

**Public Comments**  
**Henderson County Board of Commissioners**  
**April 18, 2018**

Good Afternoon. My name is Bill Burchill. I am a 10-year resident of Henderson County and a retired engineer. Thank you for allowing me to provide comments to this meeting.

Jon Laughter! Oh, Jon Laughter! "Dreadful apparition, why do you trouble me?" (Charles Dickens) Balfour Parkway was first proposed by Jon Laughter during his 2003 campaign for City Council according to the February 3, 2005 *Times-News*. Mr. Laughter's "pencil sketch" of the Balfour is included in NCDOT's Comprehensive Transportation Plan as Highway Map #10 dated October 15, 2004. That "pencil sketch" guided all planning for the Balfour for ten years leading to NCDOT's Balfour "Feasibility Study" dated September 25, 2014. It is the only figure in that document. It is in Figure 3.2 of the French Broad River Metropolitan Planning Organization's Metropolitan Transportation Plan, September 24, 2015.

I have been unable to find any details of Mr. Laughter's campaign; however, I have been told the Balfour Parkway was a major aspect of it. I have no doubt that he was the first to coin the phrase "to improve east-west vehicular mobility" or something to that effect. That is the stated primary purpose of the Balfour Parkway – "to improve east-west vehicular mobility." But, NCDOT's own data demonstrate that we do not have an "east-west vehicular mobility" problem. Certainly not for through traffic as is claimed in NCDOT's handout at its February 27 public meeting.

Both the "pencil sketch" map and the phrase "to improve east-west vehicular mobility" have taken on an almost cult-like quality. To be repeated without question. Sort of like chanting around the campfire circle. But, with no validation.

Last Friday I e-mailed you an analysis of traffic conditions in Henderson County using NCDOT's own field data from their "Project Level Traffic Forecast" which is a primary design basis for the Balfour Parkway. You also have a printed copy in the handouts for this meeting. The analysis follows the format of a similar qualitative analysis that I provided to you on March 14 and summarized at your March 21<sup>st</sup> meeting. Some of the conclusions from the current analysis are:

**The NCDOT data completely validates the observations and conclusions presented in my original analysis. In fact, some conclusions are validated at a much higher level of certainty than was anticipated. This is particularly the case relative to the extremely low level of east-west through traffic along the three roadways cited by the Balfour Parkway Plan to be of primary concern, U.S. 64 combined with U.S. 25 Business and N.C. 191. The degree to which this conclusion is validated calls into question the need "to improve east-west vehicular mobility."**

**The NCDOT data demonstrates that westbound "through traffic" is a maximum of 2½% of the traffic on US 64 (4 Seasons Blvd) – US 25 Business – NC 191. (see reverse side)**

**The NCDOT data demonstrates that eastbound "through traffic" is a maximum of 0.005% of the traffic on US 64 (4 Seasons Blvd) – US 25 Business – NC 191.**

**The NCDOT data demonstrates that only a small fraction (1–2%) of traffic on US 64 – 4 Seasons Blvd is due to "heavy trucks" and that these trucks are not "east-west through traffic." (see reverse side – City Ord. Sec. 50-192 prohibits "thru" heavy trucks)**

NCDOT's projected data for 2040 also support the conclusions of the current analysis.

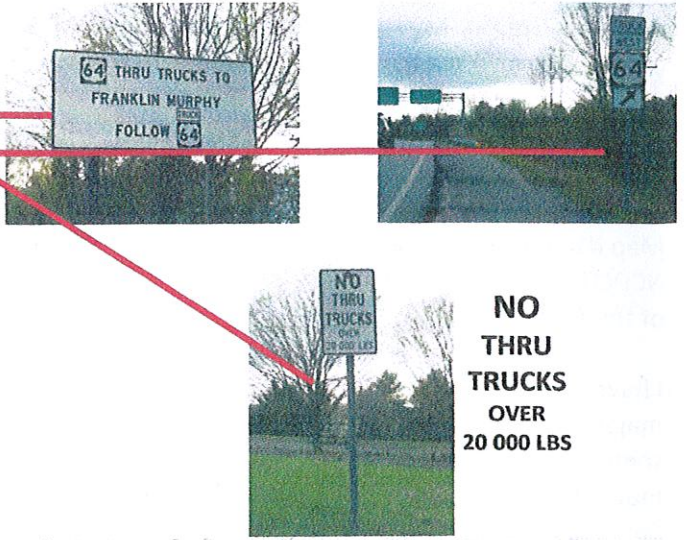
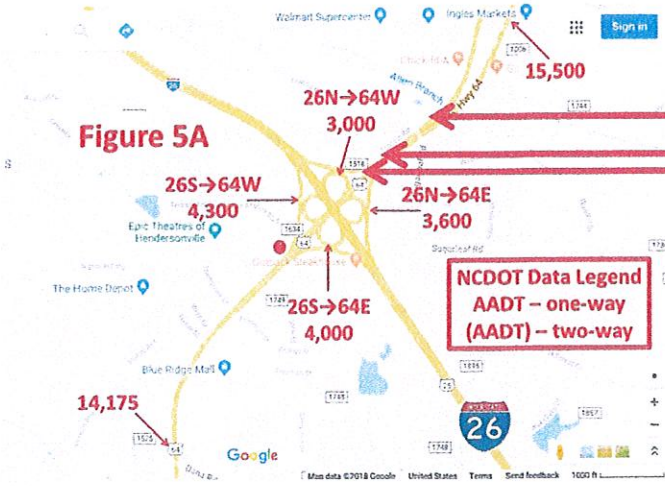
Of course, there may be other motivations to want "to improve east-west vehicular mobility." I shall have much more to say to you about this including analyzing existing east-west travel routes to show the Balfour Parkway is not needed.

Again, I offer to meet with you either individually or as a group to discuss my analysis.

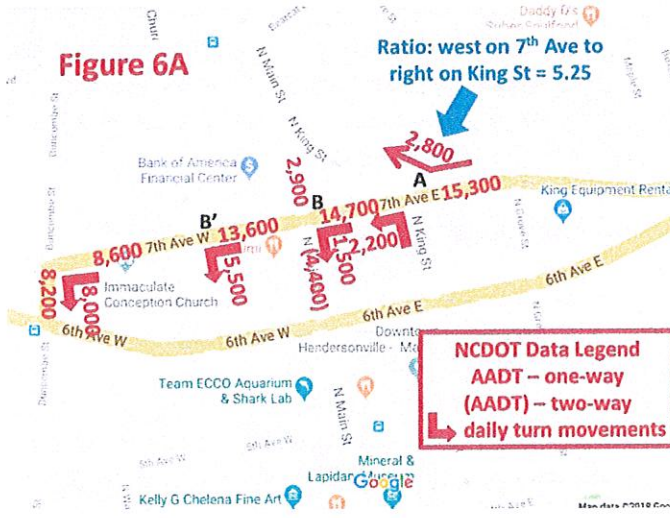
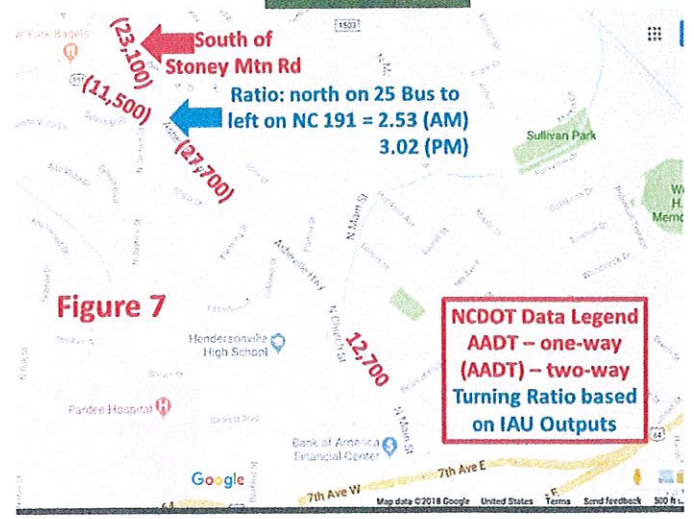
Thank you very much for the time you have given me today. I urge you to consider carefully the analysis I provided.

Respectfully submitted by Bill Burchill, 31 J P Huggins Drive, Hendersonville, NC, 828-595-4399, [burchill@tamu.edu](mailto:burchill@tamu.edu)

**Use of NCDOT data to determine the maximum fraction of westbound traffic on US 64 (4 Seasons Blvd) – US 25 Business – NC 191 that could be “through traffic.”**



NCDOT data in Figure 5A shows that westbound traffic exiting Interstate 26 is 51%  $((4,300 + 3000)/14,175)$  of the volume of westbound traffic at the west end of 4 Seasons Blvd. Thus, a maximum of 49% of the traffic at the west end of 4 Seasons Blvd could be “through traffic” from Chimney Rock Road. Of course, it is much less since not all traffic entering 4 Seasons Blvd from Chimney Rock Road is “through traffic.”



NCDOT data in Figure 6A shows that a maximum of 18%  $(2,800/15,300)$  of westbound traffic at the west end of 4 Seasons Blvd turns right (north) on N King St (point A) and then continues northward on US 25 Business. The rest  $(12,500)$  is joined by left turns from N King St  $(2,200)$  to become traffic either entering downtown Hendersonville on Main St (point B)  $(1,500)$  or Church St (point B')  $(5,500)$  or continuing west on 7<sup>th</sup> Ave  $(8,600)$  with most turning left on Buncombe St  $(8,000)$ .

NCDOT IAU Output data in Figure 7 shows that 71%  $(2.53/3.53 - AM)$  to 75%  $(3.02/4.02 - PM)$  of the northbound on US 25 Business continues northward on US 25 Business with only 25% to 29% turning left (west) onto NC 191 and continuing westward.

Thus, the maximum fraction of traffic coming Chimney Rock Road at the east end of 4 Seasons Blvd that might be westbound “through traffic” on NC 191 is only 49% times 18% times 25% = 2¼% to 49% times 18% times 29% = 2½%. As previously stated, the actual fraction is much lower since only a small fraction of the traffic that enters the east end of 4 Seasons Blvd from Chimney Rock Road is likely to be “through traffic.”

**Validation of  
“Analysis of Traffic Congestion Cited by the Balfour Parkway Plan”  
Using NCDOT Data**

The “Analysis of Traffic Congestion Cited by the Balfour Parkway Plan” was based entirely on qualitative observations of traffic on the roadways cited in the Balfour Parkway Description<sup>1</sup> distributed by NCDOT at the February 27, 2018, public meeting. This validation is based on traffic data tabulated in NCDOT report “Project Level Traffic Forecast,” New Route (Balfour Parkway) from NC 191 to US 64 Henderson County, STIP Project No. R-5744, October, 2016.

**The validation’s major conclusions are:**

**The NCDOT data completely validates the observations and conclusions presented in the original report. In fact, some conclusions are validated at a much higher level of certainty than was anticipated. This is particularly the case relative to the extremely low level of east-west through traffic along the three roadways cited by the Balfour Parkway Plan to be of primary concern, U.S. 64 combined with U.S. 25 Business and N.C. 191. The degree to which this conclusion is validated calls into question the need to “improve east-west vehicular mobility” which is the stated primary purpose of the Balfour Parkway.**

**The NCDOT data demonstrates that congestion on US 64 – 4 Seasons Blvd is due to “local” traffic, not “east-west through” traffic.**

**The NCDOT data demonstrates that westbound “through traffic” is a maximum of 2¼% of the traffic on US 64 (4 Seasons Blvd) – US 25 Business – NC 191.**

**The NCDOT data demonstrates that eastbound “through traffic” is a maximum of 0.005% of the traffic on US 64 (4 Seasons Blvd) – US 25 Business – NC 191.**

**The NCDOT data demonstrates that only a small fraction (1–2%) of traffic on US 64 – 4 Seasons Blvd is due to “heavy trucks” and that these trucks are not “east-west through traffic.”**

**The NCDOT data demonstrates the vast majority (about 80%) of traffic on US 25 Business is north-south traffic arriving from north of NC 191 or south of 7<sup>th</sup> Ave E and continuing south of 6<sup>th</sup> Ave W or north of NC 191, respectively, not “east-west through” traffic.**

**The NCDOT data demonstrates that only a small fraction (1–3%) of traffic on US 25 Business – Asheville Hwy is due to “heavy trucks.”**

**The NCDOT data demonstrates that “heavy trucks” in downtown Hendersonville follow two intersecting traffic patterns, i.e., east-west on US 64 and north-south on US 25 Business, with little interaction between the two.**

<sup>1</sup> “Balfour Parkway, Proposed new location roadway from N.C. 191 to U.S. 64, Henderson County, STIP Project No. R-5744, presented at Public Meeting, February 27, 2018.

The validation's major conclusions are continued:

The NCDOT data demonstrates that there is the potential for only minor congestion on NC 191 and that only a small fraction (1–2%) of traffic is due to “heavy trucks” in all locations except at the intersection with Mountain Rd.

All of the NCDOT data used for this validation are shown in the Appendix. The data explicitly applied were 2016 AADT (Average Annual Daily Traffic) in Table A.5, IAU (Intersection Analysis Utility) Tool Outputs in Table A.7, 2016 Base Year No-Build Design Data – D, K Factors in Table A.9, 2016 Base Year No-Build Design Data – Truck Percentages in Table A.10, and Daily Turn Movements in Figure 2016 Average Annual Daily Traffic, Existing No Build, Sheet 2 of 3. The data was collected in accordance with TSG standards on average weekdays (Tuesday – Thursday) between May 4, 2016, and May 19, 2016, while school was in session. The traffic count data included the collection of 13-hour turning movement counts (TMCs) and 48-hour tube counts. In all, the report includes 79 specific data counts on 29 roadways.

The format of this report is as follows: (1) the original analysis is preserved in its entirety with the text shown in one-column format and *smaller italic font*, (2) validation statements are shown in two-column format and regular font, (3) NCDOT AADT data is quoted in **bold red font**, (4) NCDOT IAU Output data is quoted in **bold blue font**, (5) numerous figures show the **AAADT data** and **IAU data** on maps at the locations where the data was measured, and (5) major conclusions are highlighted in frames.

### ***The Basic Premise of the Balfour Parkway is Incorrect !!***

*The basic premise of the Balfour Parkway is that it will relieve traffic congestion “through downtown Hendersonville.”*

***This is incorrect, because***


- (1) *The congestion cited in the Balfour Parkway Plan on “U.S. 64 combined with U.S. 25 Business and N.C. 191” is due almost entirely to local traffic, not east-west “through” traffic, and*
- (2) *This congestion will not be relieved by a new “route for east-west travel,” i.e., the Balfour Parkway.*

***This is demonstrated by the discussion below.***

#### **Locations of Cited Congestion**

*The Balfour Parkway Plan (BPP)<sup>1</sup> cites three locations of congestion (see map on page 7):*

*U.S. 64 – 4 Seasons Blvd (highlighted in pink on map) *

*U.S. 25 Business – Asheville Hwy (highlighted in green on map) *

*N.C. 191 – Haywood Rd (highlighted in blue on map) *

*The sources of traffic congestion in each of these segments are described below.*

## Congestion Descriptions

### U.S. 64 – 4 Seasons Blvd

U.S. 64 – 4 Seasons Blvd has a significant level of traffic congestion at all times of business day along its length from the Ingles complex at its east end to Dana Rd near the Lowes complex at its west end. The whole length of this route is lined with a dense concentration of commercial businesses including the Blue Ridge Mall. The preponderance of traffic congestion is due to “local” traffic going to and from these businesses. Traffic is also feed onto (and removed from) this route by numerous intersecting roads from the north and the south; this contributes to the “local” traffic.

The NCDOT report describes the sources of congestion on NC 64 – 4 Seasons Blvd as follows: “The principal shopping center in the forecast area, which is located just west of the I-26/US 64 interchange, includes a Wal-Mart Supercenter, Lowe’s Home Improvement, Blue Ridge Mall, and several restaurants.” This statement (which incorrectly places Walmart west of I-26) significantly understates the continuous sources of local traffic congestion on this roadway. Figure 1, which is an aerial view of 4 Seasons Blvd, shows there are many continuous sources of local congestion: large businesses (Walmart, Highlands Square Shopping Center, Home Depot, Lowes, and Blue Ridge Mall), many, many small businesses and restaurants, and seven closely-spaced traffic signals (eight for west-bound traffic for which there is a light at the end of the south-bound exit from I-26 shown in Figure 5).



A small fraction of the traffic is “through” traffic, i.e., traffic simply passing from one end to the other following a longer route. Most of this “through” traffic is either entering/exiting I-26 or entering/exiting downtown Hendersonville or north U.S. 25 Business – Asheville Hwy. Very little of this traffic is due to “east-west travel” continuing on (or arriving from) U.S. 64 – Chimney Rock Rd on the east or U.S. 25 Business – Asheville Hwy and N.C. 191 – Haywood Rd on the west as hypothesized by the BPP.

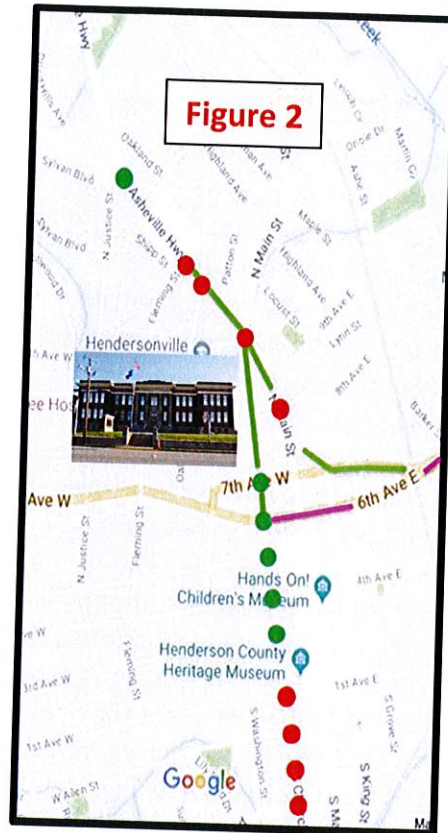
Finally, an essentially negligible amount of the traffic is “large truck” traffic due to “east-west travel.” The “large truck” traffic that does appear on U.S. 64 – 4 Seasons Blvd is due primarily to deliveries to the commercial businesses. This traffic minimizes its appearance by preferentially using roads behind the businesses and perpendicular to U.S. 64 – 4 Seasons Blvd or traveling off-business-hours during which traffic congestion on U.S. 64 – 4 Seasons Blvd is minimal.

### U.S. 25 Business – Asheville Hwy

U.S. 25 Business – Asheville Hwy has a highly variable level of traffic congestion through the day ranging from little or none to stop-and-go traffic. The section of concern in the BPP is from the intersection with 6<sup>th</sup> Ave (points C/C' on map on page 7) to the intersection with N.C. 191 – Haywood Rd (point E on map); this includes the sections of N Main St and N Church St which connect U.S. 25 Business – Asheville Hwy to 6<sup>th</sup> Ave. Peak congestion occurs during the time periods (1) when Hendersonville High School opens and closes, (2) when there is significant slowdown of

traffic going south on U.S. 25 Business – Asheville Hwy due to traffic going south on N Church St, and (3) when there is significant slowdown of traffic going north on U.S. 25 Business – Asheville Hwy due to the concentration and timing of traffic lights on N Main St from its intersection with N King St to, and somewhat beyond, its intersection with N Church St and U.S. 25 Business – Asheville Hwy. The preponderance of traffic congestion is due to traffic traveling primarily in a north-south direction on N Main St, N Church St, and U.S. 25 Business – Asheville Hwy north of its intersection with N.C. 191 – Haywood Rd.

The NCDOT report describes the sources of congestion on US 25 Business – Asheville Hwy as follows: “Hendersonville High School is located north of downtown and is bordered by Oakland Street, N Church Street, 9<sup>th</sup> Ave W and Bearcat Boulevard. There were no observations of traffic or truck generators more significant than typical businesses and residential neighborhoods within the area. In addition, no major development activity was observed.” This description omits that congestion caused by Hendersonville High School occurs only intermittently during school opening or closing. It also omits description of the intermittent congestion caused by the series of traffic lights shown in Figure 2 on northbound N Main St and US 25 Business – Asheville Hwy and on southbound N Church St. Intermittent congestion in both locations occurs during times of peak traffic associated with commercial business and school cycles. None of this congestion is due to “east-west through traffic” from US 64 to NC 191 as demonstrated by NCDOT data below.



Some of the traffic is “through” traffic, i.e., traffic simply passing from one end to the other following a longer route. Most of this “through” traffic is either entering/exiting downtown Hendersonville or north U.S. 25 Business – Asheville Hwy beyond its intersection with N.C. 191 – Haywood Rd. However, very little of this traffic is due to “east-west travel” continuing on (or arriving from) U.S. 64 – Chimney Rock Rd on the east or U.S. 25 Business – Asheville Hwy and N.C. 191 – Haywood Rd on the west as hypothesized by the BPP.

Finally, an essentially negligible amount of the traffic is “large truck” traffic due to “east-west travel.” The “large truck” traffic that does appear on U.S. 25 Business – Asheville Hwy is due to traffic to/from U.S. 25 Business – Asheville Hwy north of its intersection with N.C. 191 – Haywood Rd and is not to/from N.C. 191 – Haywood Rd.

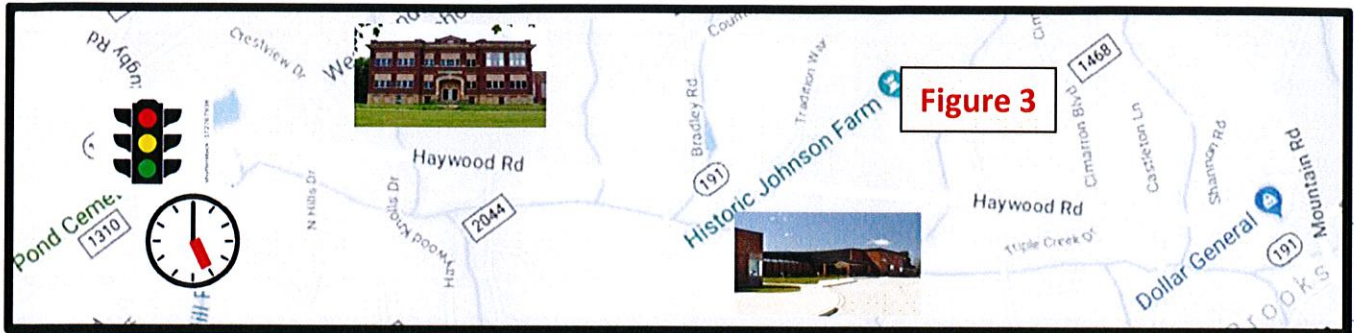
#### N.C. 191 – Haywood Rd

N.C. 191 – Haywood Rd has essentially no traffic congestion during most of the business day (and, none after business hours) except due to road construction or utility repairs. The only significant traffic congestion occurs during the time periods when West Henderson High School or Rugby Middle School opens and closes. The only other period of noticeably increased westbound traffic volume and localized congestion is a relatively short time around 5:00 pm when commuters travel from Hendersonville to Mills River. A similar increase in eastbound traffic does not occur during the morning commute period. Since both West Henderson High School and Rugby Middle

School are west of the locations at which the BPP would intersect N.C. 191 – Haywood Road, the BPP would have no role in reducing the traffic congestion caused by them.

The NCDOT report does not describe traffic congestion of NC 191 – Haywood Rd because (1) there is no significant congestion on this road within the Balfour Parkway study area and (2) the only sources of congestions on this road are

intermittent sources west of the study area. These sources which are graphically illustrated in Figure 3 are (1) Rugby Middle School, (2) West Henderson High School, and (3) the traffic light at the intersection with N and S Rugby Road.



An undetermined fraction of the traffic on N.C. 191 – Haywood Rd is “through” traffic traveling to/from Hendersonville to/from points west including Mills River, Brevard, and destinations further north on N.C. 191 after it first joins with and then separates from U.S. 280 in Mills River. However, very little of this traffic is due to “east-west travel” arriving from U.S. 64 – Chimney Rock Rd on the east via U.S. 25 Business – Asheville Hwy as hypothesized by the BPP. The remainder of the traffic is from/to the many locations along N.C. 191 – Haywood Rd which include numerous large residential neighborhoods.

Finally, there is essentially a negligible amount of the traffic on N.C. 191 – Haywood Rd that is “large truck” traffic due to “east-west travel.”

### **Observations that Demonstrate the Congestion Descriptions**

The congestion descriptions previously stated are based on observations which are made every day by drivers in Hendersonville. They should be verified by DOT taking data to measure the volume<sup>2</sup> and nature of traffic at various locations as described in the Appendix.

#### **U.S. 64 – 4 Seasons Blvd**

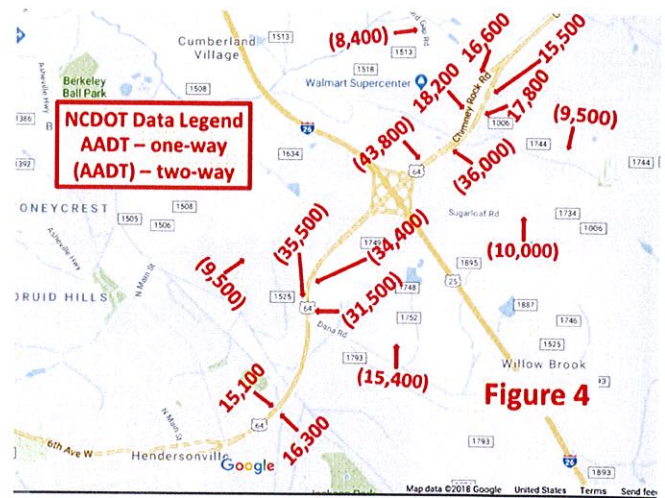
The following observations demonstrate that the preponderance of traffic congestion on U.S. 64 – 4 Seasons Blvd is due to “local” traffic rather than “through” traffic. It is readily observed that the traffic volume anywhere in the congested length<sup>3</sup> of U.S. 64 – 4 Seasons Blvd is much greater than the traffic volume entering or emerging from that length. This is particularly obvious when driving east on U.S. 64 – 4 Seasons Blvd past the Walmart complex and then the Ingles complex and continuing on Chimney Rock Rd. It is only slightly less obvious when driving west on U.S. 64 – 4 Seasons Blvd past Dana Rd near the Lowes complex and continuing on to 7<sup>th</sup> Ave E.

<sup>2</sup> Traffic volume is defined as the number of vehicles per unit time passing a specified location.

<sup>3</sup> The congested length of U.S. 64 – 4 Seasons Blvd is from the Ingles complex at its east end to Dana Rd near the Lowes complex at its west end.

The NCDOT data validates the observations stated above. Figure 4 shows the maximum traffic along NC 64 (4 Seasons Blvd) (**43,800**) is between I-26 and the Walmart complex. The traffic diminishes to the east (**36,000** → **32,100** measured at 3 locations) with significant traffic to/from intersecting roads (Sugarloaf, **10,000**; Howard Gap N, **8,400**; Howard Gap S, **9,500**). The traffic diminishes to the west (**34,400** → **31,400** measured at 3 locations) with significant traffic to/from intersecting roads (Dana, **15,400**; Duncan Hill, **9,500**). Also shown in the Appendix are traffic to/from Linda Vista (**3,300**) and Francis (**2,000**). The westbound traffic entering 4 Seasons Blvd (**16,600**) is more than three times the westbound traffic on

NC 191 west of Mountain Rd (**0.45 X 10,900 = 4,900**) (see Tables A.5 and A.9 in Appendix).

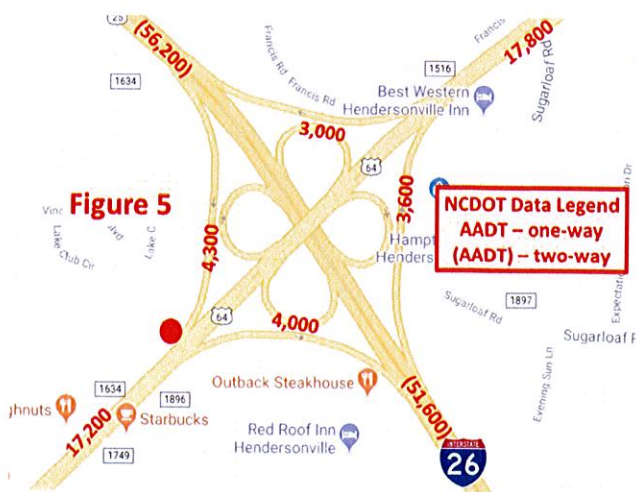


**Conclusion: The NCDOT data demonstrates that congestion on US 64 – 4 Seasons Blvd is due to “local” traffic, not “east-west through” traffic.**

*The following observations demonstrate that there is very little “through” traffic due to “east-west travel” continuing on (or arriving from) U.S. 64 – 4 Seasons Blvd on the east. It is readily observed that the volume of eastbound traffic at the east end of U.S. 64 – 4 Seasons Blvd which enters I-26 (both southward and northward) is much greater than the volume of traffic which is eastbound on U.S. 64 - Chimney Rock Rd east of the Ingles complex. Likewise, it is readily observed that the volume of westbound traffic arriving at the east end of U.S. 64 – 4 Seasons Blvd from U.S. 64 – Chimney Rock Rd east of the Ingles complex is much smaller than the volume of traffic which enters U.S. 64 – 4 Seasons Blvd from I-26 (from both the south and the north).*

The NCDOT data shown in Figure 5 validate the observations stated above relative to through traffic even though the data was not taken at the exact locations stated above. The eastbound traffic on US 64 east of I-26 coming from 4 Seasons Blvd (**17,800 – 4,000 – 3,600 = 10,200**) is half the total eastbound traffic measured at this location (**43,800 X 0.45 = 19,700**) (see Appendix Table A.9). Likewise, the volume of westbound traffic on NC 64 west of I-26 coming from east of I-26 (**15,500 – 4,300 – 3,000 = 8,200**) is half of the total westbound traffic measured at this location (**34,400 X 0.45 = 15,500**) (east of Linda Vista, see Appendix Table A.9). This demonstrates that “through” traffic at the west end of 4 Seasons Blvd is a maximum of 50% of the traffic that enters the east end of 4 Season Blvd. The actual fraction is

much lower since only a small fraction of the traffic that comes from Chimney Rock Road is likely to be “through traffic.”



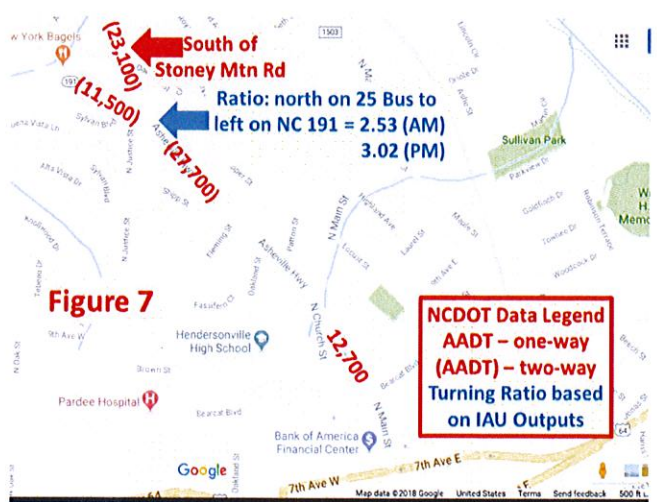
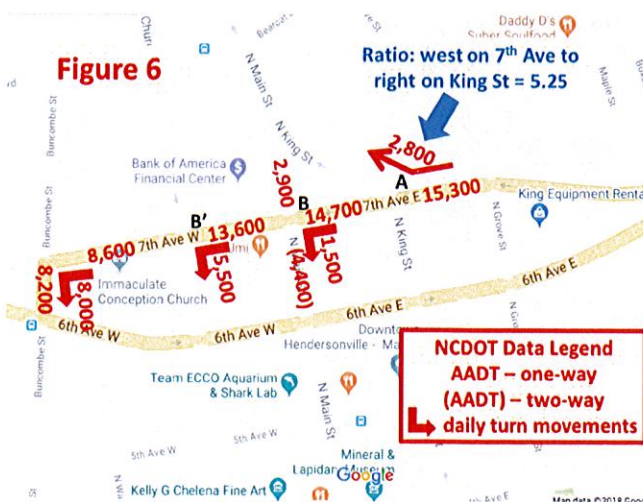


The following observations demonstrate that very little of any westbound “through” traffic at the west end of U.S. 64 – 4 Seasons Blvd is due to “east-west travel” continuing on U.S. 25 Business – Asheville Hwy and N.C. 191 – Haywood Rd. It is readily observed that most of the volume of westbound traffic at the west end of U.S. 64 – 4 Seasons Blvd continues westward on 7<sup>th</sup> Ave E at the intersection with N King St (point A on map on page 7) and then divides at either N Main St (point B on map) or N Church St (point B’ on map) into traffic entering downtown Hendersonville or continues west on 7<sup>th</sup> Ave W. Likewise, it is readily observed that only a small fraction of the westbound traffic from the west end of U.S. 64 – 4 Seasons Blvd travels north on N King St (point A on map) and then northward on U.S. 25 Business – Asheville Hwy. Similarly, it is readily observed that most of this traffic from N Main St which enters U.S. 25 Business – Asheville Hwy continues northward on U.S. 25 Business – Asheville Hwy at the intersection with N.C. 191 – Haywood Rd (point D on map) with very little of it turning left onto N.C. 191 – Haywood Rd and continuing westward.

The NCDOT data shown in Figures 6 and 7 validate the observations stated above. Figure 6 shows that most of the westbound traffic at the west end of U.S. 64 continues west on 7<sup>th</sup> Ave (14,700) at the intersection with King St (point A) and divides into traffic entering Hendersonville downtown on Main St (point B)(1,500) or Church St (point B’)(5,500) or continues west on 7<sup>th</sup> Ave (8,600) with most turning left on Buncombe St (8,000). A maximum of 18% (2,800) travels north on N King St (point A) and then northward on U.S. 25 Business. The ratio of traffic continuing west on 7<sup>th</sup> Ave to that which turns right on King St (point A) is 5.25, i.e., only one 1 vehicle turns right on King St to every 5.25 that continues west on 7<sup>th</sup> Ave. This demonstrates there is very little westbound “through” traffic going from US 64 to US 25.

that more than 80% of the traffic that enters US 25 Business from N Main St continues northward on US 25 Business (23,100/27,700 = 0.83 using equal D-factors) rather than turning left (west) on NC 191. There is uncertainty in applying this AADT data due to the large number of roads that intersect US 25 Business between the locations at which the data was measured. A more precise measure is the IAU Output data which shows that 71% (2.53/3.53 – AM) to 75% (3.02/4.02 – PM) of this traffic continues northward on US 25 Business. Thus, the maximum fraction of traffic from the east end of 4 Seasons Blvd that might be westbound “through traffic” on NC 191 is only 50% times 18% times 25% = 2¼%. As previously stated, the actual fraction is much lower since only a small fraction of the traffic that comes from Chimney Rock Road is likely to be “through traffic.”

The NCDOT AADT data shown in Figure 7 indicates



The fraction of traffic on 7<sup>th</sup> Ave E going each direction at point A on the map is indicated by the number of lanes devoted to the respective directions, i.e., 3 continuing westward on 7<sup>th</sup> Ave E and 1 turning right (northwest) on N King St. Likewise, the fraction of northbound traffic on U.S. 25 Business – Asheville Hwy going each direction at point D on the map is partially indicated by the number of lanes devoted to the respective directions, i.e., 2 continuing northward on U.S. 25 Business – Asheville Hwy and effectively 1 turning left (west) onto N.C. 191 – Haywood Rd. A better indication of the fraction of traffic from the south going each direction at point D is the duration of the traffic lights for the two directions, i.e., very long for continuing northward U.S. 25 Business – Asheville Hwy and very short for turning left (west) onto N.C. 191 – Haywood Rd.

The NCDOT report did not address the number of lanes provided to traffic traveling in each direction at the respective intersections. However, Figure 8, which shows the view looking west on 7<sup>th</sup> Ave E at the intersection with N King St, validates the observation stated above for that location.

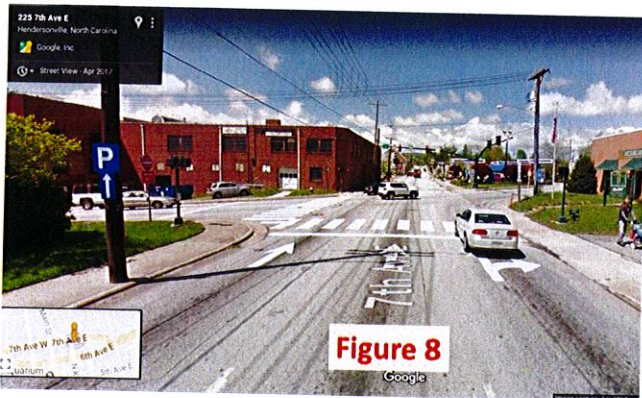
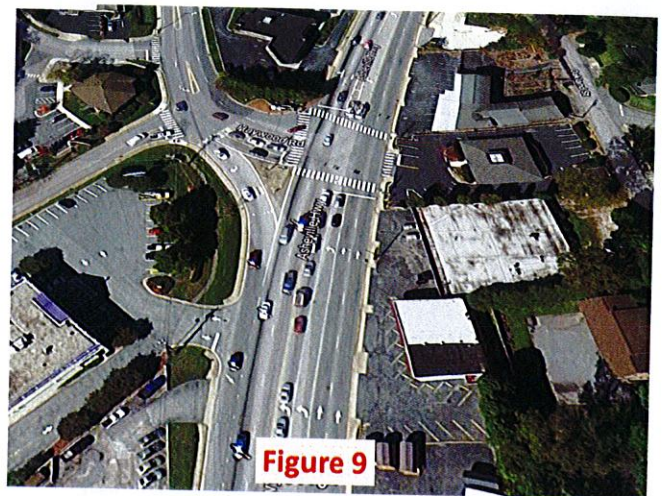


Figure 9, which shows the view looking north on US 25 Business at the intersection with NC 191,



validates the lanes observation stated above for this location. The durations of traffic lights at this intersection measured by the author at 10:45 AM on April 13, 2018, are: 60 sec for traffic continuing northward on US 25 Business and 10 sec for traffic turning left (west) onto NC 191.

The following observations demonstrate that very little of any eastbound “through” traffic at the west end of U.S. 64 – 4 Seasons Blvd is due to “east-west travel” coming from N.C. 191 – Haywood Rd. It is readily observed that the volume of traffic passing southward at the intersection of N.C. 191 – Haywood Rd with U.S. 25 Business – Asheville Hwy (point D on map) originating on N.C. 191 – Haywood Rd is much smaller than that originating on U.S. 25 Business – Asheville Hwy from the north. Likewise, it is readily observed that the volume of traffic turning left (east) on 6<sup>th</sup> Ave W from N Church St (coming from U.S. 25 Business – Asheville Hwy) (point C’ on map) is much smaller than that coming from the west on 6<sup>th</sup> Ave W plus that coming from right turns of northbound traffic from N Main St (point C on map) and from N King St and N Grove St.

The NCDOT data shown in Figures 7, 10 and 11 validate the observations stated above. The NCDOT AADT data shown in Figure 7 indicates that the volume of traffic that enters US 25 Business from NC 191 from the west is only half of that

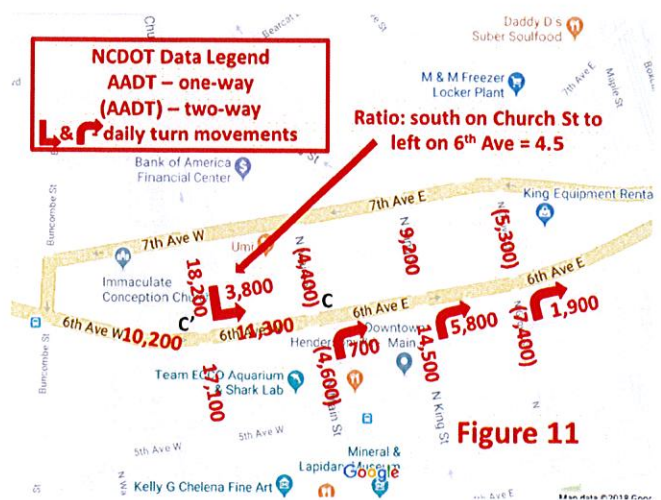
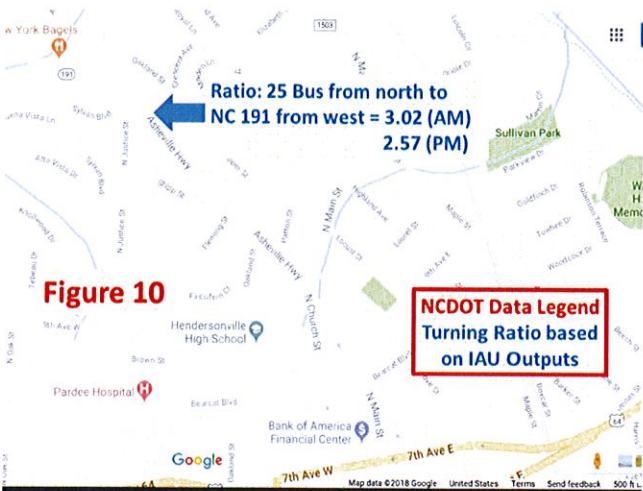
coming from the north on US 25 Business ( $11,500/23,100 = 0.50$  using equal D-factors). The uncertainty in this AADT data has already been noted. A more precise measure is the IAU Output data shown in Figure 10 which shows that 2½ (2.57

– PM) to 3 (**3.02** – AM) times more traffic comes from the north on US 25 Business than from the west on NC 191 depending on the time of day.

The NCDOT data shown in Figure 11 validates that the volume of traffic turning left of 6<sup>th</sup> Ave W from N Church St (coming from US 25 Business) (**3,800**) is much smaller than the total volume (**18,600**) that comes from the sum of traffic from the west on 6<sup>th</sup> Ave W (**10,200**) plus right turns of northbound traffic from N Main St (**700**), N King St (**5,800**), and N Grove St (**1,900**).

Thus, based on the NCDOT data, the fraction of

traffic on 4 Seasons Blvd at its east end that could potentially be “through traffic” originating on NC 191 is statistically about ¼ (dilution shown in Figure 10) times 1/5.5 (dilution shown by turning ratio in Figure 11) times **3,800/18,600** (dilution on 6<sup>th</sup> Ave) times a factor of ½ dilution at the east end of 4 Seasons Blvd due to traffic entering from I-16 as shown previously in the discussion of Figure 5. So, a statistical estimate of the fraction of eastbound “through traffic” coming from NC 191 that enters Chimney Rock Road is 0.005%! The actual fraction is even less since not all traffic entering US 25 Business from NC 191 is “through traffic.”



**Conclusion: The NCDOT data demonstrates that westbound “through traffic” is a maximum of 2¼% of the traffic on US 64 (4 Seasons Blvd) – US 25 Business – NC 191.**

**Conclusion: The NCDOT data demonstrates that eastbound “through traffic” is a maximum of 0.005% of the traffic on US 64 (4 Seasons Blvd) – US 25 Business – NC 191.**

*It cannot be readily observed whether any particular “large truck” traffic on U.S. 64 – 4 Seasons Blvd is due to “east-west travel” versus deliveries to businesses on U.S. 64 - 4 Seasons Blvd or deliveries to businesses elsewhere in Hendersonville. However, it is readily observed that the volume of “large truck” traffic on either U.S. 64 – 4 Seasons Blvd or U.S. 25 Business – Asheville Hwy north of its intersection with N.C. 191 – Haywood Rd in either direction is much larger than on N.C. 191 – Haywood Rd in either direction. This implies that there is very little “through” traffic due to “east-west travel” of “large truck” traffic.*

The NCDOT data shown in Table A.10 for percentages of trucks from 13-hour TMCs validate the observations stated above. The data for “heavy vehicle volume” taken at 6 locations on US 64 show only 1% of traffic due to TTST (truck tractor semi-trailers), classes 8-13 and 2% due to duals, classes 4-7. The data taken at 4 locations on the one-way sections of US 64 east of I-26 (Chimney Rock Road) also shows only 1% of traffic due to TTST (truck tractor semi-trailers), classes 8-

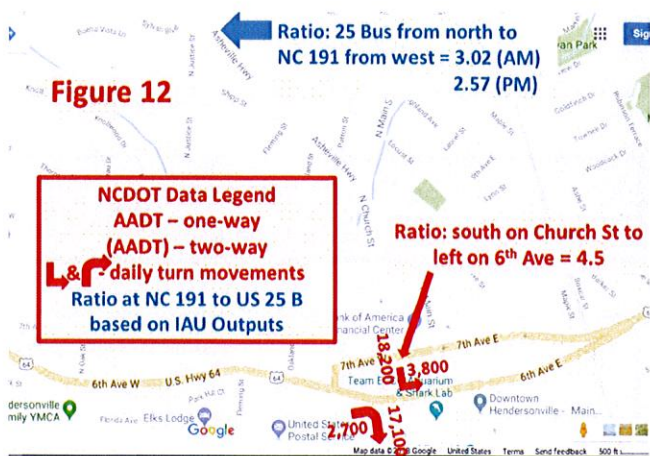
13 and 2% due to duals, classes 4-7. These percentages are consistent with deliveries to businesses along US 64 or elsewhere in Hendersonville, not with “east-west through travel.” The NCDOT data shown in Table A.10 for I-26 represents typical through traffic values. That data in both northbound and southbound directions is 10% of traffic due to TTST (truck tractor semi-trailers), classes 8-13 and 4% due to duals, classes 4-7.

**Conclusion: The NCDOT data demonstrates that only a small fraction (1–2%) of traffic on US 64 – 4 Seasons Blvd is due to “heavy trucks” and that these trucks are not “east-west through traffic.”**

U.S. 25 Business – Asheville Hwy

*The following observations demonstrate that southbound traffic congestion on U.S. 25 Business – Asheville Hwy is due primarily to traffic arriving from north of its intersection with N.C. 191 – Haywood Rd and continuing southward into downtown Hendersonville. It is readily observed that the preponderance of the volume of southbound traffic on U.S. 25 Business – Asheville Hwy arrives from U.S. 25 Business – Asheville Hwy north of its intersection with N.S. 191 – Haywood Rd (point D on map), not from N.C. 191 – Haywood Rd. Furthermore, it is readily observed that the preponderance of the volume of southbound traffic on N Church St coming from U.S. 25 Business – Asheville Hwy continues south on N Church St with very little traffic turning left (east) onto 6<sup>th</sup> Ave W (point C’ on map) and then on to U.S. 64 – 4 Seasons Blvd.*

The NCDOT data shown in Figure 12 validate the observations stated above. About 75% (**3.02/4.02** – AM, **2.57/3.57** – PM) of the southbound traffic on US 25 Business just south of NC 191 comes from US 25 Business north of its intersection with NC 191. 79% (**(17,100-2,700)/18,200**) of this southbound traffic continues south on N Church St at its intersection with US 64 (6<sup>th</sup> Ave W) with only 21% (**3,800/18,200**) turning east onto US 64. Thus, the vast majority of southbound “through traffic” in this section of US 25 Business arrives from north of NC 191 and continues south on N Church St. Therefore, congestion is not caused by “east-west through traffic.”



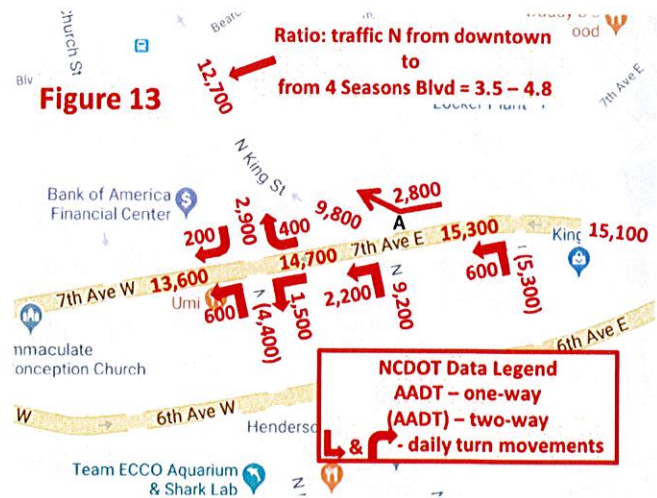
*The following observations demonstrate that northbound traffic congestion on U.S. 25 Business – Asheville Hwy is due primarily to traffic arriving from downtown Hendersonville. It is readily observed that the preponderance of the volume of traffic on N Main St just north of its merger with N King St which continues northward on U.S. 25 Business – Asheville Hwy arrives from south of 7<sup>th</sup> Ave E on N Main St, N King St, and N Grove St with only a small fraction coming from the west end of U.S. 64 – 4 Seasons Blvd which travels north on N King St (point A on map).*

Furthermore, it is readily observed that the preponderance of the volume of northbound traffic on U.S. 25 Business – Asheville Hwy continues on U.S. 25 Business – Asheville Hwy to the north beyond the intersection with N.C. 191 – Haywood Rd with very little traffic turning left (west) onto N.C. 191 – Haywood Rd (point D on map).

The NCDOT data shown in Figure 13 validate the observations stated above. The traffic going north to US 25 Business on N Main St just north of its intersection with N King St (**12,700**) is up to 83% from downtown Hendersonville coming from south of 7<sup>th</sup> Ave E on N Main St (**2,900**), N King St (**7,000 = 9,200 – 2,200**), and N Grove St (up to **600**). Only 17-22% of this traffic (**2,200 – 2,800**) comes from the west end of US 64 – 4 Seasons Blvd.

The possible range of the volume of traffic coming from 4 Seasons Blvd (**2,200 – 2,800**) is due to the uncertainty of the destination of the traffic turning left from N Grove St onto 7<sup>th</sup> Ave E. The NCDOT data do not measure this destination explicitly. It is most likely that nearly all of this traffic (left turns from N Grove St) continues north on N King St since that is the continuation of US 25 Business from south to north. If all of the left-turning traffic from N Grove St (**600**) continues northward on N King St, then only the minimum amount of the traffic there is from US 64 – 4 Seasons Blvd (**2,000 – 600 = 2,200**). If all of the left-turning traffic from N Grove St (**600**) continues westward of 7<sup>th</sup> Ave E, then all of the traffic on N King St north of 7<sup>th</sup> Ave E (**2,800**) is from US 64 – 4 Seasons Blvd.

Recall that the NCDOT AADT data shown in Figure 7 demonstrates that 71% (**2.53/3.53 – AM**) to 75% (**3.02/4.02 – PM**) of the traffic traveling north on US 25 Business continues northward on US 25 Business rather than turning left (west) on NC 191.



Thus, the vast majority of northbound “through traffic” in this section of US 25 Business arrives from downtown Hendersonville south of 7<sup>th</sup> Ave E and continues north on US 25 Business at its intersection with NC 191. Therefore, congestion is not caused by “east-west through traffic.”

**Conclusion: The NCDOT data demonstrates the vast majority (about 80%) of traffic on US 25 Business is north-south traffic arriving from north of NC 191 or south of 7<sup>th</sup> Ave E and continuing south of 6<sup>th</sup> Ave W or north of NC 191, respectively, not “east-west through” traffic.**

The following observations demonstrate that very little of the “through” traffic on U.S. 25 Business – Asheville Hwy is due to “east-west travel” continuing on (or arriving from) U.S. 64 – Chimney Rock Rd on the east or N.C. 191 – Haywood Rd on the west. As has been previously observed, the preponderance of the volume of northbound traffic on U.S. 25 Business – Asheville Hwy continues on U.S. 25 Business – Asheville Hwy to the north beyond the intersection with N.C. 191 – Haywood Rd with very little traffic turning left (west) onto N.C. 191 – Haywood Rd (point D on map). Furthermore, also as previously observed, the preponderance of the volume of southbound traffic on U.S. 25 Business – Asheville Hwy arrives from U.S. 25 Business – Asheville Hwy north of its intersection with N.S. 191 – Haywood Rd, not from N.C. 191 – Haywood Rd. It is also readily observed that even if the total volume of traffic on U.S. 25 Business – Asheville Hwy which is attributable to N.C. 191 – Haywood Wood were

subtracted from the traffic on U.S. 25 Business – Asheville Hwy during times of peak congestion, the reduction of congestion would not be noticeable.

The NCDOT data shown in Figure 7 and the discussion of it validate the observations stated above relative to northbound “through” traffic on US 25 Business. The IAU Output data shows that 71% (2.53/3.53 – AM) to 75% (3.02/4.02 – PM) of the northbound traffic continues northward on US 25 Business and does not turn west onto NC 191.

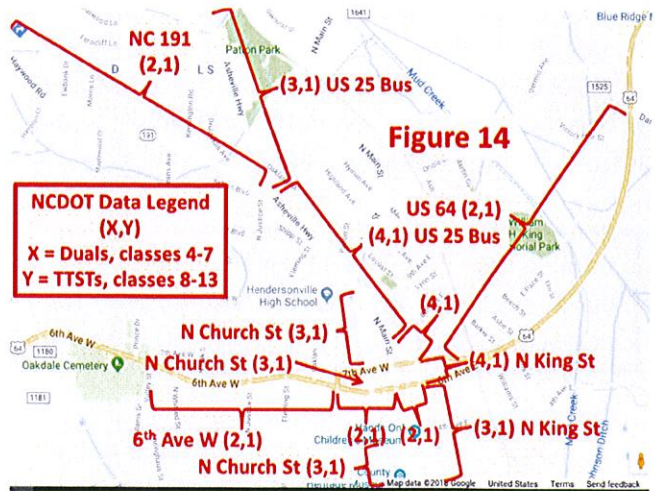
The NCDOT data shown in Figure 10 and the discussion of it validate the observations stated above relative to southbound “through” traffic on US 25 Business. The IAU Output data shows that 2½ (2.57 – PM) to 3 (3.02 – AM) times more traffic comes from the north on US 25 Business than from the west on NC 191 depending on the time of day.

*The following observations demonstrate that the “large truck” traffic that does appear on U.S. 25 Business – Asheville Hwy is due to traffic to/from U.S. 25 Business – Asheville Hwy north of its intersection with N.C. 191 – Haywood Rd and is not to/from N.C. 191 – Haywood Rd. It is readily observed that the volume of “large truck” traffic that travels northbound/southbound on U.S. 25 Business – Asheville Hwy north of its intersection with N.C. 191 – Haywood Rd (point D on map) is far greater than the volume of “large truck” traffic that travels westbound/eastbound on N.C. 191 – Haywood Rd. It is also readily observed that the type of “large truck” traffic that travels on N.C. 191 – Haywood Rd is dominated by trucks going to/from the Henderson County Solid Waste Convenience Station and Transfer Station (county landfill), the Division of Highways Henderson Complex (county maintenance station), or the Van Wingerden Greenhouse Co or associated with local construction, not transport trucks that would be involved in “through” traffic due to “east-west travel.”*

The NCDOT data shown in Figures 7, 10 and 13 are include any “large truck” traffic. Thus, they validate the observations made above.

with US 25 Business. Duals are also no more than 2% of the traffic on NC 191. However, duals are 3-4% of the traffic on all segments of US 25 Business.

The NCDOT data from Table A.10<sup>4</sup> for percentages of trucks from 13-hour TMCs also validate the observations stated above and provide even greater insight into the nature of “heavy truck” traffic on the roadways of concern. This NCDOT data is shown in Figure 14 for each of these roadways, i.e., US 64, US 25 Business, and NC 191.



The NCDOT data displayed in Figure 14 shows that TTSTs (truck tractor semi-trailers), classes 8-13 are no more than 1% of the traffic in all locations. The data for duals, classes 4-7 provides a clear indication of heavy truck traffic patterns. Duals are no more than 2% of the traffic on US 64 at all locations both east and west of its intersections

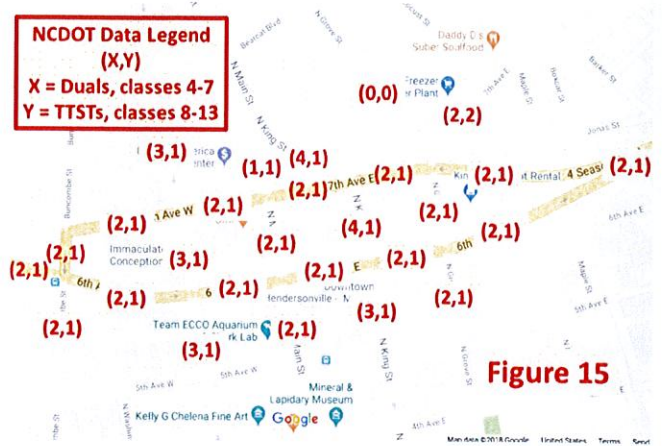
Duals are 3% of the traffic north of the intersection of US 25 Business with NC 191, on the one-way southbound portion of US 25 Business (N Church St), and on the one-way northbound portion of US

<sup>4</sup> Several data points in Table A.10 are incorrect values. Correct values are given in “Figure 2016 Average Annual Daily Traffic, Existing No Build, Sheet 2 of 3.”

25 Business south of its intersection with US 64, i.e., N King St. The remaining northbound portion of US 25 Business north of US 64 (N King St and N Main St) north to its intersection with NC 191 has 4% duals. This clearly indicates the dominance of a north-south truck traffic pattern on US 25 Business in agreement with the AADT data.

The NCDOT data in Figure 15 provides more insight into heavy truck traffic in downtown Hendersonville. Again, TTSTs (truck tractor semi-trailers), classes 8-13 are no more than 1% of the traffic in all locations except on 7<sup>th</sup> Ave E where they are 2% of the traffic. This is due to two factors. First, there is significantly less total traffic in this location (**AADT = 4,200**) so the same absolute level of heavy truck traffic here is twice the percentage that it is, for example, on N King St between 6<sup>th</sup> Ave E and 7<sup>th</sup> Ave E where the **AADT = 9,200** (see Figure 13). The level of “heavy truck” traffic on 7<sup>th</sup> Ave E is due to several businesses on or near 7<sup>th</sup> Ave E to which TTSTs make deliveries, e.g., Lowe’s, Home Depot, and Hendersonville Chrysler Dodge Jeep Ram.

Duals are 2% of the traffic at all locations on US 64



both westbound (7<sup>th</sup> Ave E & W) and eastbound (6<sup>th</sup> Ave W and E). And, duals are 3-4% of the traffic at all locations on US 25 Business both northbound (N King St and N Main St) and southbound (N Church St). This clearly indicates two intersecting traffic patterns, i.e., east-west on US 64 and north-south on US 25 Business, with little interaction between the two as was shown by the NCDOT AADT data. Thus, NCDOT data for “heavy truck” traffic agrees with the conclusions stated previously that there is very little “east-west through traffic on the combination of US 64 – US 25 Business – NC 191.

**Conclusion: The NCDOT data demonstrates that only a small fraction (1–3%) of traffic on US 25 Business – Asheville Hwy is due to “heavy trucks.”**

**Conclusion: The NCDOT data demonstrates that “heavy trucks” in downtown Hendersonville follow two intersecting traffic patterns, i.e., east-west on US 64 and north-south on US 25 Business, with little interaction between the two.**

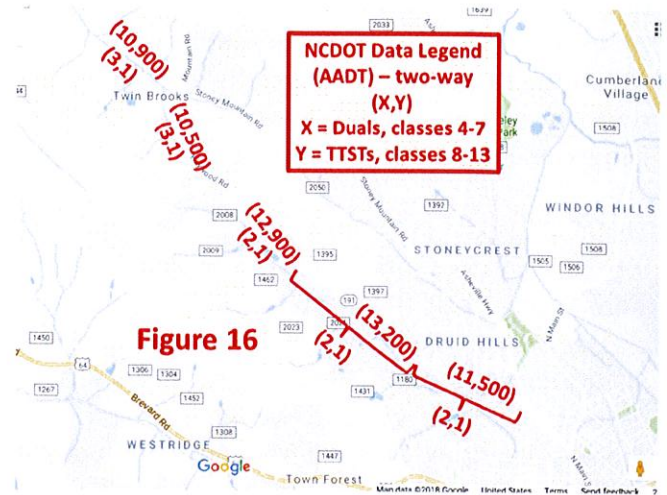
N.C. 191 – Haywood Rd

*The following observations demonstrate that N.C. 191 – Haywood Rd has essentially no traffic congestion during most of the business day, and that congestion which does occur at specific times is determined entirely by local conditions. It is readily observed that traffic at nearly all times travels at (or slightly above) the posted speed limits at all locations on N.C. 191 – Haywood Rd. It is readily observed that in the vicinity of West Henderson High School and Rugby Middle School congestion produced during time periods associated with school openings and closings is due to reduced speed limits in the vicinity of the schools and significant added traffic volume going to or coming from the schools. Likewise, increased westbound commuter traffic around 5:00 pm is readily observed to produce*

limited congestion at the intersection with N and S Rugby Rd where intermittent lines of stopped vehicles form in response to the timing of the traffic light.

The NCDOT data for NC 191 shown in Figure 16 validate the observations stated above in the portion of NC 191 in which data was recorded. No data was recorded west of that shown in Figure 16 just west of Mountain Rd. The AADT data pattern is similar to that shown in Figure 4 on 4 Seasons Blvd, i.e., the traffic volume is smaller at the ends of the roadway segment than somewhere in the middle of the segment. This is indicative of local congestion. The sources of congestion on NC 191 are the many small residential neighborhoods on both sides of the road, particularly west of Blythe St where the peak AADT (13,200) occurs. The level of traffic on NC 191 shown in Figure 16 represents the potential for only very minor congestion as is demonstrated by its peak level of 13,200 compared to 43,800 on 4 Seasons Blvd, which is more than three times greater.

The NCDOT data for “heavy trucks” given in Figure 16 show that TTSTs, classes 8-13 are no more than 1% of the traffic in all locations of NC 191. The data shows duals, classes 4-7 are no more than 2%



of the traffic on NC 191 from its intersection with US 25 Business west to near its intersection with Mountain Rd. Near Mountain Rd duals are 3% of the traffic due to travel to/from the Henderson County Solid Waste Convenience Station and Transfer Station (county landfill) and the Division of Highways Henderson Complex (county maintenance station), not “east-west through traffic.”

**Conclusion: The NCDOT data demonstrates that there is the potential for only minor congestion on NC 191 and that only a small fraction (1–2%) of traffic is due to “heavy trucks” in all locations except at the intersection with Mountain Rd..**

*The following observations (condensed from those stated previously) demonstrate that very little of the westbound traffic on N.C. 191 – Haywood Rd is due to “east-west travel” arriving from U.S. 64 – Chimney Rock Rd on the east via U.S. 25 Business – Asheville Hwy. It is readily observed that only a small fraction of the westbound traffic from the west end of U.S. 64 – 4 Seasons Blvd travels north on N King St and then northward on U.S. 25 Business – Asheville Hwy. It is also readily observed that most of this traffic continues northward on U.S. 25 Business – Asheville Hwy at the intersection with N.C. 191 – Haywood Rd with very little of it turning left onto N.C. 191 – Haywood Rd and continuing westward.*

The NCDOT data shown in Figures 7 and 13 and the discussion of it validate the observations stated above.

*The following observations (condensed from those stated previously) demonstrate that very little of the eastbound traffic on N.C. 191 – Haywood Rd is due to “east-west travel” the eventual destination of which is U.S. 64 – Chimney*



*Rock Rd. It is readily observed when traveling eastward on N.C. 191 – Haywood Rd and merging with U.S. 25 Business – Asheville Hwy. to the south that nearly all of the traffic continues south on S Church St with very little of it turning left (east) onto 6<sup>th</sup> Ave W (point C' on map on page 7) in order to continue on toward U.S. 64 – 4 Seasons Blvd.*

The NCDOT data shown in Figure 12 and the discussion of it validate the observations stated above.

*Finally, the following observations demonstrate that an essentially negligible amount of the traffic on N.C.191 – Haywood Rd is “large truck” traffic due to “east-west travel.” It is readily observed that there is a very small amount of “large truck” traffic on N.C. 191 – Haywood Rd. Furthermore, as has been previously observed, nearly all of the “large truck” traffic is associated with either the Henderson County Solid Waste Convenience Station and Transfer Station (county landfill), or the Division of Highways Henderson Complex (county maintenance station), or the Van Wingerden Greenhouse Co, or local construction.*

The NCDOT data shown in Figure 16 and the discussion of it validate the observations stated above concerning “large truck” traffic.

The NCDOT report did not address the composition of this “large truck” traffic.

### **Conclusions**

1. *The sources of congestion at the three locations cited by the BPP, i.e., U.S. 64 – 4 Seasons Blvd, U.S. 25 Business – Asheville Hwy, and N.C. 191 – Haywood Rd are readily observable and are well understood.*
2. *East-west “through” travel in these three locations is a negligible contributor to this congestion.*
3. *Congestion due to east-west “through” travel by “large truck” traffic in these three locations is essentially non-existent.*
4. *Therefore, congestion in these three locations **will not be relieved** by a new “route for east-west travel,” i.e., the Balfour Parkway.*

Prepared April 13, 2018 by  
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## Appendix

### **Traffic Data that Should be Gathered by DOT to Verify the Sources of Traffic Congestion**

#### U.S. 64 – 4 Seasons Blvd

To verify that the preponderance of traffic congestion on U.S. 64 – 4 Seasons Blvd. is due to “local” traffic rather than “through” traffic:

Data in the congested length of eastbound and westbound traffic volume at several locations including

*Just west of the Ingles complex at the east end*

*Just east and just west of the Walmart complex*

*Just east of the I-26 entrance/exit ramps on the east side of I-26*

*Just west of the I-26 entrance/exit ramps on the west side of I-26*

*Near the Blue Ridge Mall*

*Just east of Dana Rd*

Data of eastbound and westbound traffic volume on U.S. 64 – Chimney Rock Rd east of the U.S. 64 split which is east of the Ingles complex

Data of eastbound and westbound traffic volume on U.S. 64 – 4 Seasons Blvd midway between Dana Rd and the split with 7<sup>th</sup> Ave E and 6<sup>th</sup> Ave E

To verify that the volume of eastbound traffic at the east end of U.S. 64 – 4 Seasons Blvd which enters I-26 (both southward and northward) is much greater than the volume of traffic which is eastbound on U.S. 64 - Chimney Rock Rd east of the Ingles complex:

Data on eastbound traffic volume from U.S. 64 – 4 Seasons Blvd entering I-26 (both southward and northward)

Data on eastbound traffic volume on U.S. 64 – Chimney Rock Rd east of the U.S. 64 split which is east of the Ingles complex (ibid)

To verify that the volume of westbound traffic arriving at the east end of U.S. 64 – 4 Seasons Blvd from U.S. 64 – Chimney Rock Rd east of the Ingles complex is much smaller than the volume of traffic which enters U.S. 64 – 4 Seasons Blvd from I-26 (from both the south and the north):

Data on westbound traffic volume exiting I-26 (both from the south and the north)

Data on westbound traffic volume on U.S. 64 – Chimney Rock Rd east of the U.S. 64 split near the Ingles complex (ibid)

To verify that most of the volume of westbound traffic at the west end of U.S. 64 – 4 Seasons Blvd continues westward on 7<sup>th</sup> Ave E at the intersection with N King St and then divides at either N Main St or N Church St into traffic entering downtown Hendersonville or continues west on 7<sup>th</sup> Ave W:

*Data on traffic volume on 7<sup>th</sup> Ave E between U.S. 64 – 4 Seasons Blvd and N King St*

*Data on traffic volume on 7<sup>th</sup> Ave E between N King St and N Main St*

*Data on traffic volume on 7<sup>th</sup> Ave E that turns left (south) at N Main St and at N Church St*

*Data on traffic volume on N Church St that turns right (west) at 7<sup>th</sup> Ave W*

*Data on traffic volume on 7<sup>th</sup> Ave W between N Church St and Buncombe St*

*To verify that only a small fraction of the westbound traffic from the west end of U.S. 64 – 4 Seasons Blvd travels north on N King St and then northward on U.S. 25 Business – Asheville Hwy:*

*Data on traffic volume on 7<sup>th</sup> Ave E between U.S. 64 – 4 Seasons Blvd and N King St (ibid)*

*Data on traffic volume on 7<sup>th</sup> Ave E between N King St and N Main St (ibid)*

*Data on traffic volume on N King St just north of 7<sup>th</sup> Ave E*

*To verify that most of the traffic from N King St and N Main St which enters U.S. 25 Business – Asheville Hwy continues northward on U.S. 25 Business – Asheville Hwy at the intersection with N.C. 191 – Haywood Rd with very little of it turning left onto N.C. 191 – Haywood Rd and continuing westward:*

*Data on northbound traffic volume on U.S. 25 Business – Asheville Hwy both immediately north of and immediately south of the intersection with N.C. 191 – Haywood Rd*

*Data on northbound traffic volume on U.S. 25 Business – Asheville Hwy which turns left (west) on N.C. 191 – Haywood Rd*

*To verify that the volume of traffic passing southward at the intersection of N.C. 191 – Haywood Rd with U.S. 25 Business – Asheville Hwy originating on N.C. 191 – Haywood Rd is much smaller than that originating on U.S. 25 Business – Asheville Hwy from the north:*

*Data on eastbound traffic volume on N.C. 191 – Haywood Rd which turns right (south) on U.S. 25 Business – Asheville Hwy*

*Data on southbound traffic volume on U.S. 25 Business – Asheville Hwy both immediately north of and immediately south of the intersection with N.C. 191 – Haywood Rd*

*To verify that the volume of traffic turning left (east) on 6<sup>th</sup> Ave W from N Church St (coming from U.S. 25 Business – Asheville Hwy) is much smaller than that coming from the west on 6<sup>th</sup> Ave W plus that coming from right turns of northbound traffic from N Main St and from N King St and N Grove St*

*Data on traffic volume turning left (east) on 6<sup>th</sup> Ave W from N Church St*

*Data on traffic volume on 6<sup>th</sup> Ave W between Buncombe St and N Church St*

*Data on traffic volume on 6<sup>th</sup> Ave W between N Church St and N Main St*

*Data on northbound traffic volume from N Main St, N King St, and N Grove St turning right onto 6<sup>th</sup> Ave E*

*Data on eastbound traffic volume on 6<sup>th</sup> Ave E between N Grove St and the merge with 7<sup>th</sup> Ave E to become U.S. 64 – 4 Seasons Blvd*

*To verify that the volume of “large truck” traffic on either U.S. 64 – 4 Seasons Blvd or U.S. 25 Business – Asheville Hwy north of its intersection with N.C. 191 – Haywood Rd in either direction is much larger than on N.C. 191 – Haywood Rd in either direction:*

*Data on the volume of “large truck” traffic both westbound and eastbound on U.S. 64 – 4 Seasons Blvd anywhere within its length*

*Data on the volume of “large truck” traffic both northbound and southbound on U.S. 25 Business – Asheville Hwy immediately north of the intersection with N.C. 191 – Haywood Rd*

*Data on the volume of “large truck” traffic both westbound and eastbound on N.C. 191 – Haywood Rd immediately west of the intersection with U.S. 25 Business – Asheville Hwy*

*To determine the nature of “large truck” traffic on U.S. 64 – 4 Seasons Blvd surveys should be taken of all businesses along this route to ascertain the type and frequency of their truck deliveries. The result should be compared to data of eastbound and westbound “large truck” traffic volume at several locations in the congested length taken as specified above.*

*U.S. 25 Business – Asheville Hwy*

*To verify that the preponderance of the volume of southbound traffic on U.S. 25 Business – Asheville Hwy arrives from U.S. 25 Business – Asheville Hwy north of its intersection with N.S. 191 – Haywood Rd, not from N.C. 191 – Haywood Rd:*

*Data on southbound traffic volume on U.S. 25 Business – Asheville Hwy both immediately north of and immediately south of the intersection with N.C. 191 – Haywood Rd (ibid)*

*Data on east-bound traffic volume on N.C. 191 – Haywood Rd which turns right (south) on U.S. 25 Business – Asheville Hwy (ibid)*

*To verify that the preponderance of the volume of southbound traffic on N Church St coming from U.S. 25 Business – Asheville Hwy continues south on N Church St with very little traffic turning left (east) onto 6<sup>th</sup> Ave W and on to U.S. 64 – 4 Seasons Blvd:*

*Data on traffic volume on N Church St between 7<sup>th</sup> Ave W and 6<sup>th</sup> Ave W*

*Data on traffic volume turning left (east) on 6<sup>th</sup> Ave W from N Church St*

*To verify that the preponderance of the volume of traffic on N Main St just north of its merger with N King St which continues northward on U.S. 25 Business – Asheville Hwy arrives from south of 7<sup>th</sup> Ave E on N Main St, N King St, and N Grove St with only a small fraction coming from the west end of U.S. 64 – 4 Seasons Blvd:*

*Data on traffic volume on N Main St between 7<sup>th</sup> Ave and the merger with N King St*

*Data on traffic volume on N King St between 6<sup>th</sup> Ave E and 7<sup>th</sup> Ave E*

*Data on northbound traffic volume on N Grove St between 6<sup>th</sup> Ave E and 7<sup>th</sup> Ave E*

*Data on northbound traffic volume on N Grove St which turns left (west) at 7<sup>th</sup> Ave E*

*Data on traffic volume on 7<sup>th</sup> Ave E between U.S. 64 – 4 Seasons Blvd and N King St (ibid)*

*Data on traffic volume on N King St just north of 7<sup>th</sup> Ave E (ibid)*

*Data on traffic volume on N Main St just north of its merger with N King St*

*To verify that the preponderance of the volume of northbound traffic on U.S. 25 Business – Asheville Hwy continues on U.S. 25 Business – Asheville Hwy to the north beyond the intersection with N.C. 191 – Haywood Rd with very little traffic turning left (west) onto N.C. 191 – Haywood Rd:*

*Data on northbound traffic volume on U.S. 25 Business – Asheville Hwy both immediately north of and immediately south of the intersection with N.C. 191 – Haywood Rd (ibid)*

*Data on northbound traffic volume on U.S. 25 Business – Asheville Hwy which turns left (west) on N.C. 191 – Haywood Rd (ibid)*

*To verify that the volume of “large truck” traffic that travels northbound/southbound on U.S. 25 Business – Asheville Hwy north of its intersection with N.C. 191 – Haywood Rd is far greater than the volume of “large truck” traffic that travels westbound/eastbound on N.C. 191 – Haywood Rd:*

*Data on the volume of “large truck” traffic both northbound and southbound on U.S. 25 Business – Asheville Hwy both immediately north (ibid) of and immediately south of the intersection with N.C. 191 – Haywood Rd*

*Data on the volume of “large truck” traffic both westbound and eastbound on N.C. 191 – Haywood Rd immediately west of the intersection with U.S. 25 Business – Asheville Hwy (ibid)*

*To verify that the type of “large truck” traffic that travels on N.C. 191 – Haywood Rd is dominated by trucks going to/from the Henderson County Solid Waste Convenience Station and Transfer Station (county landfill), the Division of Highways Henderson Complex (county maintenance station), or the Van Wingerden Greenhouse Co or associated with local construction, not transport trucks that would be involved in “through” traffic due to “east-west travel”:*

*Camera data on the truck traffic which travels N.C. 191 – Haywood Rd both within the BPP study area and further west such as near the intersection with N and S Rugby Rd*

#### *N.C. 191 – Haywood Rd*

*To verify that traffic at nearly all times travels at (or slightly above) the posted speed limits at all locations:*

*Data on traffic volume and traffic speeds in both directions at several locations on N.C. 191 – Haywood Rd from the intersection with U.S. 25 Business – Asheville Hwy to the intersection with N.C. 280 in Mills River*

*To verify that in the vicinity of West Henderson High School and Rugby Middle School congestion is produced during time periods associated with school openings and closings:*

*Data on traffic volume and traffic speeds in both directions at locations on N.C. 191 – Haywood Rd both east and west of the respective schools during posted times of reduced speed limits*

*Data on traffic volume entering/leaving N.C. 191 – Haywood Rd to/from the respective schools during posted times of reduced speed limits*

*To verify that increased westbound commuter traffic around 5:00 pm produces limited congestion at the intersection with N and S Rugby Rd:*

*Data on traffic volume and traffic speeds in both directions at locations east and west of the intersection of N.C. 191 – Haywood Rd with N and S Rugby Rd for about 30 minutes before/after 5:00 pm*

*The verification of other observations associated with westbound traffic on N.C. 191 – Haywood Rd which is due to “east-west travel” arriving from U.S. 64 – Chimney Rock Hwy, on the east via U.S. 25 Business – Asheville Hwy and eastbound traffic on N.C. 191 – Haywood Rd due to “east-west travel” the eventual destination of which is U.S. 64 – Chimney Rock Rd on the east beyond the Ingles complex is provided by data previously specified.*

*In general, the continuity of the data should be checked by applying Kirchhoff’s Law to various nodes (intersections) along the route of concern.*

Table A.5. Project Specific Count Processing

Corridor	Key Location	24-Hour Estimate from 13-Hour Count	Seasonal Factor	Calculated AADT Estimate from Counts	2016 AADT
25 Business	North of Stoney Mtn. Rd.	22,046	1.03093	22,728	23,300
	South of Stoney Mtn. Rd.	21,775	1.03093	22,449	23,100
	South of NC 191	26,403	0.97087	25,634	27,700
NC 191	North of Mountain Rd.	10,560	1.03093	10,887	10,900
	South of Mountain Rd.	10,001	1.03093	10,310	10,500
	North of Waterside Dr.	11,746	1.03093	12,109	12,900
	North of Blythe St.	12,692	1.03093	13,085	13,200
	North of 25 Business	11,009	1.03093	-	11,500
Mountain Rd.	North of NC 191	5,866	1.03093	6,047	6,000
	North of Stoney Mtn. Rd.	3,532	0.97087	3,429	3,600
Leverette Rd.	South of NC 191	197	1.03093	203	200
Stoney Mtn. Rd.	West of 25 Business	5,608	1.03093	5,781	5,800
	East of Mountain Rd.	4,382	0.97087	4,254	4,000
Browning Ave.	North of NC 191	630	1.03093	649	700
Waterside Dr.	South of NC 191	186	1.03093	192	200
	Blythe St.	South of NC 191	6,766	1.03093	6,975
9th Avenue W	West of N. Church St.	727	0.9709	706	800
	South of 6th Ave. West	4,450	1.03093	4,588	4,600
N. Main St.	North of 6th Ave. West	4,278	1.03093	4,410	4,400
	North of 7th Ave. West	2,733	1.03093	2,818	2,900
	East of US 25 Bus.	6,009	0.9709	5,834	6,200
6th Avenue West	West of Buncombe St.	17,131	0.97087	16,632	17,300
	East of Buncombe St.	9,912	0.97087	9,623	10,200
	East of N. Church St.	10,847	1.03093	11,182	11,300
	West of N. King St.	10,319	0.97087	10,018	10,900
	West of Grove St.	16,057	0.98039	15,742	16,200
	East of Grove St.	16,325	0.98039	16,005	16,300
7th Avenue West	West of N. Church St.	8,364	1.03093	8,623	8,600
	East of N. Church St.	13,189	1.03093	13,597	13,600
	West of N. King St.	13,770	1.03093	14,196	14,700
	West of Grove St.	14,688	0.98039	14,400	15,300
7th Avenue East	East of Grove St.	14,231	0.98039	13,952	15,100
	East of Grove St.	4,133	0.98039	4,051.95	4,200
	East of Dana Rd.	4,060	1.03093	4,186	4,200
Buncombe St.	North of 6th Ave. West	8,420	0.97087	8,175	8,200
	South of 6th Ave. West	2,620	0.97087	2,544	2,500
	North of 7th Ave. West	-	-	-	800
N. Church Street	South of 6th Ave. West	16,539	1.03093	17,051	17,100
	North of 6th Ave. West	17,554	1.03093	18,097	18,200
	North of 7th Ave. West	12,625	1.03093	13,015	13,200
	South of 9th Ave. W	22,121	0.9709	21,477	25,900
N. King St.	South of 6th Ave. West	15,153	0.97087	14,712	14,500
	North of 6th Ave. West	9,620	0.97087	9,340	9,200
	North of 7th Ave. East	10,229	1.0309	10,545	9,800
Grove St.	South of 6th Ave. West	7,476	0.98039	7,329	7,400
	North of 6th Ave. West	5,357	0.98039	5,252	5,300
	North of 7th Ave. East	1,426	0.98039	1,398	900
I-26	North of US 64	-	-	-	56,200
	South of US 64	-	-	-	51,600
	Ramp to US 64 W	4,345	-	4,345	4,300
	Ramp to US 64 E	3,569	-	3,569	3,600
	Loop to US 64 W	2,983	-	2,983	3,000
	Loop to US 64 E	4,445	-	4,445	4,400
US 64	East of Dana Rd.	30,434	1.03093	31,375	31,500
	West of Linda Vista Dr.	36,468	1.03093	37,596	35,500
	East of Linda Vista Dr.	36,068	1.03093	37,184	34,400
	West of Sugarloaf Rd.	42,049	1.0309	43,348	43,800
	East of Sugarloaf Rd.	35,048	1.0309	36,131	36,000
US 64 East	West of Howard Gap Rd.	13,330	1.03093	13,742	17,800
	East of Howard Gap Rd.	11,200	1.03093	11,546	15,500
	U-Turn East of Howard Gap	-	-	-	900
US 64 West	West of Howard Gap Rd.	14,555	0.97087	14,131	18,200
	East of Howard Gap Rd.	12,523	0.97087	12,158	16,600
Dana Rd.	South of US 64 E.	14,936	1.03093	15,398	15,400
Duncan Hill	North of US 64 E.	9,245	1.03093	9,531	9,500
Linda Vista Dr.	North of 4 Season Blvd.	3,334	1.03093	3,437	3,300
Francis Rd.	North of US 64	2,002	1.0309	2,064	2,000
Sugarloaf Rd.	South of US 64	9,461	1.0309	9,754	10,000
	South of US 64 E.	9,198	1.03093	9,483	9,500
	South of US 64 W.	8,049	0.97087	7,815	8,600
	South of Nix Rd.	8,162	1.03093	8,414	8,400
Howard Gap Rd.	North of Nix Rd.	8,050	1.03093	8,299	8,300
	West of Howard Gap Rd.	3,063	1.03093	3,158	3,100
Nix Rd.	East of Clear Creek Rd.	2,309	1.03093	2,380	2,400
	North of Nix Rd.	3,870	1.03093	3,990	4,000
Clear Creek Rd.	South of Nix Rd.	5,862	1.03093	6,043	6,000

**Table A.7. Comparison of Intersection Analysis Utility (IAU) Tool Outputs with Existing TMC Data**

Intersection	Movement	Existing Data		IAU Outputs		Percentage Difference	
		AM	PM	AM	PM	AM	PM
NC 191 and Mountain Road	EBL	3	2	0	0	100%	100%
	EBT	3	3	0	0	100%	100%
	EBR	1	4	15	9	-1400%	-80%
	WBL	52	101	91	122	-36%	0%
	WBT	3	9	0	0	100%	100%
	WBR	111	150	130	136	6%	26%
	NBL	1	1	9	15	-800%	-1400%
	NBT	269	246	340	265	-2%	12%
	NBR	145	86	122	91	30%	15%
	SBL	157	155	136	130	32%	33%
	SBT	311	346	265	340	30%	21%
SBR	1	3	0	0	100%	100%	
US 25 and NC 191	EBL	134	165	117	140	14%	37%
	EBT	0	0	0	0	0%	0%
	EBR	420	311	304	357	44%	5%
	WBL	2	2	3	7	-67%	-86%
	WBT	0	0	0	0	-	-
	WBR	0	2	0	0	0%	100%
	NBL	184	304	357	304	-37%	13%
	NBT	578	840	904	918	-40%	2%
	NBR	2	4	7	3	-100%	-33%
	SBL	0	1	0	0	0%	100%
	SBT	679	727	918	904	-26%	7%
SBR	160	149	140	117	31%	33%	
US 64 and Linda Vista Drive	EBL	68	68	109	80	-21%	-94%
	EBT	1230	1320	1184	1464	33%	15%
	EBR	0	0	0	0	-	-
	WBL	0	0	0	0	-	-
	WBT	1204	1240	1464	1184	5%	34%
	WBR	28	30	67	40	-48%	-8%
	NBL	0	0	0	0	-	-
	NBT	0	0	0	0	-	-
	NBR	0	0	0	0	-	-
	SBL	54	70	40	67	68%	31%
	SBT	0	0	0	0	-	-
SBR	92	118	80	109	46%	36%	

Table A.9. 2016 Base Year No-Build Design Data – D, K Factors

Corridor	Key Location	D – Directional Distribution Percentage				K – Peak Hour Factor Percentage			
		TIP Project I-4400/I-4700		2016 Count Data		TIP Project I-4400/I-4700		2016 Count Data	
		TMC *	Mainline **	Selected 2016 NB Value	Mainline **	TMC *	Mainline **	Selected 2016 NB Value	
US 25 BUS	North of SR 1383 (Stoney Mountain Rd)	50 NB	-	55 NB	-	9	-	9	
	From SR 1383 (Stoney Mountain Rd) to NC 191	51 NB	-	55 NB	-	9	-	9	
	From NC 191 to N. Main St/9th Ave W	51 NB	-	55 NB	-	9	-	9	
	West of SR 1381 (Mountain Rd)	52 SB	-	55 SB	-	9	-	8	
NC 191	East of SR 1381 (Mountain Rd)	52 SB	-	55 SB	-	8	-	8	
	West of Waterside Dr	52 SB	-	55 SB	-	8	-	8	
	From Waterside Dr to SR 1180 (Blythe St)	53 SB	-	55 SB	-	8	-	8	
	From SR 1180 (Blythe St) to US 25 BUS	53 SB	-	55 SB	-	9	-	8	
SR 1381 (Mountain Rd)	From NC 191 to SR 1383 (Stoney Mountain Rd)	64 EB	-	55WB	-	8	-	8	
	North of SR 1383 (Stoney Mountain Rd)	53 WB	-	55WB	-	9	-	8	
	South of NC 191	58 SB	-	60 SB	-	12	-	12	
	West of US 25 BUS	52 EB	-	55 EB	-	8	-	8	
SR 1383 (Stoney Mountain Rd)	East of SR 1381 (Mountain Rd)	51 EB	-	55 EB	-	9	-	9	
	North of NC 191	52 SB	-	55 SB	-	7	-	7	
	South of NC 191	51 SB	-	55 SB	-	6	-	6	
	South of NC 191	50	-	55 SB	-	8	-	8	
9th Ave W	West of N. Church St	67 EB	-	70 EB	-	14	-	14	
	South of 6th Ave	55 NB	-	60 NB	-	8	-	9	
	From 6th Ave to 7th Ave	60 NB	-	60 NB	-	9	-	9	
	North of 7th Ave	60 NB	-	60 NB	-	9	-	9	
N. Main St	East of US 25 BUS	53 EB	-	55 EB	-	10	-	10	
	West of Buncombe St	54 EB	-	55 EB	-	8	-	9	
	From Buncombe St to N. Church St	100 EB	-	100 EB	-	9	-	9	
	From N. Church St to N. Main St	100 EB	-	100 EB	-	8	-	9	
6th Ave	From N. Main St to N. King St	100 EB	-	100 EB	-	8	-	9	
	From N. King St to Grove St	100 EB	-	100 EB	-	9	-	9	
	East of Grove St	100 EB	-	100 EB	-	8	-	9	
	West of N. Church St	100 WB	-	100 WB	-	8	-	8	
7th Ave	From N. Church St to N. Main St	100 WB	-	100 WB	-	8	-	8	
	From N. Main St to N. King St	100 WB	-	100 WB	-	8	-	9	
	From N. King St to Grove St	100 WB	-	100 WB	-	10	-	9	
	East of Grove St	100 WB	-	100 WB	-	9	-	9	
7th Ave E	East of Grove St	71 WB	-	70 WB	-	9	-	9	
	East of SR 1525 (Dana Rd)	100 NB	-	100 NB	-	8	-	8	
	North of 6th Ave West	100 SB	-	100 SB	-	9	-	9	
	South of 6th Ave West	51 SB	-	55 SB	-	9	-	9	
Buncombe St	North of 7th Ave West	-	-	55 NB	-	-	-	9	
	South of 6th Ave West	100 SB	-	100 SB	-	8	-	8	
	From 6th Ave West to 7th Ave West	100 SB	-	100 SB	-	8	-	8	
	From 7th Ave West to 9th Ave West	100 SB	-	100 SB	-	8	-	8	
N. Church St	From 7th Ave West to 9th Ave West	52 NB	-	55 NB	-	9	-	9	

STIP Project I-4400/I-4700 dated February 2012  
 \*\*2016 Project Specific 13-hour Turning Movement Counts  
 \*\*\*2016 Project Specific 48-hour Mainline Counts





Table A.9. 2016 Base Year No-Build Design Data – D, K Factors (cont'd)

Corridor	Key Location	D – Directional Distribution Percentage			K – Peak Hour Factor Percentage				
		TIP Project I-4400/I-4700	2016 Count Data TMC*	Mainline**	Selected 2016 NB Value	TIP Project I-4400/I-4700	2016 Count Data TMC*	Mainline**	Selected 2016 NB Value
N. King St	South of 6th Ave East	-	100 NB	-	100 NB	-	8	-	8
	From 6th Ave East to 4 Seasons Blvd	-	100 NB	-	100 NB	-	8	-	8
	North of 4 Seasons Blvd	-	100 NB	-	100 NB	-	8	-	8
Grove St	South of 6th Ave East	-	52 SB	-	55 SB	-	8	-	9
	From 6th Ave East to 4 Seasons Blvd	-	58 SB	-	60 SB	-	9	-	9
	North of 4 Seasons Blvd	-	63 SB	-	65 SB	-	4	-	9
I-26	North of US 64	55 NB	-	53 SB	55 SB	10	-	8	9
	South of US 64	55 NB	-	53 SB	55 SB	10	-	8	9
	West of SR 1525 (Duncan Hill Rd/Dana Rd)	-	55 EB	-	55 EB	-	8	-	8
US 64	From SR 1525 (Duncan Hill Rd/Dana Rd) to 7th Ave E	-	58 EB	-	55 EB	-	8	-	8
	From 7th Ave E to SR 1521 (Linda Vista Dr)	-	51 WB	-	55 EB	-	8	-	8
	East of SR 1521 (Linda Vista Dr)	-	51 EB	-	55 EB	-	8	-	8
US 64 E	West of I-26	55 EB	-	-	55 WB	10	-	-	9
	From I-26 to SR 1516 (Francis Rd)/SR 1897 (Sugarloaf Rd)	55 EB	52 WB	-	55 WB	11	9	-	9
	East of SR 1516 (Francis Rd)/SR 1897 (Sugarloaf Rd)	55 EB	50 WB	-	55 WB	11	9	-	9
US 64 W	West of SR 1006 (Howard Gap Rd)	-	100 EB	-	100 EB	-	9	-	9
	East of SR 1006 (Howard Gap Rd)	-	100 EB	-	100 EB	-	9	-	9
	U-Turn East of SR 1006 (Howard Gap Rd)	-	-	100 WB	100 WB	-	-	7	9
SR 1525 (Dana Rd)	West of SR 1006 (Howard Gap Rd)	-	100 WB	-	100 WB	-	8	-	9
	East of SR 1006 (Howard Gap Rd)	-	100 WB	-	100 WB	-	8	-	9
	South of US 64 E	55 NB	50	-	55 SB	12	7	-	7
SR 1521 (Linda Vista Dr)	North of US 64 E	-	61 SB	-	60 SB	-	7	-	7
	North of US 64	-	57 SB	-	60 SB	-	9	-	9
	South of US 64	55 SB	51 NB	-	55 NB	12	8	-	8
SR 1006 (Howard Gap Rd)	North of US 64	55 NB	51 NB	-	55 NB	10	8	-	8
	South of US 64 E	-	52 SB	-	55 SB	-	8	-	8
	From US 64 E to US 64 W	-	60 NB	-	60 NB	-	9	-	10
SR 1513 (Nix Rd)	From US 64 W to SR 1513 (Nix Rd)	-	53 SB	-	55 SB	-	9	-	9
	North of SR 1513 (Nix Rd)	-	51 SB	-	55 SB	-	9	-	9
	West of SR 1006 (Howard Gap Rd)	-	53 EB	-	55 EB	-	9	-	9
SR 1503 (Clear Creek Rd)	East of SR 1503 (Clear Creek Rd)	-	53 EB	-	55 EB	-	9	-	9
	North of SR 1513 (Nix Rd)	-	52 SB	-	55 SB	-	9	-	9
	South of SR 1513 (Nix Rd)	-	50	-	55 SB	-	9	-	9

STIP Project I-4400/I-4700 dated February 2012  
\*2016 Project Specific 13-hour Turning Movement Counts  
\*\*2016 Project Specific 48-hour Mainline Counts

Table A.10. 2016 Base Year No-Build Design Data - Truck Percentages

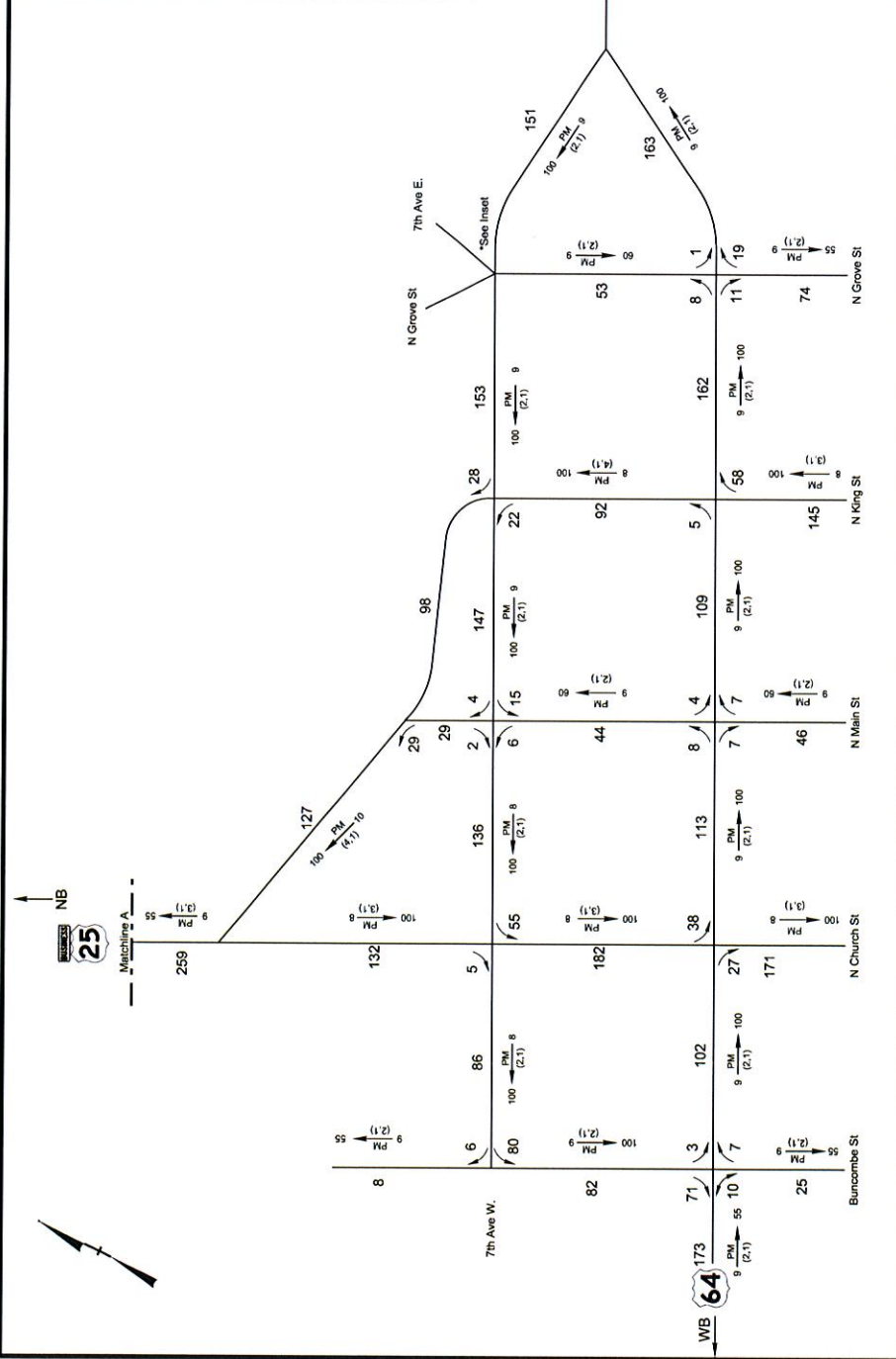
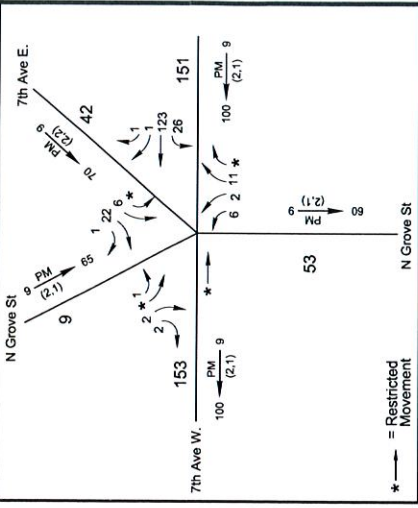
Corridor	Key Location	Truck Percentage (Dual / TTST)			
		TIP Project I-4400/I- 4700	2016 Count Data		Selected 2016 NB Value
			TMC *	Mainline **	
US 25 BUS	North of SR 1383 (Stoney Mountain Rd)	-	(3,1)	-	(4,1)
	From SR 1383 (Stoney Mountain Rd) to NC 191	-	(2,1)	-	(4,1)
	From NC 191 to N. Main St/9th Ave W	-	(4,1)	-	(3,1)
NC 191	West of SR 1381 (Mountain Rd)	-	(3,1)	-	(3,1)
	East of SR 1381 (Mountain Rd)	-	(3,1)	-	(3,1)
	West of Waterside Dr	-	(1,1)	-	(2,1)
	From Waterside Dr to SR 1180 (Blythe St)	-	(2,1)	-	(2,1)
	From SR 1180 (Blythe St) to US 25 BUS	-	(2,1)	-	(2,1)
SR 1381 (Mountain Rd)	From NC 191 to SR 1383 (Stoney Mountain Rd)	-	(3,2)	-	(3,2)
	North of SR 1383 (Stoney Mountain Rd)	-	(4,2)	-	(3,2)
SR 1444 (Leverette Rd)	South of NC 191	-	(4,2)	-	(4,2)
SR 1383 (Stoney Mountain Rd)	West of US 25 BUS	-	(4,1)	-	(4,1)
	East of SR 1381 (Mountain Rd)	-	(6,2)	-	(6,2)
SR 1395 (Browning Ave)	North of NC 191	-	(1,1)	-	(2,1)
Waterside Dr	South of NC 191	-	(2,1)	-	(2,1)
SR 1180 (Blythe St)	South of NC 191	-	(1,1)	-	(2,1)
9th Ave W	West of N. Church St	-	(0,0)	-	(2,1)
	South of 6th Ave	-	(1,1)	-	(2,1)
N. Main St	From 6th Ave to 7th Ave	-	(1,1)	-	(2,1)
	North of 7th Ave	-	(1,1)	-	(2,1)
	East of US 25 BUS	-	(0,0)	-	(2,1)
6th Ave	West of Buncombe St	-	(1,1)	-	(2,1)
	From Buncombe St to N. Church St	-	(2,1)	-	(2,1)
	From N. Church St to N. Main St	-	(2,1)	-	(2,1)
	From N. Main St to N. King St	-	(1,1)	-	(2,1)
	From N. King St to Grove St	-	(1,1)	-	(2,1)
7th Ave	East of Grove St	-	(2,1)	-	(2,1)
	West of N. Church St	-	(1,1)	-	(2,1)
	From N. Church St to N. Main St	-	(1,1)	-	(2,1)
	From N. Main St to N. King St	-	(1,1)	-	(2,1)
7th Ave E	From N. King St to Grove St	-	(2,1)	-	(2,1)
	East of Grove St	-	(1,1)	-	(2,1)
	East of Grove St	-	(2,2)	-	(2,2)
Buncombe St	East of SR 1525 (Dana Rd)	-	(2,2)	-	(2,2)
	North of 6th Ave West	-	(2,1)	-	(2,1)
	South of 6th Ave West	-	(1,1)	-	(2,1)
N. Church St	North of 7th Ave West	-	-	-	(2,1)
	South of 6th Ave West	-	(3,1)	-	(3,1)
	From 6th Ave West to 7th Ave West	-	(3,1)	-	(3,1)
	From 7th Ave West to 9th Ave West	-	(1,1)	-	(3,1)
N. King St	From 7th Ave West to 9th Ave West	-	(1,1)	-	(3,1)
	South of 6th Ave East	-	(9,4)	-	(3,1)
	From 6th Ave East to 4 Seasons Blvd	-	(4,1)	-	(4,1)
Grove St	North of 4 Seasons Blvd	-	(4,1)	-	(4,1)
	South of 6th Ave East	-	(1,1)	-	(2,1)
I-26	From 6th Ave East to 4 Seasons Blvd	-	(1,1)	-	(2,1)
	North of 4 Seasons Blvd	-	(0,0)	-	(2,1)
US 64	North of US 64	(4, 11)	-	-	(4,10)
	South of US 64	(4, 12)	-	-	(4,10)
	West of SR 1525 (Duncan Hill Rd/Dana Rd)	-	(2,1)	-	(2,1)
	From SR 1525 (Duncan Hill Rd/Dana Rd) to 7th Ave E	-	(2,1)	-	(2,1)
	From 7th Ave E to SR 1521 (Linda Vista Dr)	-	(2,1)	-	(2,1)
US 64 E	East of SR 1521 (Linda Vista Dr)	-	(2,1)	-	(2,1)
	West of I-26	(3, 1)	-	-	(2,1)
	From I-26 to SR 1516 (Francis Rd)/SR 1897 (Sugarloaf Rd)	(2, 1)	(2,1)	-	(2,1)
US 64 W	East of SR 1516 (Francis Rd)/SR 1897 (Sugarloaf Rd)	(2, 1)	(2,1)	-	(2,1)
	West of SR 1006 (Howard Gap Rd)	-	(2,1)	-	(2,1)
	East of SR 1006 (Howard Gap Rd)	-	(2,1)	-	(2,1)
SR 1525 (Dana Rd)	U-Turn East of SR 1006 (Howard Gap Rd)	-	-	(3,0)	-
	West of SR 1006 (Howard Gap Rd)	-	(2,1)	-	(2,1)
SR 1525 (Duncan Hill Rd)	East of SR 1006 (Howard Gap Rd)	-	(2,1)	-	(2,1)
SR 1521 (Linda Vista Dr)	South of US 64 E	(5, 1)	(2,2)	-	(2,2)
SR 1516 (Francis Rd)	North of US 64 E	-	(3,2)	-	(3,2)
SR 1897 (Sugarloaf Rd)	North of US 64	-	(2,1)	-	(2,1)
SR 1006 (Howard Gap Rd)	North of US 64	(2, 1)	(4,2)	-	(4,2)
	South of US 64	(2, 1)	(3,1)	-	(3,1)
	South of US 64 E	-	(3,2)	-	(3,2)
	From US 64 E to US 64 W	-	(4,2)	-	(4,2)
SR 1513 (Nix Rd)	From US 64 W to SR 1513 (Nix Rd)	-	(3,2)	-	(2,1)
	North of SR 1513 (Nix Rd)	-	(1,1)	-	(2,1)
	West of SR 1006 (Howard Gap Rd)	-	(1,1)	-	(2,1)
SR 1503 (Clear Creek Rd)	East of SR 1503 (Clear Creek Rd)	-	(4,3)	-	(4,3)
	North of SR 1513 (Nix Rd)	-	(4,3)	-	(4,3)
SR 1503 (Clear Creek Rd)	South of SR 1513 (Nix Rd)	-	(4,3)	-	(4,3)
	South of SR 1513 (Nix Rd)	-	(4,3)	-	(4,3)

TIP Project I-4400/I-4700 dated February 2012

\*2016 Project Specific 13-hour Turning Movement Counts

\*\*2016 Project Specific 48-hour Mainline Counts

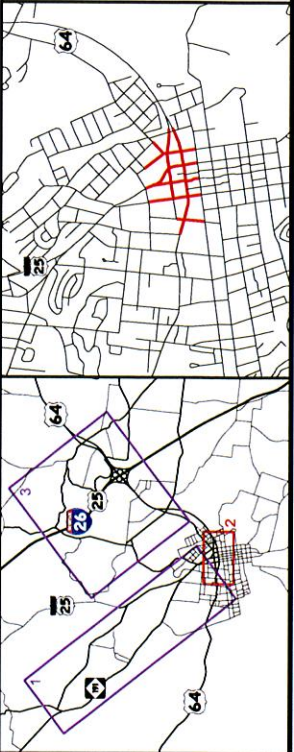
# INSET



<b>2016 AVERAGE ANNUAL DAILY TRAFFIC</b>	
<b>EXISTING NO BUILD</b>	
SHEET 2 OF 3	
TIP: R-5744	WBS: 50201.1.1
COUNTY: Henderson	DIVISION: 14
DATE: October 2016	
PREPARED BY: <b>RK&amp;K</b>	
LOCATION: US 64 from Buncombe St to N Grove St	
PROJECT: New Route (Balfour Parkway) from NC 191 to US 64	

**LEGEND**

- = Existing Roadway
- - - = Future Roadway
- ## = No. of Vehicles Per Day in 100s
- DH = Design Hourly Volume = K30
- PM = PM Peak Period
- D = Peak Hour Directional Split (%)
- = Indicates Direction
- (dt) = Duals, TT-STs (%)
- ↔ = Daily Turn Movements
- 1- = Less than 100 Vehicles Per Day



**Public Comments**  
**Henderson County Board of Commissioners Meeting**  
**April 18, 2018**

My name is Bill Erickson. I am a retired engineer and a nineteen-year resident of Henderson County.

Last month, I proposed to this Board a *Mills River—1-26—Fletcher Roadway* as an alternative to the Balfour Parkway. Such a roadway would achieve Balfour's purpose *without* destroying scores of homes and displacing hundreds of residents. It would also eliminate the need to widen N.C. 191 into a four-lane median-divided highway between Mills River and Mountain Road because a Mills River—1-26—Fletcher Roadway would reduce southbound traffic on N.C. 191 that travels through Hendersonville to the Four Seasons I-26 interchange. By offering faster access to I-26, it would also reduce non-airport traffic on N.C. 280 in the vicinity of Asheville Airport and reduce congestion on U.S. 25 between Fletcher and Exit 44.

In its latest Balfour Parkway Project Newsletter, DOT dismissed the Mills River—1-26—Fletcher alternative by claiming that it "would not achieve the same purpose as the Balfour Parkway or eliminate the need for the Balfour Parkway." \* This begs the question: *What is the purpose of the Balfour Parkway?* According to DOT "the primary purpose of the Balfour Parkway is to improve east-west vehicular mobility in Henderson County...." I maintain that a direct high-speed roadway linking Mills River and Fletcher with an I-26 interchange in between *would* achieve that purpose.

Despite its dismissal of a Mills River-Fletcher Roadway, DOT evidently recognizes that "east-west vehicular mobility" between Mills River and Fletcher *does* need improvement. In the DOT SPOT 5.0 spreadsheet that lists new road projects, SPOT ID H172206 calls for widening Butler Bridge Road between N.C. 280 (Boylston Highway) and U.S. 25 (Hendersonville Road).\*\* The length of Butler Bridge is 2.5 miles and the cost of widening it would be \$42.9 million, which works out to \$17 million per mile. When compared to the \$12 million per mile cost of widening N.C. 191 to a four-lane median-divided highway, there can be little doubt that DOT has the very same thing in mind for Butler Bridge Road – widening it from a two-lane roadway into yet another four-lane median-divided highway, with the consequent destruction of homes and displacement of residents.

DOT's stubborn insistence on building the Balfour, despite overwhelming evidence that Balfour will not reduce congestion on Four Seasons Blvd, widening N.C. 191 into a four-lane median-divided highway, the obvious purpose of which is to feed the Balfour beast and consume its excrement, and doing the same to Butler Bridge Road, demonstrates an egregious lack of imagination on the part of DOT, and also the Henderson County TAC and the French Broad River MPO, which advocate these monstrosities.

We say **NO** to the Balfour, **NO** to 191-widening, and **NO** to Butler Bridge widening, and we urge DOT, the Henderson County TAC, and the French Broad River MPO to consider a much better, much less costly, and much less destructive alternative.

There is a carpentry proverb that says "*Measure twice, cut once.*" Think about it.

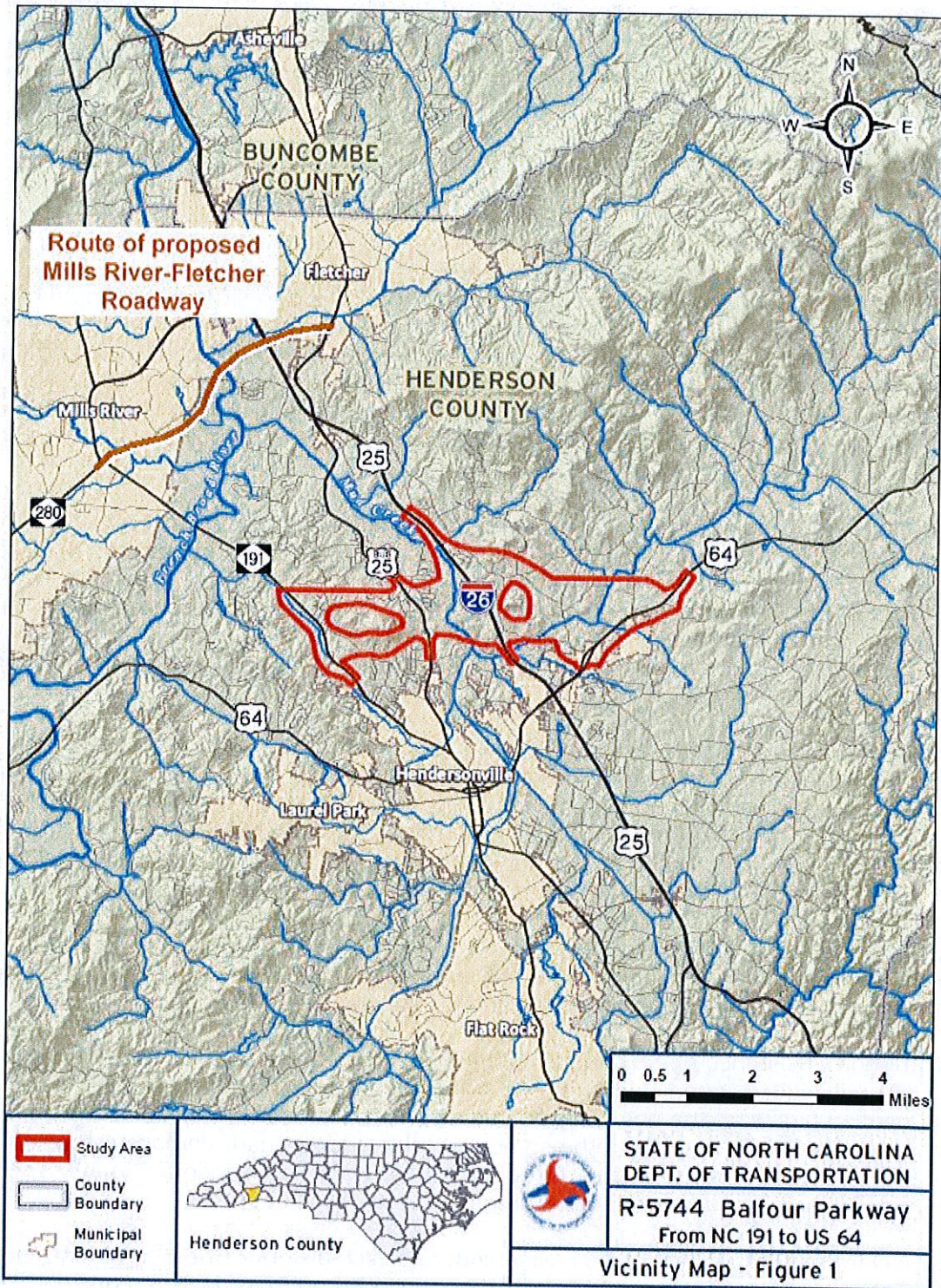
Thank you for your time and consideration.

Respectfully submitted by Bill Erickson, 3116 Magnolia Drive, Hendersonville, NC, 28792, (828) 693-5992, [berickson@frontier-knowledge.com](mailto:berickson@frontier-knowledge.com)

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\* *Balfour Parkway Project Newsletter*, NCDOT, April 2018, p. 3

\*\* See bottom of reverse side.



SPOT ID	Mode	TIP	Project Category	Route	From / Cross Street	To	Description	Specific Improvement Type	Cost to NCDOT
H172206	Highway		Division Needs	SR 1345 (Butler Bridge Rd)	NC 280 (Boylston Highway)	US 25 (Hendersonville Road)	Widen roadway.	1 - Widen Existing Roadway	\$ 42,900,000

From Excel Spreadsheet of P5.0 Quantitative Scores and Draft Statewide Mobility Projects (as of 4.3.18)

<https://connect.ncdot.gov/projects/planning/pages/prioritizationresources.aspx>

# HENDERSON COUNTY 2011

## Economic Impact for Henderson County

The camps generated considerable economic impacts for Henderson County. Moreover, substantial tax revenues were also generated. Specifically, the total economic impact on the Henderson County from residential summer camps and their operations was approximately \$120 million, with 3,411 fulltime equivalent jobs created beyond camp staff, and nearly \$10 million in new tax revenues.

<b>FINDING # 1:</b>	<u>Direct Economic Impact to Henderson County: \$77 million.</u>
<b>FINDING # 2:</b>	<u>Total Economic Impact to Henderson County: \$120 million.</u>
<b>FINDING # 3:</b>	<u>Induced Economic Impacts to Henderson County: \$81 million in increased resident income and 3,411 FTE jobs created.</u>
<b>FINDING # 4:</b>	<u>Incremental Tax Impacts to Henderson County: \$10 million.</u>

### Camps/Camp Directors

Within Henderson County, 17 camps submitted usable data via an online survey. In order to include a total of 18 camps in the economic impact statistics, the average data from the 17 camps was used to calculate an extrapolation for 1 additional camp. A total of 18 camps were included in the economic impact statistics for Henderson County.

### Campers' Families

For the family visitor data, 1,828 usable surveys were completed representing 13,355 families.

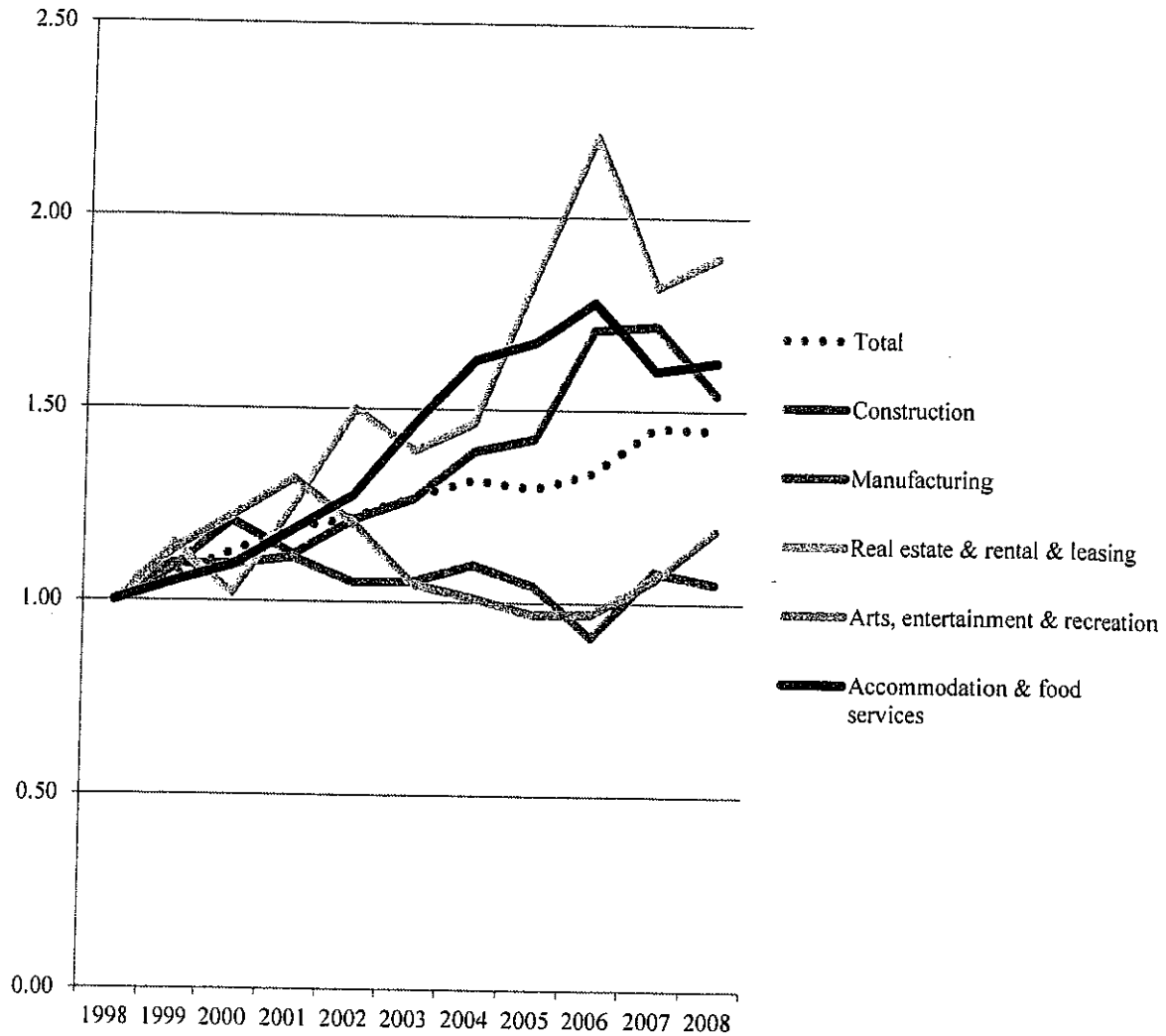
A total of 13,053 families were included in the economic impact statistics as "incremental visitors", as they traveled specifically to Henderson County because of the residential camps and did not live in Henderson County. Each of these families spent an average of \$2,289 dollars during their stays in Henderson County.

### Camp Staff

Seasonal staff members, who traveled specifically to WNC because of the residential camps, were estimated to be 1,181; each spent an average of \$3,858 dollars during their entire stay in the county (before, during, and after camps). These "incremental visitors" (seasonal staff members) lived outside the county and would not have visited WNC if it were not for the residential camps. Only these seasonal staff members ("incremental visitors") were included in the economic impact statistics.

## Industry Growth for Henderson County

The graph below represents the annual payroll growth index for Henderson County using Census data from the North American Industry Classification System (NAICS). Camp recreation is typically listed under Accommodation (according to NAICS), but obviously shares some commonality with Arts, Entertainment, and Recreation. Accommodation is one of the larger industries in the County and Arts, Entertainment, and Recreation appear to be on the rise in Henderson County.



Hello. My name is Jacques Bourgeois and I am 8 years old. My house is approximately ½ mile past the proposed outdoor shooting range. And, since I am homeschooled, my school is that close too.

In fact, the woods surrounding my house and my neighbor's homes are my classroom. Several days a week I'm in those woods studying and observing nature for assignments. I keep a journal of my discoveries and have a nature collection set up in my garage with my cool findings. My dad and I hunt mushrooms and maintain a few trails. My family hikes down to the Green River from an old logging road that is right outside our back door. My dog Daisy and I roam the property and map out and name the landmarks we see. My friends love to visit me because most of them have never experienced a forested backyard that feels so full of adventure yet is safe to explore. We see a large variety of wildlife and because it's so quiet in my neighborhood, I can even hear the Green River from our deck. My outdoor classroom is massive and amazing and my walks often take me very close to the site where the county wants to put an outdoor shooting range. This makes me so concerned for my family and my neighbors and for the wildlife and environment. The noise, the taking down of trees, the disruption of animal habitats, the contamination of water, the increased traffic to the area- all these factors cause me to fear that my outdoor classroom will be disturbed and forever harmed.

I wish I had time to tell you about all the rest of my neighbors on my road, a number of whom are property owners directly beside the proposed shooting range. We are a close community that looks out for one another. We are people who value living in harmony with nature. I understand that the proposed shooting range property is in a Residential District zone that will require a special use permit. I also understand that one of the qualifying standards to receive the special use permit is that the proposed facility be "in harmony with the surrounding area." I testify to you today, as someone who would be a neighbor to the outdoor shooting range, that this project is not in harmony with nature or with our neighborhood.

I hope that our neighborhood will remain the quiet, peaceful place that it is, full of wildlife and plants, and neighbors who value nature and one another. Please don't disrupt my home, my school, my neighborhood and the local wildlife habitats by building the outdoor shooting range in this location.

Thank you for your time and consideration.

Jacques Bourgeois (8 years old)

618 Knight Road, Saluda, NC 28773

713 493 9814