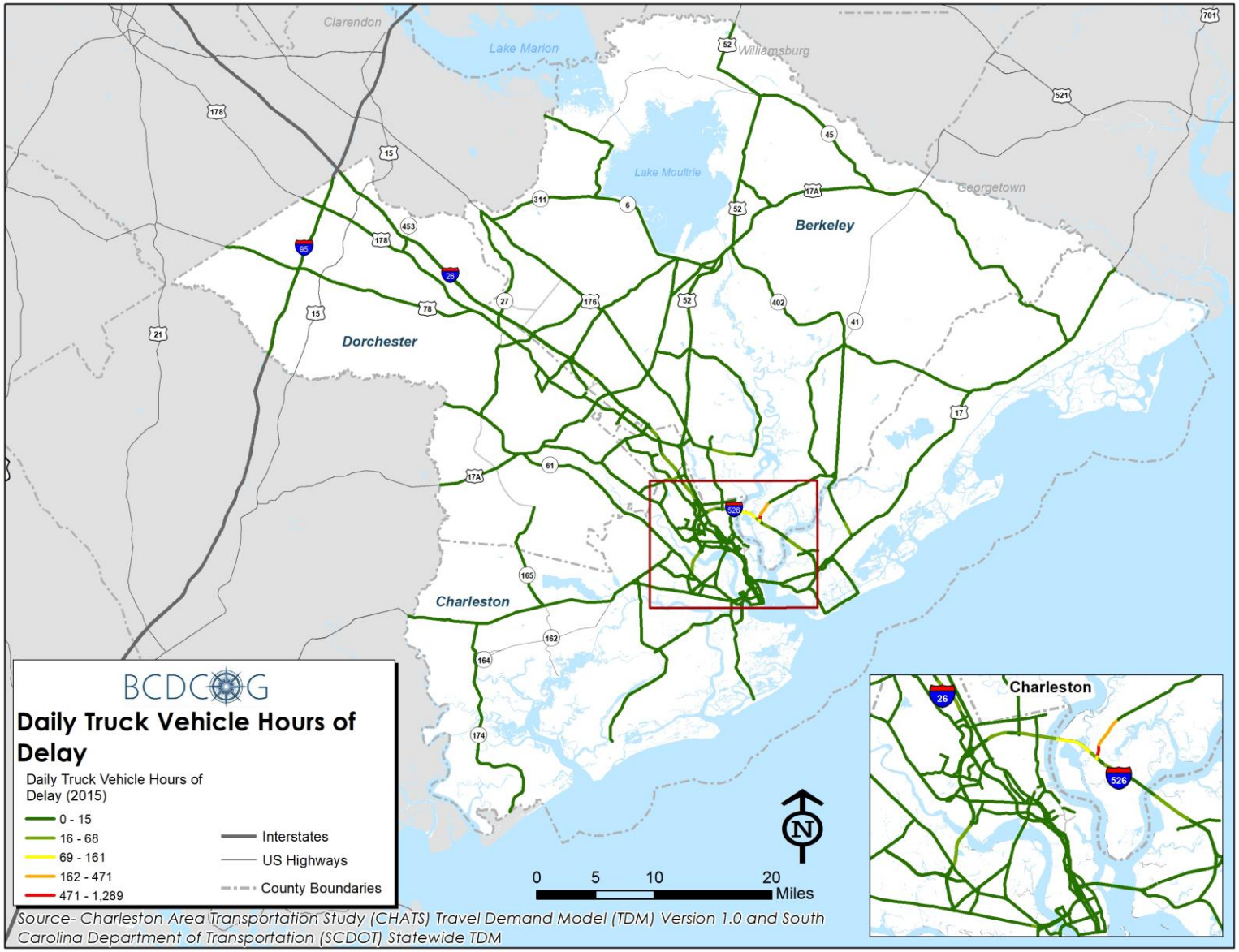
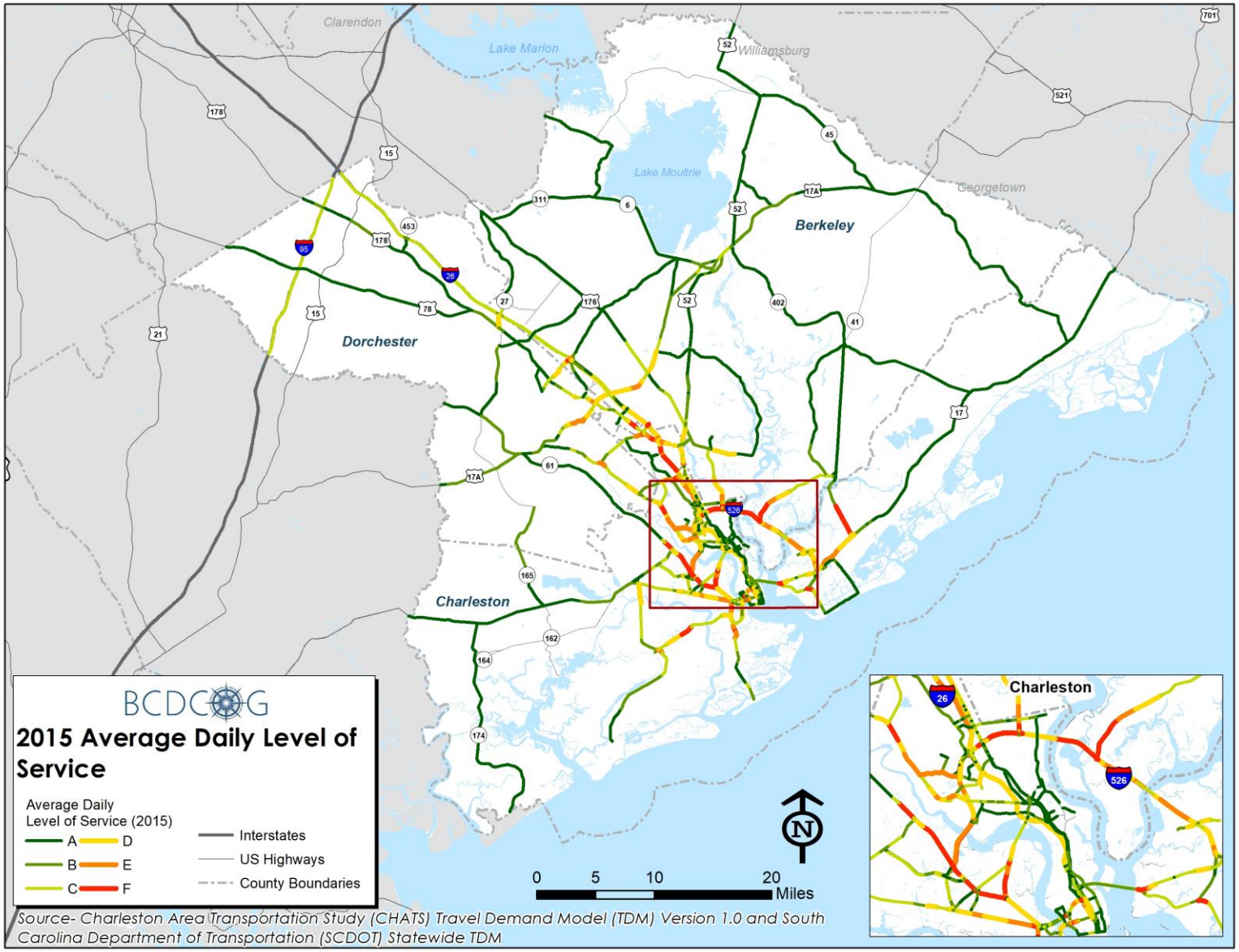


Figure 4-5: Average Daily Level of Service (All Vehicles), 2015



- **95th Percentile Travel Time** – This measure is derived from travel times on a segment based on multiple observations, usually over a period of months. It indicates that 95% of the time, the travel time on a roadway segment is lower than the 95th percentile value. Therefore, the higher the 95th percentile travel time, the longer it takes to travel on a roadway. This metric departs from the 80th percentile value given in the FHWA Guidebook; this adjustment was made based on guidance found in the FHWA Freight Performance Measure Approaches for Bottlenecks, Arterials, and Linking Volumes to Congestion Report.[17]

- **Planning Time Index 95th (PTI 95th)** – The planning time index (PTI) is computed as the 95th percentile travel time divided by the free-flow travel time. For example, a planning time index of 1.60 means that, for a 15-minute trip in light traffic, the total time that should be planned for the trip is 24 minutes. The higher the PTI, the longer the travel time that should be budgeted to reach a destination on time.

- **Frequency of Congestion** – This is expressed as the percentage of time that travel speeds fall below 75% of the free-flow speed during the worst peak period (from 6:00 a.m. to 9:00 a.m. for the morning peak period and from 4:00 p.m. to 7:00 p.m. for the afternoon peak period). So, the higher the percentage, the longer the roadway is congested during that period.

Freight bottlenecks were identified using a combination of PTI 95th (calculated using free-flow speed and 95th percentile travel time) and frequency of congestion. The PTI is a measure of congestion intensity while the frequency of congestion is a measure of congestion recurrence. The portions of the congested roadway network which had a combination of the highest PTI and frequency of congestion were identified as freight bottlenecks. Road segments were scored based on their frequency of congestion and PTI scores as shown in **Table 4-7**. For example, a roadway segment with a frequency of congestion of 70% and a PTI of 4 would receive a score of 8.

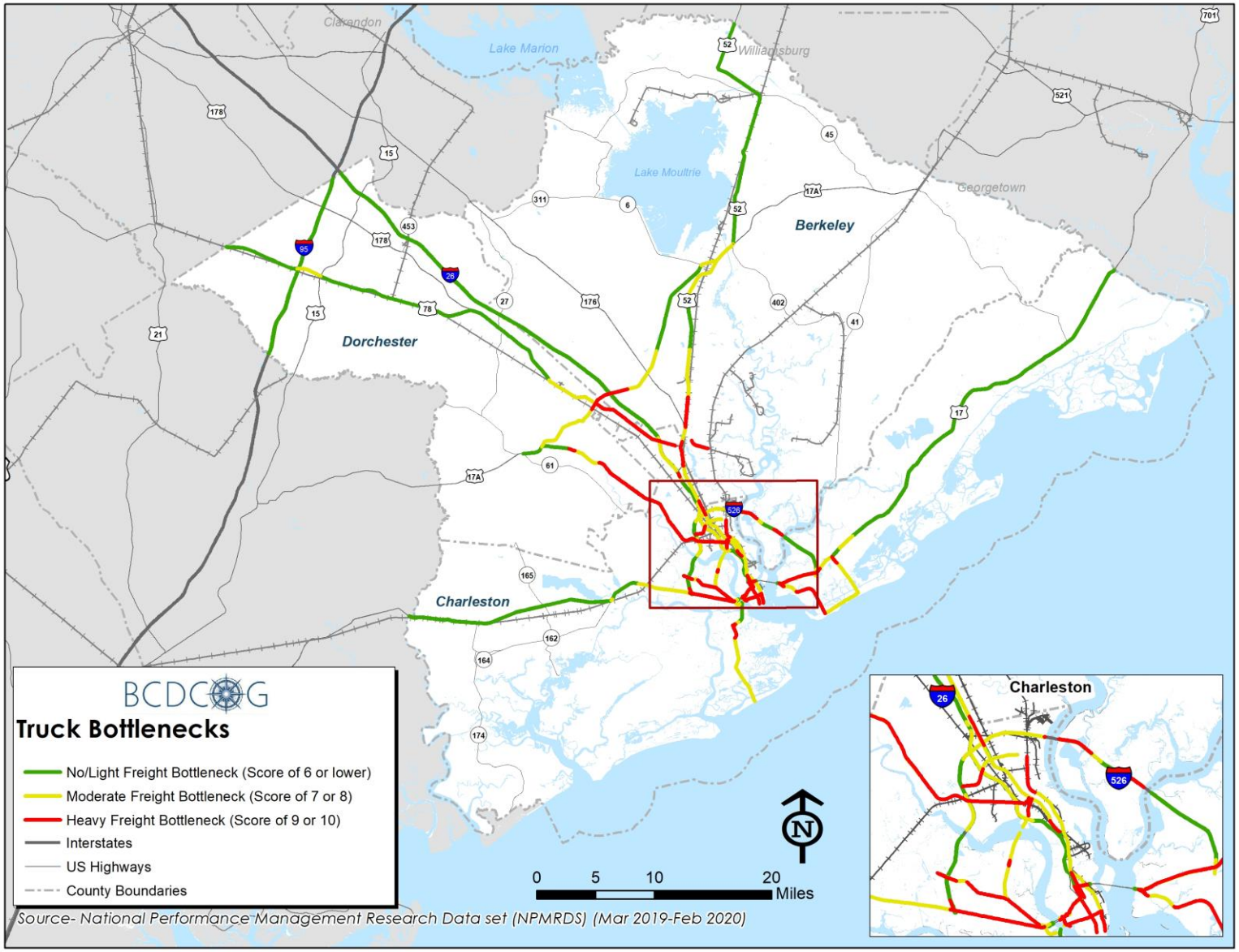
Table 4-7: Freight Network Bottleneck Scoring

Score	Frequency of Congestion	Score	Planning Time Index 95th
1	Frequency ≤ 15%	1	PTI ≤ 1.50
2	15% < Frequency ≤ 30%	2	1.50 < PTI ≤ 2.00
3	30% < Frequency ≤ 60%	3	2.00 < PTI ≤ 3.00
4	60% < Frequency ≤ 90%	4	3.00 < PTI ≤ 5.00
5	Frequency > 90%	5	PTI > 5.00

The results of this process are illustrated in **Figure 4-6**. I-26 and I-526, SC 642, US 52, US 78, US 17, and several streets in downtown Charleston all appear to present significant bottlenecks for trucks. (Note that SC 41 data are not provided in the NPMRDS, so it is not included in the map.)

[17] https://ops.fhwa.dot.gov/publications/fhwahop15033/fhwahop15033.pdf

Figure 4-6: NPMRDS Truck Bottlenecks (2019-2020)



4.3 INFRASTRUCTURE CONDITIONS

Poor pavement condition reduces freight efficiency and contributes to increased wear and tear on trucks. Bridges in poor condition may require increased maintenance in the future, especially if truck traffic increases. Bridges that are restricted to less than the standard legal weight limit and those with low vertical clearance can impede commerce by forcing trucks to use alternate routes. Some of these routings may be circuitous, adding cost and time to shipments. This section identifies potential issues related to bridges and pavement on the regional freight network.

4.3.1 Bridge Conditions

Bridges in poor condition were identified and mapped using the 2018 SCDOT bridge database. In South Carolina, bridges are in poor condition if the deck, superstructure, or substructure are rated 4 or lower using the National Bridge Inventory (NBI) rating scale of 0 to 9.[18] There are eight bridges in the BCD region that are on the regional freight network and rated in poor condition (see **Table 4-8** and **Figure 4-7**), including one on I-26 over the CSX Railroad in North Charleston. Others are located on US 17, US 17ALT, SC 97, US 176, SC 174, and US 78. Such bridges are more likely to require costly repairs in the future to continue in service. If they must be posted for load, trucks may have to detour around them, adding cost and time to shipments.

The project team consulted the NBI database to assess low-clearance (less than 15 feet) and load-posted bridges on the regional freight network. No such bridges were found.

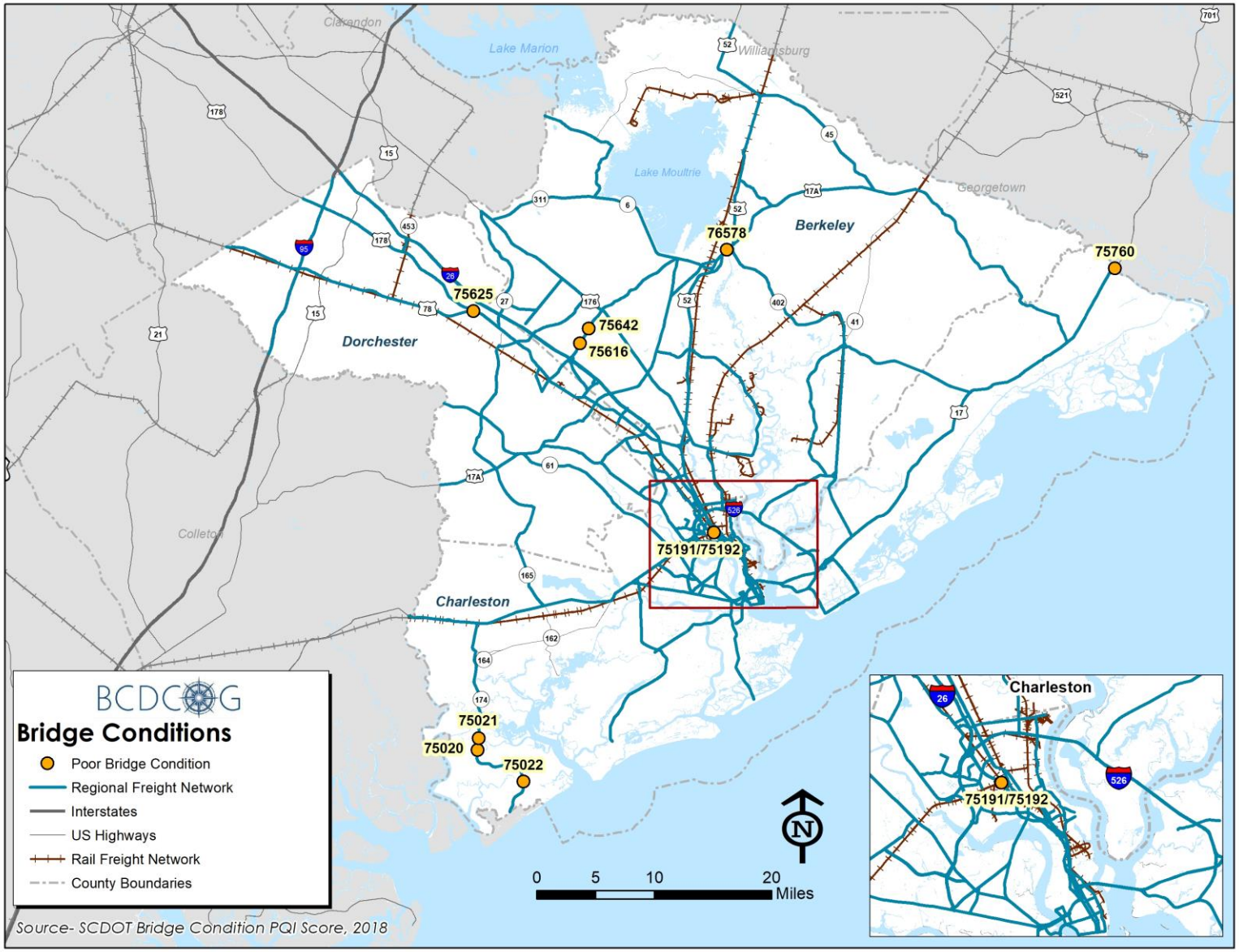
Table 4-8: Bridges in Poor Condition on the BCD Regional Freight Network

Bridge ID	County	Route	Crossing	Location	Rating
75191/75192	Charleston	I-26	S.C.L. RR & Southern Rwy	N Charleston	Poor
75625	Dorchester	US 78	Four Hole Swamp	3.8 mi NW of Ridgeville	Poor
76578	Berkeley	US 17 Alt	Santee Tail Race Canal	1 mi N of Moncks Corner	Poor
75760	Charleston/ Georgetown	US 17	South Santee River	18 mi S Georgetown	Poor
75020	Charleston	SC 174 E	Russell Creek	8 mi N of Edisto Beach	Poor
75021	Charleston	SC 174 E	Sand Creek	9 mi N of Edisto Beach	Poor
75022	Charleston	SC 174 E	Store Creek	4 mi N of Edisto Beach	Poor
75616	Berkeley	S-16 E	TRIB TO CYPRESS SWAMP	12.2MI SW MONCKS CORNER	Poor
75642	Berkeley	S-16 E	SANDY RUN CREEK	10.7MI SW MONCKS CORNER	Poor

Source: SCDOT Bridge Database, 2018

[18] SCDOT, Final Transportation Asset Management Plan, August 2019.

Figure 4-7: Freight Network Bridges in Poor Condition, 2018



4.3.2 Pavement Conditions

Figure 4-8 shows SCDOT pavement condition data for the freight network; the mileage and percentage shares by tier are detailed in **Table 4-9**. The pavement condition ratings are based on the SCDOT Pavement Quality Index (PQI), which is a combination of Pavement Serviceability Index (a roughness/rutting measure) and Pavement Distress Index (a measure of cracking or other distress). PQI scores are given on a 5-point scale as:

- Poor – PQI 0.0 to 2.6
- Fair – PQI 2.7 to 3.3
- Good – PQI 3.4 to 5.0

Table 4-9: Freight Network Pavement Condition Summary, 2018

Tier	Good	Fair	Poor	Total
1	152.8 miles (87.4%)	20.2 miles (11.5%)	1.9 miles (1.1%)	174.9 miles
2	222.6 miles (41.1%)	129.4 miles (23.9%)	189.8 miles (35%)	541.8 miles
3	77.1 miles (32.7%)	66.1 miles (28%)	92.7 miles (39.3%)	235.9 miles

Source: SCDOT, 2018

Note: Some freight network segments lack pavement condition data, so the total mileage by tier is less than that reported in ***Table 3-1***.

Pavement on Tier 1 routes (Interstates) is generally performing well, which is unsurprising as Interstate highway maintenance is a key priority for SCDOT. Conditions deteriorate somewhat on the lower tier routes, which include several US and state highways that are important for goods movement in the region, e.g. US 17, US 52, and US 78.

One concern discussed in FAC meetings and other conversations has been the impact of mining operations and related industries on rural roadways. SCDHEC maintains a database of active mines in the state. A map of the active mines in the BCDCOG region is shown in **Figure 4-9**.

The predominant type of mines in the region are sand only mines. These mines are located throughout the region but are located in clusters in the following areas:

- Ravenel;
- Johns Island;
- Awendaw;
- Near SC 41;
- Near US 17 Alternate; and
- Dorchester

Figure 4-8: Freight Network Pavement Existing Conditions, 2018

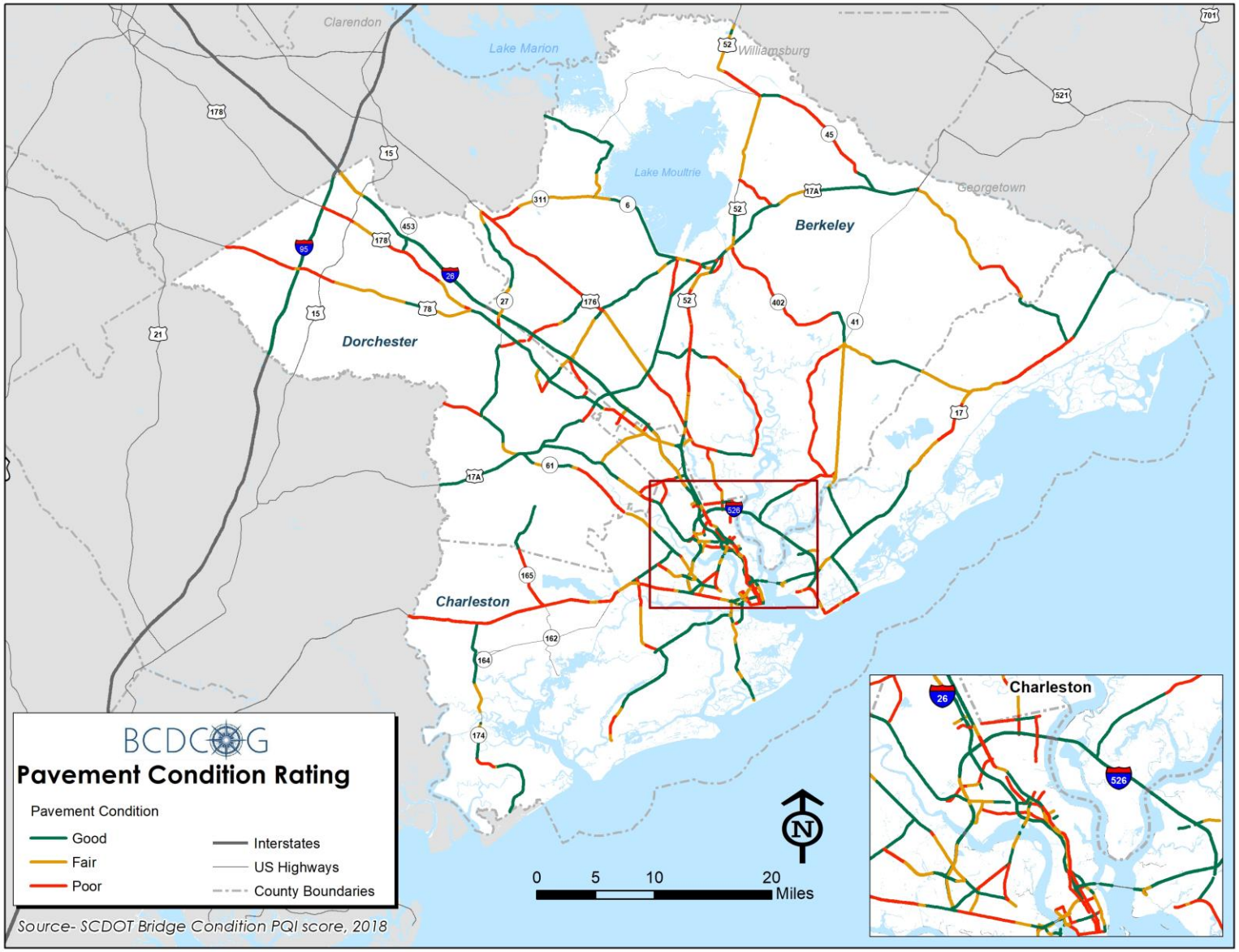
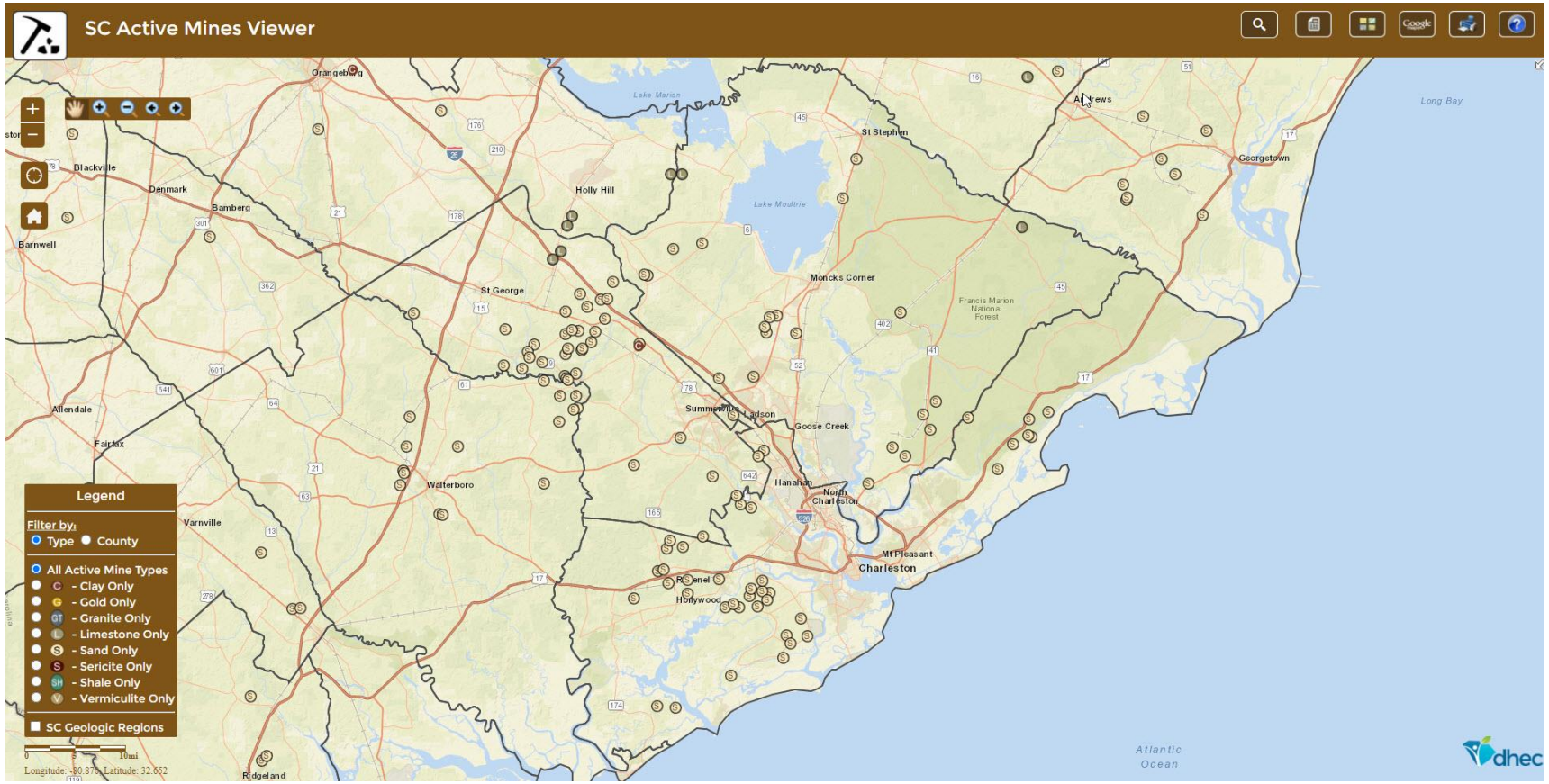


Figure 4-9: SCDHEC Active Mines in the BCDCOG Region



Source: SCDHEC

Continued use of these rural roadways to transport sand and other materials to construction sites can deteriorate the pavement and condition of the roadways on which they travel. **Table 4-10** shows the roadways adjacent to these mining operations that may put a disproportionate strain on the rural roadways in the area.

Table 4-10: Roadways Impacted by Mining Operations

Roads	Limits
SC 41	Hoover Road to Rubin Court
US 17 Alternate	Pinecrest Drive to Black Tom Road
Mudville Road	Highway 6 to Old Gilliard Road
Main Road	River Road to Maybank Highway
River Road	Maybank Highway to Edenvale Road
US 17	SC 174 to SC 162
Highway 165	US 17 to Hyde Park Road
US 17	Sewee Road to Doar Road
SC 19	Hatteras Bluff to Old Dam Road
Sandridge Road	Wire Road to US 78
US 178	US 78 to Gable Farm Road

5. SUMMARY

Table 5-1 provides summary information about the tiered network including roadways by tier, corridor mileage, maximum total traffic and truck volumes, intermodal facilities accessed, CMV crash data, freight congestion metrics (truck bottlenecks and level of service on the freight network), and infrastructure condition data (poor condition bridges and pavement quality issues).

The Tier 1 corridors constitute the most critical freight routes including Interstates and connections to intermodal freight facilities. Several of these routes are NHS Intermodal Connectors. Land use along almost all these routes is designated as current and/or future industrial, indicating the importance of these routes for regional freight-dependent businesses. Key findings for these corridors include:

- From a safety standpoint, the most CMV crashes occur on I-26 and I-526. Although the CMV crash rate on these routes is comparatively low, the ratio of severe CMV crashes to all CMV crashes among Tier 1 routes is the highest on I-26, possibly indicating that this route is a key freight safety concern for the region. Other Tier 1 routes have higher CMV crash rates but few severe crashes. Truck parking is available on key Interstate highway routes, but not as much on last-mile routes; still, many freight businesses provide parking for their own fleets/drivers, making it hard to assess parking supply adequacy.

- Several Tier 1 routes are critical for both freight and regional commuter/passenger traffic, and therefore experience congestion now or in the future. All three of the Interstate routes in the region are expected to show failing LOS by 2040. International Boulevard, Long Point Road, Montague Avenue, Remount Road, and US 52 – all of which are critical last-mile freight routes – are also expected to see failing LOS in the future. Several of these roads also contain truck bottlenecks, e.g. I-26, I-526, and Montague Avenue.

- Infrastructure is in generally good condition on these routes, although some last-mile connectors have poor pavement quality (Meeting Street, Remount Road, US 52) and there is one poor condition bridge on I-26.

Tier 2 corridors generally have less truck traffic, but are still significant regional routes for freight and passenger traffic. Key findings for these routes include:

- The number of CMV crashes are generally lower than Tier 1 routes, as are CMV crash rates, but some hotspots do exist. For example, US 17 and US 17A combined had more than 1,100 CMV crashes from 2015-2019, 25 of which were severe (more than any Tier 1 route except I-26). US 52, US 78, and US 176 also had comparatively high numbers of severe crashes, and high ratios of severe CMV crashes to all crashes. (Some other routes had higher ratios but they were based on relatively few crashes.)

- Some Tier 2 routes show failing LOS in the base and/or future year, including US 17, US 17A, Goose Creek Road, Red Bank Road, SC 171, US 52, and US 78. Many of these routes also contain truck bottlenecks.

- Pavement quality and bridge condition issues are more apparent on these routes. SC 174 has three bridges in poor condition on the regional freight network; US 17, US 17A, US 176, and US 78 have one each. The share of corridor mileage with pavement in poor condition on Tier 2 routes ranges up to almost 80% (SC 402).

Tier 3 routes vary widely in terms of truck volumes but several of them connect to critical intermodal facilities including Charleston International Airport, the Norfolk Southern 7-Mile Yard, and North Charleston Container Terminal. Some carry higher total traffic/truck traffic than Tier 1 and 2 routes, potentially indicating a need to pay special attention to last-mile connectors. Most are also located in existing or future planned industrial land use areas. Key findings for Tier 3 routes are:

- Ashley Phosphate Road had 326 CMV-involved crashes from 2015-2019, far more than any other Tier 3 route and more than most Tier 1 and 2 routes; although none of these crashes were severe, the route may bear monitoring in the future given the volume of traffic it carries. There is also a grade crossing safety hotspot on Ashley Phosphate (FRA grade crossing ID 631974A). Other Tier 3 routes with potential freight safety concerns are Palmetto Commerce Parkway, Clements Ferry Road, SC 462, Rhett Avenue (connects to North Charleston Container Terminal), and Cainhoy Road.

- Clements Ferry Road and Ashley Phosphate Road are also severely congested in both the current and future years. Montague Avenue, SC 642, and SC 7 have truck bottlenecks and are expected to have failing LOS by 2040. Many have severe congestion (e.g., Ashley Phosphate Road, Clements Ferry Road), and/or pavement in poor condition (e.g., N. Rhett Avenue accessing the North Charleston Terminal). Of the 37 identified Tier 3 routes, 20 are expected to have failing LOS by 2040.

- There are no bridges in poor condition on Tier 3 roads, but most of them have at least some segments with poor pavement quality, including many with significant truck traffic like Ashley Phosphate Road, Clements Ferry Road, Rhett Avenue, and Palmetto Commerce Parkway. Absent pavement rehabilitation, conditions on such routes will continue to deteriorate.

Table 5-1: Summary of Safety, Congestion, and Infrastructure Conditions on the Regional Freight Network

Tier	Road Name	Mileage	Max AADT (2015)1	Max AADTT (2015)1	Intermodal Facilities Served	CMV Crashes (2015-2019)[2]	CMV Crash Rate (per 100 mil VMT)	Severe CMV Crashes (2015-2019)[2]	Ratio of Severe to All CMV Crashes	Max Freight Bottleneck Score[3]	Max LOS (2015)[1]	Max LOS (2040)[1]	Percent Roadways with Poor PQI[4]	# of Poor Condition Bridges[5]
1	Banco Road	0.38	33,676	8,583		21		0	0.00%	N/A	D	E	0.00%	
1	Chuck Dawley Blvd.	0.07	19,200	1,121		1		0	0.00%	N/A	B	F	N/A	
1	East Bay Street	1.96	15,388	598	Columbus Street/Union Pier Terminals, Navy Base Intermodal Facility	33		0	0.00%	9	B	E	0.00%	
1	I-26	111.65	68,923	8,685		1,143		24	2.10%	10	F	F	0.00%	1
1	I-526	24.17	46,880	11,629	Wando Welch Container Terminal	381		2	0.52%	10	F	F	0.00%	
1	I-95	18.82	20,000	6,000		162		2	1.23%	2	C	E	0.00%	
1	International Blvd.	0.86	36,278	2,671	Charleston International Airport	10		0	0.00%	N/A	E	F	N/A	
1	Long Point Road	0.90	31,943	12,844	Wando Welch Container Terminal	45		1	2.22%	N/A	D	F	0.00%	
1	Meeting Street	0.36	2,914	2,125	CSX Ashley Junction	12		0	0.00%	N/A	A	A	N/A	
1	Montague Avenue	0.54	36,015	5,552	Norfolk Southern 7-Mile Yard, CSX Ashley Junction	35		0	0.00%	9	D	F	100.00%	
1	Morrison Drive	1.55	16,540	2,115	Columbus Street Terminal	27		0	0.00%	8	B	E	0.00%	

Tier	Road Name	Mileage	Max AADT (2015)1	Max AADTT (2015)1	Intermodal Facilities Served	CMV Crashes (2015-2019)[2]	CMV Crash Rate (per 100 mil VMT)	Severe CMV Crashes (2015-2019)[2]	Ratio of Severe to All CMV Crashes	Max Freight Bottleneck Score[3]	Max LOS (2015)[1]	Max LOS (2040)[1]	Percent Roadways with Poor PQI[4]	# of Poor Condition Bridges[5]
1	Mount Pleasant Street	0.14	10,838	1,135		21		0	0.00%	N/A	A	C	100.00%	
1	Port Access Road	1.73	N/A	N/A		0		0	N/A	N/A	N/A	N/A	N/A	
1	RAMP I-26/I-526	5.48	28,080	4,384		147		1	0.68%	N/A	F	F	N/A	
1	RAMP to I-526 from US-17	0.47	11,487	1,687		10		0	0.00%	9	B	D	100.00%	
1	Remount Road	3.52	26,774	10,073	North Charleston Terminal	100		2	2.00%	N/A	C	F	66.37%	
1	Septima Clark Pkwy.	0.19	32,775	2,007		4		0	0.00%	N/A	D	F	N/A	
1	US-78	0.04	34,940	4,059		8		0	0.00%	N/A	D	F	N/A	
2	Arthur Ravenel Bridge / US-17	3.76	41,938	2,733		41		2	4.88%	10	C	E	0.00%	
2	Ben Sawyer Blvd.	3.25	19,867	1,424		21		0	0.00%	9	F	F	81.68%	
2	Bohicket Road	12.37	21,454	1,112		45		2	4.44%	N/A	E	D	17.00%	
2	Carner Avenue	0.98	3,771	829		1		1	100.00%	8	A	B	N/A	
2	Coleman Blvd.	2.74	25,883	1,742		30		0	0.00%	9	C	F	79.59%	
2	Folly Road	11.16	54,441	5,294		58		0	0.00%	10	F	F	2.33%	
2	Goose Creek/NAD Road	1.85	23,373	3,185		17		0	0.00%	N/A	B	F	0.00%	
2	Isle of Palms Connector / SC-517	4.57	19,145	1,006		12		0	0.00%	10	B	C	0.00%	

Tier	Road Name	Mileage	Max AADT (2015)1	Max AADTT (2015)1	Intermodal Facilities Served	CMV Crashes (2015-2019)[2]	CMV Crash Rate (per 100 mil VMT)	Severe CMV Crashes (2015-2019)[2]	Ratio of Severe to All CMV Crashes	Max Freight Bottleneck Score[3]	Max LOS (2015)[1]	Max LOS (2040)[1]	Percent Roadways with Poor PQI[4]	# of Poor Condition Bridges[5]
2	James Island Expressway / SC-30	2.71	27,888	1,752		2		0	0.00%	10	D	F	13.97%	
2	Jasper Blvd.	1.99	6,148	176		0		0	N/A	8	A	A	74.54%	
2	Maybank Highway	8.52	31,280	2,699		47		1	2.13%	N/A	F	F	0.00%	
2	Meeting Street	4.71	28,512	4,433		61		1	1.64%	10	D	F	93.85%	
2	Old Folly Road	0.12	789	40		0		0	N/A	N/A	A	A	N/A	
2	Old Town Road	2.23	22,903	2,232		11		0	0.00%	9	F	F	91.96%	
2	Palm Blvd.	1.98	6,148	176		2		0	0.00%	5	A	A	100.00%	
2	RAMP to US-17	1.79	29,331	1,906		10		2	20.00%	9	F	F	8.42%	
2	Red Bank Road	7.94	28,412	3,867		59		1	1.69%	9	D	F	53.45%	
2	Rivers Avenue	11.95	34,650	3,297	Norfolk Southern 7-Mile Yard, CSX Ashley Junction	254		3	1.18%	10	E	F	19.89%	
2	Sam Rittenberg Blvd.	2.18	48,358	4,769		18		1	5.56%	10	E	F	0.00%	
2	SC-174	24.15	5,055	336		25		0	0.00%	N/A	A	A	9.50%	3
2	SC-402	18.72	9,499	441		40		0	0.00%	N/A	A	D	79.76%	
2	SC-41	20.58	29,278	1,897		68		1	1.47%	N/A	F	F	0.00%	
2	SC-45	40.57	6,769	374		8		0	0.00%	N/A	A	A	42.06%	
2	SC-6	29.08	9,842	701		21		0	0.00%	N/A	B	F	5.62%	
2	SC-61	37.26	39,010	2,817		103		1	0.97%	10	F	F	32.10%	
2	SC-7	0.17	29,042	3,421		4		0	0.00%	N/A	B	F	0.00%	
2	Septima Clark Pkwy.	1.01	56,965	3,808		29		0	0.00%	9	E	F	0.00%	
2	US-17	58.33	73,995	5,120		280		3	1.07%	10	F	F	25.48%	1

Tier	Road Name	Mileage	Max AADT (2015)1	Max AADTT (2015)1	Intermodal Facilities Served	CMV Crashes (2015-2019)[2]	CMV Crash Rate (per 100 mil VMT)	Severe CMV Crashes (2015-2019)[2]	Ratio of Severe to All CMV Crashes	Max Freight Bottleneck Score[3]	Max LOS (2015)[1]	Max LOS (2040)[1]	Percent Roadways with Poor PQI[4]	# of Poor Condition Bridges[5]
2	US-17 / Savannah Highway	34.15	52,977	6,999		331		9	2.72%	10	F	F	87.16%	
2	US-176	30.86	33,096	2,727		144		6	4.17%	N/A	C	F	75.11%	
2	US-178	20.93	6,064	404		37		0	0.00%	N/A	B	C	62.36%	
2	US-17A	61.22	54,247	7,643		358		11	3.07%	10	E	F	4.12%	
2	US-52	46.70	26,085	2,984		159		2	1.26%	9	D	F	43.37%	1
2	US-78	53.94	40,551	4,440		308		7	2.27%	10	F	F	27.55%	1
2	Wesley Drive	0.23	40,160	4,207		16		0	0.00%	N/A	E	E	100.00%	
3	Albemarle Road	0.10	509	21		0		0	N/A	N/A	A	A	N/A	
3	Ashley Crossing	0.88	1,799	16		4		0	0.00%	N/A	A	A	0.00%	
3	Ashley Phosphate Road	5.18	75,908	11,782		299		0	0.00%	N/A	F	F	78.76%	
3	Autonomous Road	3.57	N/A	N/A		0		0	N/A	N/A	N/A	N/A	N/A	
3	Aviation Avenue	0.81	15,363	2,085	Charleston International Airport	31		0	0.00%	N/A	B	E	0.00%	
3	Azalea Drive	3.53	9,880	4,099		42		1	2.38%	N/A	B	F	100.00%	
3	Bainbridge Avenue	0.62	2,574	504		1		0	0.00%	N/A	A	A	N/A	
3	Bees Ferry Road	5.39	25,967	1,440		14		0	0.00%	N/A	C	F	0.00%	
3	Brigade Street	0.07	1,152	205		1		0	0.00%	N/A	A	A	N/A	
3	Broad Street	1.17	9,140	127		10		0	0.00%	N/A	C	F	100.00%	
3	Burton Lane	0.34	1,468	258		4		1	25.00%	N/A	A	A	0.00%	
3	Bushy Park Road	8.82	3,245	1,676		3		0	0.00%	N/A	A	E	100.00%	
3	Cainhoy Road	16.12	7,777	1,662		24		2	8.33%	N/A	B	B	94.74%	

Tier	Road Name	Mileage	Max AADT (2015)1	Max AADTT (2015)1	Intermodal Facilities Served	CMV Crashes (2015-2019)[2]	CMV Crash Rate (per 100 mil VMT)	Severe CMV Crashes (2015-2019)[2]	Ratio of Severe to All CMV Crashes	Max Freight Bottleneck Score[3]	Max LOS (2015)[1]	Max LOS (2040)[1]	Percent Roadways with Poor PQI[4]	# of Poor Condition Bridges[5]
3	Calhoun Street	1.55	37,286	2,534		43		0	0.00%	10	F	F	33.33%	
3	Centre Pointe Drive	0.84	7,857	848		8		0	0.00%	N/A	A	B	N/A	
3	Chuck Dawley Blvd.	1.34	17,296	1,082		12		0	0.00%	N/A	B	D	0.00%	
3	Clements Ferry Road	9.96	32,670	12,177		72		2	2.78%	N/A	F	F	45.61%	
3	College Park Road	1.23	44,195	4,441		67		0	0.00%	N/A	F	F	100.00%	
3	Columbus Street	0.63	3,157	141		7		1	14.29%	N/A	A	B	100.00%	
3	Cooper Store Road	9.47	1,254	20		10		1	10.00%	N/A	A	A	0.00%	
3	Cosgrove Avenue	1.37	18,067	1,874		35		2	5.71%	9	B	E	27.04%	
3	Courtenay Drive	0.50	9,558	773		16		0	0.00%	N/A	C	F	100.00%	
3	Cross County Road	2.58	15,086	2,380		30		1	3.33%	N/A	C	E	100.00%	
3	Cypress Campground Road	8.78	1,792	258		12		1	8.33%	N/A	A	E	47.20%	
3	Cypress Gardens Road	9.94	7,003	849		26		0	0.00%	N/A	A	F	24.04%	
3	Delemar Highway	4.19	5,623	144		7		0	0.00%	N/A	B	F	0.00%	
3	Dorchester Road	22.83	45,798	4,271		221		2	0.90%	10	F	F	13.75%	
3	Drop Off Drive	2.76	2,498	769		38		2	5.26%	N/A	A	A	0.00%	
3	E.Church Street	4.42	1,194	93		2		0	0.00%	N/A	A	A	N/A	

Tier	Road Name	Mileage	Max AADT (2015)1	Max AADTT (2015)1	Intermodal Facilities Served	CMV Crashes (2015-2019)[2]	CMV Crash Rate (per 100 mil VMT)	Severe CMV Crashes (2015-2019)[2]	Ratio of Severe to All CMV Crashes	Max Freight Bottleneck Score[3]	Max LOS (2015)[1]	Max LOS (2040)[1]	Percent Roadways with Poor PQI[4]	# of Poor Condition Bridges[5]
3	Farmington Road	2.50	5,890	2,956		61		4	6.56%	N/A	B	C	0.00%	
3	Fielding Connector	0.61	20,154	550		3		0	0.00%	8	B	D	0.00%	
3	Fishburne Street	0.31	3,803	46		0		0	N/A	N/A	A	C	100.00%	
3	Givhans Road	7.43	10,115	121		8		0	0.00%	N/A	B	F	0.60%	
3	Glenn McConnell Pkwy.	15.11	19,250	1,229		13		0	0.00%	N/A	C	F	20.24%	
3	Hagood Avenue	0.41	3,566	16		2		0	0.00%	N/A	A	A	100.00%	
3	Heriot Street	0.24	2,337	138		2		0	0.00%	N/A	A	B	0.00%	
3	Hobson Avenue	1.94	3,221	850		3		0	0.00%	N/A	A	A	N/A	
3	Huger Street	0.62	4,195	154		3		0	0.00%	N/A	A	C	100.00%	
3	Hungry Neck Blvd.	2.60	13,732	775		17		0	0.00%	N/A	B	F	N/A	
3	International Blvd.	2.08	24,769	3,108	Charleston International Airport	29		0	0.00%	N/A	C	D	N/A	
3	James Island Expressway / SC-30	0.54	25,705	1,825		2		0	0.00%	9	F	F	10.04%	
3	Jedburg Road	9.10	20,786	6,034		58		3	5.17%	N/A	F	F	0.00%	2
3	King Street	3.72	13,986	408		56		1	1.79%	10	F	F	46.33%	
3	King Street Extn.	2.98	5,001	755		29		1	3.45%	N/A	B	F	N/A	
3	Ladson Road	5.57	39,131	5,987		83		1	1.20%	N/A	E	F	0.00%	
3	Leeds Avenue	1.36	14,094	1,765		20		0	0.00%	N/A	B	C	0.00%	
3	Lockwood Drive	1.62	14,783	305		8		0	0.00%	10	B	F	25.95%	

Tier	Road Name	Mileage	Max AADT (2015)1	Max AADTT (2015)1	Intermodal Facilities Served	CMV Crashes (2015-2019)[2]	CMV Crash Rate (per 100 mil VMT)	Severe CMV Crashes (2015-2019)[2]	Ratio of Severe to All CMV Crashes	Max Freight Bottleneck Score[3]	Max LOS (2015)[1]	Max LOS (2040)[1]	Percent Roadways with Poor PQI[4]	# of Poor Condition Bridges[5]
3	Long Point Road	1.22	25,277	7,136		26		0	0.00%	N/A	D	F	0.00%	
3	Main Road	8.31	17,571	2,024		98		0	0.00%	N/A	E	F	51.02%	
3	Mallard Road	1.40	7,707	509		8		0	0.00%	N/A	C	C	77.80%	
3	Maybank Highway	0.39	5,574	90		3		0	0.00%	N/A	B	B	0.00%	
3	McMillan Avenue	0.29	3,699	318		2		0	0.00%	N/A	A	A	N/A	
3	Meeting Street	5.14	27,203	1,542	CSX Ashley Junction	49		0	0.00%	N/A	E	F	79.19%	
3	Michaux Pkwy.	1.16	17,827	790	Charleston International Airport	7		0	0.00%	N/A	E	F	N/A	
3	Montague Avenue	0.83	27,825	4,004	Norfolk Southern 7-Mile Yard, CSX Ashley Junction	24		0	0.00%	9	C	E	100.00%	
3	N.Maple Street	2.14	2,215	933		4		0	0.00%	N/A	A	C	100.00%	
3	N.Rhett Avenue	6.66	36,042	8,291	North Charleston Terminal	125		2	1.60%	N/A	F	F	46.73%	
3	Noisette Blvd.	1.31	2,142	265		11		0	0.00%	N/A	A	B	N/A	
3	Old Dairy Road	3.78	8,989	5,613		17		0	0.00%	N/A	B	B	100.00%	
3	Old Orangeburg Road	2.60	3,668	219		8		0	0.00%	N/A	A	A	37.12%	
3	Old Whitesville Road	3.95	3,307	57		4		0	0.00%	N/A	A	B	100.00%	
3	Palmetto Commerce Pkwy.	13.27	9,224	2,329	Charleston International Airport	53		4	7.55%	N/A	C	F	N/A	

Tier	Road Name	Mileage	Max AADT (2015)1	Max AADTT (2015)1	Intermodal Facilities Served	CMV Crashes (2015-2019)[2]	CMV Crash Rate (per 100 mil VMT)	Severe CMV Crashes (2015-2019)[2]	Ratio of Severe to All CMV Crashes	Max Freight Bottleneck Score[3]	Max LOS (2015)[1]	Max LOS (2040)[1]	Percent Roadways with Poor PQI[4]	# of Poor Condition Bridges[5]
3	Paul Cantrell Blvd.	1.45	26,114	1,670		15		0	0.00%	9	D	F	0.00%	
3	Pomflant Access Road	1.36	103	103		1		0	0.00%	N/A	A	A	N/A	
3	Red Bay Road	3.67	3,551	2,623		7		0	0.00%	N/A	B	A	N/A	
3	Reflectance Drive	0.69	1,949	247		9		0	0.00%	N/A	A	B	100.00%	
3	Remount Road	0.86	18,091	2,433	Charleston International Airport	39		0	0.00%	N/A	B	E	100.00%	
3	Reynolds Avenue	0.81	3,302	633		5		0	0.00%	N/A	A	A	100.00%	
3	Ridgeville Road	3.73	17,620	1,234		29		0	0.00%	N/A	D	F	92.26%	
3	Rivers Avenue	0.54	2,886	294		8		1	12.50%	N/A	A	B	0.00%	
3	Royle Road	1.00	6,187	347		10		1	10.00%	N/A	B	F	0.00%	
3	Sam Rittenberg Blvd.	3.87	30,535	3,856		39		0	0.00%	N/A	D	F	52.36%	
3	Sandlapper Pkwy. Extn.	2.14	N/A	N/A		0		0	N/A	N/A	N/A	N/A	N/A	
3	SC-165	7.25	6,263	192		24		3	12.50%	N/A	B	F	89.19%	
3	SC-27	11.98	14,502	264		15		1	6.67%	N/A	C	B	0.00%	
3	SC-311	11.04	5,259	201		2		0	0.00%	N/A	A	B	29.15%	
3	SC-453	1.43	3,901	288		3		0	0.00%	N/A	A	B	0.00%	
3	SC-61	0.49	7,184	159		13		0	0.00%	N/A	B	A	0.00%	
3	SC-7	0.31	36,762	4,781		34		1	2.94%	8	C	F	0.00%	
3	Steed Creek Road	14.26	3,074	88		3		0	0.00%	N/A	A	A	0.00%	
3	Stromboli Avenue	0.78	263	154		1		0	0.00%	N/A	A	A	0.00%	
3	US-17	0.38	4,389	122		17		1	5.88%	N/A	B	F	N/A	
3	US-52 Bypass	2.47	9,110	740		4		0	0.00%	N/A	B	F	100.00%	

Tier	Road Name	Mileage	Max AADT (2015)1	Max AADTT (2015)1	Intermodal Facilities Served	CMV Crashes (2015-2019)[2]	CMV Crash Rate (per 100 mil VMT)	Severe CMV Crashes (2015-2019)[2]	Ratio of Severe to All CMV Crashes	Max Freight Bottleneck Score[3]	Max LOS (2015)[1]	Max LOS (2040)[1]	Percent Roadways with Poor PQI[4]	# of Poor Condition Bridges[5]
3	Virginia Avenue	2.13	4,898	2,834		20		0	0.00%	N/A	A	D	100.00%	
3	Volvo Car Drive	5.94	N/A	N/A	Volvo Camp Hall	0		0	N/A	N/A	N/A	N/A	N/A	
3	Von Ohnsen Road	0.94	4,098	255		10		1	10.00%	N/A	A	D	100.00%	
3	W.Montague Avenue	1.98	22,898	2,601		36		0	0.00%	9	C	E	68.55%	
3	Wappoo Road	1.33	7,750	488		14		0	0.00%	N/A	B	C	0.00%	
3	Weber Drive	1.00	4,908	1,439		1		0	0.00%	N/A	A	F	N/A	
3	Wesley Drive	0.12	21,361	2,440		21		0	0.00%	N/A	C	E	100.00%	
3	Wright Road	3.53	N/A	N/A		0		0	N/A	N/A	N/A	N/A	N/A	

Data Sources:

1 CHATS/SCDOT Travel Demand Model (2015)
2 SC Department of Public Safety (2015-2019)
3 National Performance Management Research Data Set (March 2019-February 2020)
4 SCDOT Pavement Condition Database (2018)
5 SCDOT Bridge Database (2018)

N/A Data not available

6. CONCLUSIONS

Developing a regional freight network is the first step in completing the BCD Regional Freight Mobility Plan. The network assessment provides baseline regional freight conditions which can be used to identify freight-related issues and needs. The freight operational analysis evaluates the network by three metrics: safety, freight congestion and infrastructure conditions. These three metrics analyze and monitor performance on the network and help identify freight needs and potential strategies to address them.

This network assessment will be used to conduct a land use analysis for the study. The freight network provides a starting point for the BCDCOG and its member governments to encourage freight related land use growth. Parcels and tracts of land surrounding the freight network are prime locations where freight related industry should be located and targeted to accommodate future freight growth. Identifying the freight network and potential corridors of freight development leads to an analysis of network performance to generate system needs.

Freight system needs and network gaps will be determined building on the analysis provided herein. **Table 5-1** in this memo summarizes the high-level freight performance of the network, categorized by safety, freight congestion, and bridge/pavement condition. Freight needs will then be compared to planned and programmed projects to understand where BCDCOG member projects are addressing freight needs, and where gaps may exist that constitute unmet needs. Such gaps will form the basis for prioritized program, policy, and project recommendations to achieve regional freight network performance goals and objectives.

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