

# PUBLIC COMMENT SIGNUP SHEET - OTHER

## MAY 7, 2018

Pursuant to N.C. Gen. Stat. §153A-52.1, the Henderson County welcomes public comment at its meetings. Please note that each speaker is limited to three (3) minutes, unless a different time limit is announced. Also, the Board may adopt rules limiting the number of persons speaking taking the same position on a given issue, and other rules regarding the maintenance of good order.

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1. Dennis Justice  
**PRINTED** NAME  
31 Tamis Lane  
Fletcher NC 28732  
MAILING ADDRESS

[Signature]  
SIGNATURE  
Jackson Park / BRCC  
Topic

2. Glen Enggram  
**PRINTED** NAME  
230 Millard J Dr.  
MAILING ADDRESS

[Signature]  
SIGNATURE  
64 Abert  
Topic

3. Peggy Smith  
**PRINTED** NAME  
21 Huntas Lane  
MAILING ADDRESS

[Signature]  
SIGNATURE  
64 Abert  
Topic

4. Jay Jarvis  
**PRINTED** NAME  
109 Edgehill  
MAILING ADDRESS

[Signature]  
SIGNATURE  
64 Abert  
Topic

5.

SHARON BROUSSARD  
PRINTED NAME

Sharon Broussard  
SIGNATURE

3223 BREVARD RD.  
HENDERSONVILLE  
MAILING ADDRESS

64W  
Topic

6.

JEANETTE GLENN  
PRINTED NAME

Jeanette Glenn  
SIGNATURE

606 CRYSTAL DRIVE  
HILL TO 28791  
MAILING ADDRESS

64W  
Topic

7.

JIM DURFEE  
PRINTED NAME

Jim Durfee  
SIGNATURE

54 SHAW'S CREEK LN  
MAILING ADDRESS

64 WEST  
Topic

692-3311

8.

PRINTED NAME  
MAILING ADDRESS

SIGNATURE  
Topic

9.

PRINTED NAME  
MAILING ADDRESS

SIGNATURE  
Topic

10.

PRINTED NAME  
MAILING ADDRESS

SIGNATURE  
Topic

# LAW ENFORCEMENT TRAINING

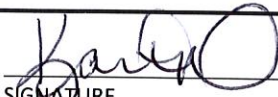
MAY 7, 2018

## PUBLIC COMMENT SIGNUP SHEET


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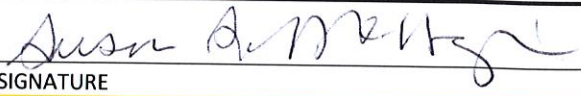
1. **KARA MOERS**  
PRINTED NAME  
852 WHITES LAKE BLVD.  
SALVOA, NC 28773  
MAILING ADDRESS  
 For  Against

  
SIGNATURE  
TOPIC - LAW ENFORCEMENT TRAINING  
SALVOA HENDERSON NC  
Residence: City County State


2. **Alex Harvey**  
PRINTED NAME  
3870 Macedonia Rd  
MAILING ADDRESS  
 For  Against

  
SIGNATURE  
TOPIC - LAW ENFORCEMENT TRAINING  
Salvo Henderson NC  
Residence: City County State

3. **Susan S McIlhugh**  
PRINTED NAME  
3120 Macedonia Rd  
MAILING ADDRESS  
 For  Against

  
SIGNATURE  
TOPIC - LAW ENFORCEMENT TRAINING  
Salvo Henderson NC  
Residence: City County State

4. **Sam Bell**  
PRINTED NAME  
MAILING ADDRESS  
 For  Against

  
SIGNATURE  
TOPIC - LAW ENFORCEMENT TRAINING  
Salvo Polk NC  
Residence: City County State

5. Amos Dawson  
**PRINTED NAME**  
160 Little Nine Mtn. Dr.  
SALUDA, NC 28773  
MAILING ADDRESS

Amos Dawson III  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**

SALUDA Henderson NC.  
Residence: City County State

For  Against

6. Mike Fischer  
**PRINTED NAME**  
775 Whites Lake Blvd.  
Saluda NC 28773  
MAILING ADDRESS

McFisk  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**

Saluda Henderson NC  
Residence: City County State

For  Against

7. LYDIA CARDINAL  
**PRINTED NAME**  
469 Burrell pace Rd  
Saluda, NC 28773  
MAILING ADDRESS

Lydia J Cardinal  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**

Saluda POLK NC  
Residence: City County State

For  Against

8. DAVID FOTI  
**PRINTED NAME**  
  
  
MAILING ADDRESS  
 For  Against

David Foti  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**

Saluda Henderson NC  
Residence: City County State

9. Katrina Thissen  
**PRINTED NAME**  
  
  
MAILING ADDRESS  
 For  Against

Katrina Thissen  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**

Saluda Henderson NC  
Residence: City County State

10. Kay Shurtleff  
**PRINTED NAME**  
172 Haven Dr.  
Saluda, NC  
MAILING ADDRESS  
 For  Against

Kay Shurtleff  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**

Saluda Henderson NC  
Residence: City County State

11. CLAUDE BOYERSON  
**PRINTED NAME**  
938 Haven Dr.  
Saluda, NC 28773  
MAILING ADDRESS  
 For  Against

Claude G. Boyerson  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**  
Saluda Henderson NC  
Residence: City County State

12. BEN IOBST  
**PRINTED NAME**  
294 Lake Hosea Dr.  
Saluda, NC 28773  
MAILING ADDRESS  
 For  Against

Bobst  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**  
SALUDA HENDERSON NC  
Residence: City County State

13. Carl McMurray  
**PRINTED NAME**  
113 E Hilltop Dr  
Saluda NC 28773  
MAILING ADDRESS  
 For  Against

Carl McMurray  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**  
Saluda Henderson NC  
Residence: City County State

14. Cathy Jackson  
**PRINTED NAME**  
1230 Frammer Gap Rd  
Saluda  
MAILING ADDRESS  
 For  Against

Cathy Jackson  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**  
Saluda Henderson NC  
Residence: City County State

15. \_\_\_\_\_  
**PRINTED NAME**  
\_\_\_\_\_  
MAILING ADDRESS  
 For  Against

\_\_\_\_\_  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**  
Residence: City County State

16. Bob Andersen  
**PRINTED NAME**  
1022 Corsica Ln  
Saluda NC  
MAILING ADDRESS  
 For  Against

Bob Andersen  
SIGNATURE  
**TOPIC - LAW ENFORCEMENT TRAINING**  
Saluda Henderson NC  
Residence: City County State

# NCDOT BALFOUR PARKWAY MAY 7, 2018 PUBLIC COMMENT SIGNUP SHEET

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1. RICH SHADER  
PRINTED NAME

173 GREYSTONE DRIVE HENDERSONVILLE  
MAILING ADDRESS

For  Against

Rich Shader  
SIGNATURE

**TOPIC - NCDOT BALFOUR PARKWAY**

HENDERSONVILLE HENDERSON NC  
 Residence: City County State

2. Cindy Lemon  
PRINTED NAME

3153 Cheryl Dr  
Hendersonville 28792  
MAILING ADDRESS

For  Against

Cindy Lemon  
SIGNATURE

**TOPIC - NCDOT BALFOUR PARKWAY**

Hendersonville Henderson NC  
 Residence: City County State

3. Bill Ericsson  
PRINTED NAME

316 Magnolia Dr  
Hendersonville 28792  
MAILING ADDRESS

For  Against

Bill Ericsson  
SIGNATURE

**TOPIC - NCDOT BALFOUR PARKWAY**

Hendersonville Henderson NC  
 Residence: City County State

4. RON INGRAHAM  
PRINTED NAME

311 GREYSTONE DR  
Hendersonville 28792  
MAILING ADDRESS

For  Against

Ron Ingram  
SIGNATURE

**TOPIC - NCDOT BALFOUR PARKWAY**

Henderson Henderson NC  
 Residence: City County State

5. CLORIA GILL  
**PRINTED NAME**  
570 Sunnydale Way  
N. Lenoir St 28792  
**MAILING ADDRESS**

[Signature]  
**SIGNATURE**

**TOPIC - NCDOT BALFOUR PARKWAY**

Residence: City \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_

For  Against

6. Phyllis Jensen  
**PRINTED NAME**  
203 Cold Stream Way  
**MAILING ADDRESS**

[Signature]  
**SIGNATURE**

**TOPIC - NCDOT BALFOUR PARKWAY**

Hendersonville Henderson NC  
Residence: City \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_

For  Against

7. Anita Davis  
**PRINTED NAME**  
210 Cold Stream Way  
Hendersonville, NC  
**MAILING ADDRESS** 28791

[Signature]  
**SIGNATURE**

**TOPIC - NCDOT BALFOUR PARKWAY**

Hendersonville Henderson NC  
Residence: City \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_

For  Against

8. LINDA INERHAM  
**PRINTED NAME**  
311 GREYSTONE DR  
HENDERSONVILLE, NC  
**MAILING ADDRESS**

[Signature]  
**SIGNATURE**

**TOPIC - NCDOT BALFOUR PARKWAY**

HENDERSONVILLE HENDERSON NC  
Residence: City \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_

For  Against

9. CARL BECKER  
**PRINTED NAME**  
2740 MILLER LN  
HENDERSONVILLE 28799  
**MAILING ADDRESS**

[Signature]  
**SIGNATURE**

**TOPIC - NCDOT BALFOUR PARKWAY**

Residence: City \_\_\_\_\_ County HGN State NC

For  Against

10. Ken Fitch  
**PRINTED NAME**  
1046 Patton St  
Hendersonville, NC 28792  
**MAILING ADDRESS**

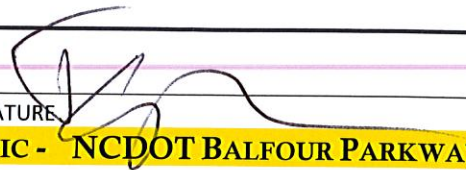
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**SIGNATURE**

**TOPIC - NCDOT BALFOUR PARKWAY**


Hendersonville Henderson NC  
Residence: City \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_

For  Against

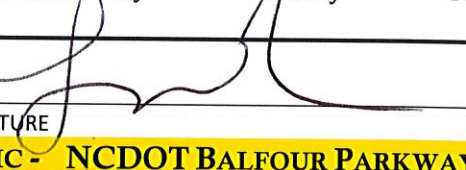
11. **TARYN SCHNURER**  
PRINTED NAME  
83 CURTAIN BLUFF  
HVL, NC 28791  
MAILING ADDRESS  
 For  Against

  
SIGNATURE  
**TOPIC - NCDOT BALFOUR PARKWAY**  
Residence: City County State

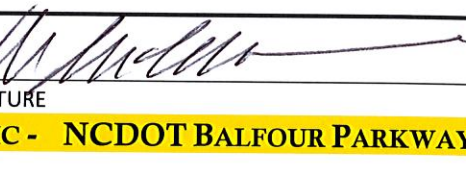
12. **MARY VERRILL**  
PRINTED NAME  
24 QUARTZ TRAIL  
HVL 28791  
MAILING ADDRESS  
 For  Against

  
SIGNATURE  
**TOPIC - NCDOT BALFOUR PARKWAY**  
Residence: City County State

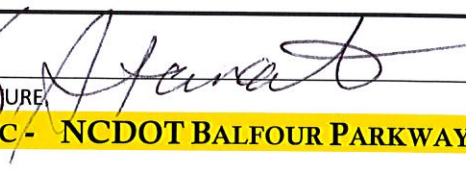
13. **LYND A COOK**  
PRINTED NAME  
43 QUARTZ TRAIL  
HVL 28791  
MAILING ADDRESS  
 For  Against

  
SIGNATURE  
**TOPIC - NCDOT BALFOUR PARKWAY**  
Residence: City County State

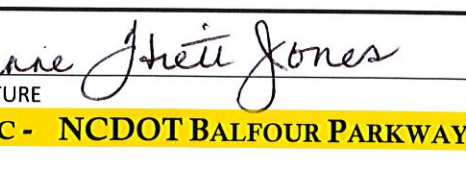
14. **BILL HABERER**  
PRINTED NAME  
41 W. JUNE LN  
H'VILLE 28792  
MAILING ADDRESS  
 For  Against

  
SIGNATURE  
**TOPIC - NCDOT BALFOUR PARKWAY**  
Residence: City County State

15. **KATHLEEN STANCATI**  
PRINTED NAME  
6 Charles Lane  
Hendersonville, 28792  
MAILING ADDRESS  
 For  Against

  
SIGNATURE  
**TOPIC - NCDOT BALFOUR PARKWAY**  
Residence: City County State

16. **Jeanne Hiatt Jones**  
PRINTED NAME  
162 Ashfield Ct.  
Hendersonville, NC 28791  
MAILING ADDRESS  
 For  Against

  
SIGNATURE  
**TOPIC - NCDOT BALFOUR PARKWAY**  
Hendersonville Henderson Ne  
Residence: City County State



17.

PRINTED NAME

Michael Reim

411 Stoney Mtn Rd

MAILING ADDRESS

For  Against

Hudle 28791

*Michael Reim*

SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Residence: City County State

18.

Lynhia Keilor

PRINTED NAME

2756 Holly Hill Dr N.

MAILING ADDRESS

For  Against

Hendersonville NC

*Lynhia Keilor*

SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Hendersonville Henderson N.C.  
Residence: City County State

19.

Daniel Palmer

PRINTED NAME

100 Michael Dr

MAILING ADDRESS

For  Against

Hulle

*Daniel Palmer*

SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Hendersonville Henderson NC  
Residence: City County State

20.

JENNIFER LEWIS

PRINTED NAME

106 CROSSAN DRIVE

HENDERSONVILLE, NC.

MAILING ADDRESS

For  Against

SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Residence: City County State

21.

Jay Rogers

PRINTED NAME

15 Hickory Court LN

Hendersonville 28792

MAILING ADDRESS

For  Against

*Jay Rogers*

SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Hendersonson NC  
Residence: City County State

22.

BOB PAPES

PRINTED NAME

208 CARRIAGE SERVICES WAY

HENDERSONVILLE, NC 28901

MAILING ADDRESS

For  Against

*Bob Papes*

SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Residence: City County State

23.

Alex Nelson  
PRINTED NAME

109 St. Marys Dr

Hendersonville 28792  
MAILING ADDRESS

For  Against

*Alex Nelson*  
SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Residence: City H County  State

24.

Steve Jones  
PRINTED NAME

805 Greenfield Dr,

H.ville 28791  
MAILING ADDRESS

For  Against

*Stephen A Jones*  
SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Residence: City H.ville County Henderson State NC

25.

DARLENE SOVA  
PRINTED NAME

68 Laurelwood Circle W. #19

Hendersonville  
MAILING ADDRESS

For  Against

*Darlene Sova*  
SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Residence: City Hendersonville County Henderson State NC

26.

PRINTED NAME

MAILING ADDRESS

For  Against

SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Residence: City County State

27.

PRINTED NAME

MAILING ADDRESS

For  Against

SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Residence: City County State

28.

PRINTED NAME

MAILING ADDRESS

For  Against

SIGNATURE

TOPIC - NCDOT BALFOUR PARKWAY

Residence: City County State

**Public Comments**  
**Henderson County Board of Commissioners**  
**May 7, 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.

My comments concern the Balfour Parkway and its impact on traffic in downtown Hendersonville on 4 Seasons Blvd – US 64, Asheville Hwy – US 25 Business, and Haywood Rd – NC 191. These are the three roadways stated by NCDOT to be of concern in the description of the Balfour Parkway distributed by NCDOT at a public meeting on February 27. I presented you a qualitative analysis of this traffic on March 14. On April 13 I presented you a validation of that analysis based on data measured by NCDOT in May 2016. Last Friday, April 27, I presented you a quantitative analysis based on NCDOT's projection of traffic in 2040. The results of that analysis are summarized on the back of your handout, and the details are provided in the report attached to the handout.

The NCDOT's 2040 projections show:

The Balfour Parkway (1) may reduce traffic volume on 4 Seasons Blvd to the 2016 level, but will not reduce the degree of congestion, (2) may reduce traffic volume on US 25 Business to 30% above the 2016 level, but will not reduce the degree of congestion, and (3) will increase traffic volume on NC 191 east of Mountain Rd by about 60% and significantly increase the degree of congestion.

The Balfour Parkway will provide an additional route for east-west traffic. Whether traffic demand justifies this new route is unclear because:

- Peak traffic volume on the three roads of concern will be reduced by only about 15%.
- However, peak traffic volume on the three roads of concern plus the Balfour Parkway increases by about 10%.

The NCDOT's 2040 projections with the Balfour Parkway show that the increase of traffic volume on NC 191 east of Mountain Rd in 2040 is about double that on either 4 Seasons Blvd or US 25 Business.

The NCDOT's projections show the Balfour Parkway will not change the main traffic patterns in downtown Hendersonville:

- lack of east-west through traffic on the combination of these roadways
- dominance (70-80%) of north-south through traffic on US 25 Business
- dominance (more than 50%) of east-west traffic on US 64 continuing west of Church St

The NCDOT's projections show that the Balfour Parkway will not change the following traffic conditions:

Congestion on 4 Seasons Blvd is due to "local" traffic, not "east-west through" traffic.

Through traffic is a small fraction of the traffic on these roadways (maximum of 5.2%, probably about ¼% westbound and maximum of 15%, probably less than 1% eastbound).

Only a small fraction (1–2%) of traffic on 4 Seasons Blvd is due to "heavy trucks" and these trucks are not "east-west through traffic."

Only a small fraction (1–3%) of traffic on US 25 Business is due to "heavy trucks."

Only a small fraction (1–2%) of traffic on NC 191 is due to "heavy trucks" in all locations except at the intersection with Mountain Rd.

Thank you very much for the time. I urge you to consider carefully these conclusions which are based on NCDOT's own traffic projections for the year 2040.

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

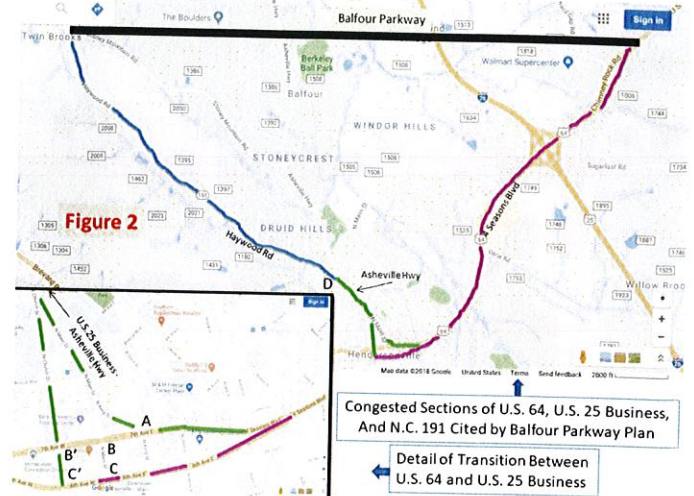
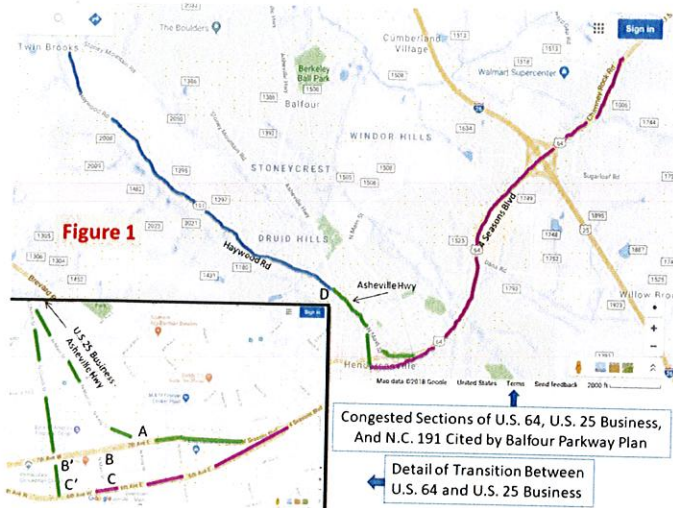
Segment	Characteristic	Metric	2016 Data Value	2040 No Build	2040 with Balfour
US 64 (4 Seasons Blvd)	Traffic Volume	Peak AADT	43,800	55,500	43,500
	Degree of Congestion	Peak AADT / Min AADT	43,800/30,300 = 1.4	55,500/38,300 = 1.4	43,500/31,000 = 1.4
	Fraction of Heavy Trucks	(% duals, % TTSTs)	(2,1)	(2,1)	(2,1)
	Traffic Pattern	Ratio: west on 7 <sup>th</sup> Ave to right (north) on King St	(15,300-2,800)/2,800 = 4.5 → east-west on US 64	(20,100-3,800)/3,800 = 4.3 → east-west on US 64	(17,200-3,300)/3,300 = 4.2 → east-west on US 64
	Traffic Volume	Peak AADT	27,700	39,200	35,900
	Degree of Congestion	Peak AADT / Min AADT	27,700/23,100 = 1.2	39,200/30,300 = 1.3	35,900/29,200 = 1.2
US 25 Business	Fraction of Heavy Trucks	(% duals, % TTSTs)	(3-4,1)	(3-4,1)	(3-4,1)
	Traffic Pattern	Ratio: 25 Bus from north to 191 from west	(23,100-3,500)/8,000 = 2.5	(30,300-5,800)/14,600 = 1.7	(29,300-5,600)/12,100 = 2.0
		Ratio: south on Church St to left (east) on 6 <sup>th</sup> Ave	(17,100-2,700)/3,800 = 3.8	(24,300-3,500)/5,100 = 4.0	(20,900-2,900)/4,600 = 3.9
		Ratio: traffic N from downtown to from 4 Seasons	(12,700-2,800)/2,800 = 3.5	(18,200-3,800)/3,800 = 3.8	(16,500-3,300)/3,300 = 4.0
		Ratio: north on 25 Bus to left (west) on NC 191	(27,700-8,000)/8,000 = 2.5	(39,200-14,600)/14,600 = 1.7	(35,900-12,100)/12,100 = 2.0
			→ north-south on US 25 Business	→ north-south on US 25 Business	→ north-south on US 25 Business
NC 191	Traffic Volume	Peak AADT	13,200	23,900	21,200
	Degree of Congestion	Peak AADT / Min AADT	13,200/10,500 = 1.3	23,900/19,000 = 1.3	21,200/13,900 = 1.5
	Fraction of Heavy Trucks	(% duals, % TTSTs)	(2-3,1)	(2-3,1)	(2-3,1)
	Traffic Pattern	N/A	east-west on NC 191 – no traffic splits	east-west on NC 191 – no traffic splits	east-west on NC 191 – no traffic splits
System	Traffic Volume	Sum of Peak AADTs	43,800+27,700+13,200 = 84,700	55,500+39,200+23,900 = 118,600	43,500+35,900+21,200 = 100,600
	Traffic Pattern Overall	north-south vs east-west	Intersecting north-south & east west	Intersecting north-south & east west	Intersecting north-south & east west
	Traffic Pattern	Ratio: west on 7 <sup>th</sup> Ave to right (north) on King St	(15,300-2,800)/2,800 = 4.5	(20,100-3,800)/3,800 = 4.3	(17,200-3,300)/3,300 = 4.2
	westbound thru traffic	Ratio: north on 25 Bus to left (west) on NC 191	(27,700-8,000)/8,000 = 2.5	(39,200-14,600)/14,600 = 1.7	(35,900-12,100)/12,100 = 2.0
		Ratio: 25 Bus from N to NC 191 from west	(23,100-3,500)/8,000 = 2.5	(30,300-5,800)/14,600 = 1.7	(29,300-5,600)/12,100 = 2.0
	eastbound thru traffic	Ratio: south on Church St to left (east) on 6 <sup>th</sup>	(17,100-2,700)/3,800 = 3.8	(24,300-3,500)/5,100 = 4.0	(20,900-2,900)/4,600 = 3.9
Balfour Parkway	Traffic Volume	Peak AADT	-	-	29,400 <sup>1</sup>

<sup>1</sup> Projected between US 25 Business and Interstate 26. Traffic volume is one half this level between Howard Gap Rd & Chimney Rock Rd and between Stoney Mountain Rd and US 25 Business. The minimum traffic volume is one quarter this level at the western end between Stoney Mountain Rd and Mountain Rd.

# Traffic Conditions, Patterns, and Metrics Demonstrated by NCDOT Balfour Parkway Data in 2016 and 2040

## 1. Introduction

The Balfour Parkway Project Study Area was explicitly defined in 2016 to include the sections of US 64 (4 Seasons Blvd), US 25 Business, and NC 191 highlighted in Figure 1. These sections were included in the study area in order to authorize traffic measurements that would be used (1) to determine 2016 baseline traffic conditions and patterns on these roads, (2) to project 2040 traffic conditions and patterns on these roads without the Balfour Parkway, and (3) to project 2040 traffic conditions and patterns on these roads and the Balfour Parkway (Figure 2).



Measured traffic data is 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. According to the report, “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 13-hour turning movement counts (TMCs) and 48-hour tube counts.”

The NCDOT report gives measured and projected traffic volume as Annual Average Daily Traffic (AADT) in units of vehicles per day, vpd. AADT is a statistical quantity, i.e., it is the probable traffic volume, not a deterministic absolute volume. Thus, any AADT value reported by NCDOT is the probable level of traffic, not the actual level each day. The NCDOT data can be used to determine traffic patterns using standard statistical techniques.

The NCDOT 2016 data clearly describes the traffic conditions on US 64 (4 Seasons Blvd), US 25 Business, and NC 191 and the traffic patterns on this system of roadways.

## 2. 2016 Traffic Conditions and Patterns

The primary purpose of the Balfour Parkway stated in the handout<sup>1</sup> distributed by NCDOT at a February 27, 2018, public meeting “is to **improve east-west vehicular mobility** in Henderson County ...” However, the handout further states “U.S. 64 combined with U.S. 25 Business and N.C. 191 provide a route for east-west travel. However, [these routes] are becoming increasingly **congested.**” It goes on to state “The result is a

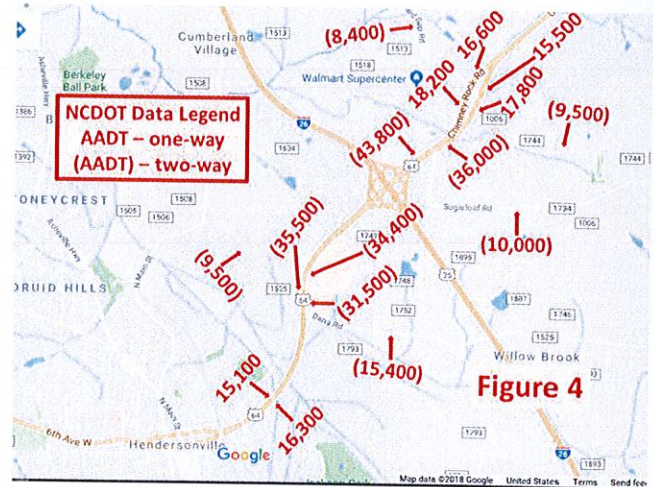
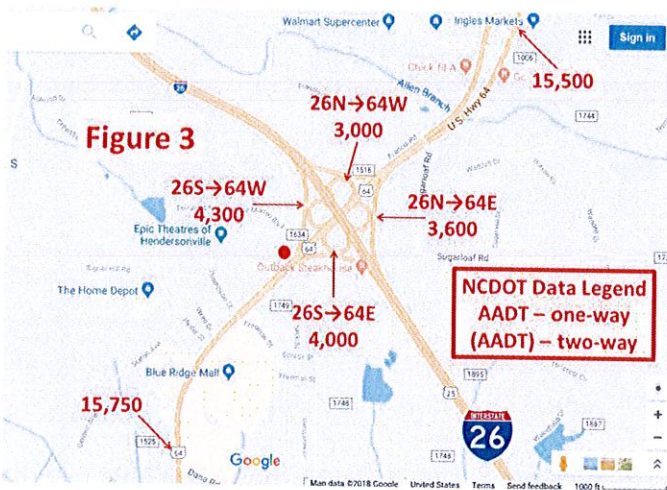
<sup>1</sup> “Balfour Parkway, Proposed new location roadway from N.C. 191 to U.S. 64, Henderson County, STIP Project No. R-5744, handout distributed at Public Meeting, February 27, 2018.

transportation system with recurring **congestion ...**” It states “In addition, **large trucks** do not have an efficient route through the area.” It also states among “other benefits” of the Parkway “a potential reduction in the volume of traffic (including **heavy trucks**) traveling through downtown Hendersonville.”

The obvious implication is that the Balfour Parkway will not only improve east-west vehicular mobility but will also reduce congestion and the presence of heavy trucks on the roadways of concern.

### 2.1 US 64 (4 Seasons Blvd)

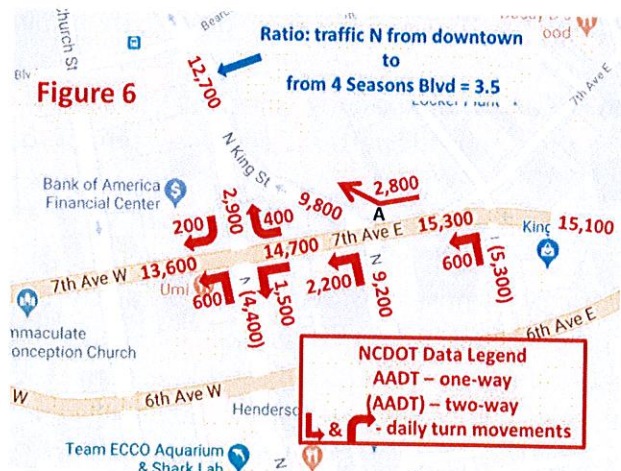
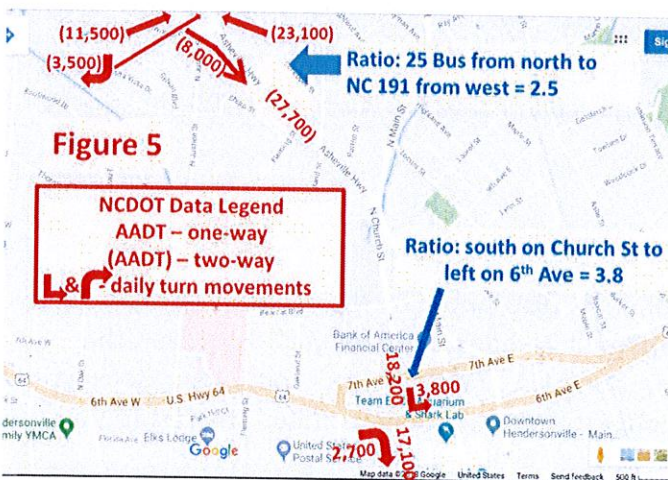
NCDOT data on US 64 (4 Seasons Blvd) is shown in Figures 3 and 4. The data in Figure 3 show that the volume of traffic arriving on US 64 in either direction from Interstate 26 is about half the volume exiting US 64 (4 Seasons Blvd) in that direction at either end. Thus, Interstate 26 is a major source of traffic on both 4 Seasons Blvd west of Interstate 26 and on Chimney Rock Road near the Highlands Square Shopping Center.



The data in Figure 4 exhibits the pattern of traffic caused by local congestion. The peak traffic volume **(43,800)** is about 1.4 times the traffic volume at either end. Traffic volume is highest interior to this length due to circulation to/from this road and many businesses along the road and several intersecting roads.

### 2.2 US 25 Business

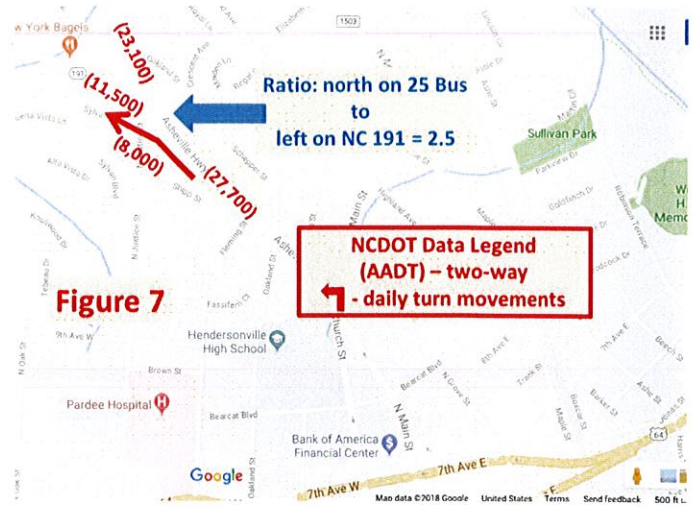
NCDOT data on US 25 Business is shown in Figures 5 – 7. The data in Figure 5 show that about 70% of the



southbound traffic on US 25 Business south of its intersection with NC 191 comes from US 25 Business north of this intersection. Only about 30% of the southbound traffic on US 25 Business comes from NC 191. The

data in Figure 5 also show that about 80% of the southbound traffic on US 25 Business at its intersection with US 64 (6<sup>th</sup> Ave W) continues southbound. Only about 20% of this southbound traffic turns left on US 64 (6<sup>th</sup> Ave W) toward 4 Seasons Blvd.

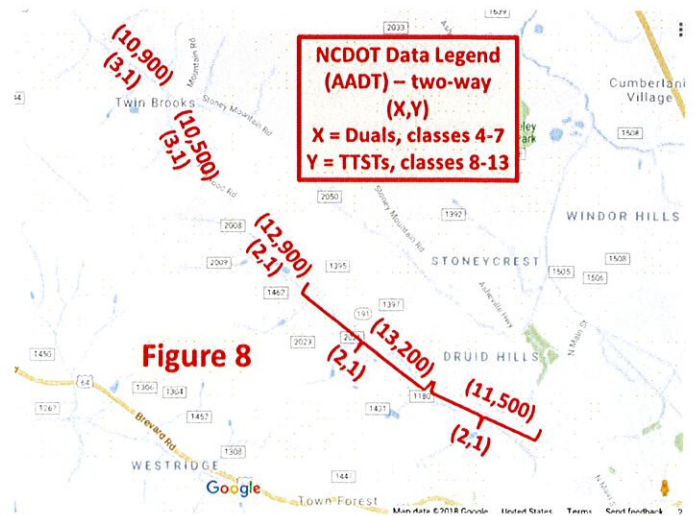
The data in Figure 6 show that about 80% of the northbound traffic on US 25 Business north of its intersection with NC 64 (7<sup>th</sup> Ave E) comes from south of US 64 (7<sup>th</sup> Ave E). Only about 20% of this northbound traffic data comes from the east on US 64 (4 Seasons Blvd). The data in Figure 7 show that about 70% of the northbound traffic on US 25 Business at its intersection with NC 191 continues northbound. Only about 30% of this northbound traffic turns left on NC 191 toward the west.



Thus, NCDOT data on US 25 Business shown in Figures 5-7 demonstrate that the dominant traffic pattern on US 25 Business is due to north-south traffic. It also demonstrates that very little of the traffic on US 25 Business is traveling east-west to/from US 64 (4 Seasons Blvd) and NC 191. The ratios of traffic in different directions at the intersections shown in blue font in Figures 5-7 are metrics which can be used to indicate the traffic pattern on US 25 Business.

**2.3 NC 191**

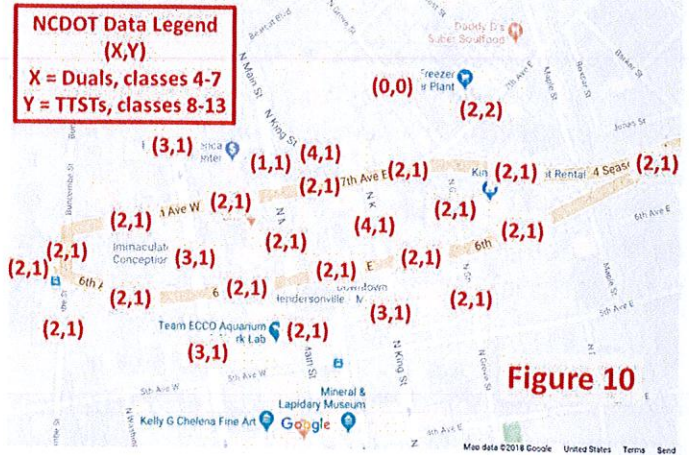
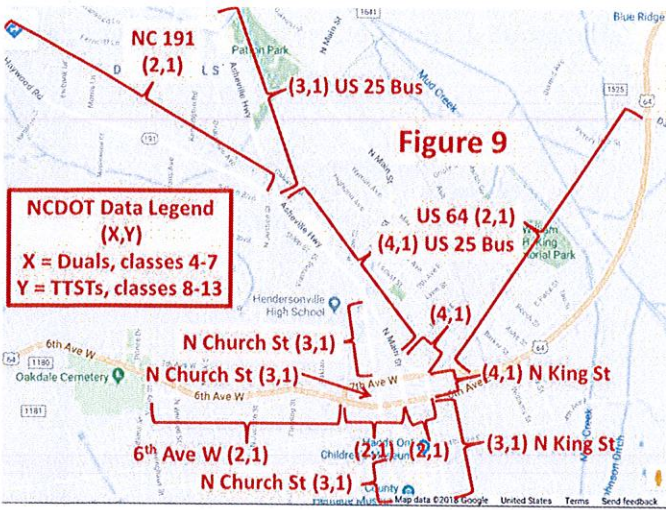
NCDOT data on NC 191 is shown in Figure 8. No data was recorded west of that shown in Figure 8 just west of Mountain Rd. The traffic pattern is similar to that shown in Figure 4 on 4 Seasons Blvd, i.e., the traffic volume is smaller at the ends of the roadway segment than in the middle of the segment. As is stated in Section 2.1, 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. The level of traffic on NC 191 shown in Figure 8 represents the potential for only very minor congestion. For comparison, the peak level (13,200) is much smaller than the peak level (43,800) on US 64 (4 Seasons Blvd).



**2.4 Heavy or Large Truck Traffic**

NCDOT data for heavy or large truck traffic is shown in Figures 8 – 10. These data show that TTSTs (truck tractor semi-trailers), classes 8-13 are no more than 1% of the traffic in all locations with only one exception. That exception is on 7<sup>th</sup> Ave E where up to 2% of the traffic is due to TTSTs. This is because there is significantly less total traffic in this location so the same number of TTSTs produces a higher percentage. The data also show that duals, classes 4-7 are no more than 2% of the traffic on US 64 and NC 191 at all locations with again only one exception. That exception is on NC 191 at near Mountain Rd where up to 3% of the traffic

is due to duals. This is because of 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). However, the data shows that duals are 3-4% of the traffic on US 25 Business at all locations.



Thus, the level of heavy truck traffic on all of these roadways is very small. In addition, it is nowhere close to the level of heavy truck traffic the NCDOT data display for through traffic on Interstate 26 which is 10% of traffic due to TTSTs and 4% due to duals. More important is that the data 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. This agrees with the observations in Sections 2.2 and 2.5 relative to traffic patterns on these two roads.

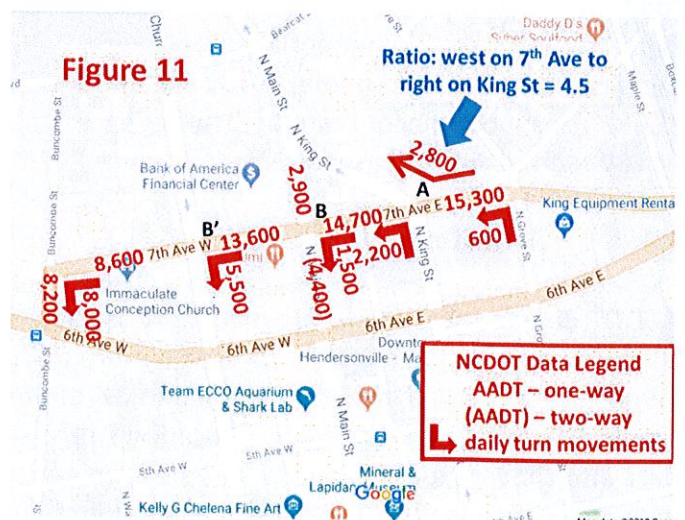
### 2.5 Westbound Through Traffic

The NCDOT data provides a statistical model for the traffic network shown in Figure 1. It can be applied to determine the maximum fraction of through traffic passing from the east end of US 64 (4 Seasons Blvd), i.e., Chimney Rock Rd, to NC 191. Traffic which enters from Chimney Rock Rd divides at the intersection with US 25 Business and divides again at the intersection with NC 191.

NCDOT data in Figure 11 show 18% (maximum) of westbound traffic on US 64 (4 Seasons Blvd) at its intersection with US 25 Business travels northward on US 25 Business. (The fraction could be as low as 14% depending on the destination of traffic turning left from N Grove St to 7<sup>th</sup> Ave E. The NCDOT traffic measurements did not determine this destination. The portion of this traffic that turns right on N King St reduces the amount that could be from 4 Seasons Blvd). The NCDOT data in Figure 7 shows that a maximum of 29% of the northbound traffic on US 25 Business turns left (west) on NC 191. Thus, the maximum fraction of westbound through traffic is 18% X 29% = 5.2%.

The NCDOT data in Figure 11 also show that more than half of the westbound traffic from 4 Seasons Blvd continues westward on US 64 (7<sup>th</sup> Ave and 6<sup>th</sup>

Ave) demonstrating a dominant east-west traffic pattern on US 64 (4 Seasons Blvd, 7<sup>th</sup> Ave and 7<sup>th</sup> Ave). The ratio shown in Figure 11 in blue font is a metric which indicates this traffic pattern.





NCDOT data in Figure 4 shows **16,600 vpd** entering 4 Seasons Blvd from Chimney Rock Rd. If this is all through traffic, then the average number of through-traffic vehicles per day would be 860 ( $5.2\% \times 16,600$ ). Of course, the actual number is much smaller since not all traffic entering 4 Seasons Blvd from Chimney Rock Rd is through traffic. In the author's opinion, the fraction of vehicles entering 4 Seasons Blvd from Chimney Rock Rd that is through traffic is probably about 5%. Thus, the average number of westbound through-traffic vehicles is probably about 40 vehicles per day which is about 1/4% of the westbound traffic on Chimney Rock Rd.

## 2.6 Eastbound Through Traffic

The NCDOT data can be applied to determine the maximum fraction of through traffic passing from NC 191 to the east end of US 64 (4 Seasons Blvd) and on to Chimney Rock Rd. The data provides a statistical model for the traffic network shown in Figure 1. Traffic from NC 191 divides at the intersection with US 25 Business and divides again at the intersection with US 64 (6<sup>th</sup> Ave W).

NCDOT data in Figure 5 shows that 70% of the traffic on NC 191 turns right on US 25 Business and continues southbound. NCDOT data in Figure 5 also shows that only 21% of this traffic turns left on US 64 (6<sup>th</sup> Ave W) and continues on toward 4 Seasons Blvd. Thus, the maximum fraction of eastbound through traffic is  $70\% \times 21\% = 15\%$ .

NCDOT data in Figure 8 shows **(11,500)** (2 directions) on NC 191 just west of its intersection with US 25 Business. If all of the eastbound traffic is through traffic, then the average number of through-traffic vehicles per day would be 860 ( $15\% \times \frac{1}{2} \times 11,500$ ). (This exactly balances the calculated number of westbound through vehicles on the system calculated in Section 2.5, which it must since the system is in equilibrium.) Of course, the actual number is much smaller than this since not all traffic eastbound traffic on NC 191 is through traffic. In the author's opinion, the fraction of vehicles on NC 191 that is through traffic is probably about 5%. Thus, the average number of eastbound through-traffic vehicles is probably less than about 40 vehicles per day which is less than 1% of the eastbound traffic on NC 191.

## 2.7 Traffic Conditions, Patterns, and Metrics

Traffic Conditions on each roadway segment are characterized by the traffic volume (Peak AADT), the degree of congestion (Peak AADT / Minimum AADT), and the fraction of heavy truck traffic. The Traffic Pattern on each roadway segment is the dominance of east-west traffic flow versus north-south traffic flow for both overall traffic and for heavy truck traffic. The Traffic Condition on the system (U.S. 64 combined with U.S. 25 Business and N.C. 191) is characterized by the sum of the peak traffic volumes on each of the system's major segments.<sup>2</sup> The Traffic Pattern on the system is characterized by the existence (or not) of dominant north-south or east-west traffic flow in the major roadways of the system and the fraction of through traffic in each direction. Traffic metrics are parameters or ratios that allow easy comparison between the conditions and patterns for a particular roadway segment or the overall system between 2016 measurements and 2040 projections with or without the Balfour Parkway.

The conditions, patterns, and metrics for each roadway segment and the system based on NCDOT 2016 measured data are summarized in Table 1.

<sup>2</sup> Note this sum is only a metric used to characterize the Traffic Condition on the system and to compare 2016 Traffic Conditions to 2040 Traffic Conditions. It is not an actual total traffic volume.

Segment	Characteristic	Metric	Figure	2016 Data Value
US 64 (4 Seasons Blvd)	Traffic Volume	Peak AADT	4	<b>43,800</b>
	Degree of Congestion	Peak AADT / Min AADT	4	<b>43,800/30,300 = 1.4</b>
	Fraction of Heavy Trucks	(% duals,% TTSTs)	9, 10	<b>(2,1)</b>
	Traffic Pattern	Ratio: west on 7 <sup>th</sup> Ave to right (north) on King St	11	<b>(15,300-2,800)/2,800 = 4.5 → east-west on US 64</b>
US 25 Business	Traffic Volume	Peak AADT	5 or 7	<b>27,700</b>
	Degree of Congestion	Peak AADT / Min AADT	5 or 7	<b>27,700/23,100 = 1.2</b>
	Fraction of Heavy Trucks	(% duals,% TTSTs)	9, 10	<b>(3-4,1)</b>
	Traffic Pattern	Ratio: 25 Bus from north to 191 from west	5	<b>(23,100-3,500)/8,000 = 2.5</b>
		Ratio: south on Church St to left (east) on 6 <sup>th</sup> Ave	5	<b>(17,100-2,700)/3,800 = 3.8</b>
		Ratio: traffic N from downtown to from 4 Seasons	6	<b>(12,700-2,800)/2,800 = 3.5</b>
		Ratio: north on 25 Bus to left (west) on NC 191	7	<b>(27,700-8,000)/8,000 = 2.5 → north-south on US 25 Business</b>
NC 191	Traffic Volume	Peak AADT	8	<b>13,200</b>
	Degree of Congestion	Peak AADT / Min AADT	8	<b>13,200/10,500 = 1.3</b>
	Fraction of Heavy Trucks	(% duals,% TTSTs)	8	<b>(2-3,1)</b>
	Traffic Pattern	N/A	N/A	<b>east-west on NC 191 – no traffic splits</b>
System	Traffic Volume	Sum of Peak AADTs	4,5,8	<b>43,800+27,700+13,200 = 84,700</b>
	Traffic Pattern Overall	north-south vs east-west	5,6,7	<b>Intersecting north-south &amp; east west</b>
	Traffic Pattern westbound thru traffic	Ratio: west on 7 <sup>th</sup> Ave to right (north) on King St	11	<b>4.5</b>
		Ratio: north on 25 Bus to left (west) on NC 191	7	<b>2.5</b>
	Traffic Pattern eastbound thru traffic	Ratio: 25 Bus from N to NC 191 from west	5	<b>2.5</b>
		Ratio: south on Church St to left (east) on 6 <sup>th</sup>	5	<b>3.8</b>

**Table 1 Traffic Conditions, Patterns, and Metrics Based on NCDOT 2016 Data**

The results in Table 1 have been described in Sections 2.1 through 2.6.

The NCDOT “Project Level Traffic Forecast” report also contains projections of traffic data in 2040 with and without the Balfour Parkway. NCDOT states<sup>3</sup> that the data set titled “Future Build Alternative 2” represents data with the Balfour Parkway. Conditions without the Balfour Parkway are represented by the data set titled “Future No Build.” Scaling from the 2016 data to the 2040 projections is based on the FBRMPO 2015 Travel Demand Model<sup>4</sup> calibrated using the FBRMPO 2013 Household Travel Survey<sup>5</sup>. The NCDOT traffic projections for 2040 are compared in Table 2 to the 2016 results from Table 1.

<sup>3</sup> Discussion with NCDOT traffic engineers, April 18, 2018.

<sup>4</sup> FBRMPO, “Travel Demand Model, Model Development Report,” February 6, 2015

<sup>5</sup> NCDOT, FBRMPO, “Western North Carolina Household Travel Survey,” Final Report, October 16, 2013

Segment	Characteristic	Metric	2016 Data Value	2040 No Build	2040 with Balfour
US 64 (4 Seasons Blvd)	Traffic Volume	Peak AADT	43,800	55,500	43,500
	Degree of Congestion	Peak AADT / Min AADT	43,800/30,300 = 1.4	55,500/38,300 = 1.4	43,500/31,000 = 1.4
	Fraction of Heavy Trucks	(% duals, % TTSTs)	(2,1)	(2,1)	(2,1)
	Traffic Pattern	Ratio: west on 7 <sup>th</sup> Ave to right (north) on King St	(15,300-2,800)/2,800 = 4.5 → east-west on US 64	(20,100-3,800)/3,800 = 4.3 → east-west on US 64	(17,200-3,300)/3,300 = 4.2 → east-west on US 64
US 25 Business	Traffic Volume	Peak AADT	27,700	39,200	35,900
	Degree of Congestion	Peak AADT / Min AADT	27,700/23,100 = 1.2	39,200/30,300 = 1.3	35,900/29,200 = 1.2
	Fraction of Heavy Trucks	(% duals, % TTSTs)	(3-4,1)	(3-4,1)	(3-4,1)
	Traffic Pattern	Ratio: 25 Bus from north to 191 from west	(23,100-3,500)/8,000 = 2.5	(30,300-5,800)/14,600 = 1.7	(29,300-5,600)/12,100 = 2.0
NC 191	Traffic Volume	Peak AADT	13,200	23,900	21,200
	Degree of Congestion	Peak AADT / Min AADT	13,200/10,500 = 1.3	23,900/19,000 = 1.3	21,200/13,900 = 1.5
	Fraction of Heavy Trucks	(% duals, % TTSTs)	(2-3,1)	(2-3,1)	(2-3,1)
	Traffic Pattern	Ratio: south on Church St to left (east) on 6 <sup>th</sup> Ave	(17,100-2,700)/3,800 = 3.8	(24,300-3,500)/5,100 = 4.0	(20,900-2,900)/4,600 = 3.9
System	Traffic Volume	Sum of Peak AADTs	43,800+27,700+13,200 = 84,700	55,500+39,200+23,900 = 118,600	43,500+35,900+21,200 = 100,600
	Traffic Pattern Overall	north-south vs east-west	Intersecting north-south & east west	Intersecting north-south & east west	Intersecting north-south & east west
	Traffic Volume	Ratio: west on 7 <sup>th</sup> Ave to right (north) on King St	(15,300-2,800)/2,800 = 4.5	(20,100-3,800)/3,800 = 4.3	(17,200-3,300)/3,300 = 4.2
	Traffic Pattern	Ratio: north on 25 Bus to left (west) on NC 191	(27,700-8,000)/8,000 = 2.5	(39,200-14,600)/14,600 = 1.7	(35,900-12,100)/12,100 = 2.0
System	Traffic Volume	Ratio: 25 Bus from N to NC 191 from west	(23,100-3,500)/8,000 = 2.5	(30,300-5,800)/14,600 = 1.7	(29,300-5,600)/12,100 = 2.0
	Traffic Pattern	Ratio: south on Church St to left (east) on 6 <sup>th</sup>	(17,100-2,700)/3,800 = 3.8	(24,300-3,500)/5,100 = 4.0	(20,900-2,900)/4,600 = 3.9
	Traffic Volume	Peak AADT	13,200	23,900	21,200
	Traffic Pattern	Ratio: north on 25 Bus to left (west) on NC 191	(27,700-8,000)/8,000 = 2.5	(39,200-14,600)/14,600 = 1.7	(35,900-12,100)/12,100 = 2.0

Table 2 Traffic Conditions, Patterns, and Metrics Based on NCDOT 2040 Projections

The observations and conclusions stated in Sections 2.8 and 2.9 are based on the comparisons given in Table 2 with no examination or evaluation of the FBRMPO 2015 Travel Demand Model, the FBRMPO 2013 Household Travel Survey, or NCDOT traffic engineering computer models. In particular, the computer modeling of the distribution and circulation of traffic between the existing roadway system (Figure 1 - U.S. 64 combined with U.S. 25 Business and N.C. 191) and the Balfour Parkway (Figure 2) was not examined or evaluated. In addition, the NCDOT "Project Level Traffic Forecast" report has only limited data or projections of traffic on other existing roadways that provide "east-west vehicular mobility" such as Howard Gap Rd, Signal Hill Rd, Berkeley Hills Rd, Brookside Camp Road, Mountain Rd, Stoney Mountain Rd, Rugby Dr, and US 64 (6<sup>th</sup> Ave W) west of Buncombe St.

## 2.8 Observations

The data values and projections in Table 2 are the basis for all of the following observations.

### 2.8.1 US 64 (4 Seasons Blvd)

The traffic volume on US 64 (4 Seasons Blvd) will increase from 2016 to 2040 by 27% (**55,500/43,800**) without the Balfour Parkway but will be essentially the same as in 2016 with the Balfour Parkway. Thus, it could be said that the Balfour Parkway reduces traffic volume on US 64 (4 Seasons Blvd) by 22% [(**55,500-43,500**)/**55,500**]]. This reduction requires further examination because of three considerations:

1. The Balfour Parkway serves east-west traffic demand between US 64 on its east end and NC 191 on its west end as shown in Figure 2.<sup>6</sup> However, the 2016 data shows that the vast majority (82% or more, see Section 2.5) of the westbound traffic on US 64 (4 Seasons Blvd) is destined for US 64 (7<sup>th</sup> Ave W and 6<sup>th</sup> Ave W), not NC 191 at the west end of the Balfour Parkway. The Traffic Pattern metric for US 64 (4 Seasons Blvd) in Table 2 shows this will be 81% in 2040 with the Balfour Parkway built.
2. The 2016 data shows that the vast majority, 77% [(**16,300-3,800**)/**16,300**], see Figures 4 & 5], of the eastbound traffic on US 64 (4 Seasons Blvd) comes from either US 64 west of Church St or downtown Hendersonville, not NC 191. The 2040 projections with the Balfour Parkway built show that 76% [(**19,500-4,600**)/**19,500**]] comes from either US 64 west or Church St or downtown Hendersonville, not NC 191.
3. The westward destinations of the Balfour Parkway and US 64 are entirely different (NC 191/Mills River and Brevard Rd/Brevard, respectively) and have essentially no connection between the two except for US 280 between Mills River and Brevard.

Therefore, why does the Balfour Parkway relieve traffic volume on US 64 (4 Seasons Blvd) when about 80% of the westbound or eastbound traffic on 4 Seasons Blvd in either 2016 or 2040 is not destined to NC 191 or coming from NC 191, respectively?

The degree of congestion on US 64 (4 Seasons Blvd) (**1.4**) remains the same in 2040 as it is in 2016 whether the Balfour Parkway is built or not. Therefore, the Balfour Parkway does not reduce the degree of congestion on 4 Seasons Blvd, and another solution is needed to address this congestion.

<sup>6</sup> The design of the Balfour Parkway given in the NCDOT "Project Level Traffic Forecast" report shows that it will cross Howard Gap Rd, Interstate 26, US 25 Business, and Stoney Mountain Rd, and it will have an intersection with each of these roads. Therefore, it will also serve as an east-west traffic connector between each pair of these cross roads. The forecast maximum traffic volume on the Balfour Parkway in 2040 is between Interstate 26 and US 25 Business (**29,400**) (2 directions) which is slightly less than on Chimney Rock Road in 2016 east of its divided section. The forecast traffic volume on the Balfour Parkway in 2040 between Stoney Mountain Rd and US 25 Business or between Howard Gap Rd and Chimney Rock Rd is about half of this value. The forecast traffic volume on the Balfour Parkway at its west end approaching NC 191 is only one quarter of this value which is only three-quarters of the traffic volume on NC 191 just west of Mountain Rd in 2016.

The fraction of heavy truck traffic on US 64 (4 Seasons Blvd) **(2,1)** remains the same in 2040 as it is in 2016 whether the Balfour Parkway is built or not. Clearly this level of heavy truck traffic is primarily serving delivery needs of businesses along and near 4 Seasons Blvd. (It is also noted that westbound heavy truck traffic on 4 Seasons Blvd is prohibited by Hendersonville City Ord. Sec. 50-192 as is signed on 4 Seasons Blvd just east of Interstate 26.) Therefore, since the traffic volume on 4 Seasons Blvd in 2040 with the Balfour Parkway built will be essentially the same as in 2016, the Balfour Parkway does not produce a reduction in the volume of heavy trucks on 4 Seasons Blvd.

The traffic pattern on US 64 (4 Seasons Blvd) **(4.2-4.5 → east-west on US 64)** remains the same in 2040 as it is in 2016 whether the Balfour Parkway is built or not. Therefore, the Balfour Parkway has no influence on this east-west traffic pattern on US 64 (4 Seasons Blvd, 7<sup>th</sup> Ave and 7<sup>th</sup> Ave). This is because the Balfour Parkway terminates on its west end at NC 191 which has essentially no connectivity with US 64 west of this termination except US 280 in Mills River.

### 2.8.2 US 25 Business

The traffic volume on US 25 Business will increase from 2016 to 2040 by 42% **(39,200/27,700)** without the Balfour Parkway and 30% **(35,900/27,700)** with the Balfour Parkway. Thus, it could be said that the Balfour Parkway reduces traffic volume on US 25 Business by 8% **[ $(39,200-35,900)/39,200$ ]**. However, even with the Balfour Parkway, traffic volume on US 25 Business is 30% **(35,900/27,700)** above its 2016 level, and another solution may be needed.

The degree of congestion on US 25 Business **(1.2)** remains the same in 2040 as it is in 2016 even if the Balfour Parkway is built. It increases slightly **(1.3)** in 2040 if the Balfour Parkway is not built, but it will still be dominated by intermittent sources of local congestion (school & business cycles and traffic lights) over which the Balfour Parkway has no influence.

The fraction of heavy truck traffic on US 25 Business **(3-4,1)** remains the same in 2040 as it is in 2016 whether the Balfour Parkway is built or not. Clearly this level of heavy truck traffic is primarily due to the dominance of the north-south traffic pattern on US 25 Business. Therefore, the Balfour Parkway, the stated primary purpose of which "is to improve east-west vehicular mobility," will have no influence on the heavy truck traffic on US 25 Business.

The traffic pattern on US 25 Business **(≅2-4 → north south on US 25 Business)** remains the same in 2040 as it is in 2016 whether the Balfour Parkway is built or not. The 2040 projections without the Balfour Parkway exhibit an unexpected and unexplained decrease **(1.7)** in the dominance of traffic flow on US 25 Business over that on NC 191 at the intersection of the two roads. Careful examination of the computer modeling would be required to provide an explanation. However, the Balfour Parkway, the stated primary purpose of which "is to improve east-west vehicular mobility," will have no influence on the north-south traffic pattern on US 25 Business.

### 2.8.3 NC 191

The traffic volume on NC 191 will increase from 2016 to 2040 by 81% **(23,900/13,200)** without the Balfour Parkway and 61% **(21,200/13,200)** with the Balfour Parkway. Thus, it could be said that the Balfour Parkway reduces traffic volume on NC 191 by 11% **[ $(23,900-21,200)/23,900$ ]**. However, the big question is, "Why is the increase in traffic volume on NC 191 with or without the Balfour Parkway double that on either US 64 (4 Seasons Blvd) or US 25 Business?" Careful examination of the scaling from the 2016 data to the 2040 projections using the FBRMPO 2015 Travel Demand Model<sup>4</sup> and the FBRMPO 2013 Household Travel Survey<sup>5</sup>

as well as the computer modeling would be required to provide an explanation. Perhaps it has to do with assumptions about added traffic due to the likely widening of NC 191 from US 25 Business to Mountain Road.

The degree of congestion on NC 191 (**1.3**) remains the same in 2040 as it is in 2016 if the Balfour Parkway is not built. However, the degree of congestion increases significantly to **1.5** if the Balfour Parkway is built. In fact, it even exceeds that on US 64 (4 Seasons Blvd). Note that the 2040 projections only represent NC 191 from US 25 Business to Mountain Rd. Hence, it appears that the projections indicate that the Balfour Parkway will cause a very significant increase in both traffic volume and congestion in this section of NC 191. Congestion west of Mountain Rd is presently due entirely to intermittent sources of local congestion (school cycles and the traffic light at Rugby Rd). However, if the Balfour Parkway also produces a very significant increase in traffic volume on that section of the road (west of Mountain Rd), these intermittent sources could become a much greater problem.

The fraction of heavy truck traffic on NC 191 (**2-3,1**) remains the same in 2040 as it is in 2016 whether the Balfour Parkway is built or not. However, in 2016 (and currently) this heavy truck traffic is due almost entirely to local sources, i.e., 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. Since the fraction of heavy truck traffic projected in 2040 is unchanged from 2016, it appears that the projected absolute volume of heavy truck traffic increases by the same factor as stated above for overall traffic volume, i.e., 81% without the Balfour Parkway and 61% with the Balfour Parkway. Careful examination of the scaling from the 2016 data to the 2040 projections using the FBRMPO 2015 Travel Demand Model<sup>4</sup> and the FBRMPO 2013 Household Travel Survey<sup>5</sup> as well as the computer modeling would be required to provide an explanation.

The traffic pattern on NC 191 should not change significantly due to the Balfour parkway. It will remain an overall east-west (actually southeast- northwest) pattern; however, the configuration of the junction with the Balfour Parkway is yet to be determined. That junction and the traffic that it delivers to NC 191 from the Balfour Parkway may significantly alter conditions on NC 191 in both directions as described above.

#### 2.8.4 System

The traffic volume on the system (U.S. 64 combined with U.S. 25 Business and N.C. 191) will increase from 2016 to 2040 by 40% (**118,600/84,700**) without the Balfour Parkway and 19% (**100,600/84,700**) with the Balfour Parkway. Thus, it could be said that the Balfour Parkway reduces traffic volume on the system by 15% [**(118,600-100,600)/118,600**]. However, the NCDOT "Project Level Traffic Forecast" report also includes a 2040 projection of peak traffic volume on the Balfour Parkway of (**29,400**). Adding this to the "2040 with Balfour" system traffic volume of (**100,600**), the total volume including the Balfour Parkway is (**130,000**) which is (**11,400**) greater than the "2040 No Build" system traffic volume of (**118,600**).<sup>7</sup> The source of this extra 10% (**11,400/118,600**) is unclear. Again, careful examination of the computer modeling would be required to provide an explanation.

The traffic pattern on the system (U.S. 64 combined with U.S. 25 Business and N.C. 191) remains the same in 2040 as it is in 2016, i.e., intersecting north-south and east-west traffic patterns, whether the Balfour Parkway is built or not. Likewise, the projections indicate the same very low level of east-west through traffic on the system in 2040 as in 2016 (**2.5-4.5**) with (**2.0-4.2**) or without (**1.7-4.3**) the Balfour Parkway. Therefore, the Balfour Parkway has no influence on the system traffic pattern.

<sup>7</sup> As previously stated in Footnote 4, this sum is only a metric used to characterize the Traffic Condition on the system and to compare 2016 Traffic Conditions to 2040 Traffic Conditions. It is not an actual total traffic volume.

## 2.9 Conclusions

The overall conclusion is that the observations and conclusions stated in previous versions of the author's traffic analyses<sup>8</sup> relative to 2016 also apply to 2040 with one exception.<sup>9</sup>

The conclusions previously stated (which remain valid in 2040) are:

The traffic conditions and patterns on U.S. 64 combined with U.S. 25 Business and N.C. 191 in Hendersonville are summarized as follows:

- lack of east-west through traffic on the combination of these roadways
- local congestion on 4 Seasons Blvd
- dominance of north-south traffic on US 25 Business
- dominance of east-west traffic on US 64 (continuing west of Church St)
- 4 intersections that determine the overall through-traffic pattern [191/25B, 25B (Church)/64 west (6<sup>th</sup>), 25B (King)/64 east (6<sup>th</sup>), and 64 east (7<sup>th</sup>)/25B (King)]

The Balfour Parkway will not change this.

Congestion on US 64 (4 Seasons Blvd) is due to "local" traffic, not "east-west through" traffic. The Balfour Parkway will not improve this congestion.

Westbound "through traffic" is a small fraction of the traffic on the system (maximum of 5.2%, probably about ¼%). The Balfour Parkway will not change this.

Eastbound "through traffic" is a small fraction of the traffic on the system (maximum of 15%, probably less than 1%). The Balfour Parkway will not change this.

The vast majority (70-80%) 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 Balfour Parkway will not change this.

All through traffic in downtown Hendersonville follows two intersecting traffic patterns, i.e., east-west on US 64 and north-south on US 25 Business, with little interaction between the two. The Balfour Parkway will not change this.

Only a small fraction (1-2%) of traffic on US 64 (4 Seasons Blvd) is due to "heavy trucks" and these trucks are not "east-west through traffic." The Balfour Parkway will not change this.

Only a small fraction (1-3%) of traffic on US 25 Business is due to "heavy trucks." The Balfour Parkway will not change this.

Only a small fraction (1-2%) of traffic on NC 191 is due to "heavy trucks" in all locations except at the intersection with Mountain Rd. The Balfour Parkway will not change this.

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<sup>8</sup> "Analysis of Traffic Congestion Cited by Balfour Parkway Plan," March 7, 2018, and "Validation of Analysis of Traffic Congestion Cited by the Balfour Parkway Plan Using NCDOT Data," April 13, 2018

<sup>9</sup> The NCDOT 2040 traffic projections indicate that the Balfour Parkway will cause traffic conditions on NC 191 between US 25 Business and Mountain Rd to worsen significantly.

Additional conclusions can be stated based on the NCDOT 2040 traffic projections:

The Balfour Parkway (1) may reduce traffic volume on 4 Seasons Blvd to the 2016 level, but does not reduce the degree of congestion, (2) may reduce traffic volume on US 25 Business to 30% above the 2016 level, but does not reduce the degree of congestion, and (3) increases traffic volume on NC 191 by about 60% and significantly increases the degree of congestion.

The Balfour Parkway will provide an additional route for east-west traffic (as is obvious from Figure 2). Whether traffic demand justifies this new route is unclear.

- Peak traffic volume on the system (U.S. 64 combined with U.S. 25 Business and N.C. 191) is reduced by only about 15% by the Balfour Parkway.
- However, peak traffic volume overall increases by about 10% due to the Balfour Parkway.

The increase of traffic volume on NC 191 (between US 25 Business and Mountain Rd) in 2040 is about double that on either US 64 (4 Seasons Blvd) or US 25 Business with or without the Balfour Parkway.

## STOP THE BALFOUR PARKWAY

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<sup>10</sup> The author acknowledges helpful discussions on April 18, 2018, with NCDOT traffic engineers who reviewed an earlier version of this analysis. The following corrections were made based on their feedback:

1. Corrected calculations of fraction of east-west through traffic by omitting inappropriate traffic dilution factors.
2. Omitted use of IAU Tool Outputs which are applicable only to peak traffic conditions.
3. Omitted use of D-factors which are applicable only to peak traffic conditions.



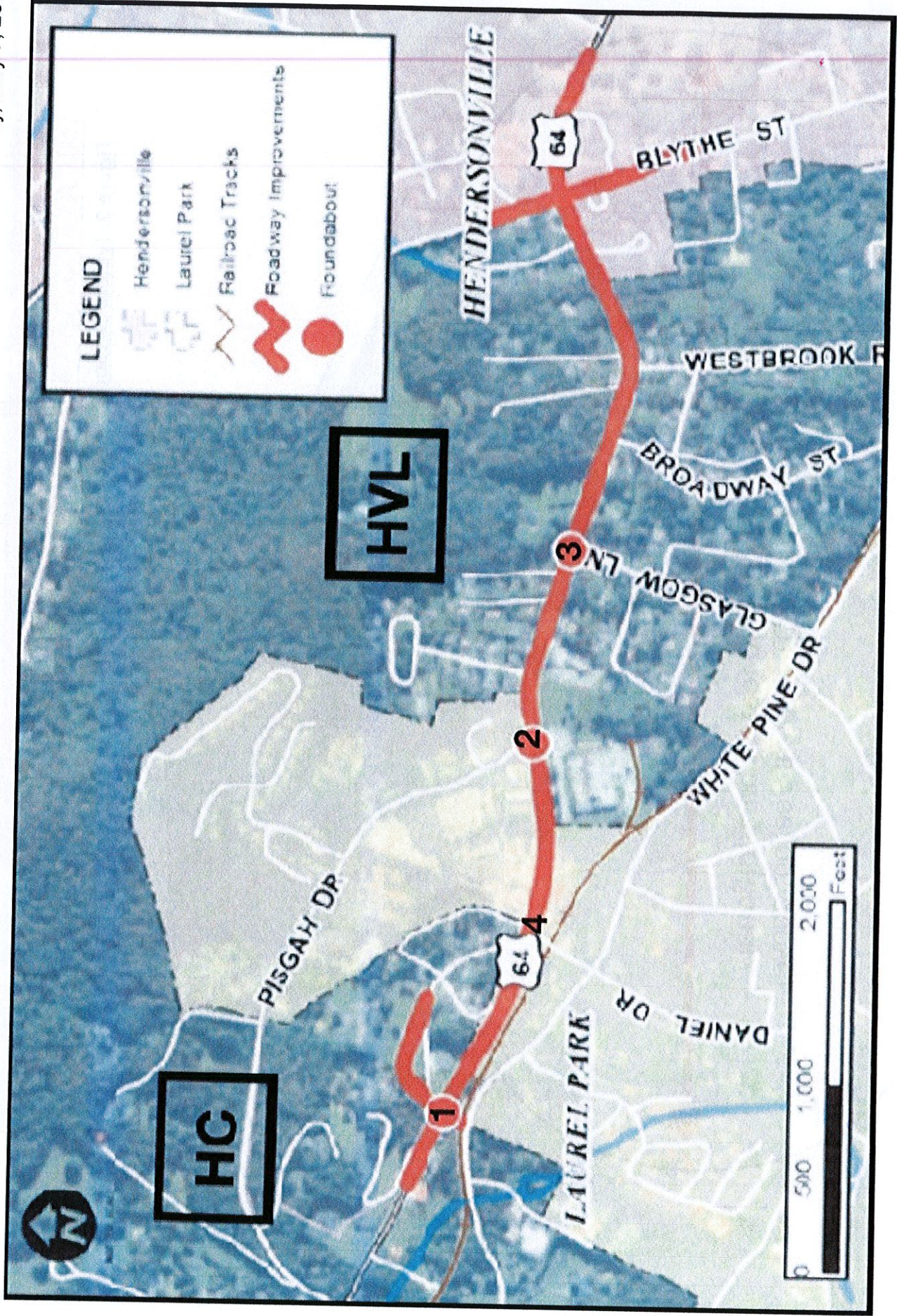


Figure 2: Typical Section

