



# Asheville Area Congestion Report

French Broad River MPO

11/2/21

# Introduction

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The Asheville Metropolitan Area has continued to see population and employment growth over the last several decades and as the area's urban footprint has grown, so have the number of congestion events that have slowed down commuters and freight along the region's major roadway corridors.

As a follow-up to the Congestion Management Process (CMP), adopted by the French Broad River MPO, this report looks at different metrics to help identify and monitor congestion in the region. This report takes advantage of new datasets that have become available to the MPO, including travel time reliability data as well as data relating to risk to travelers walking or on bike.

## Major Takeaways

- 1. Resiliency and Congestion Relief Have Common Interests** Based on the Bottleneck Analysis, some of the region's biggest bottlenecks were on I-40 in the Pigeon River Gorge, caused by landslides from major storms, not recurring peak-hour traffic-jams.
- 2. AM Delay is Minimal, PM Delay is Substantial** With both measures of delay- Travel Time Index and Planning Time Index- roadways across the region are significantly more likely to experience delay in the afternoon "rush" (4-6PM) than in the morning "rush" (7-9AM.) Many of the roadways studied for this report had faster traffic flows in the morning rush than they did on average throughout the day.
- 3. Construction projects contributed to many of the routes suffering the largest increase in delay.** Section of I-26 that began construction, work that was done on the Jeff Bowen Bridge, and work on NC 191 as part of I-5504 (NC 191 Interchange) overlapped with areas that saw the greatest increase in travel times between 2018 and 2019.

- 4. There is still a lot of potential for multimodal improvements.** One of the routes recommended in the CMP for multimodal improvements (Charlotte Street) had a road diet implemented in 2020, but many areas that have more opportunities for mode-shift are still seen as having more risk, based on NCDOT's bike/ped risk analysis, including Merrimon Avenue, Weaver Boulevard, and Biltmore Avenue.
- 5. Recurring congestion appears to be less of an issue than non-recurring congestion in the region.** Travel-time reliability data indicates few routes that have severe daily congestion, but several major routes that have severe congestion events on a "non-recurring" basis. These events may be caused by crashes, construction, weather events, etc., but our region's travel patterns are also known to fluctuate significantly based on the day of the week. Many parts of the region see significantly more congestion on Friday afternoons than other parts of the week and some places are even most likely to see congestion peak during the weekends.
- 6. The construction projects to address congestion are causing congestion.** This isn't an unforeseen event-construction projects often require changes in lane configuration and require detours and slow-downs, but it is worth noting that the region has made significant investments in roadway capacity and those projects are causing short-term congestion events.

Generally, this report serves as a snapshot on the congestion and related issues in the region through 2019. This includes impacts to vehicular and freight users in the region but also people who travel by bicycle, walking, and by utilizing transit. Our region continues to grow, transportation impacts are frequently cited as a growing pain, this report may help decision-makers stay informed on the state of congestion in the region and will be updated regularly.

# Overall State of the System

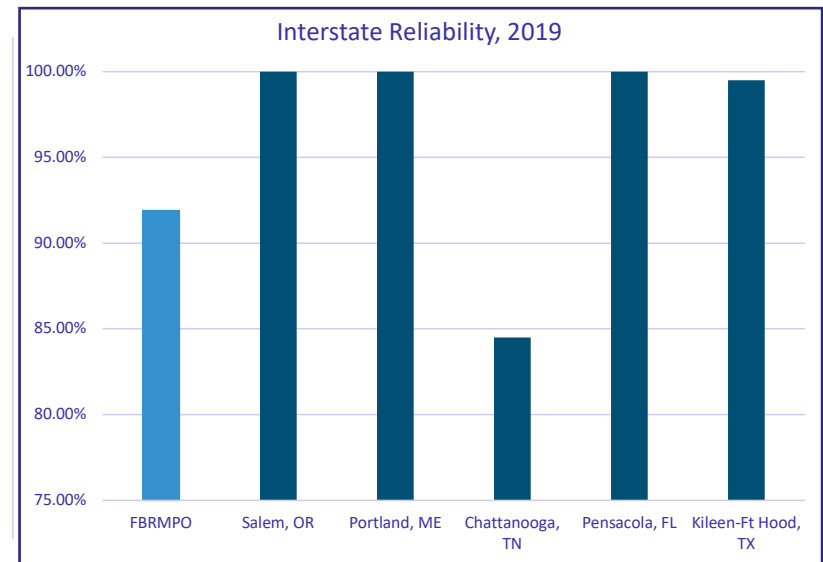
To help provide a picture of the system's reliability, the French Broad River MPO (FBRMPO) region was compared to five other similar-sized MPOs, including Salem, Oregon; Portland, Maine; Chattanooga, Tennessee; Pensacola, Florida; and Kileen-Fort Hood, Texas. Obviously, there are distinctions between each of these metropolitan areas that make a direct comparison inadvisable, but given the similar size in population there is room for comparison between the metropolitan areas.

## Interstate Reliability

In 2019, the French Broad River MPO's Interstate Reliability was below that of its comparable MPOs, with a rate of 91.9% reliable. This was considerably above Chattanooga, Tennessee, which was 84.5% reliable, but below the other four metro areas in comparison, which all scored at or near 100% reliable.

To note: this metric goes by designated Interstates in the region, so some freeway sections were not considered as part of this, including the section of Future I-26 north of Asheville and US 23/74 in Haywood County.

Also of note, the region's Interstate Reliability has steadily eroded since 2017 with 96.5% reliability, 95.4% reliability in 2018, and 91.9% in 2019.

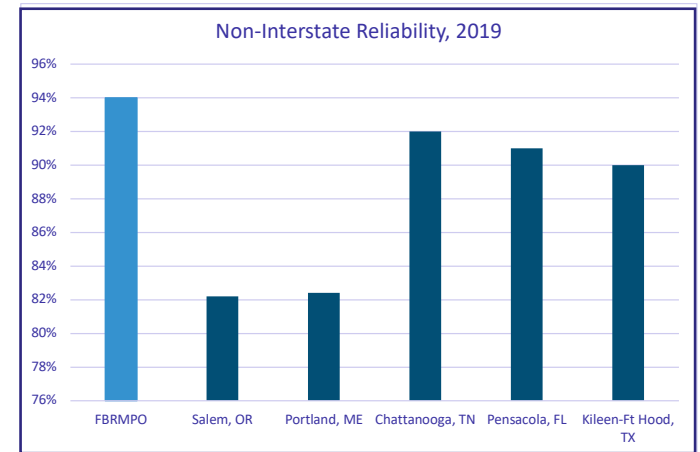




## Non-Interstate Reliability

For the non-interstate part of the region’s roadway network, the region does quite well with greater reliability than its peer regions at 94% reliable. Portland, Maine and Salem, Oregon, especially, scored well below the other regions in this metric.

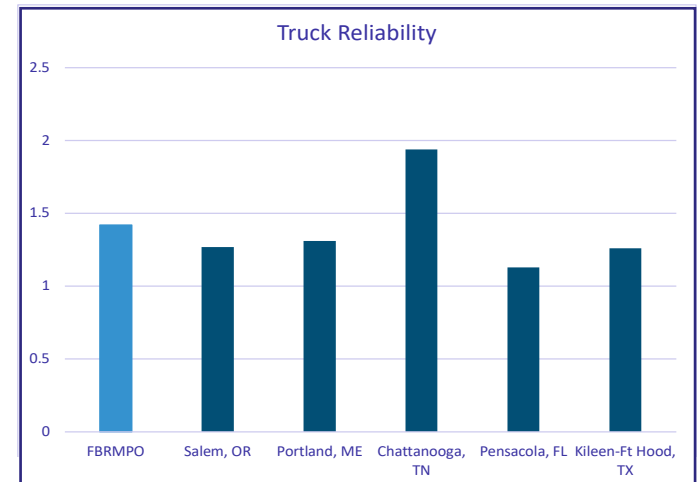
Of note with non-interstate reliability is that it does not encompass all of the non-interstate routes, but mostly freeway segments (Future I-26, US 25 in Henderson County from I-26 to SC, and US 23/74) and other major US routes (US 25 in much of Asheville, parts of US 74A, parts of US 19 in Haywood County, and parts of US 64 in Henderson County.)



## Truck Reliability

The truck reliability metric works a little differently in that the closer to “one,” the more reliable the system. The FBRMPO region had the second lowest truck reliability score out of the six peer metros, but was much closer to the four more reliable systems than to Chattanooga, Tennessee.

For the metric, travel-time information was taken from truck sources, as opposed to passenger vehicles, and data was collected over the interstate segments of I-26, I-40, and I-240.



# Top Bottlenecks in the Region in 2019

A data tool available via RITIS provides an analysis on “bottlenecks” or sources of congestion that cause significant backups. The analysis was run for the entire year with a ranking provided based on the number of vehicles impacted, the length of delay, and the number of congestion events originating from the same “bottleneck.” Notes are not intended to “write-off” congestion events but notes potentially contributing factors.

Route	Location	# of Events	Average Daily Duration	Notes
I-26 WB	Exit 33 (NC 191)	355	1 hour, 33 minutes	Significant construction on I-5504
I-40 WB	Exit 7 (Harmon Den)	71	37 minutes	Rockslides from major precipitation events
I-26 EB	Exit 37 (NC 146)	166	32 minutes	Significant construction on I-4700
Future I-26 WB	I-240/Patton Avenue	7	7 hours, 30 minutes	Major bridge repairs on the Jeff Bowen Bridge during 2019
I-40	Exit 7 (Harmon Den)	29	43 minutes	Rockslides from major precipitation events nearby
I-26 WB	Exit 37 (NC 146)	206	39 minutes	Significant construction on I-4700
I-26 EB	Exit 40 (NC 280)	192	40 minutes	Significant construction on I-4700/I-4400
US 19 (Patton Avenue) SB	NC 63 (New Leicester Highway)	30	1 hour, 35 minutes	Intersection Improvements
I-26 EB	Exit 33 (NC 191)	66	1 hour, 4 minutes	Significant construction on I-5504
I-40 WB	NC/TN Line	73	12 minutes	Rockslides from major precipitation events nearby

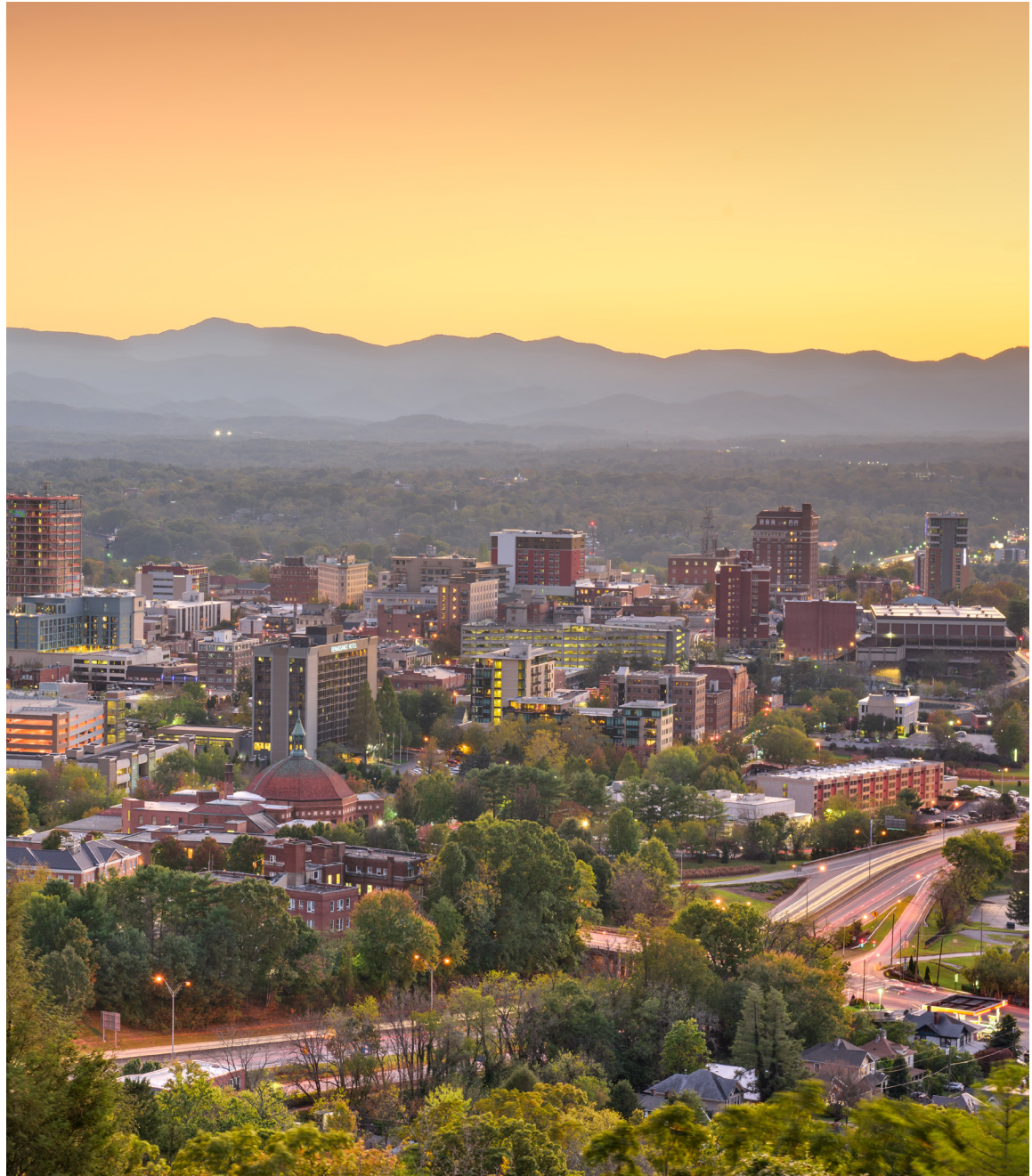
# Evaluating Delay

For this report, the MPO primarily looks at two different metrics: Travel Time Index and Planning Time Index. These metrics are used throughout the country and in other parts of the world to determine travel-time reliability and better measure the impact of congestion on roadway users. These measures generally take on different aspects of how users experience congestion.

Per the Bureau of Transportation Statistics<sup>1</sup>, **Travel Time Index (TTI)** is the ratio of the travel time during the peak period to the time required to make the same trip at free-flow speeds. A value of 1.3, for example, indicates a 20-minute free-flow trip requires 26 minutes during the peak period. Generally, this metric helps to identify areas with more recurring congestion, i.e. areas where daily congestion events are expected during the defined time period.

The **Planning Time Index (PTI)** is the ratio of travel time on the worst day of the month (the 95th percentile travel time) compared to the time required to make the same trip at free-flow speeds. A PTI of 1.60 indicates a 20-minute free-flow trip takes more than 32 minutes only one day per month<sup>2</sup>. Generally, this metric helps to identify areas where non-recurring congestion may be occurring more frequently and/or may be more severe.

For this report, TTI and PTI were collected for roadway segments identified in the MPO's Congestion Management Process for AM (7-9AM) and PM (4-6PM) peaks. The below maps illustrate the data by roadway segment in the region for each peak period identified.



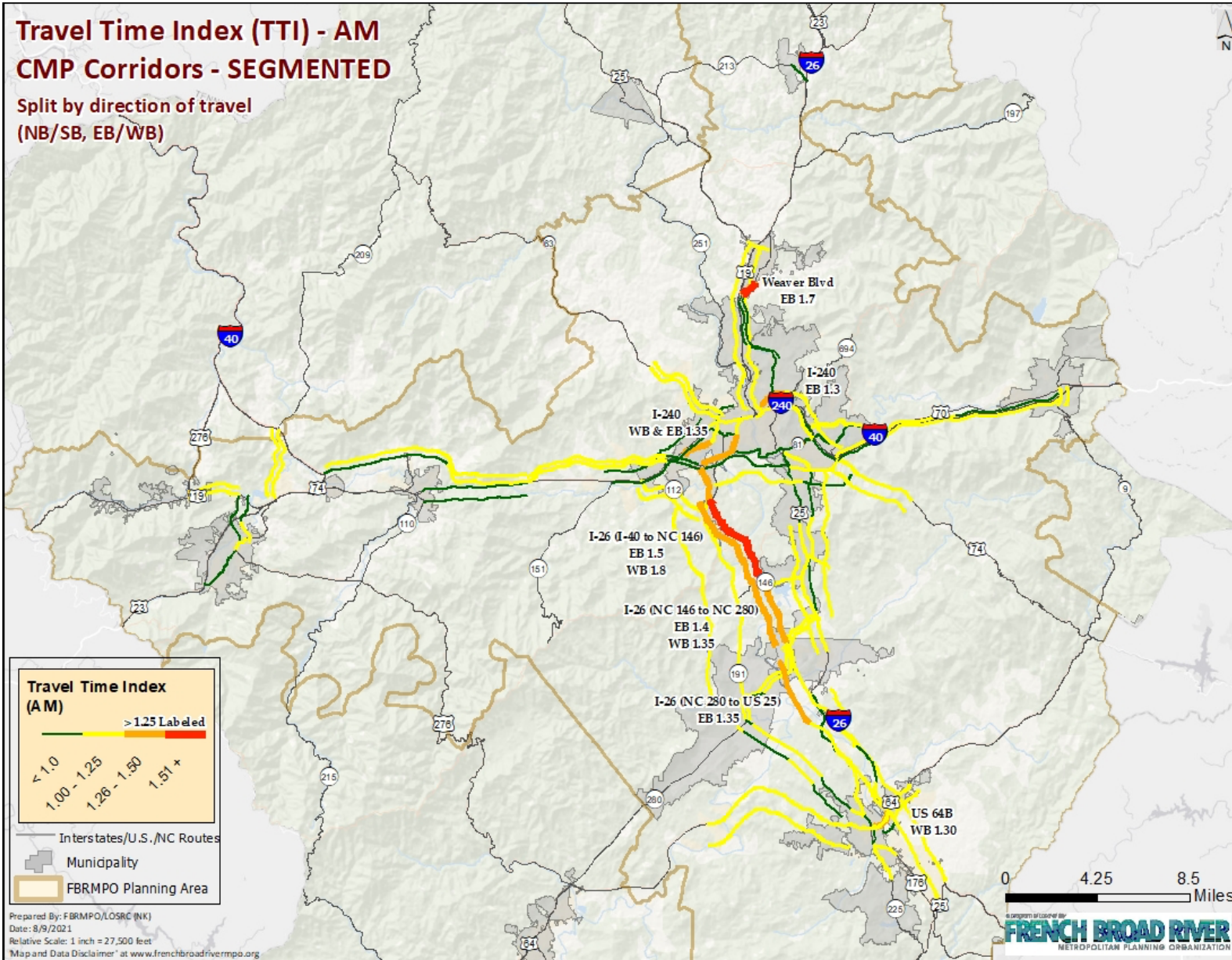
<sup>1</sup> <https://www.bts.gov/content/travel-time-index>

<sup>2</sup> [https://www.bts.gov/archive/publications/passenger\\_travel\\_2016/tables/fig3\\_3](https://www.bts.gov/archive/publications/passenger_travel_2016/tables/fig3_3)

## Travel-Time Index- AM Peaks

### Travel Time Index (TTI) - AM CMP Corridors - SEGMENTED

Split by direction of travel  
(NB/SB, EB/WB)



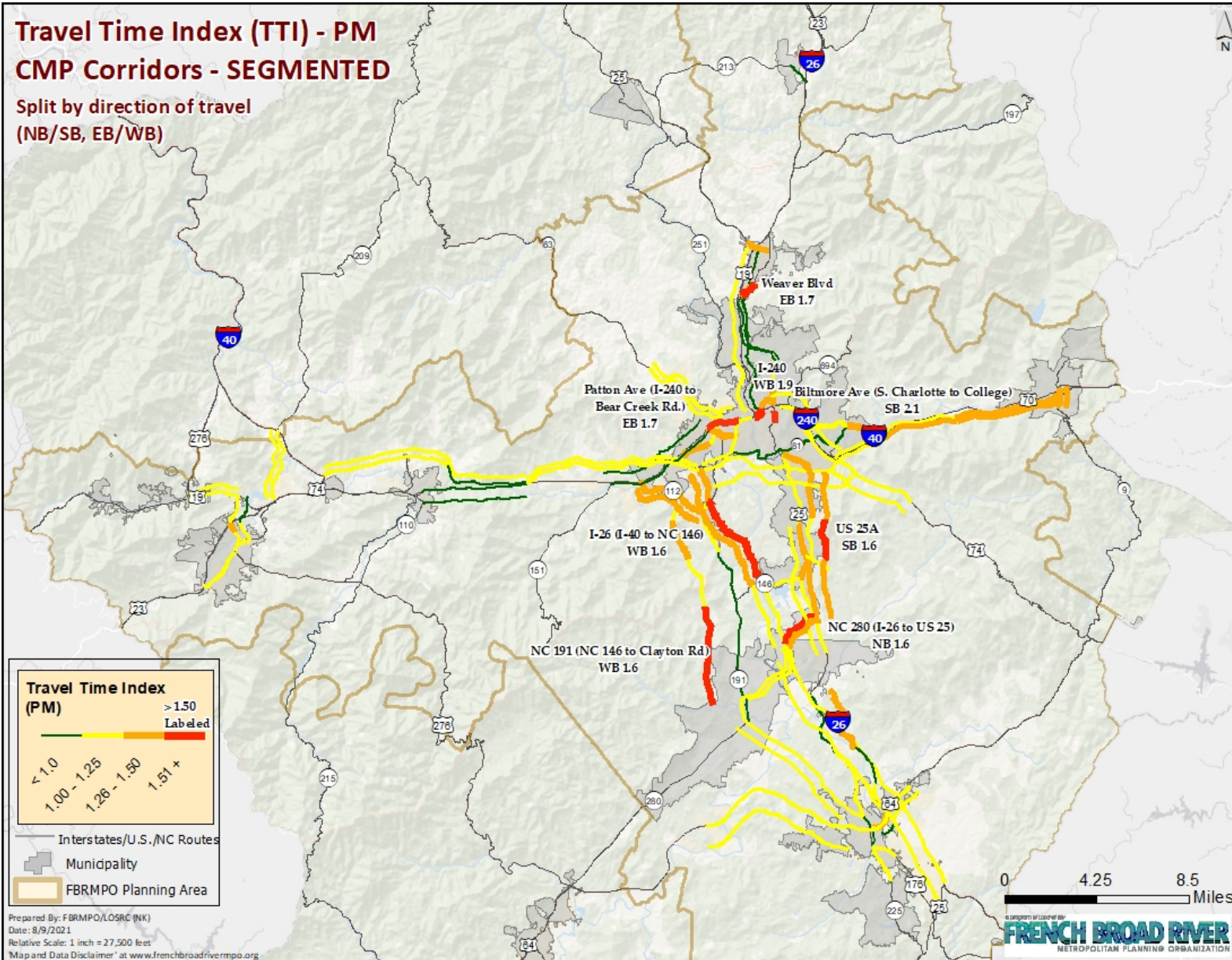
AM TRAVEL  
TIME INDEX

**3.6%**  
of studied  
roadway  
miles have  
a Travel  
Time  
Index over  
**1.5**

## Travel-Time Index- PM Peaks

### Travel Time Index (TTI) - PM CMP Corridors - SEGMENTED

Split by direction of travel  
(NB/SB, EB/WB)

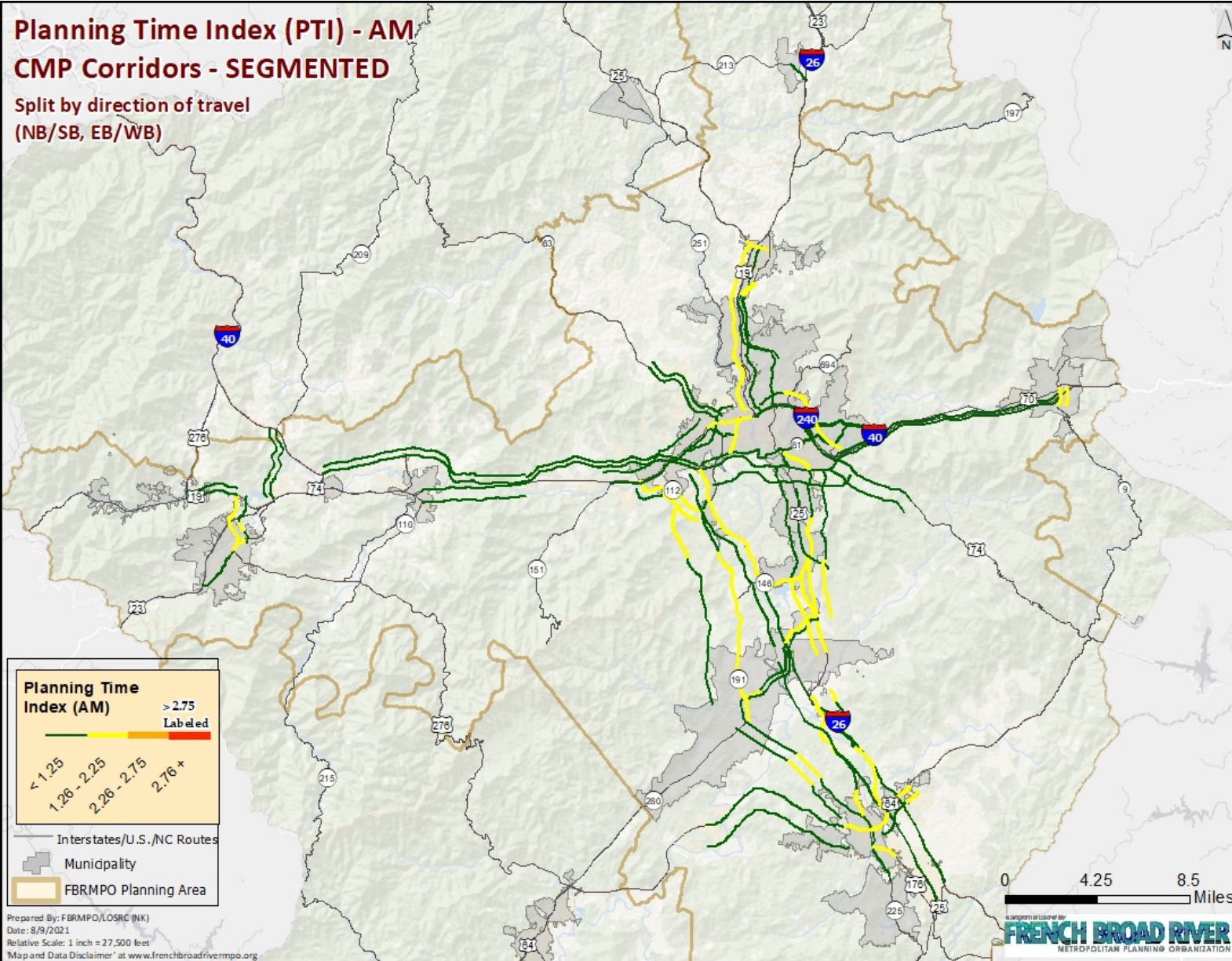


PM TRAVEL  
TIME INDEX

**10.8%**  
of studied  
roadway  
miles have  
a Travel  
Time  
Index over  
1.5



## Planning-Time Index- AM Peaks



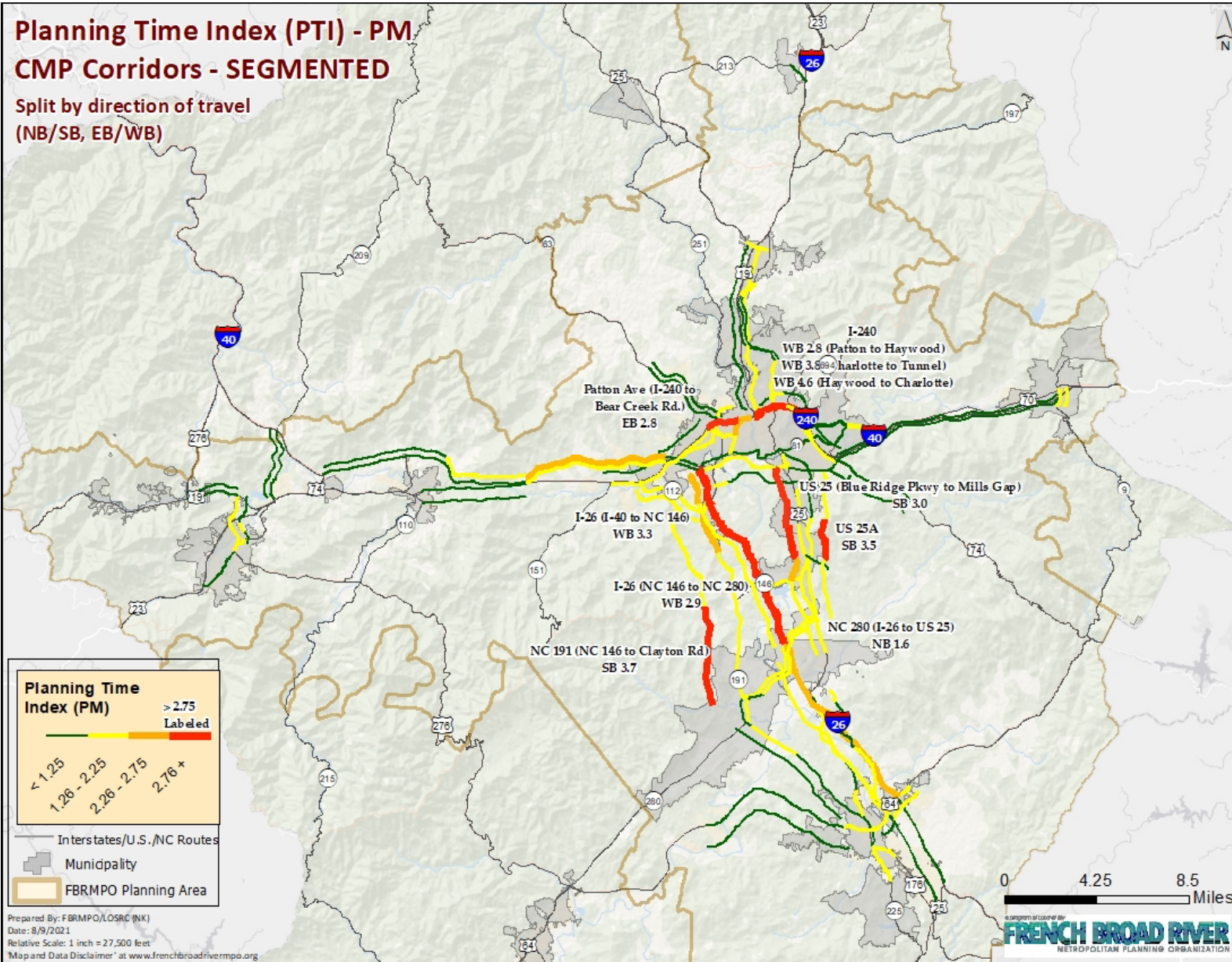
AM PLANNING  
TIME INDEX

**16.0%**  
of studied  
roadway  
miles have  
a Planning  
Time  
Index over  
**1.5**

## Planning-Time Index- PM Peaks

### Planning Time Index (PTI) - PM CMP Corridors - SEGMENTED

Split by direction of travel  
(NB/SB, EB/WB)



AM PLANNING  
TIME INDEX

**51.4%**  
of studied  
roadway  
miles have  
a Planning  
Time  
Index over  
1.5

# Bicycle, Pedestrian, and Transit

The 2018 CMP classifies “congested” roadways into different corridor types with Destination Corridors identified as major roadway corridors experiencing congestion that intersect areas that are relatively more conducive to bicycle and pedestrian travel. This identification is important for two different reasons: **1) IMPROVE SAFETY:** in areas where bicycle and pedestrian travel is more likely to occur, prioritizing speed and vehicular movements can lead to more safety concerns for people traveling by bike or walking; and **2) REDUCE CONGESTION:** enhancing bicycle and pedestrian accommodations along these corridors and inducing more trips by those modes may play a significant role in reducing congestion in those areas.

This section of the report helps to monitor Destination Corridors in terms of how these roads interact with bicycle and pedestrian modes. The corridors below are sorted based on a bicycle and pedestrian risk score developed by NCDOT as part of the Prioritization Process. The bicycle and pedestrian risk score is based on roadway accommodations as well as bicycle and pedestrian trip generators to develop an index based on projected use as well risk to each user. For this analysis, some CMP corridors are longer than the segments in the bicycle and pedestrian risk score so an average of overlapping segments has been applied.

Along with the bicycle and pedestrian risk score are recorded bicycle and pedestrian crashes within 50 feet of the identified corridor over a five-year period.



Facility	From	To	Bicycle Crashes (2015-2019)	Pedestrian Crashes (2015- 2019)	Bicycle and Pedestrian Risk Score (NCDOT)
Charlotte Street*	Chestnut Street	College Street	0.00	0.00	50.40
Weaver Boulevard	I-26	Main Street	0.00	1.00	50.30
Merrimon Avenue	I-240	Beaverdam Road	1.00	16.00	50.10
Biltmore Avenue	College Street	Biltmore Village	4.00	12.00	48.90
Tunnel/South Tunnel Road	Swannanoa River Road	Tunnel	4.00	15.00	46.90
Hendersonville Road	Lodge St	Blue Ridge Parkway	2.00	6.00	46.60
US 64	Blythe Street	King Street	0.00	2.00	46.20
NC 191	US 25B	Blythe Street	0.00	0.00	46.10
North Main Street	US 276/Pigeon	Walnut	0.00	0.00	46.00
Spartanburg Highway	Brooklyn Avenue	NC 225	3.00	4.00	44.50
South Main Street	Hyatt Creek	US 276	1.00	1.00	44.50
Swannanoa River Road	Biltmore Avenue	Tunnel Road	0.00	6.00	43.30
Amboy/Meadow Road	I-240	Biltmore Avenue	1.00	1.00	43.30
NC 225	Highland Lake Road	US 176	0.00	0.00	41.60
Elk Mountain Road	I-26	Riverside Drive	0.00	0.00	40.80
Sweeten Creek Road	I-40	US 25	0.00	2.00	39.90
Haywood Road	I-240	Patton Avenue	9.00	6.00	38.90
NC 213	Main Street	I-26	0.00	0.00	37.70
NC 110	Main Street	Henson Cove Road	2.00	3.00	35.80
US 25B	US 176	NC 191	1.00	6.00	31.30
Patton Avenue	Haywood	I-240	3.00	3.00	31.10

\*A Road Diet was implemented on a portion of Charlotte Street

## Transit

The CMP also identifies increasing transit use as a recommendation to help address congestion along destination corridors. For this analysis, annual ridership for fixed-route transit routes overlapping the identified corridors was calculated based on route-by-route ridership counts provided by local transit agencies. To note: considerations were made to calculate stop-by-stop ridership numbers, but congestion impacting each route could impact users along the entire route, regardless of whether their stop is along the corridor or not.

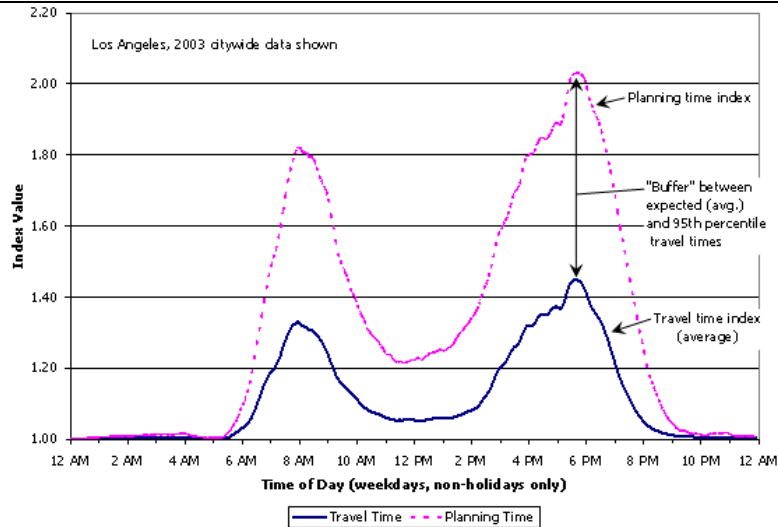
Also, not every destination corridor identified in the CMP is currently served by fixed-route transit. Those corridors have been noted in the table provided below.

Facility	From	To	Transit Riders (2019)
Haywood Road	I-240	Patton Avenue	361,588
Tunnel/South Tunnel Road	Swannanoa River Road	Tunnel	297,308
Biltmore Avenue	College Street	Biltmore Village	263,917
Swannanoa River Road	Biltmore Avenue	Tunnel Road	237,729
Patton Avenue	Haywood	I-240	209,030
Merrimon Avenue	I-240	Beaverdam Road	198,829
Hendersonville Road	Lodge St	Blue Ridge Parkway	182,164
Sweeten Creek Road	I-40	US 25	96,270
Charlotte Street	Chesnut	College Street	34,723
US 64	Blythe Street	King Street	31,077
Spartanburg Highway	Brooklyn Avenue	NC 225	23,836
NC 225	Highland Lake Road	US 176	23,836
US 25B	US 176	NC 191	23,836
North Main Street	US 276/Pigeon	Walnut	3,080
South Main Street	Hyatt Creek	US 276	3,080
NC 110	Main Street	Henson Cove Road	3,080
Weaver Boulevard	I-26	Main Street	No Fixed Route Service
NC 191	US 25B	Blythe Street	No Fixed Route Service
Amboy/Meadow Road	I-240	Biltmore Avenue	No Fixed Route Service
Elk Mountain Road	I-26	Riverside Drive	No Fixed Route Service
NC 213	Main	I-26	No Fixed Route Service

# Appendix A: Travel Time Index Tables by Route Classification

## Legend

Attribute	What It Means
Travel Time Index	A ratio of average travel-time over a select time period over free-flow travel-time
TTI Day	Travel Time Index Throughout The Day (6AM-9PM)
TTI AM	Travel Time Index at the AM Peak (7AM-9AM)
TTI PM	Travel Time Index at the PM Peak (4PM-6PM)
Change	A comparison of 2019 vs. 2018 conditions (negative numbers suggest a decrease in reliability, positive numbers suggest an increase in reliability)



Travel Time Reliability Measures, Source: FHWA

## Freight Corridors

CMP Code	Route	2019			2018			Change		
		TTI Day	TTI AM	TTI PM	TTI Day	TTI AM	TTI PM	TTI Day	TTI AM	TTI PM
F2 WB	I-26 WB NC 280 to I-40	1.19	1.09	1.59	1.14	1.08	1.49	-0.05	-0.01	-0.10
F7 WB	I-240 WB 74A to Future 26	1.03	0.93	1.42	1.04	0.94	1.42	0.01	0.01	0.00
F2 EB	I-26 EB I-40 to NC 280	1.11	1.04	1.37	1.09	1.02	1.3	-0.02	-0.02	-0.07
F5 EB	I-240 EB I-40 to Future 26	1.04	1.09	1.23	1.06	1.14	1.23	0.02	0.05	0.00
F5 WB	I-240 WB Future 26 to I-40	1.03	1.02	1.14	1.01	0.98	1.16	-0.02	-0.04	0.02
F8 WB	I-40 WB I-26 to Exit 37	1.01	0.95	1.14	1.09	0.99	1.16	0.08	0.04	0.02
F6 SB	Future 26 SB from Weaver Blvd to I-240	1.04	1.18	1.11	1.06	1.22	1.14	0.02	0.04	0.03
F1 WB	I-26 WB US 25 to NC 280	1.04	1	1.09	1.04	1.03	1.13	0.00	0.03	0.04
F3 WB	I-40 WB US 74A to I-26	0.97	0.95	1.06	0.97	0.96	1.05	0.00	0.01	-0.01
F4 WB	I-40 WB NC 9 to US 74A	0.99	0.96	1.06	0.97	0.97	0.98	-0.02	0.01	-0.08
F7 EB	I-240 EB Future 26 to 74A	0.97	0.98	1.03	0.98	0.99	1.07	0.01	0.01	0.04
F9 WB	I-40 WB Exit 37 to US 23/74	0.99	0.96	1.03	0.98	0.97	1	-0.01	0.01	-0.03
F1 EB	I-26 EB NC 280 to US 25	1	0.98	1.02	1.01	0.98	1	0.01	0.00	-0.02
F6 NB	Future 26 NB from I-240 to Weaver Blvd	0.97	0.96	1.02	0.96	0.95	1.01	-0.01	-0.01	-0.01
F4 EB	I-40 EB US 74A to NC 9	0.98	0.97	0.98	0.98	0.98	0.99	0.00	0.01	0.01
F8 EB	I-40 EB Exit 37 to I-26	0.95	0.95	0.98	0.97	0.96	0.99	0.02	0.01	0.01
F3 EB	I-40 EB I-26 to US 74A	0.96	0.96	0.95	0.96	1.01	0.98	0.00	0.05	0.03
F9 EB	I-40 EB US 23/74 to Exit 37	0.94	0.94	0.94	0.96	0.96	0.95	0.02	0.02	0.01

## Mobility Corridors

CMP Code	Route	2019			2018			Change		
		TTI Day	TTI AM	TTI PM	TTI Day	TTI AM	TTI PM	TTI Day	TTI AM	TTI PM
M2 SB	US 25A SB I-40 to NC 280	1.6	1.2	2.28	1.63	1.16	2.15	0.03	-0.04	-0.13
M2 NB	US 25A NB NC 280 to I-40	1.41	1.29	1.79	1.37	1.32	1.79	-0.04	0.03	0
M5 SB	US 25B SB Reems Creek to New Stock	1.6	1.47	1.75	1.6	1.53	1.67	0	0.06	-0.08
M5 NB	US 25B NB New Stock to Reems Creek	1.55	1.47	1.69	1.57	1.49	1.7	0.02	0.02	0.01
M1 SB	US 19/23 WB Haywood to NC 151	1.43	1.31	1.55	1.4	1.24	1.6	-0.03	-0.07	0.05
M12 NB	NC 9 NB Blue Ridge to US 70	1.39	1.19	1.54	1.45	1.22	1.65	0.06	0.03	0.11
M1 NB	US 19/23 EB NC 151 to Haywood	1.43	1.61	1.51	1.41	1.51	1.57	-0.02	-0.1	0.06
M13 SB	NC 191 SB I-26 to NC 280	1.14	1.05	1.44	1.1	1.01	1.34	-0.04	-0.04	-0.1
M14 NB	NC 112 NB NC 191 to US 1923	1.14	1.11	1.43	1.16	1.09	1.46	0.02	-0.02	0.03
M9 SB	NC 280 SB US 25 to Butler Bridge	1.23	1.14	1.39	1.23	1.12	1.41	0	-0.02	0.02
M12 SB	NC 9 SB US 70 to Blue Ridge	1.29	1.15	1.36	1.4	1.22	1.5	0.11	0.07	0.14
M17 EB	US 64 EB King to Howard Gap	1.22	1.05	1.35	1.07	0.85	1.29	-0.15	-0.2	-0.06
M13 NB	NC 191 NB NC 280 to I-26	1.1	1.03	1.31	1.07	1.01	1.26	-0.03	-0.02	-0.05
M17 WB	US 64 WB Howard Gap to King	1.23	1.03	1.29	1.07	0.92	1.13	-0.16	-0.11	-0.16
M8 SB	US 25 SB BRP to Cane Creek	1.09	1.02	1.24	1.11	1.01	1.28	0.02	-0.01	0.04
M9 NB	NC 280 NB Butler Bridge to US 25	1.16	1.09	1.22	1.15	1.08	1.22	-0.01	-0.01	0
M15 SB	NC 280 SB Butler Bridge to 191	1.12	1.1	1.22	1.11	1.06	1.23	-0.01	-0.04	0.01
M16 SB	NC 191 SB 280 to Blythe	1.12	1.1	1.22	1.11	1.06	1.23	-0.01	-0.04	0.01
M8 NB	US 25 NB Cane Creek to BRP	1.11	1.06	1.19	1.13	1.07	1.27	0.02	0.01	0.08
M22 NB	NC 209 NB US 23/74 to I-40	1.16	1.1	1.19	1.2	1.16	1.21	0.04	0.06	0.02
M14 SB	NC 112 SB US 1923 to NC 191	1.08	1.09	1.17	1.08	1.08	1.17	0	-0.01	0
M4 SB	NC 63 SB Newfound to US 19/23	1.23	1.23	1.16	1.23	1.23	1.23	0	0	0.07
M11 EB	NC 146 EB I-26 to US 25	1.08	1.09	1.16	1.08	1.08	1.16	0	-0.01	0
M11 WB	NC 146 WB US 25 to I-26	1.07	1.1	1.16	1.12	1.13	1.3	0.05	0.03	0.14
M15 NB	NC 280 NB 191 to Butler Bridge	1.08	1.08	1.16	1.08	1.06	1.14	0	-0.02	-0.02
M16 NB	NC 191 NB Blythe to 280	1.08	1.08	1.16	1.08	1.06	1.14	0	-0.02	-0.02
M7 WB	US 70 WB BRP to I-240	1.06	0.98	1.14	1.08	1	1.15	0.02	0.02	0.01
M20 NB	US 276 NB Main to US 19	1.07	0.98	1.13	1.11	0.97	1.18	0.04	-0.01	0.05



CMP Code	Route	2019			2018			Change		
		TTI Day	TTI AM	TTI PM	TTI Day	TTI AM	TTI PM	TTI Day	TTI AM	TTI PM
M4 NB	NC 63 NB US 19/23 to Newfound	1.06	1.03	1.06	1.06	1.06	1.06	0	0.03	0
M20 SB	US 276 SB US 19 to Main	1.02	0.94	1.06	1.05	0.95	1.09	0.03	0.01	0.03
M6 SB	US 25 SB New Stock to Beaverdam	0.99	0.96	1.02	1.04	0.99	1.08	0.05	0.03	0.06
M18 WB	US 64 WB Blythe to Brickyard	1	0.99	1.01	0.89	0.87	0.91	-0.11	-0.12	-0.1
M18 EB	US 64 EB Brickyard to Blythe	0.99	0.98	1	0.91	0.91	0.91	-0.08	-0.07	-0.09
M19 NB	US 25B NB 191 to Butler Bridge	0.99	1.03	0.99	0.89	0.94	0.89	-0.1	-0.09	-0.1
M3 NB	US 74A NB Old Fort to I-40	1	1.11	0.98	1.02	1.14	1.02	0.02	0.03	0.04
M7 EB	US 70 EB I-240 to BRP	0.93	0.9	0.97	0.96	0.92	0.99	0.03	0.02	0.02
M19 SB	US 25B SB Butler Bridge to 191	0.95	0.95	0.97	0.85	0.85	0.89	-0.1	-0.1	-0.08
M22 SB	NC 209 SB I-40 to US 23/74	0.96	0.93	0.97	0.97	0.95	0.98	0.01	0.02	0.01
M23 SB	US 19 SB Wiggins to Main	0.93	0.92	0.94	0.92			-0.02		
M21 EB	US 19 EB Jonathan Creek to Russ	0.91	0.89	0.91	0.91	0.9	0.91	0	0.01	0
M21 WB	US 19 WB Russ to Jonathan Creek	0.91	0.91	0.91	0.92	0.92	0.92	0.01	0.01	0.01
M23 NB	US 19 NB Main to Wiggins	0.9	0.89	0.9	0.91			0.01		
M10 EB	Mills Gap US 25 to Concord Road							0	0	0
M10 WB	Mills Gap US 25 to Concord Road							0	0	0

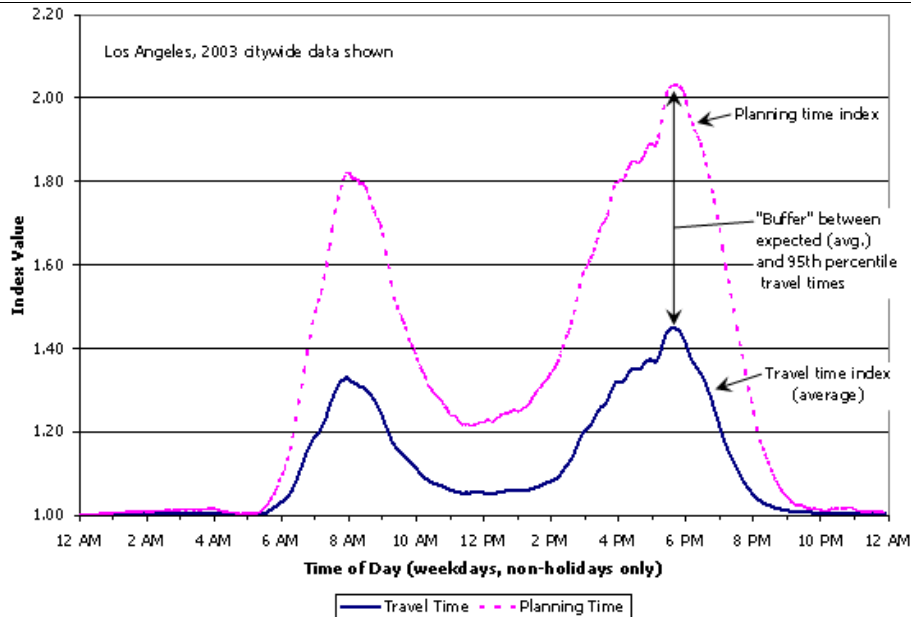
## Destination Corridors

CMP Code	Route	2019			2018			Change		
		TTI Day	TTI AM	TTI PM	TTI Day2	TTI AM3	TTI PM4	TTI Day5	TTI AM6	TTI PM7
D11 SB	Patton SB I-240 to Haywood	1.27	1.09	1.67	1.26	1.1	1.66	-0.01	0.01	-0.01
D7 EB	Weaver EB from I-26 to Main	1.4	1.26	1.48	1.43	1.29	1.54	0.03	0.03	0.06
D10 NB	US 25A NB I-40 to US 25	1.3	1.07	1.46	1.31	1.05	1.49	0.01	-0.02	0.03
D7 WB	Weaver WB from Main to I-26	1.33	1.13	1.45	1.38	1.18	1.5	0.05	0.05	0.05
D11 NB	Patton NB Haywood to I-240	1.25	1.25	1.37	1.25	1.23	1.39	0	-0.02	0.02
D3 SB	Haywood SB Patton to I-240	1.19	1.01	1.37	1.26	1.04	1.5	0.07	0.03	0.13
D19 NB	N Main NB Pigeon to Walnut	1.26	1.07	1.3	1.35	1.1	1.41	0.09	0.03	0.11
D1 SB	US 25 SB Lodge to BRP	1	0.97	1.22	1.05	0.99	1.25	0.05	0.02	0.03
D3 NB	Haywood NB I-240 to Patton	1.09	0.95	1.22	1.15	0.98	1.31	0.06	0.03	0.09
D19 SB	N Main SB Walnut to Pigeon	1.15	0.96	1.2	1.25	1.01	1.31	0.1	0.05	0.11
D6 SB	US 25 SB Beaverdam to I-240	1.04	0.89	1.19	1.08	0.93	1.21	0.04	0.04	0.02
D13 EB	US 64 EB Blythe to King	1.15	1.07	1.18	1.15	1.1	1.18	0	0.03	0
D15 WB	US 176 WB Brooklyn to 225	1.07	1.07	1.16	1.11	1.08	1.19	0.04	0.01	0.03
D6 NB	US 25 NB I-240 to Beaverdam	1.06	0.95	1.16	1.11	0.97	1.22	0.05	0.02	0.06
D8 WB	Tunnel from NC 81 to Tunnel	1.07	0.95	1.15	1.11	0.94	1.22	0.04	-0.01	0.07
D1 NB	US 25 NB BRP to Lodge	1.01	0.94	1.11	1.05	0.97	1.16	0.04	0.03	0.05
D14 NB	US 225 NB Highland Lake to US 176	1.04	0.98	1.07	0.88	0.84	0.9	-0.16	-0.14	-0.17
D13 WB	US 64 WB King to Blythe	1.03	1.03	1.06	1.06	1.05	1.13	0.03	0.02	0.07
D5 SB	NC 81 SB US 70 to Biltmore	1	0.91	1.06	1.04	0.94	1.11	0.04	0.03	0.05
D8 EB	Tunnel from Tunnel to NC 81	1	0.91	1.06	1.06	0.93	1.14	0.06	0.02	0.08
D15 EB	US 176 EB 225 to Brooklyn	1	0.98	1.05	1.03	0.99	1.09	0.03	0.01	0.04
D10 SB	US 25A SB US 25 to I-40	0.98	0.9	1.04	1.01	0.9	1.08	0.03	0	0.04
D18 SB	S Main SB	1	0.91	1.03	1.06	0.94	1.1	0.06	0.03	0.07
D18 NB	S Main NB Hyatt Creek to Pigeon	0.97	0.88	1.02	1.04	0.94	1.11	0.07	0.06	0.09
D14 SB	US 225 SB US 176 to Highland Lake	0.99	0.97	1.01	1.01	0.93	1.07	0.02	-0.04	0.06
D17 SB	US 25 SB 191 to 176	0.92	0.81	1	0.99	0.86	1.09	0.07	0.05	0.09
D5 NB	NC 81 NB Biltmore to US 70	0.94	0.86	0.98	1	0.91	1.05	0.06	0.05	0.07
D2 NB	NC 191 NB US 25B to Blythe	0.91	0.92	0.92	0.94	0.93	0.96	0.03	0.01	0.04

CMP Code	Route	2019			2018			Change		
		TTI Day	TTI AM	TTI PM	TTI Day2	TTI AM3	TTI PM4	TTI Day5	TTI AM6	TTI PM7
D2 SB	NC 191 SB Blythe to US 25B	0.86	0.83	0.87	0.88	0.84	0.89	0.02	0.01	0.02
D20 EB	213 EB Main to 26	0.85	0.84	0.85	0.86	0.85	0.86	0.01	0.01	0.01
D4 EB	Amboy/Meadow EB I-240 to Biltmore							0	0	0
D4 WB	Amboy/Meadow WB Biltmore to I-240							0	0	0
D9	Charlotte Street							0	0	0
D9	Charlotte Street							0	0	0
D12	Elk Mountain							0	0	0
D12	Elk Mountain							0	0	0
D21	Biltmore Avenue							0	0	0
D21	Biltmore Avenue							0	0	0
D16 NB	NC 110							0	0	0
D16 SB	NC 110							0	0	0

# Appendix B: Planning Time Index Tables by Route Classification

Attribute	What It Means
Planning Time Index	A ratio of 95 <sup>th</sup> percentile travel-time over a select time period over free-flow travel-time
PTI Day	Planning Time Index Throughout The Day (6AM-9PM)
PTI AM	Planning Time Index at the AM Peak (7AM-9AM)
PTI PM	Planning Time Index at the PM Peak (4PM-6PM)
Change	A comparison of 2019 vs. 2018 conditions (negative numbers suggest a decrease in reliability, positive numbers suggest an increase in reliability)



Travel Time Reliability Measures, Source: FHWA

## Freight Corridors

CMP Code	Route	2019			2018			Change		
		PTI Day	PTI AM	PTI PM	PTI Day	PTI AM	PTI PM	PTI Day	PTI AM	PTI PM
F2 WB	I-26 WB NC 280 to I-40	2.02	1.42	3.11	1.9	1.42	2.6	-0.12	0.00	-0.51
F7 WB	I-240 WB 74A to Future 26	1.46	1.02	2.58	1.47	1.04	2.76	0.01	0.02	0.18
F2 EB	I-26 EB I-40 to NC 280	1.72	1.21	2.36	1.66	1.19	2.29	-0.06	-0.02	-0.07
F5 EB	I-240 EB I-40 to Future 26	1.33	1.67	2.21	1.44	1.84	2.21	0.11	0.17	0.00
F8 WB	I-40 WB I-26 to Exit 37	1.25	1.07	1.84	1.64	1.08	1.94	0.39	0.01	0.10
F6 SB	Future 26 SB from Weaver Blvd to I-240	1.33	1.98	1.71	1.38	2.13	1.8	0.05	0.15	0.09
F1 WB	I-26 WB US 25 to NC 280	1.23	1.09	1.65	1.26	1.12	1.82	0.03	0.03	0.17
F5 WB	I-240 WB Future 26 to I-40	1.14	1.1	1.58	1.16	1.12	1.65	0.02	0.02	0.07
F7 EB	I-240 EB Future 26 to 74A	1.15	1.23	1.52	1.14	1.23	1.41	-0.01	0.00	-0.11
F6 NB	Future 26 NB from I-240 to Weaver Blvd	1.07	1.04	1.37	1.07	1.05	1.28	0.00	0.01	-0.09
F3 WB	I-40 WB US 74A to I-26	1.07	1.03	1.34	1.07	1.05	1.41	0.00	0.02	0.07
F8 EB	I-40 EB Exit 37 to I-26	1.08	1.04	1.2	1.11	1.08	1.23	0.03	0.04	0.03
F9 WB	I-40 WB Exit 37 to US 23/74	1.07	1.05	1.14	1.09	1.06	1.14	0.02	0.01	0.00
F1 EB	I-26 EB NC 280 to US 25	1.1	1.08	1.13	1.11	1.09	1.13	0.01	0.01	0.00
F4 WB	I-40 WB NC 9 to US 74A	1.04	1.03	1.08	1.04	1.04	1.08	0.00	0.01	0.00
F3 EB	I-40 EB I-26 to US 74A	1.05	1.04	1.05	1.05	1.22	1.1	0.00	0.18	0.05
F4 EB	I-40 EB US 74A to NC 9	1.06	1.05	1.05	1.06	1.07	1.06	0.00	0.02	0.01
F9 EB	I-40 EB US 23/74 to Exit 37	1.01	1.01	1.01	1.02	1.02	1.02	0.01	0.01	0.01

## Mobility Corridors

CMP Code	Route	2019			2018			Change		
		PTI Day	PTI AM	PTI PM	PTI Day	PTI AM	PTI PM	PTI Day	PTI AM	PTI PM
M13 SB	NC 191 SB I-26 to NC 280	1.72	1.37	2.74	1.58	1.28	2.4	-0.14	-0.09	-0.34
M14 NB	NC 112 NB NC 191 to US 1923	1.72	1.41	2.44	1.72	1.37	2.49	0	-0.04	0.05
M2 SB	US 25A SB I-40 to NC 280	1.6	1.2	2.28	1.63	1.16	2.15	0.03	-0.04	-0.13
M13 NB	NC 191 NB NC 280 to I-26	1.54	1.29	2.25	1.44	1.26	1.96	-0.1	-0.03	-0.29
M17 EB	US 64 EB King to Howard Gap	2	1.54	2.18	1.53	1.04	1.86	-0.47	-0.5	-0.32
M12 NB	NC 9 NB Blue Ridge to US 70	1.93	1.55	2.13	2.19	1.64	2.46	0.26	0.09	0.33
M17 WB	US 64 WB Howard Gap to King	1.93	1.53	2.04	1.39	1.12	1.39	-0.54	-0.41	-0.65
M9 SB	NC 280 SB US 25 to Butler Bridge	1.59	1.36	1.92	1.59	1.31	2.06	0	-0.05	0.14
M12 SB	NC 9 SB US 70 to Blue Ridge	1.83	1.56	1.83	2.11	1.7	2.18	0.28	0.14	0.35
M2 NB	US 25A NB NC 280 to I-40	1.41	1.29	1.79	1.37	1.32	1.79	-0.04	0.03	0
M5 SB	US 25B SB Reems Creek to New Stock	1.6	1.47	1.75	1.6	1.53	1.67	0	0.06	-0.08
M8 SB	US 25 SB BRP to Cane Creek	1.51	1.3	1.73	1.47	1.29	1.78	-0.04	-0.01	0.05
M5 NB	US 25B NB New Stock to Reems Creek	1.55	1.47	1.69	1.57	1.49	1.7	0.02	0.02	0.01
M8 NB	US 25 NB Cane Creek to BRP	1.52	1.41	1.68	1.48	1.38	2.01	-0.04	-0.03	0.33
M 15 SB	NC 280 SB Butler Bridge to 191	1.5	1.4	1.61	1.47	1.3	1.63	-0.03	-0.1	0.02
M16 SB	NC 191 SB 280 to Blythe	1.5	1.4	1.61	1.47	1.3	1.63	-0.03	-0.1	0.02
M11 WB	NC 146 WB US 25 to I-26	1.42	1.61	1.56	1.55	1.7	1.96	0.13	0.09	0.4
M1 SB	US 19/23 WB Haywood to NC 151	1.43	1.31	1.55	1.4	1.24	1.6	-0.03	-0.07	0.05
M11 EB	NC 146 EB I-26 to US 25	1.45	1.47	1.54	1.43	1.43	1.52	-0.02	-0.04	-0.02
M9 NB	NC 280 NB Butler Bridge to US 25	1.51	1.38	1.53	1.44	1.35	1.5	-0.07	-0.03	-0.03
M14 SB	NC 112 SB US 1923 to NC 191	1.38	1.46	1.53	1.41	1.43	1.54	0.03	-0.03	0.01
M1 NB	US 19/23 EB NC 151 to Haywood	1.43	1.61	1.51	1.41	1.51	1.57	-0.02	-0.1	0.06
M20 NB	US 276 NB Main to US 19	1.36	1.24	1.47	1.41	1.22	1.52	0.05	-0.02	0.05
M15 NB	NC 280 NB 191 to Butler Bridge	1.38	1.35	1.46	1.35	1.35	1.42	-0.03	0	-0.04
M16 NB	NC 191 NB Blythe to 280	1.38	1.35	1.46	1.35	1.35	1.42	-0.03	0	-0.04
M7 WB	US 70 WB BRP to I-240	1.36	1.18	1.42	1.39	1.25	1.46	0.03	0.07	0.04
M6 NB	US 25 NB Beaverdam to New Stock	1.26	1.15	1.39	1.36	1.23	1.47	0.1	0.08	0.08
M22 NB	NC 209 NB US 23/74 to I-40	1.34	1.29	1.35	1.33	1.28	1.33	-0.01	-0.01	-0.02

CMP Code	Route	2019			2018			Change		
		PTI Day	PTI AM	PTI PM	PTI Day	PTI AM	PTI PM	PTI Day	PTI AM	PTI PM
M6 SB	US 25 SB New Stock to Beaverdam	1.15	1.12	1.2	1.32	1.18	1.32	0.17	0.06	0.12
M19 SB	US 25B SB Butler Bridge to 191	1.15	1.16	1.2	1	0.97	1.03	-0.15	-0.19	-0.17
M7 EB	US 70 EB I-240 to BRP	1.11	1.07	1.18	1.14	1.08	1.18	0.03	0.01	0
M4 SB	NC 63 SB Newfound to US 19/23	1.23	1.23	1.16	1.23	1.23	1.23	0	0	0.07
M18 WB	US 64 WB Blythe to Brickyard	1.12	1.12	1.14	0.97	0.95	0.97	-0.15	-0.17	-0.17
M18 EB	US 64 EB Brickyard to Blythe	1.11	1.11	1.12	0.99	0.99	0.99	-0.12	-0.12	-0.13
M3 SB	US 74A SB I-40 to Old Fort	1.06	1.11	1.09	1.09	1.17	1.08	0.03	0.06	-0.01
M4 NB	NC 63 NB US 19/23 to Newfound	1.06	1.03	1.06	1.06	1.06	1.06	0	0.03	0
M21 EB	US 19 EB Jonathan Creek to Russ	1.04	1.01	1.04	1.02	0.99	1.02	-0.02	-0.02	-0.02
M21 WB	US 19 WB Russ to Jonathan Creek	1.03	1.03	1.03	1.03	1.03	1.03	0	0	0
M22 SB	NC 209 SB I-40 to US 23/74	1.03	1	1.03	1.05	1.03	1.05	0.02	0.03	0.02
M23 SB	US 19 SB Wiggins to Main	1	1	1.02	1.02	1.02	1.02	0.02	0.02	0
M23 NB	US 19 NB Main to Wiggins	0.98	0.95	1	1	0.98	1.02	0.02	0.03	0.02
M3 NB	US 74A NB Old Fort to I-40	1	1.11	0.98	1.02	1.14	1.02	0.02	0.03	0.04
M10 EB	Mills Gap							0	0	0
M10 WB	Mills Gap							0	0	0

## Destination Corridors

CMP Code	Route	2019			2018			Change		
		PTI Day	PTI AM	PTI PM	PTI Day	PTI AM	PTI PM	PTI Day	PTI AM	PTI PM
D11 SB	Patton SB I-240 to Haywood	2.18	1.6	2.83	1.99	1.49	2.52	-0.19	-0.11	-0.31
D1 SB	US 25 SB Lodge to BRP	1.33	1.22	2.39	1.39	1.22	2.06	0.06	0	-0.33
D7 WB	Weaver WB from Main to I-26	1.86	1.45	2.17	2	1.53	2.36	0.14	0.08	0.19
D7 EB	Weaver EB from I-26 to Main	1.93	1.71	2.09	2.2	1.87	2.23	0.27	0.16	0.14
D10 NB	US 25A NB I-40 to US 25	1.96	1.52	2.01	2.01	1.52	2.11	0.05	0	0.1
D11 NB	Patton NB Haywood to I-240	1.87	1.82	2.01	1.76	1.61	1.94	-0.11	-0.21	-0.07
D3 SB	Haywood SB Patton to I-240	1.58	1.35	1.82	1.78	1.44	2.01	0.2	0.09	0.19
D13 EB	US 64 EB Blythe to King	1.75	1.56	1.65	1.58	1.45	1.6	-0.17	-0.11	-0.05
D19 NB	N Main NB Pigeon to Walnut	1.84	1.59	1.65	1.84	1.7	1.74	0	0.11	0.09
D15 WB	US 176 WB Brooklyn to 225	1.44	1.44	1.63	1.53	1.53	1.63	0.09	0.09	0
D8 WB	Tunnel from NC 81 to Tunnel	1.47	1.24	1.57	1.61	1.24	1.71	0.14	0	0.14
D5 SB	NC 81 SB US 70 to Biltmore	1.45	1.22	1.55	1.45	1.22	1.55	0	0	0
D6 SB	US 25 SB Beaverdam to I-240	1.45	1.22	1.55	1.45	1.22	1.55	0	0	0
D5 NB	NC 81 NB Biltmore to US 70	1.44	1.28	1.53	1.47	1.28	1.58	0.03	0	0.05
D1 NB	US 25 NB BRP to Lodge	1.39	1.32	1.52	1.39	1.21	1.65	0	-0.11	0.13
D6 NB	US 25 NB I-240 to Beaverdam	1.41	1.28	1.47	1.4	1.28	1.47	-0.01	0	0
D15 EB	US 176 EB 225 to Brooklyn	1.37	1.36	1.44	1.38	1.36	1.44	0.01	0	0
D10 SB	US 25A SB US 25 to I-40	1.32	1.25	1.42	1.47	1.25	1.5	0.15	0	0.08
D13 WB	US 64 WB King to Blythe	1.47	1.53	1.41	1.5	1.53	1.47	0.03	0	0.06
D17 SB	US 25 SB 191 to 176	1.29	1.1	1.41	1.42	1.19	1.51	0.13	0.09	0.1
D14 NB	US 225 NB Highland Lake to US 176	1.37	1.16	1.37	0.99	0.94	1.02	-0.38	-0.22	-0.35
D19 SB	N Main SB Walnut to Pigeon	1.56	1.36	1.36	1.71	1.42	1.67	0.15	0.06	0.31
D8 EB	Tunnel from Tunnel to NC 81	1.33	1.15	1.34	1.45	1.22	1.54	0.12	0.07	0.2
D18 SB	S Main SB	1.25	1.09	1.29	1.36	1.2	1.36	0.11	0.11	0.07
D18 NB	S Main NB Hyatt Creek to Pigeon	1.24	1.11	1.27	1.43	1.18	1.44	0.19	0.07	0.17
D14 SB	US 225 SB US 176 to Highland Lake	1.23	1.19	1.26	1.32	1.19	1.4	0.09	0	0.14
D17 NB	US 25 NB 176 to 191	1.23	1.22	1.2	1.28	1.24	1.28	0.05	0.02	0.08
D3 NB	Haywood NB I-240 to Patton	1.16	1.09	1.18	1.26	1.2	1.29	0.1	0.11	0.11



CMP Code	Route	2019			2018			Change		
		PTI Day	PTI AM	PTI PM	PTI Day	PTI AM	PTI PM	PTI Day	PTI AM	PTI PM
D2 SB	NC 191 SB Blythe to US 25B	1	0.93	1	1.04	0.96	1.04	0.04	0.03	0.04
D20 EB	213 EB Main to 26	0.96	0.96	0.96	1	1	1	0.04	0.04	0.04
D4 EB	Amboy/Meadow EB I-240 to Biltmore							0	0	0
D4 WB	Amboy/Meadow WB Biltmore to I-240							0	0	0
D9	Charlotte Street							0	0	0
D9	Charlotte Street							0	0	0
D12	Elk Mountain							0	0	0
D12	Elk Mountain							0	0	0
D21	Biltmore Avenue							0	0	0
D21	Biltmore Avenue							0	0	0
D16 NB	NC 110							0	0	0
D16 SB	NC 110							0	0	0