

Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study Technical Memorandum #4 Traffic Data and Projection Summary

Knoxville, Knox County, TN

Executive Summary

This memorandum summarizes the initial year (2025) and design year (2045) projected turning movement volumes for both the “No-Build” and “Build” Alternatives within the *Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study Area*. The traffic projections assume a 1.5 percent annual growth in traffic, consistent with the Knoxville Transportation Planning Organization’s Travel Demand Model. Calculations of the projections are provided.

For

City of Knoxville
Housing and Neighborhood Development Department
400 Main Street, Room 655
Knoxville, TN 37901

By

Gresham Smith
2095 Lakeside Centre Way #120
Knoxville, TN 37922

Gresham Smith Project No. 44321.00

March 24, 2020

***Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study
Traffic Data and Projection Summary
Knoxville, Knox County, TN***

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION
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505 DEADERICK STREET
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CLAY BRIGHT
COMMISSIONER

BILL LEE
GOVERNOR

March 25, 2020

Mr. Jon Story
Gresham, Smith Partners.
222 Second Avenue, Suite 1400
Nashville TN 37201-2308

RE: Magnolia Ave., Rutledge Pike & Ashville Hwy. Interchange Study
Technical Memorandum # 4 Traffic Data.
Knoxville, Knox County

Dear Mr. Story,
Our office has reviewed the traffic volumes and methodology you submitted on March 24, 2020 for the subject project. The traffic volumes have our approval for use in the study. If I can be of further assistance, please contact me.

Sincerely,

Tony Armstrong

Tony Armstrong
Transportation Manager 2

Cc: Mike Gilbert
file

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1.0 TRAFFIC PROJECTION SUMMARY

The traffic projections were developed for two primary concepts, the “No-Build” and “Build” Alternatives. The “No Build” Alternative would not provide direct access to the Burlington Commercial District. The “Build” Alternative would provide a direct connection to the Burlington Commercial District at or near existing McCalla Avenue. Figure 1 provides a single-line concept sketch of the Build Alternative connection to the commercial district. It should be noted that each primary concept can include multiple sub-concepts, i.e. the “Build” Alternative could include a signalized intersection, roundabout, or other concept that creates a 4-legged intersection at McCalla Avenue.

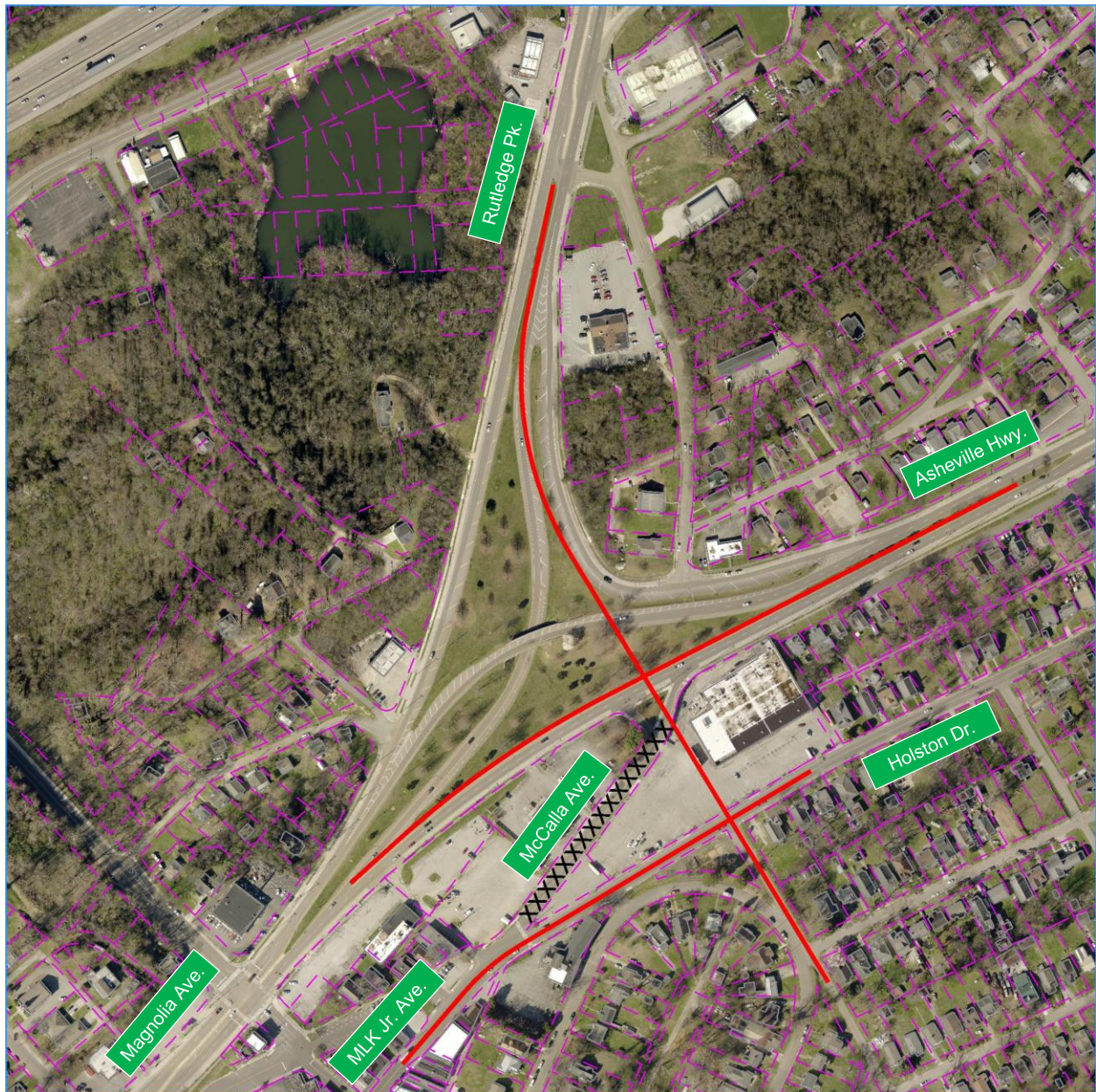


FIGURE 1 :BUILD ALTERNATIVE SINGLE-LINE SKETCH

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Figure 2 through Figure 5 summarize the initial year (2025) and design year (2045) projected turning movement volumes for both the “No-Build” and “Build” Alternatives within the *Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study* Area. The traffic projections assume a 1.5 percent annual growth in traffic, consistent with the Knoxville Transportation Planning Organization’s Travel Demand Model.

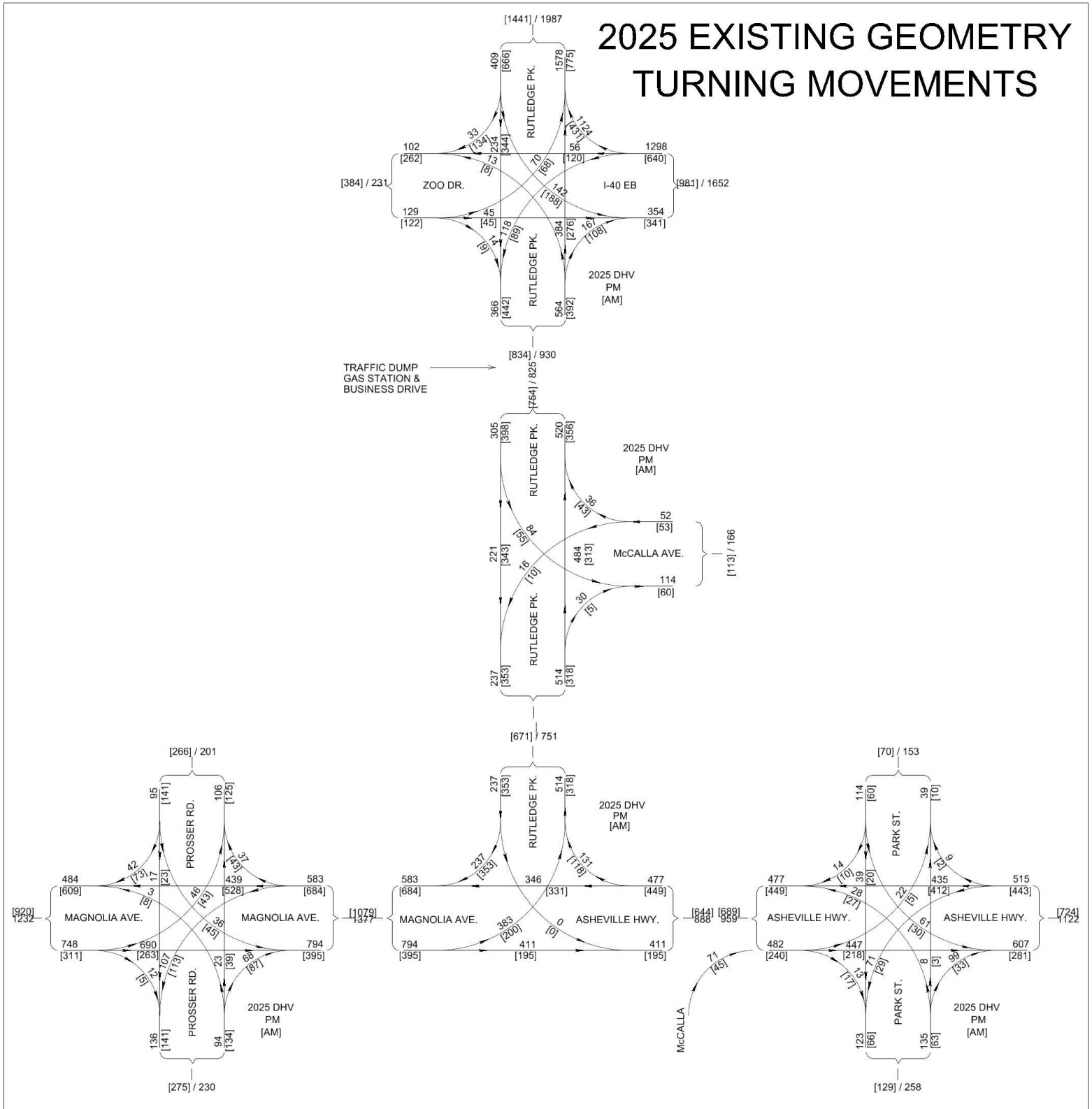


FIGURE 2: 2025 TURNING MOVEMENTS (NO- BUILD / EXISTING GEOMETRY)

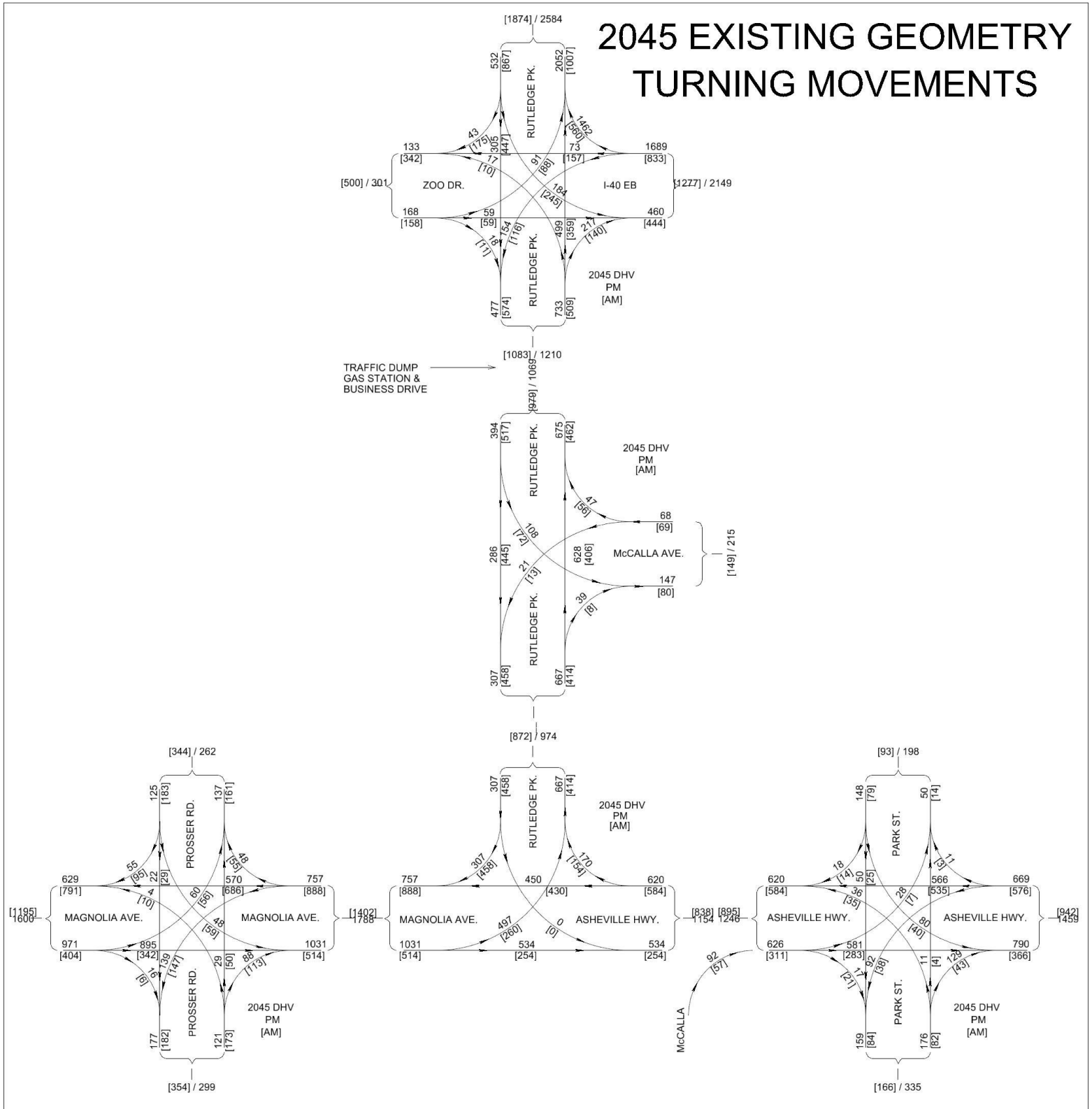


FIGURE 3: 2045 TURNING MOVEMENTS (NO-BUILD / EXISTING GEOMETRY)

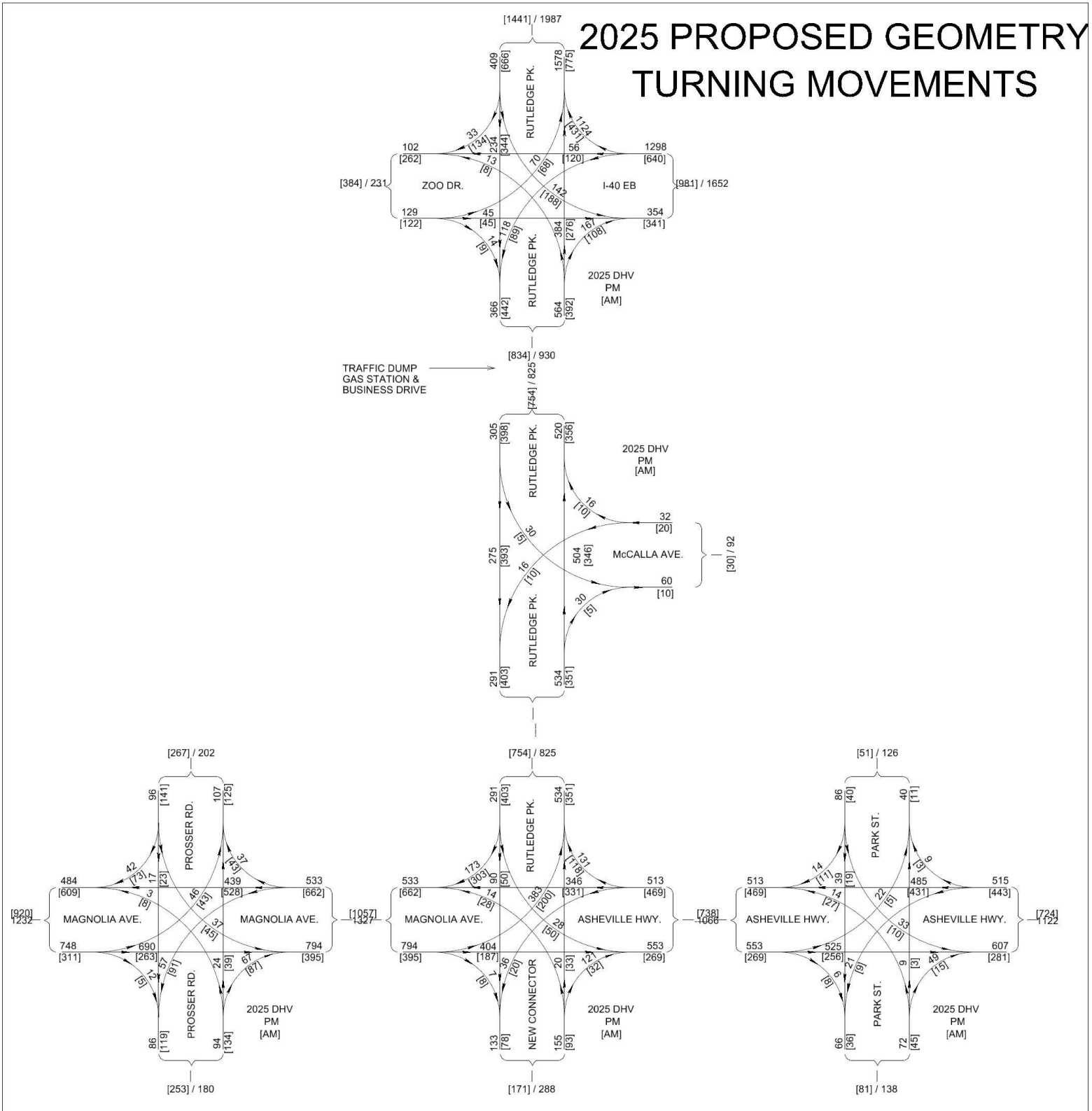


FIGURE 4: 2025 TURNING MOVEMENTS (BUILD WITH CONNECTION TO BURLINGTON COMMERCIAL DISTRICT)

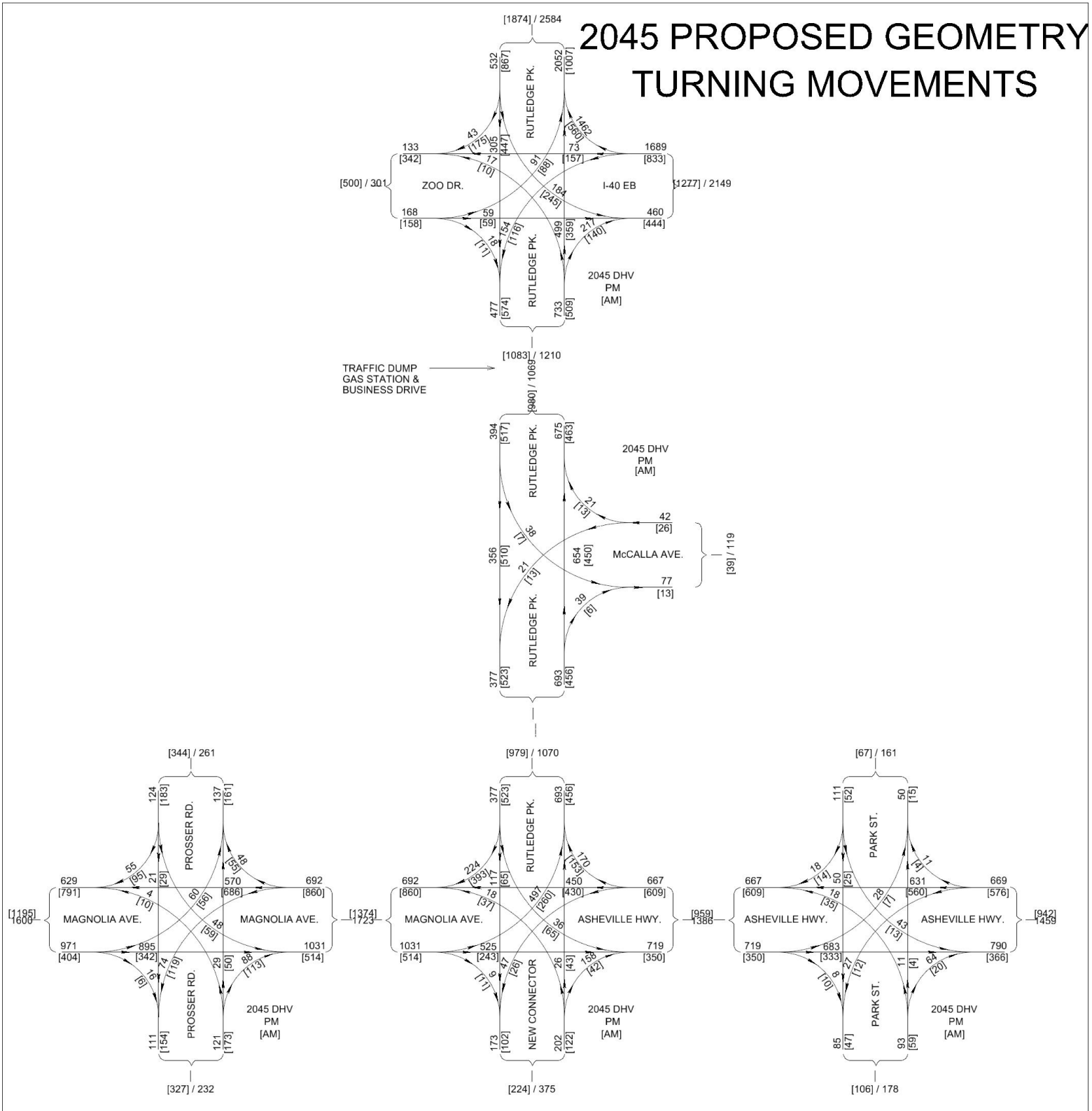


FIGURE 5: 2045 TURNING MOVEMENTS (BUILD WITH CONNECTION TO BURLINGTON COMMERCIAL DISTRICT)

2.0 TRAFFIC DATA SOURCES

Traffic data from three primary sources are utilized in the *Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study* traffic projections:

- Tennessee Department of Transportation (TDOT) Annual Average Daily Traffic (AADT) Data
- Field Collected Data
- Knoxville Area Transportation Planning Organization (TPO) Travel Demand Model (TDM) Data

2.1 TDOT AADT DATA

Figure 6 shows the Annual Average Daily Traffic (AADT) volumes reported by TDOT along the major roadways in the Study Area. Magnolia Avenue (SR 1) has an AADT of 12,860 with 3 percent trucks, Rutledge Pike (SR 1) 10,210 with 31 percent trucks, and Asheville Highway (SR 168) 7,440 with 6 percent trucks. It should be noted that the truck volumes along Rutledge Pike (SR 1) were likely collected north of I-40 where several trucking-related businesses are located. Martin Luther King Jr. Boulevard has an AADT of 5,200. TDOT AADT data are available on their website at

<https://www.arcgis.com/apps/webappviewer/index.html?id=075987cdae37474b88fa400d65681354>.

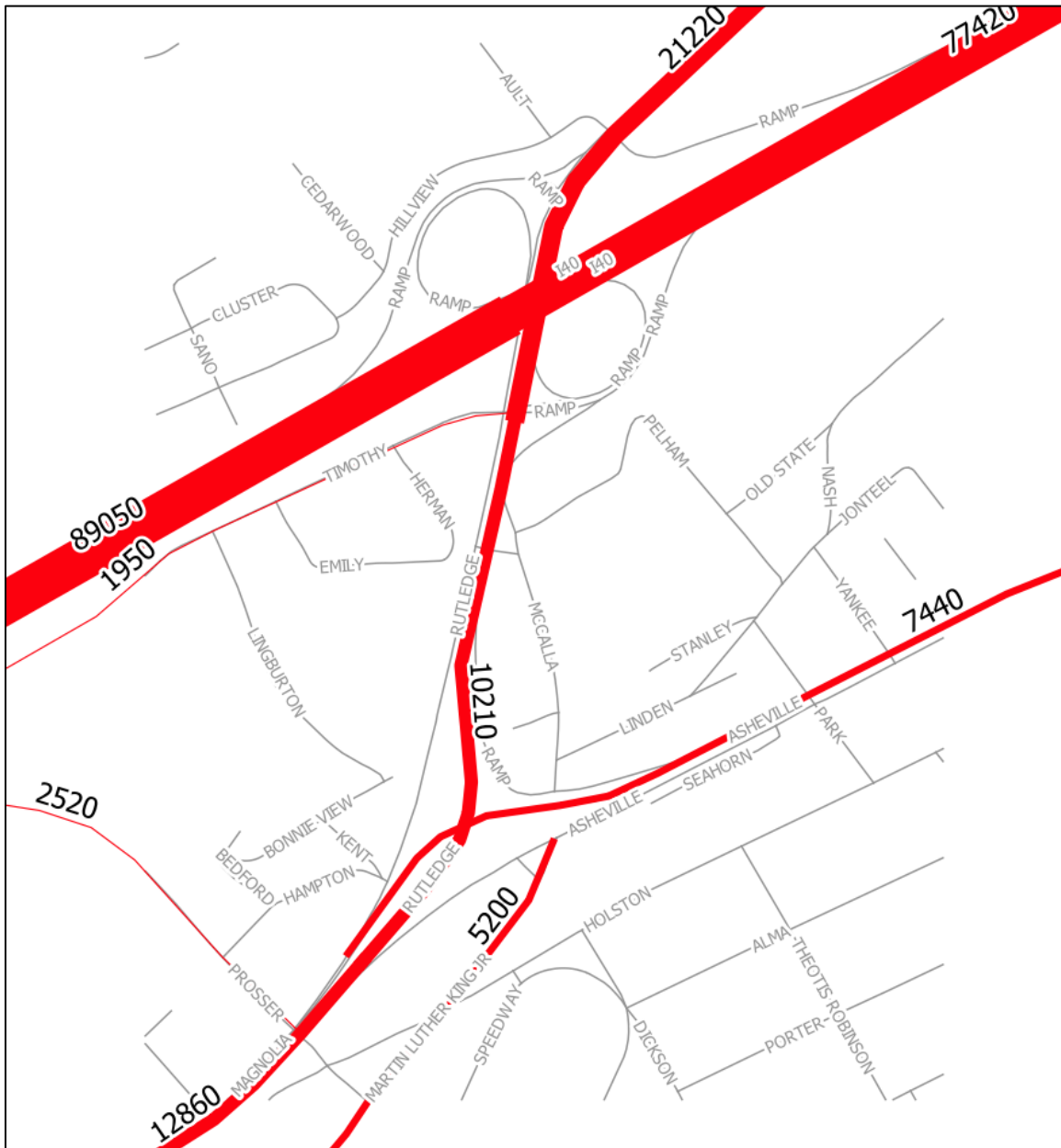


FIGURE 6: ANNUAL AVERAGE DAILY TRAFFIC
Source: TDOT 2018 (most recent year available)

2.2 FIELD COLLECTED DATA

Turning movement and ramp volume traffic data for the *Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study* were collected on Tuesday, January 21, 2020 from 6 AM to 6 PM. Knox County Schools and the University of Tennessee were open. Data at eight (8) intersections and five (5) ramps were collected. Figure 7 summarizes the data locations. The locations are labeled by data collection Site ID. Table 1 summarizes the AM and PM peak hours at each location. The Study Area peak hours of traffic are from 7:30 to 8:30 AM and 4:30 to 5:30 PM. Data were collected outside the Study Area's official log miles (LM) along Magnolia Avenue

**Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study
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Knoxville, Knox County, TN**

(SR 1). These locations were collected to determine the traffic impacts of these closely spaced signalized intersections on the Study Area. The traffic count databases are on file at the City of Knoxville.

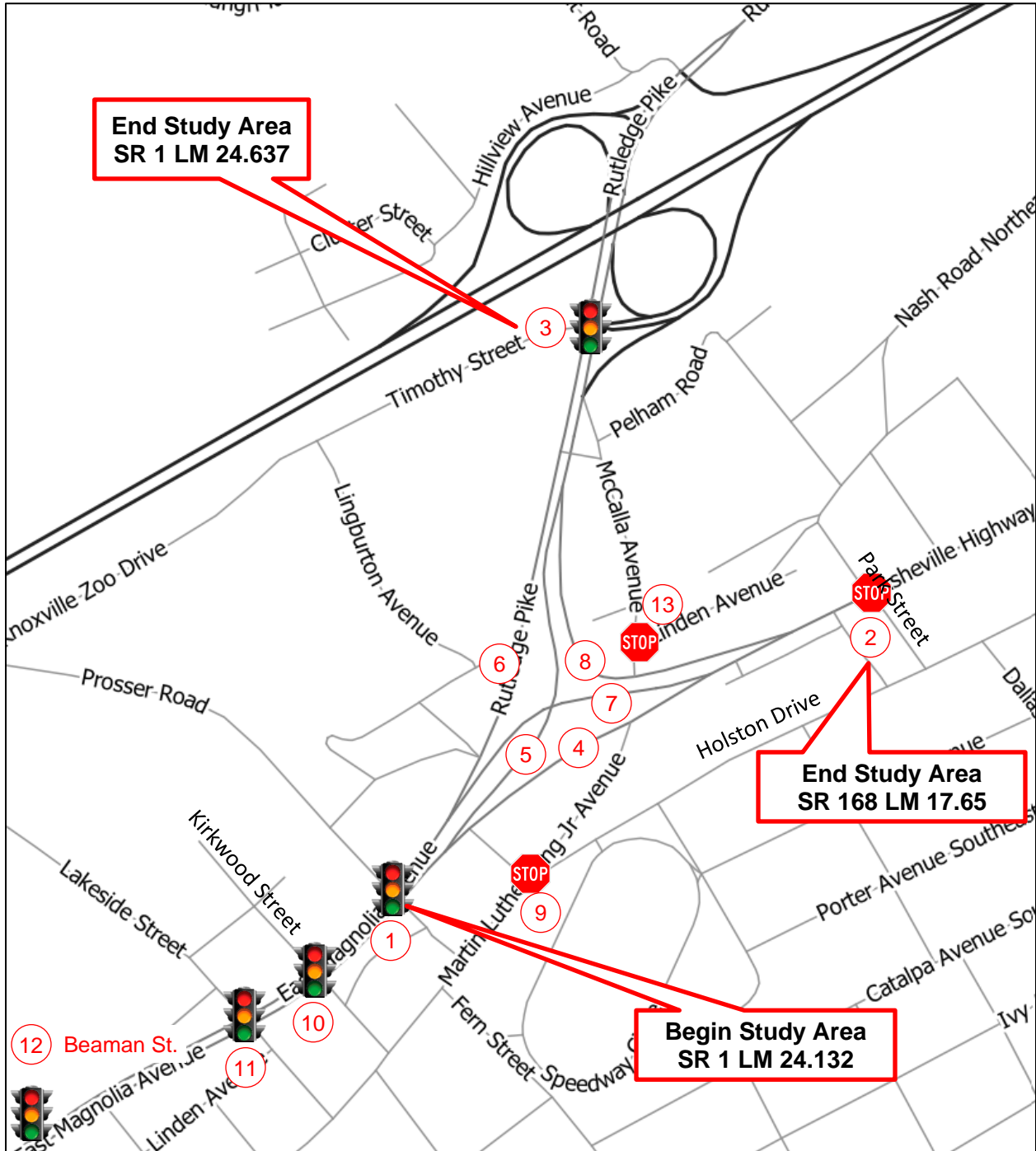


FIGURE 7: TRAFFIC DATA LOCATIONS WITH TRAFFIC CONTROL FEATURES

**Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study
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TABLE 1: PEAK HOUR BY LOCATION

Magnolia Avenue Interchange Study Peak Hours by Intersection			
ID	Crossroad	AM Peak Hour	PM Peak Hour
12	Magnolia Ave. (SR 1) at Beaman St.	7:30 – 8:30	3:30 – 4:30
11	Magnolia Ave. (SR 1) at Lakeside St.	7:30 – 8:30	3:30 – 4:30
10	Magnolia Ave. (SR 1) at Kirkwood St.	7:30 – 8:30	3:30 – 4:30
1	Magnolia Ave. (SR 1) at Prosser Rd.	7:30 – 8:30	3:45 – 4:45
2	Asheville Hwy. (SR 168) at Park St.	7:30 – 8:30	4:15 – 5:15
3	I-40 Eastbound Ramps at Rutledge Pike (SR 1)	7:15 – 8:15	4:45 – 5:45
9	Martin Luther King Jr. Ave. at Holston Dr.	7:30 – 8:30	3:00 – 4:00
13	McCalla Dr. at Linden Ave.	8:00 – 9:00	4:15 – 5:15
4	Magnolia Ave. (SR 1) Eastbound Ramp	8:00 – 9:00	4:00 – 5:00
5	Rutledge Pike (SR 1) Westbound Ramp	7:15 – 8:15	4:30 – 5:30
6	Rutledge Pike (SR 1) Southbound Ramp	7:15 – 8:15	5:00 – 6:00
7	Asheville Highway (SR 168) Westbound Ramp	7:30 – 8:30	4:30 – 5:30
8	Asheville Highway (SR 168) Northbound Ramp	7:15 – 8:15	3:15 – 4:15

Source: Field Counts 1/21/2020

3.0 TRAFFIC PROJECTION DATA

3.1 TDOT AADT DATA

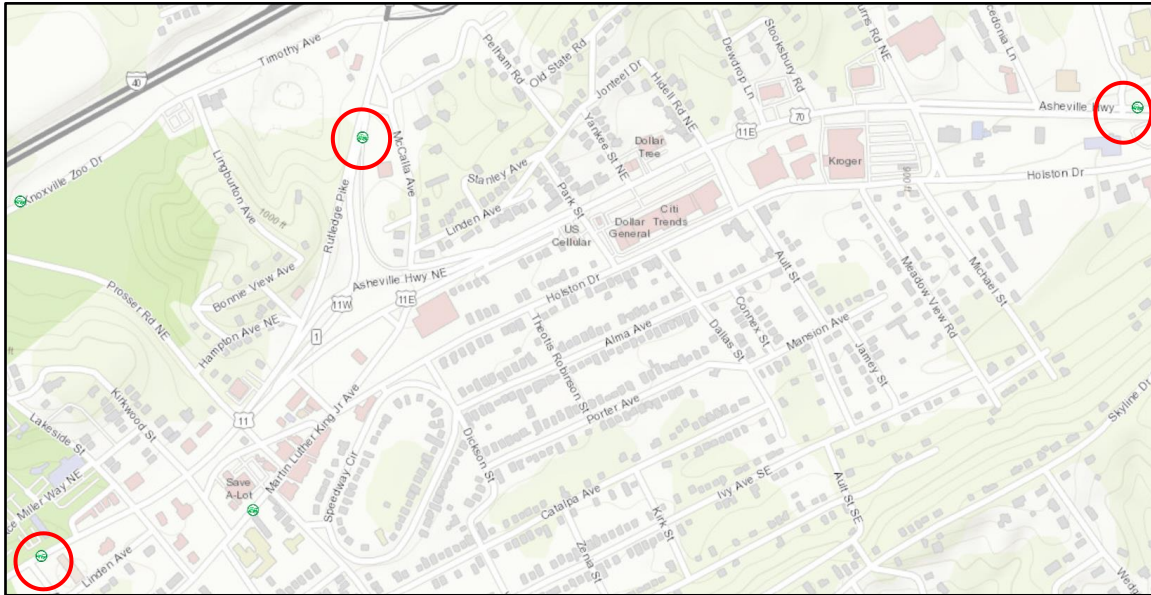
TDOT AADT data from the past 10 years were reviewed. The data were from three nearby TDOT count stations (Station 149, 057, and 358). Table 2 summarizes the AADT data collected at these three count stations along with their location. Table 3 charts the last 10 years of traffic data. Magnolia Avenue (SR 1) has seen an annual 2.26 percent decrease in traffic volumes. Asheville Highway (SR 168) has seen a 7.79 percent annual decrease in traffic volumes. Rutledge Pike (SR 1) has seen a 1.57 percent increase in annual traffic volumes.

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TABLE 2: TDOT AADT HISTORICAL DATA (1 OF 2)

AADT Historical Traffic Growth

Magnolia Ave. Sta. 149		Asheville Hwy. Sta. 057		Rutledge Pk. Sta. 358	
2009	15,910	2009	14,350	2009	9,681
2010	14,030	2010	13,663	2010	8,359
2011	12,658	2011	11,209	2011	8,250
2012	12,725	2012	9,924	2012	8,749
2013	13,500	2013	10,416	2013	8,838
2014	11,851	2014	10,025	2014	8,840
2015	13,122	2015	10,125	2015	8,928
2016	12,844	2016	9,759	2016	9,978
2017	11,560	2017	9,140	2017	10,023
2018	12,859	2018	7,440	2018	10,214

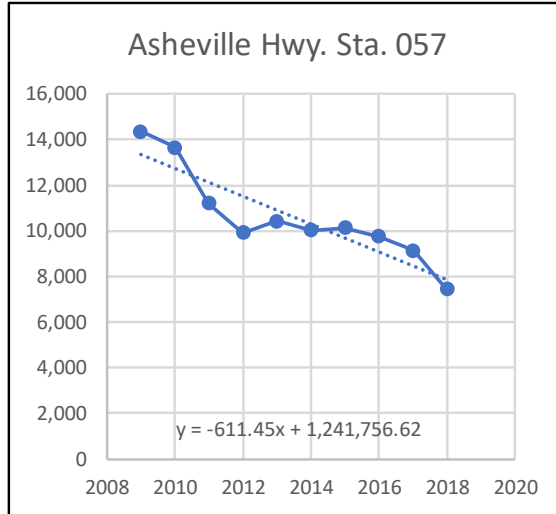
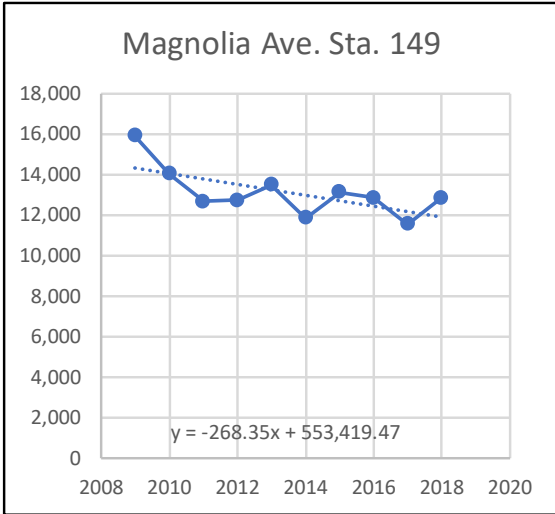


Source: TDOT Traffic History Website

**Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study
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Knoxville, Knox County, TN**

TABLE 3: TDOT AADT HISTORICAL DATA (2 OF 2)

AADT Historical Traffic Growth



Count Station Data	
2009	14,304
2018	11,889
Diff:	-2,415
Diff/Yr:	-268
%:	-2.26%

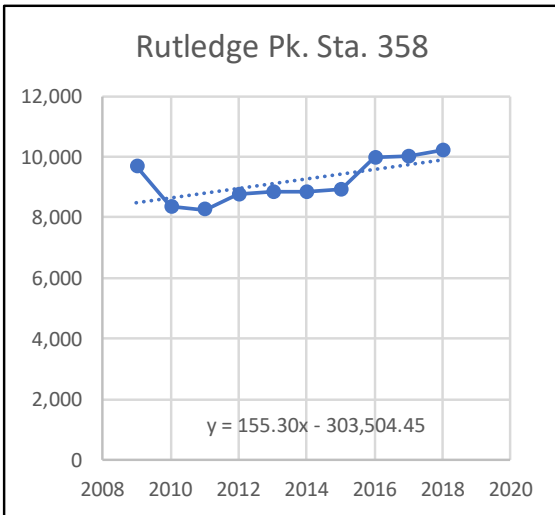
Projected	
2018	12,000
2025	13,300
2045	17,300

Count Station Data	
2009	13,354
2018	7,851
Diff:	-5,503
Diff/Yr:	-611
%:	-7.79%

Projected	
2018	8,000
2025	8,800
2045	11,400

Use 1.5%

Use 1.5%



Count Station Data	
2009	8,493
2018	9,891
Diff:	1,398
Diff/Yr:	155
%:	1.57%

Projected	
2018	10,000
2025	11,100
2045	14,400

Use 1.5%

3.2 TPO TDM DATA

Table 4 summarizes the AADT volumes along Magnolia Avenue (SR 1), Rutledge Pike (SR 1), and Asheville Highway (SR 168) predicted in the TPO's TDM. The volumes are underestimated when compared to the TDOT field collected AADT volumes and turning movement volumes collected for the *Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study*. However, the TPO's growth projections take into account future new development and infill opportunities within and surrounding the study area. Magnolia Avenue (SR 1) is predicted to see an annual 1.52 percent increase in traffic volumes. Asheville Highway (SR 168) is predicted to see a 1.06 percent increase in traffic volumes. Rutledge Pike (SR 1) is predicted to see a 1.26 percent increase in traffic volumes. The *Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study* assumes an annual traffic growth rate of 1.5 percent. This is equivalent to an overall increase in traffic of 7.5 percent from 2020 to 2025, and another 30 percent increase from 2020 to 2025, for a total increase of 37.5 percent from 2020 to 2045.

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TABLE 4: TPO TDM TRAFFIC PROJECTIONS

TPO Travel Demand Model Projection Data

Magnolia Ave.	
2014	4,790
2024	4,980
2030	5,590
2040	7,620

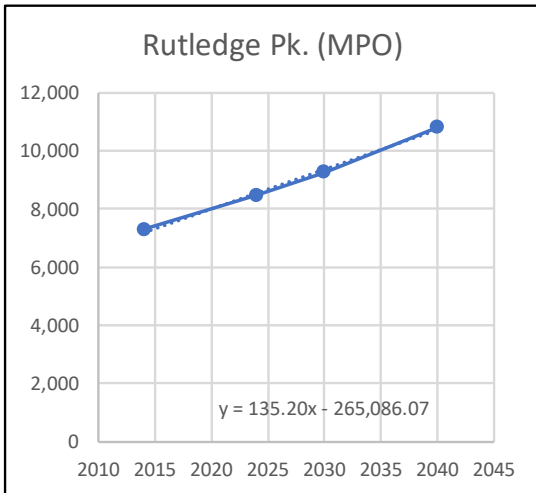
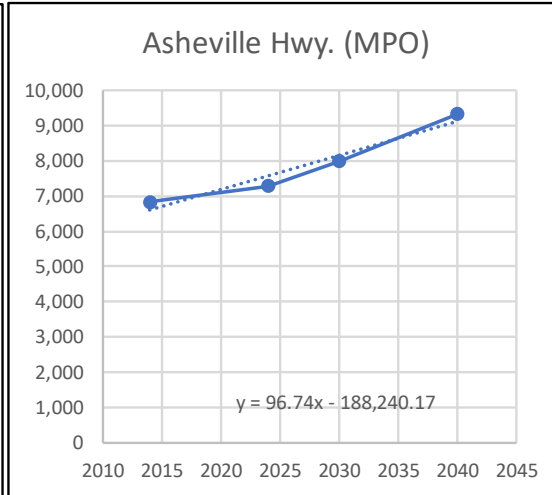
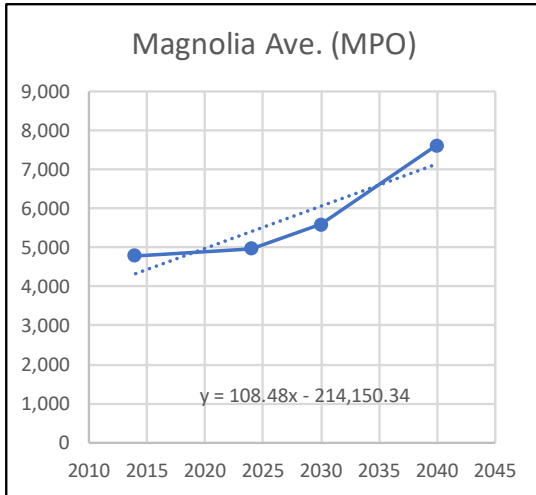
Growth Rate: 1.52%

Asheville Hwy.	
2014	6,830
2024	7,290
2030	7,980
2040	9,320

Growth Rate: 1.06%

Rutledge Pk.	
2014	7,290
2024	8,470
2030	9,260
2040	10,810

Growth Rate: 1.26%



Note: Growth rate and volumes developed from linear regression equations of TPO TDM data (see charts)

Magnolia Ave. Growth Rate	
2014	4,328
2040	7,149
Diff:	2,820
Diff/Yr:	108
%:	1.52%

Asheville Hwy. Growth Rate	
2014	6,594
2040	9,109
Diff:	2,515
Diff/Yr:	97
%:	1.06%

Rutledge Pk. Growth Rate	
2014	7,206
2040	10,721
Diff:	3,515
Diff/Yr:	135
%:	1.26%

Use 1.5% Growth Rate

4.0 TRAFFIC PROJECTION CALCULATIONS

The traffic projection calculations are described below with the calculations provided on the following pages. The projections utilize the field-collected turning movement volumes and increase them 1.5 percent per year, consistent with the TPO's TDM growth estimate.

4.1 AM PROJECTION CALCULATIONS

Field Collected Peak Hour Turning Movement Volumes – Existing Geometry 2020 AM summarizes the morning peak-hour field collected turning movements.

Projected / Unbalanced Peak Hour Turning Movement Volumes – Existing Geometry 2025 AM applies a 1.5 percent annual growth rate to the 2020 AM volumes to inflate them to the year 2025. This is equivalent to a total growth of 7.5 percent.

Projected / Unbalanced Peak Hour Turning Movement Volumes – Existing Geometry 2045 AM applies a 1.5 percent annual growth rate to the 2025 AM volumes to inflate them to the year 2045. This is equivalent to a total growth of 30 percent above the 2025 volumes and 37.5 percent above the 2020 field collected volumes.

Projected / Balanced Peak Hour Turning Movement Volumes – Existing Geometry 2025 AM adjusts the 2025 unbalanced volumes. There were small discrepancies between intersections in the field counts where vehicles departing one intersection did not sum to those entering the next. These volumes were balanced so they would be equal. The volumes at the I-40 Eastbound Ramps at Rutledge Pike (SR 1) intersection were not balanced with the adjacent intersection due to the presence of a gas station and restaurant at the interchange. Also, the volumes at Park Street with Asheville Highway (SR 168) were not balanced due to the presence of the McCalla Avenue limited movement intersection to the west. **These volumes will be utilized in the “No Build” alternative.**

Projected / Balanced Peak Hour Turning Movement Volumes – Existing Geometry 2045 AM adjusts the 2045 unbalanced volumes. There were small discrepancies between intersections in the field counts where vehicles departing one intersection did not sum to those entering the next. These volumes were balanced so they would be equal. The volumes at the I-40 Eastbound Ramps at Rutledge Pike (SR 1) intersection were not balanced with the adjacent intersection due to the presence of a gas station and restaurant at the interchange. Also, the volumes at Park Street with Asheville Highway (SR 168) were not balanced due to the presence of the McCalla Avenue limited movement intersection to the west. **These volumes will be utilized in the “No Build” alternative.**

Projected / Balanced Peak Hour Turning Movement Volumes – with Full Movement Intersection 2025 AM redistributes the balanced No Build volumes to account for a full-movement intersection being constructed at the interchange. The volumes at the I-40 Eastbound Ramps at Rutledge Pike (SR 1) intersection were not balanced with the adjacent intersection due to the presence of a gas station and restaurant at the interchange. **These volumes will be utilized in the “Build” alternative(s).**

Projected / Balanced Peak Hour Turning Movement Volumes – with Full Movement Intersection 2045 AM redistributes the balanced No Build volumes to account for a full-movement intersection

being constructed at the interchange. The volumes at the I-40 Eastbound Ramps at Rutledge Pike (SR 1) intersection were not balanced with the adjacent intersection due to the presence of a gas station and restaurant at the interchange. **These volumes will be utilized in the “Build” alternative(s).**

4.2 PM PROJECTION CALCULATIONS

Field Collected Peak Hour Turning Movement Volumes – Existing Geometry 2020 PM summarizes the evening peak-hour field collected turning movements.

Projected / Unbalanced Peak Hour Turning Movement Volumes – Existing Geometry 2025 PM applies a 1.5 percent annual growth rate to the 2020 PM volumes to inflate them to the year 2025. This is equivalent to a total growth of 7.5 percent.

Projected / Unbalanced Peak Hour Turning Movement Volumes – Existing Geometry 2045 PM applies a 1.5 percent annual growth rate to the 2025 PM volumes to inflate them to the year 2045. This is equivalent to a total growth of 30 percent above the 2025 volumes and 37.5 percent above the 2020 field collected volumes.

Projected / Balanced Peak Hour Turning Movement Volumes – Existing Geometry 2025 PM adjusts the 2025 unbalanced volumes. There were small discrepancies between intersections in the field counts where vehicles departing one intersection did not sum to those entering the next. These volumes were balanced so they would be equal. The volumes at the I-40 Eastbound Ramps at Rutledge Pike (SR 1) intersection were not balanced with the adjacent intersection due to the presence of a gas station and restaurant at the interchange. Also, the volumes at Park Street with Asheville Highway (SR 168) were not balanced due to the presence of the McCalla Avenue limited movement intersection to the west. **These volumes will be utilized in the “No Build” alternative.**

Projected / Balanced Peak Hour Turning Movement Volumes – Existing Geometry 2045 PM adjusts the 2045 unbalanced volumes. There were small discrepancies between intersections in the field counts where vehicles departing one intersection did not sum to those entering the next. These volumes were balanced so they would be equal. The volumes at the I-40 Eastbound Ramps at Rutledge Pike (SR 1) intersection were not balanced with the adjacent intersection due to the presence of a gas station and restaurant at the interchange. Also, the volumes at Park Street with Asheville Highway (SR 168) were not balanced due to the presence of the McCalla Avenue limited movement intersection to the west. **These volumes will be utilized in the “No Build” alternative.**

Projected / Balanced Peak Hour Turning Movement Volumes – with Full Movement Intersection 2025 PM redistributes the balanced No Build volumes to account for a full-movement intersection being constructed at the interchange. The volumes at the I-40 Eastbound Ramps at Rutledge Pike (SR 1) intersection were not balanced with the adjacent intersection due to the presence of a gas station and restaurant at the interchange. **These volumes will be utilized in the “Build” alternative(s).**

Projected / Balanced Peak Hour Turning Movement Volumes – with Full Movement Intersection 2045 PM redistributes the balanced No Build volumes to account for a full-movement intersection being constructed at the interchange. The volumes at the I-40 Eastbound Ramps at Rutledge Pike (SR 1) intersection were not balanced with the adjacent intersection due to the presence of

a gas station and restaurant at the interchange. **These volumes will be utilized in the “Build” alternative(s).**

Traffic Data

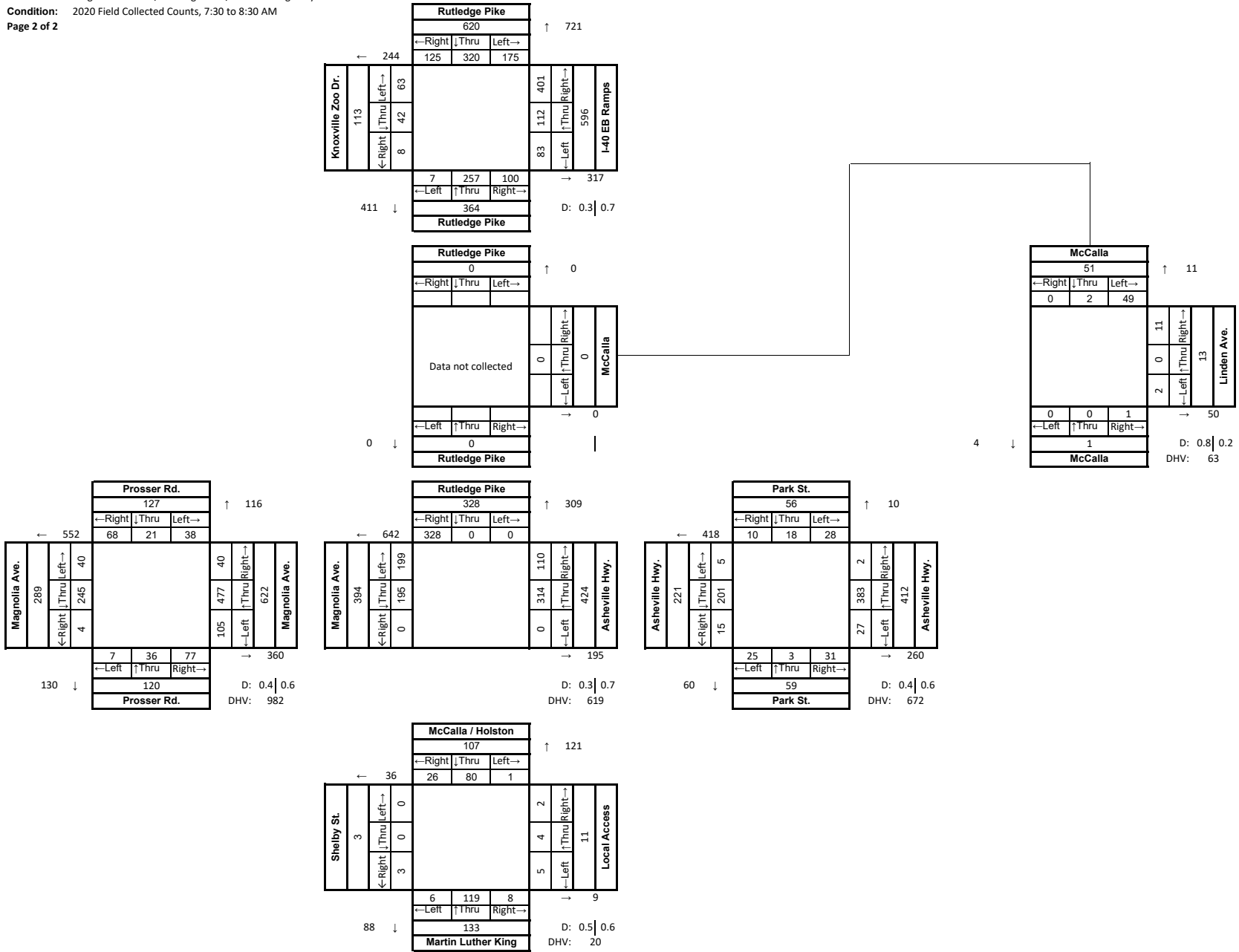
Field Collected Peak Hour Turning Movement Volumes - Existing Geometry

2020 AM

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		23				
↑ 541		←-Right Thru Left→			↑ 24	
312		10 2 11				
←-Right Thru Left→						
9					11	
283					526	
10					←-Left Thru Right→	
					6	
					←-Left	
					543	
					Magnolia Ave.	
					↓ 306	
		5 3 2				
		←-Left Thru Right→				
17 ↓		10			D: 0.4 0.6	
		Beaman St.			DHV: 849	

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		8				
↑ 542		←-Right Thru Left→			↑ 9	
301		7 1 0				
←-Right Thru Left→						
14					3	
281					531	
6					←-Left Thru Right→	
					15	
					←-Left	
					549	
					Magnolia Ave.	
					↓ 282	
		4 0 1				
		←-Left Thru Right→				
30 ↓		5			D: 0.3 0.7	
		Lakeside St.			DHV: 831	

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		8				
↑ 539		←-Right Thru Left→			↑ 1	
278		4 0 4				
←-Right Thru Left→						
39					0	
238					504	
1					←-Left Thru Right→	
					40	
					←-Left	
					544	
					Magnolia Ave.	
					↓ 287	
		31 0 45				
		←-Left Thru Right→				
79 ↓		76			D: 0.3 0.7	
		Kirkwood St.			DHV: 831	



Traffic Data

Projected / Unbalanced Peak Hour Turning Movement Volumes- Existing Geometry

2025 AM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Unbalanced Counts, 7:30 to 8:30 AM, 1.5% per year =
 Page 1 of 2

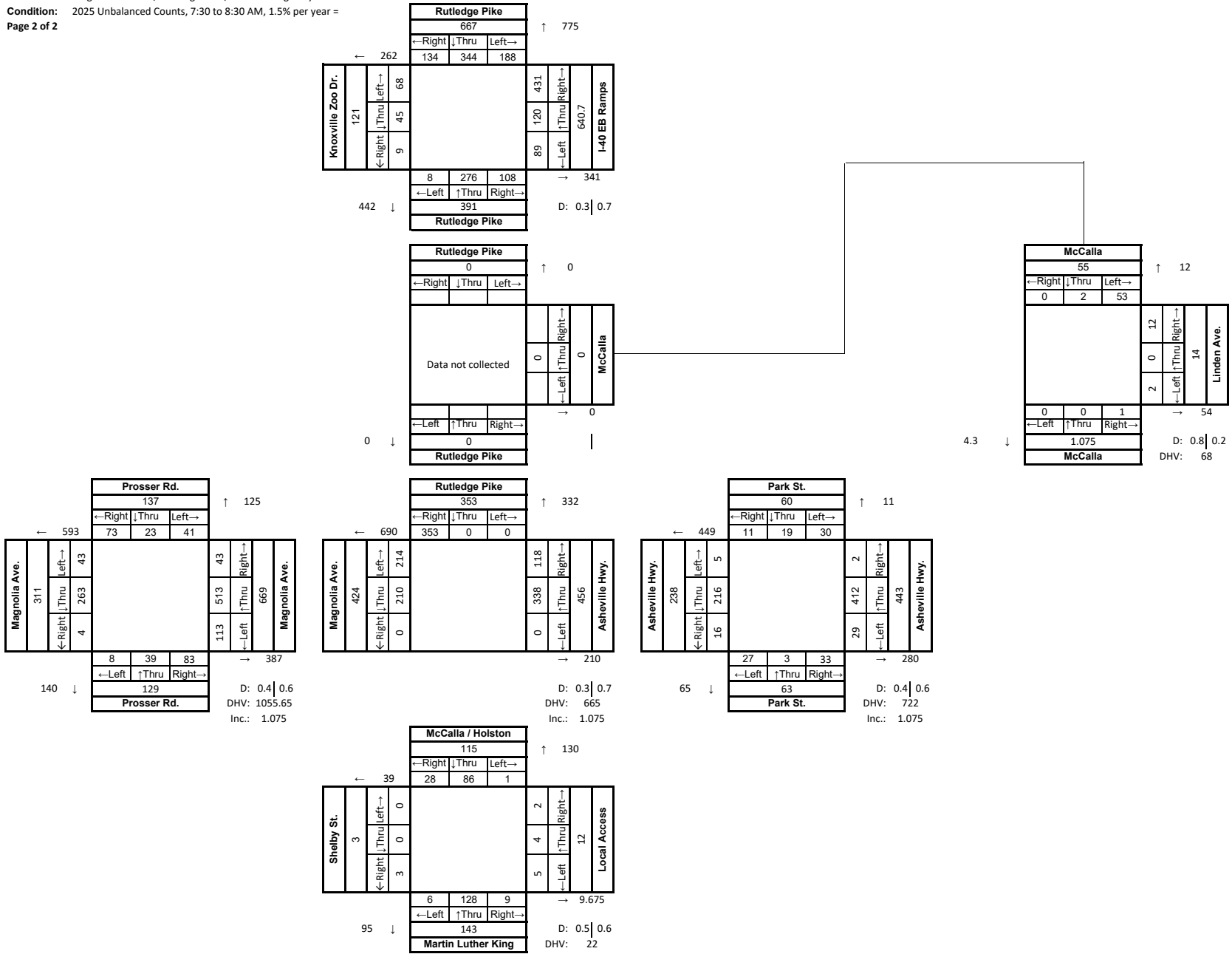
1.075 x Field Counts

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		25				
↑ 582		←-Right Thru Left→			↑ 26	
335		11 2 12			12	
←-Right Thru Left→		11			665	
10		6			↑ Thru Right→	
18 ↓		5 3 2			584	
←-Left ↑Thru Right→		11			←-Left	
11		↓ 329			Magnolia Ave.	
D: 0.4 0.6		D: 0.3 0.7			D: 0.3 0.7	
DHV: 913		DHV: 893			DHV: 893	
Inc.: 1.075		Inc.: 1.075			Inc.: 1.075	

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		9				
↑ 583		←-Right Thru Left→			↑ 10	
324		8 1 0			3	
←-Right Thru Left→		6			671	
15		16			↑ Thru Right→	
32 ↓		4 0 1			590	
←-Left ↑Thru Right→		5			←-Left	
5		↓ 303			Magnolia Ave.	
D: 0.3 0.7		D: 0.3 0.7			D: 0.3 0.7	
DHV: 893		DHV: 893			DHV: 893	
Inc.: 1.075		Inc.: 1.075			Inc.: 1.075	

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		9				
↑ 579		←-Right Thru Left→			↑ 1	
289		4 0 4			0	
←-Right Thru Left→		1			542	
42		43			↑ Thru Right→	
85 ↓		33 0 48			585	
←-Left ↑Thru Right→		82			←-Left	
82		↓ 309			Magnolia Ave.	
D: 0.3 0.7		D: 0.3 0.7			D: 0.3 0.7	
DHV: 893		DHV: 893			DHV: 893	
Inc.: 1.075		Inc.: 1.075			Inc.: 1.075	

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Unbalanced Counts, 7:30 to 8:30 AM, 1.5% per year =
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Traffic Data

Projected / Unbalanced Peak Hour Turning Movement Volumes - Existing Geometry

2045 AM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Unbalanced Counts, 7:30 to 8:30 AM, 1.5% per year =
 Page 1 of 2

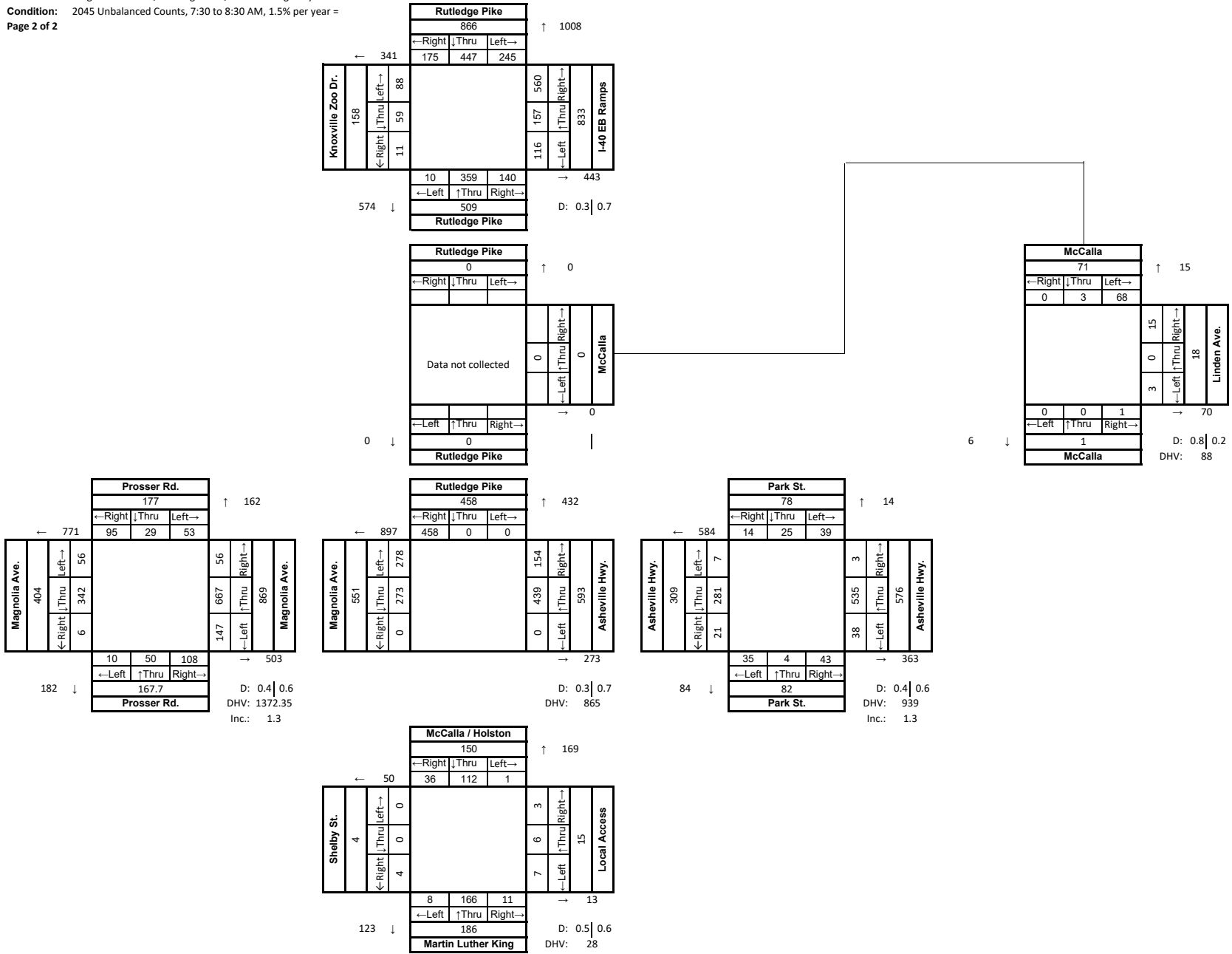
1.30 x 2025 Count Projections

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		32				
↑ 756		←-Right Thru Left→			↑ 34	
436		14 3 15				
←-Right Thru Left→					15	
14					735	
13					8	
					759	
					Magnolia Ave.	
					→ 428	
					D: 0.4 0.6	
					DHV: 1186	
					Inc.: 1.3	
24 ↓		Beaman St.				
		7 4 3				
		←-Left Thru Right→				
		14				

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		11				
↑ 757		←-Right Thru Left→			↑ 13	
421		10 1 0				
←-Right Thru Left→					4	
8					742	
20					21	
					767	
					Magnolia Ave.	
					→ 394	
					D: 0.3 0.7	
					DHV: 1161	
					Inc.: 1.3	
42 ↓		Lakeside St.				
		6 0 1				
		←-Left Thru Right→				
		7				

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		11				
↑ 753		←-Right Thru Left→			↑ 1	
389		6 0 6				
←-Right Thru Left→					0	
1					704	
55					56	
					760	
					Magnolia Ave.	
					→ 401	
					D: 0.3 0.7	
					DHV: 1161	
					Inc.: 1.3	
110 ↓		Kirkwood St.				
		43 0 63				
		←-Left Thru Right→				
		106				

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Unbalanced Counts, 7:30 to 8:30 AM, 1.5% per year =
 Page 2 of 2



Traffic Data

Projected / Balanced Peak Hour Turning Movement Volumes - Existing Geometry

2025 AM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Balanced Counts, 7:30 to 8:30 AM, 1.5% per year =
 Page 1 of 2

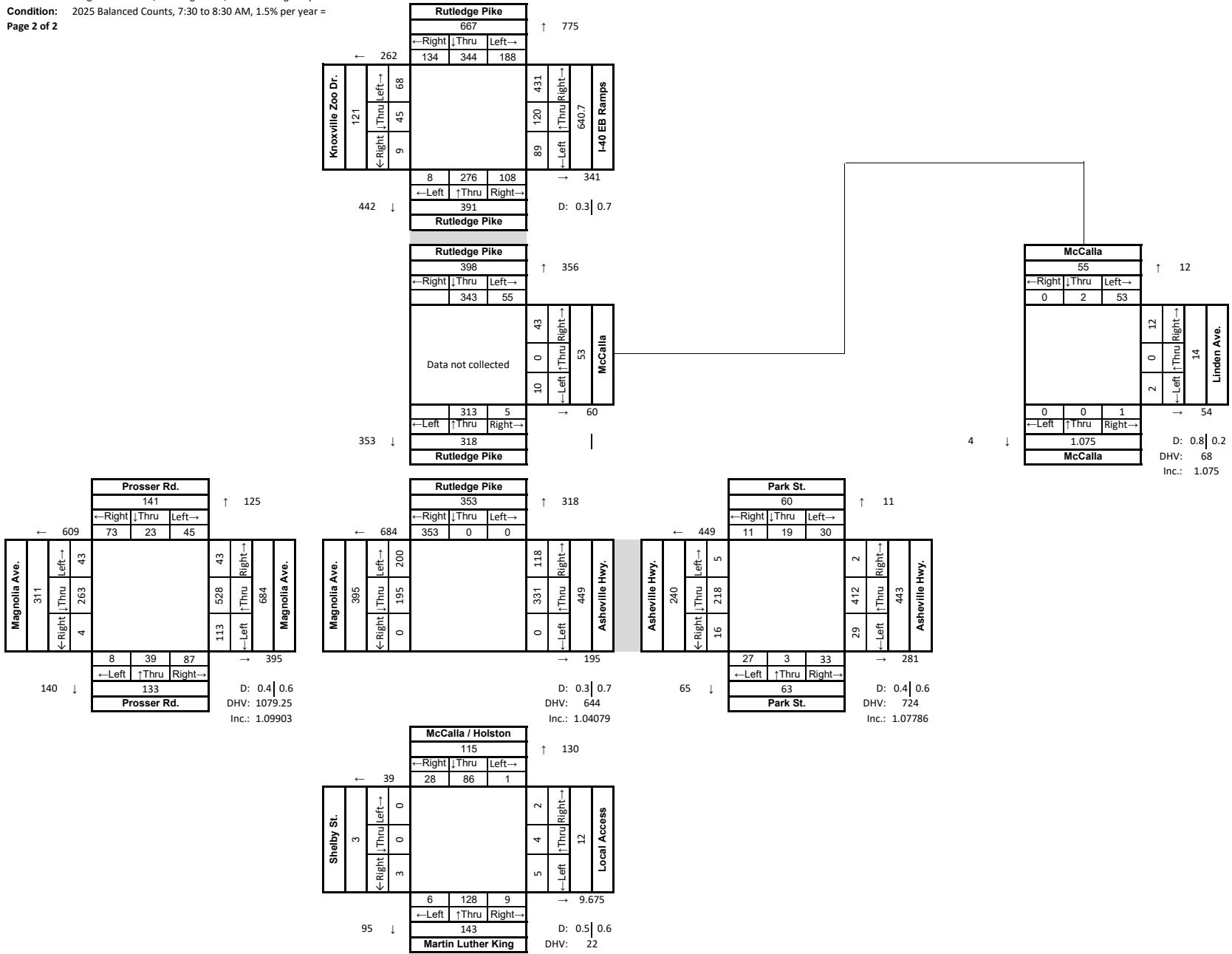
1.075 x Field Counts

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		25				
↑ 580		←-Right Thru Left→			↑ 27	
330		11 2 12			324	
←-Right Thru Left→		6 564 13			←-Right Thru Left→	
10		6			←-Left Thru Right→	
11		5 3 2			←-Left Thru Right→	
18 ↓		11			D: 0.4 0.6	
		Beaman St.			DHV: 907	
		Inc.: 1.06882				

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		9				
↑ 583		←-Right Thru Left→			↑ 16	
324		8 1 0			303	
←-Right Thru Left→		23 571 10			←-Right Thru Left→	
15		4 0 1			←-Left Thru Right→	
6		5			←-Left Thru Right→	
39 ↓		5			D: 0.3 0.7	
		Lakeside St.			DHV: 907	
		Inc.: 1.09143				

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		9				
↑ 604		←-Right Thru Left→			↑ 1	
303		4 0 4			311	
←-Right Thru Left→		43 566 0			←-Right Thru Left→	
46		33 0 51			←-Left Thru Right→	
1		84			←-Left Thru Right→	
89 ↓		84			D: 0.3 0.7	
		Kirkwood St.			DHV: 920	
		Inc.: 1.10728				

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Balanced Counts, 7:30 to 8:30 AM, 1.5% per year =
 Page 2 of 2



Traffic Data

Projected / Balanced Peak Hour Turning Movement Volumes - Existing Geometry

2045 AM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Balanced Counts, 7:30 to 8:30 AM, 1.5% per year =
 Page 1 of 2

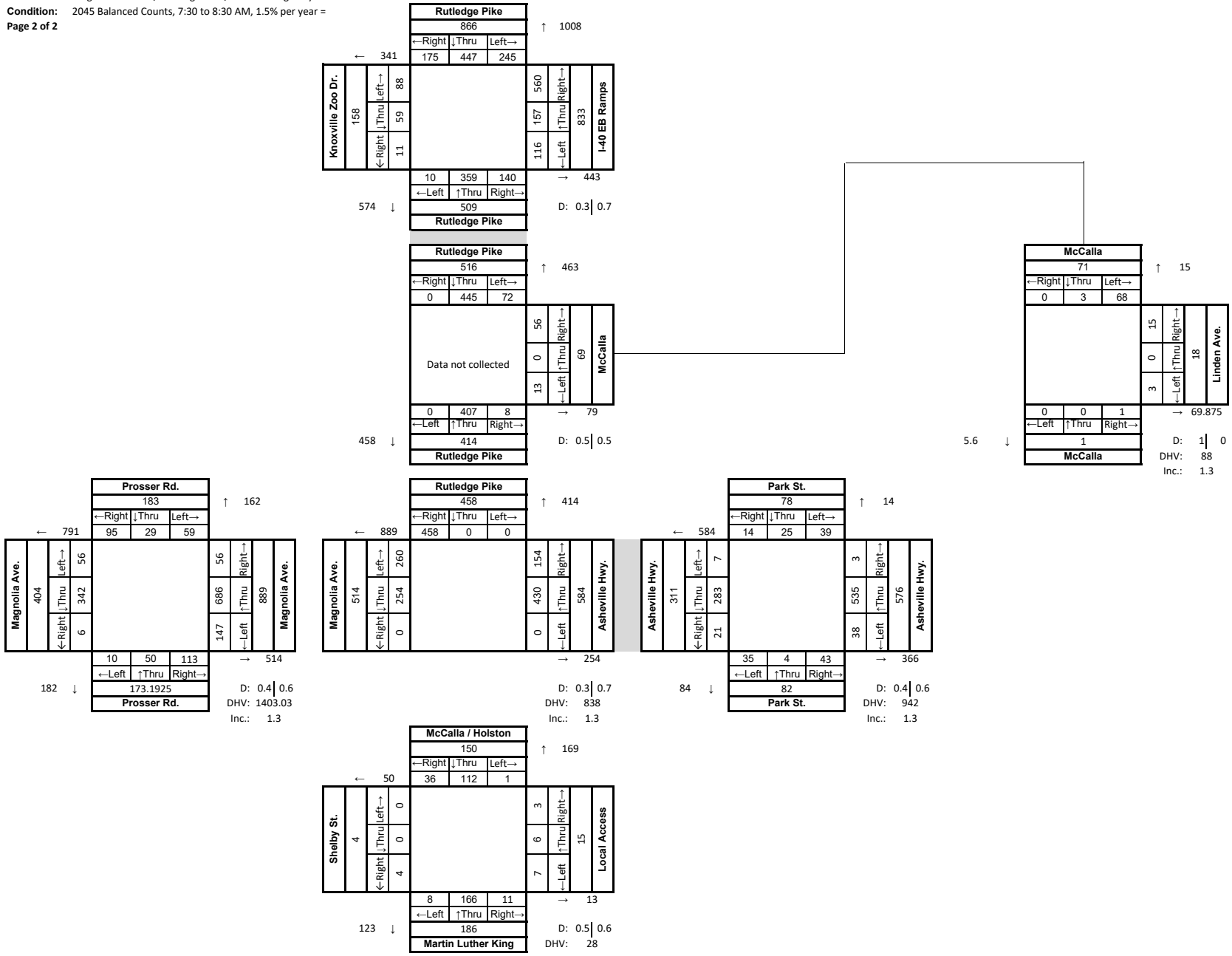
1.30 x 2025 Count Projections

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		32				
↑ 752		←-Right Thru Left→			↑ 35	
430		14	3	15		
←-Right Thru Left→					←-Left Thru Right→	
13		403	14	17	756	
					Magnolia Ave.	
		8	731	17		
					←-Left Thru Right→	
					756	
					Magnolia Ave.	
					↑ 421	
					←-Left Thru Right→	
24 ↓		7	4	3	→ 421	
					←-Left Thru Right→	
					14	
					Beaman St.	
					D: 0.4 0.6	
					DHV: 1177	
					Inc.: 1.29758	

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		11				
↑ 756		←-Right Thru Left→			↑ 21	
421		10	1	0		
←-Right Thru Left→					←-Left Thru Right→	
20		393	8	13	784	
					Magnolia Ave.	
		30	741	13		
					←-Left Thru Right→	
					784	
					Magnolia Ave.	
					↑ 394	
					←-Left Thru Right→	
51 ↓		6	0	1	→ 394	
					←-Left Thru Right→	
					7	
					Lakeside St.	
					D: 0.3 0.7	
					DHV: 1178	
					Inc.: 1.29882	

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		11				
↑ 784		←-Right Thru Left→			↑ 1	
394		6	0	6		
←-Right Thru Left→					←-Left Thru Right→	
60		333	1	0	791	
					Magnolia Ave.	
		56	735	0		
					←-Left Thru Right→	
					110	
					Kirkwood St.	
					D: 0.3 0.7	
					DHV: 1195	
					Inc.: 1.29913	

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Balanced Counts, 7:30 to 8:30 AM, 1.5% per year =
 Page 2 of 2



Traffic Data

Projected / Balanced Peak Hour Turning Movement Volumes - with Full Movement Intersection

2025 AM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Balanced Intersection, 7:30 to 8:30 AM, 1.5% per year =
 Page 1 of 2

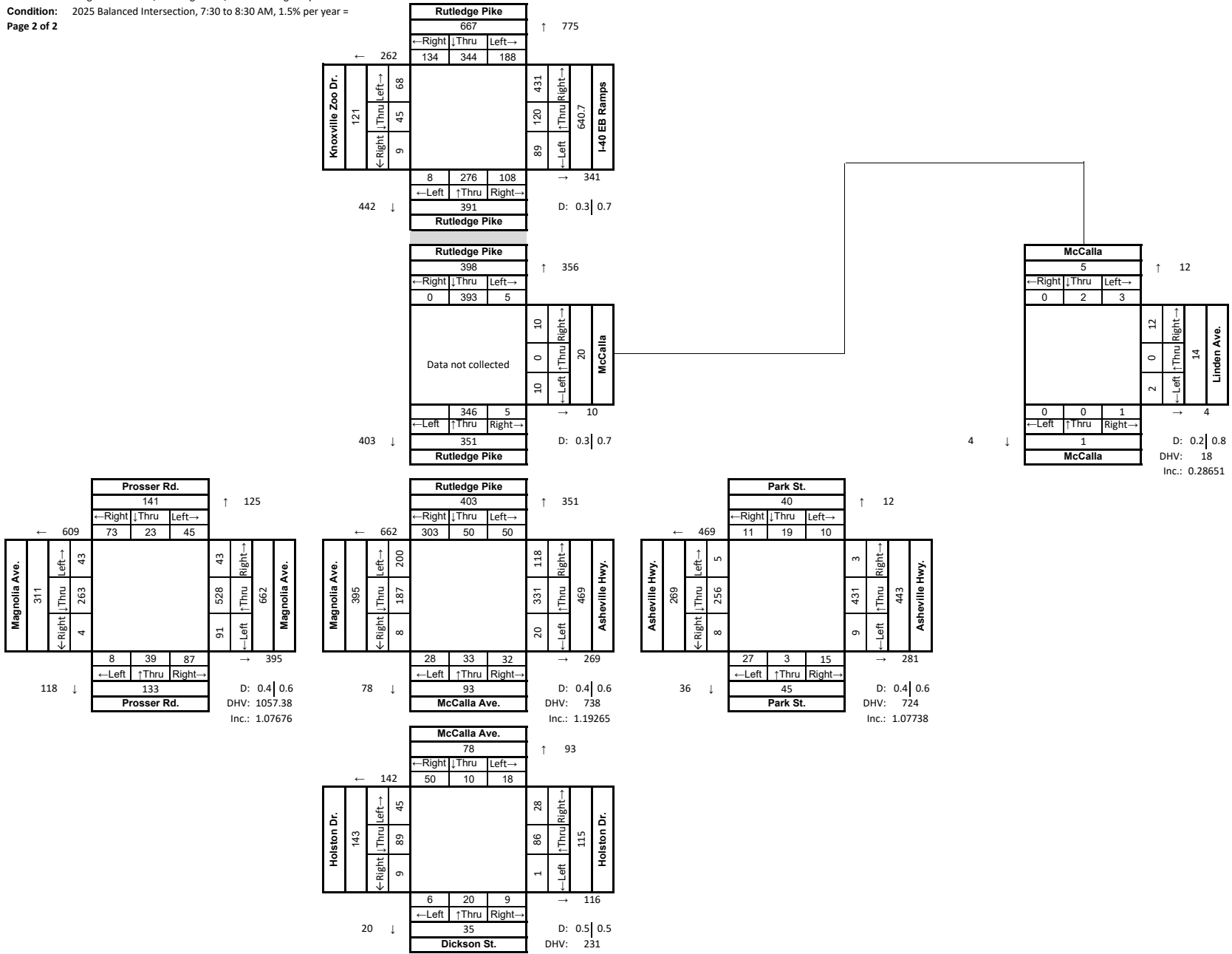
1.075 x Field Counts

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		25				
↑ 580		←-Right Thru Left→			↑ 27	
330		11			12	
←-Right Thru Left→		10			13	
10		6			564	
11		6			583	
←-Right Thru Left→		←-Left Thru Right→			←-Left Thru Right→	
18 ↓		5			324	
3		2			11	
2		←-Left Thru Right→			D: 0.4 0.6	
11		D: 0.4 0.6			DHV: 907	
Beaman St.		Inc.: 1.06882			Inc.: 1.06882	

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		9				
↑ 583		←-Right Thru Left→			↑ 16	
324		8			1	
←-Right Thru Left→		6			10	
15		23			571	
15		6			604	
←-Right Thru Left→		←-Left Thru Right→			←-Left Thru Right→	
39 ↓		4			303	
0		1			5	
1		←-Left Thru Right→			D: 0.3 0.7	
5		D: 0.3 0.7			DHV: 907	
Lakeside St.		Inc.: 1.09143			Inc.: 1.09143	

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		9				
↑ 604		←-Right Thru Left→			↑ 1	
303		4			0	
←-Right Thru Left→		1			0	
46		43			566	
46		1			609	
←-Right Thru Left→		←-Left Thru Right→			←-Left Thru Right→	
89 ↓		33			311	
0		51			84	
51		←-Left Thru Right→			D: 0.3 0.7	
84		D: 0.3 0.7			DHV: 920	
Kirkwood St.		Inc.: 1.10728			Inc.: 1.10728	

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Balanced Intersection, 7:30 to 8:30 AM, 1.5% per year =
 Page 2 of 2



Traffic Data

Projected / Balanced Peak Hour Turning Movement Volumes - with Full Movement Intersection

2045 AM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Balanced Intersection, 7:30 to 8:30 AM, 1.5% per year =
 Page 1 of 2

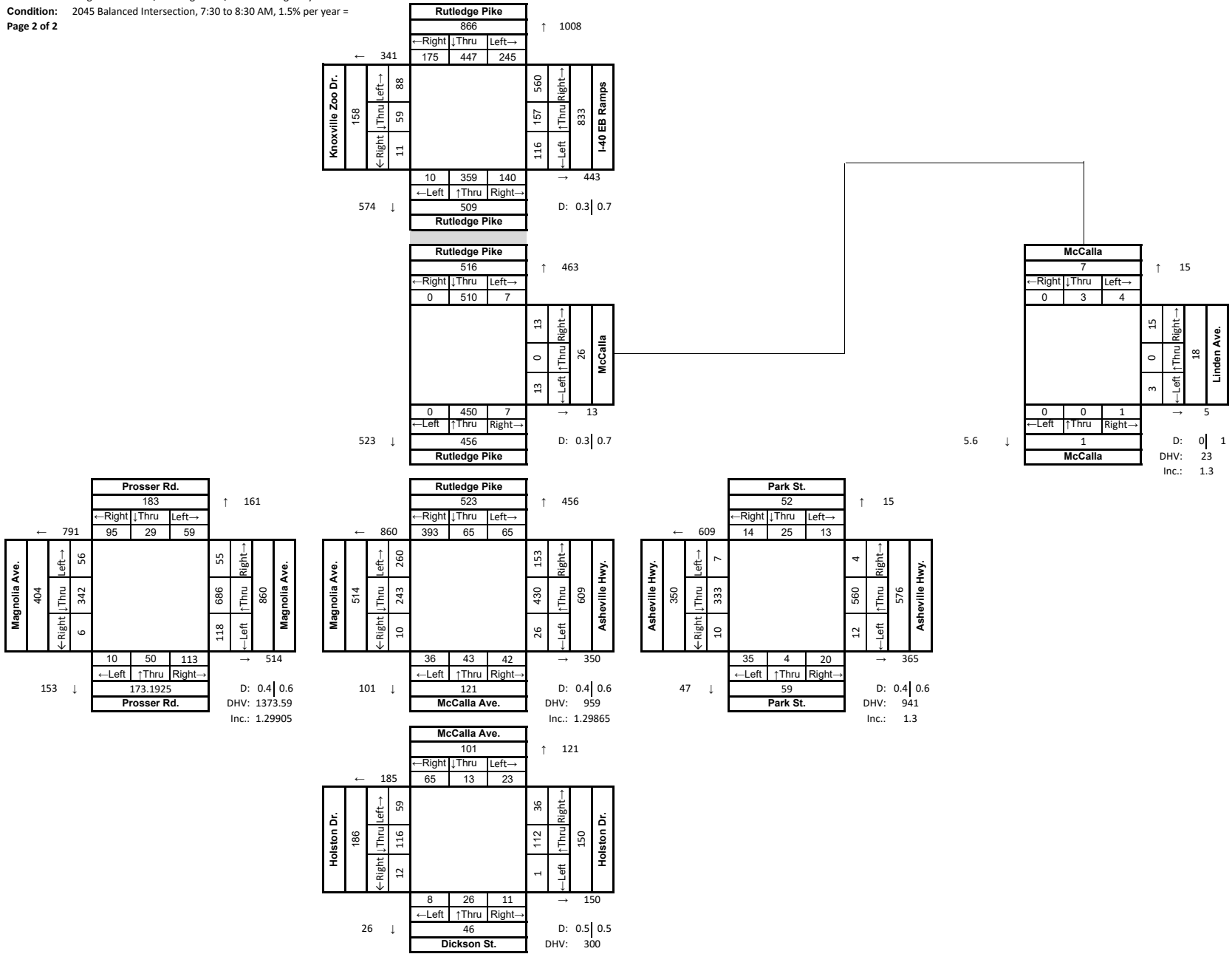
1.30 x 2025 Count Projections

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		32				
↑ 752		←-Right Thru Left→			↑ 35	
430		14 3 15			17	
←-Right Thru Left→		13 403 14			731	
13		8			756	
←-Left Thru Right→		7 4 3			8	
24 ↓		→ 421			Magnolia Ave.	
←-Left Thru Right→		14			D: 0.4 0.6	
Beaman St.		DHV: 1177			Inc.: 1.29758	

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		11				
↑ 756		←-Right Thru Left→			↑ 21	
421		10 1 0			13	
←-Right Thru Left→		20			741	
20		30			784	
←-Left Thru Right→		6 0 1			8	
51 ↓		→ 394			Magnolia Ave.	
←-Left Thru Right→		7			D: 0.3 0.7	
Lakeside St.		DHV: 1178			Inc.: 1.29882	

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		11				
↑ 784		←-Right Thru Left→			↑ 1	
394		6 0 6			0	
←-Right Thru Left→		60			735	
60		56			791	
←-Left Thru Right→		43 0 66			8	
116 ↓		→ 404			Magnolia Ave.	
←-Left Thru Right→		110			D: 0.3 0.7	
Kirkwood St.		DHV: 1195			Inc.: 1.29913	

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Balanced Intersection, 7:30 to 8:30 AM, 1.5% per year =
 Page 2 of 2



Traffic Data

Field Collected Peak Hour Turning Movement Volumes - Existing Geometry

2020 PM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2020 Field Collected Counts, 4:30 to 5:30 PM
 Page 1 of 2

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		50				
↑ 397		←-Right Thru Left→			↑ 16	
669		24 0 26			↓ 676	
←-Right Thru Left→		6			↓ 676	
21		3 371			↓ 676	
644		6			↓ 676	
4		←-Left			↓ 676	
2		↑ Thru Right→			↓ 676	
6		380			↓ 676	
6		Magnolia Ave.			↓ 676	
24 ↓		←-Left ↑ Thru Right→			↓ 676	
14		D: 0.6 0.4			↓ 676	
Beaman St.		DHV: 1056			↓ 676	

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		25				
↑ 381		←-Right Thru Left→			↑ 14	
678		9 5 11			↓ 666	
←-Right Thru Left→		5			↓ 666	
27		33 367			↓ 666	
644		5			↓ 666	
7		←-Left			↓ 666	
5		↑ Thru Right→			↓ 666	
2		405			↓ 666	
11		Magnolia Ave.			↓ 666	
5 ↓		←-Left ↑ Thru Right→			↓ 666	
18		D: 0.6 0.4			↓ 666	
Lakeside St.		DHV: 1071			↓ 666	

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		14				
↑ 405		←-Right Thru Left→			↑ 7	
686		0 2 12			↓ 696	
←-Right Thru Left→		4			↓ 696	
67		44 384			↓ 696	
627		4			↓ 696	
2		←-Left			↓ 696	
21		↑ Thru Right→			↓ 696	
1		432			↓ 696	
57		Magnolia Ave.			↓ 696	
113 ↓		←-Left ↑ Thru Right→			↓ 696	
79		D: 0.6 0.4			↓ 696	
Kirkwood St.		DHV: 1128			↓ 696	

Traffic Data

Projected / Unbalanced Peak Hour Turning Movement Volumes- Existing Geometry

2025 PM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Unbalanced Counts, 4:30 to 5:30 PM, 1.5% per year =
 Page 1 of 2

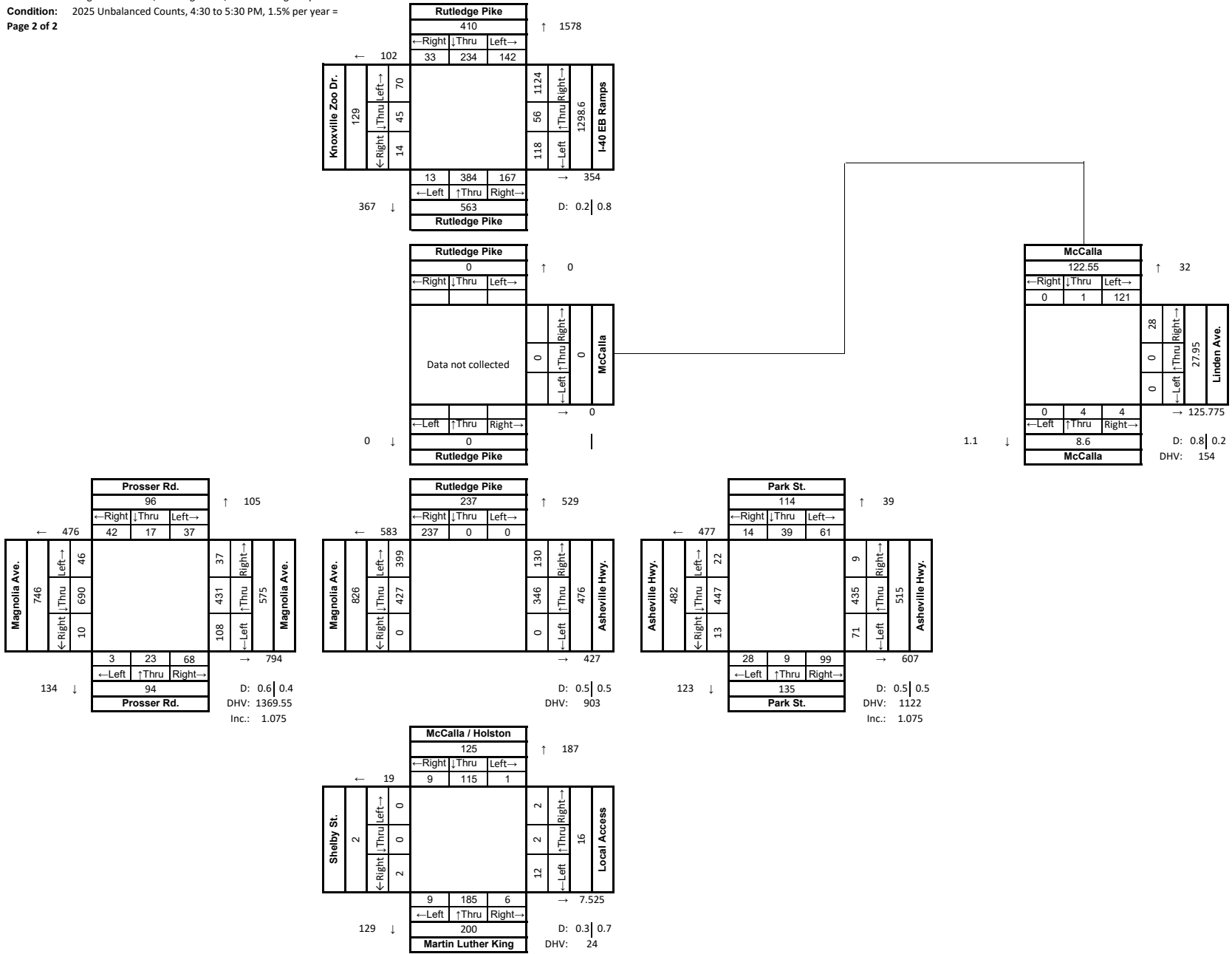
1.075 x Field Counts

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		54				
↑ 427		←-Right Thru Left→			↑ 17	
719		26 0 28			6	
←-Right Thru Left→		23 692 4			399	
23		3			409	
←-Left Thru Right→		2 6 6			→ 726.7	
26 ↓		←-Left Thru Right→			D: 0.6 0.4	
		15			DHV: 1135	
		Beaman St.			Inc.: 1.075	

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		27				
↑ 410		←-Right Thru Left→			↑ 15	
728		10 5 12			5	
←-Right Thru Left→		29 692 8			395	
29		35			435	
←-Left Thru Right→		5 2 12			→ 716	
70 ↓		←-Left Thru Right→			D: 0.6 0.4	
		19			DHV: 1151	
		Lakeside St.			Inc.: 1.075	

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		15				
↑ 435		←-Right Thru Left→			↑ 8	
748		0 2 13			4	
←-Right Thru Left→		72 674 2			47	
72		47			464	
←-Left Thru Right→		23 1 61			→ 748	
121 ↓		←-Left Thru Right→			D: 0.6 0.4	
		85			DHV: 1213	
		Kirkwood St.			Inc.: 1.075	

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Unbalanced Counts, 4:30 to 5:30 PM, 1.5% per year =
 Page 2 of 2



Traffic Data

Projected / Unbalanced Peak Hour Turning Movement Volumes - Existing Geometry

2045 PM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Unbalanced Counts, 4:30 to 5:30 PM, 1.5% per year =
 Page 1 of 2

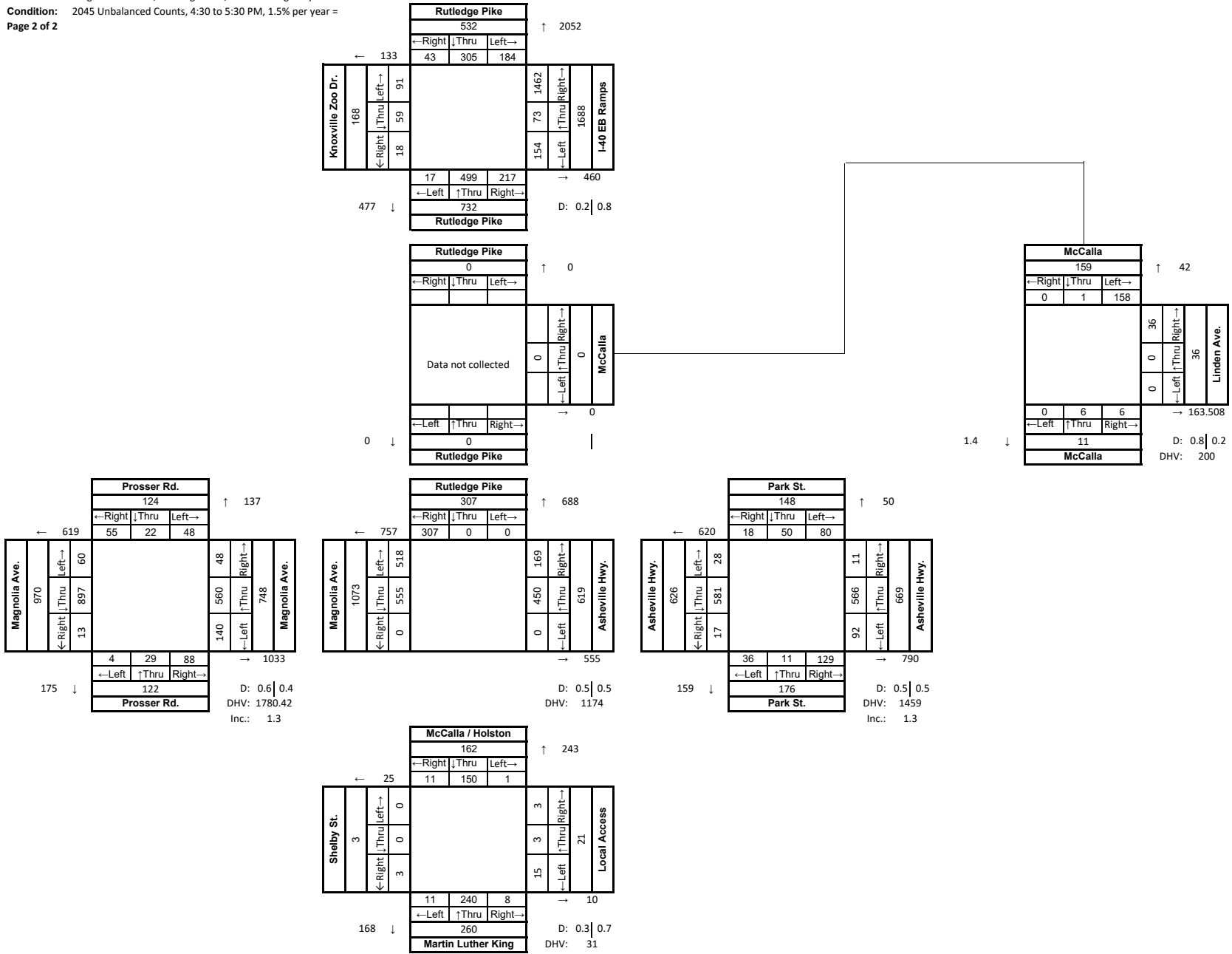
1.30 x 2025 Count Projections

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		70				
↑ 555		←-Right Thru Left→			↑ 22	
835		34 0 36			8	
←-Right Thru Left→		900 6			518	
29		4			4	
←-Left Thru Right→		945			531	
34 ↓		3 8 8			D: 0.6 0.4	
		←-Left Thru Right→			DHV: 1476	
		20			Inc.: 1.3	
		Beaman St.				

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		35				
↑ 532		←-Right Thru Left→			↑ 20	
948		13 7 15			7	
←-Right Thru Left→		900 10			513	
38		46			4	
←-Left Thru Right→		931			566	
91 ↓		7 3 15			D: 0.6 0.4	
		←-Left Thru Right→			DHV: 1497	
		25			Inc.: 1.3	
		Lakeside St.				

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		20				
↑ 566		←-Right Thru Left→			↑ 10	
973		0 3 17			6	
←-Right Thru Left→		94 876 3			537	
94		61			4	
←-Left Thru Right→		973			604	
158 ↓		29 1 80			D: 0.6 0.4	
		←-Left Thru Right→			DHV: 1576	
		110			Inc.: 1.3	
		Kirkwood St.				

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Unbalanced Counts, 4:30 to 5:30 PM, 1.5% per year =
 Page 2 of 2



Traffic Data

Projected / Balanced Peak Hour Turning Movement Volumes - Existing Geometry

2025 PM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Balanced Counts, 4:30 to 5:30 PM, 1.5% per year =
 Page 1 of 2

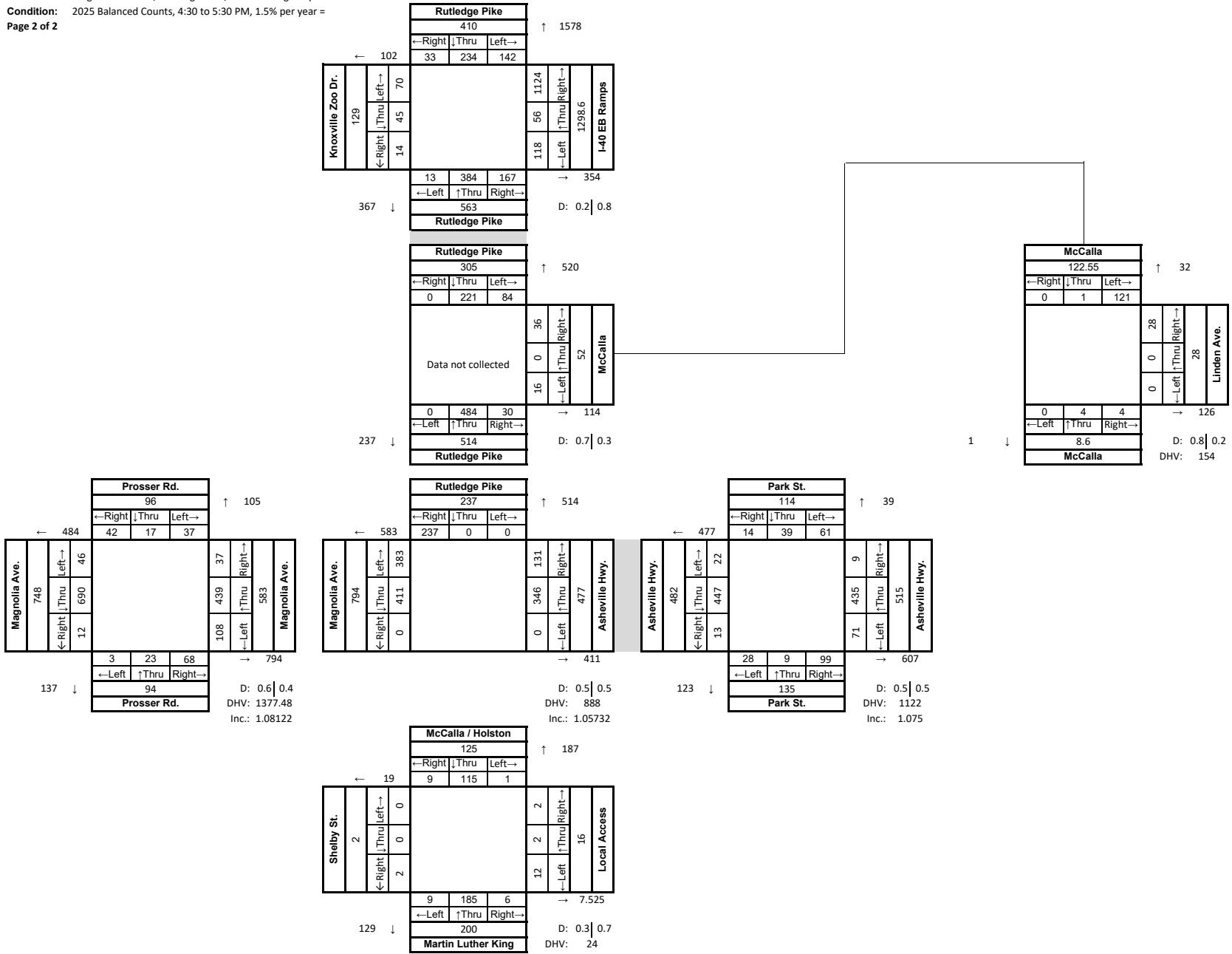
1.075 x Field Counts

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		59				
↑ 428		←-Right Thru Left→			↑ 17	
719		26 0 33			6	
←-Right Thru Left→		23 692 4			3 400 6	
23		3			410	
←-Left Thru Right→		2 6 12			←-Left Thru Right→	
26 ↓		21			→ 737	
		D: 0.6 0.4				
		DHV: 1147				
		Inc.: 1.08615				

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		39				
↑ 410		←-Right Thru Left→			↑ 15	
737		10 5 24			5	
←-Right Thru Left→		29 700 8			35 395 5	
29		5			435	
←-Left Thru Right→		5 2 24			←-Left Thru Right→	
70 ↓		32			→ 748	
		D: 0.6 0.4				
		DHV: 1183				
		Inc.: 1.10493				

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		15				
↑ 435		←-Right Thru Left→			↑ 23	
748		0 2 13			20	
←-Right Thru Left→		72 674 2			51 413 20	
72		5			484	
←-Left Thru Right→		23 1 61			←-Left Thru Right→	
125 ↓		85			→ 748	
		D: 0.6 0.4				
		DHV: 1232				
		Inc.: 1.0922				

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Balanced Counts, 4:30 to 5:30 PM, 1.5% per year =
 Page 2 of 2



Traffic Data

Projected / Balanced Peak Hour Turning Movement Volumes - Existing Geometry

2045 PM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Balanced Counts, 4:30 to 5:30 PM, 1.5% per year =
 Page 1 of 2

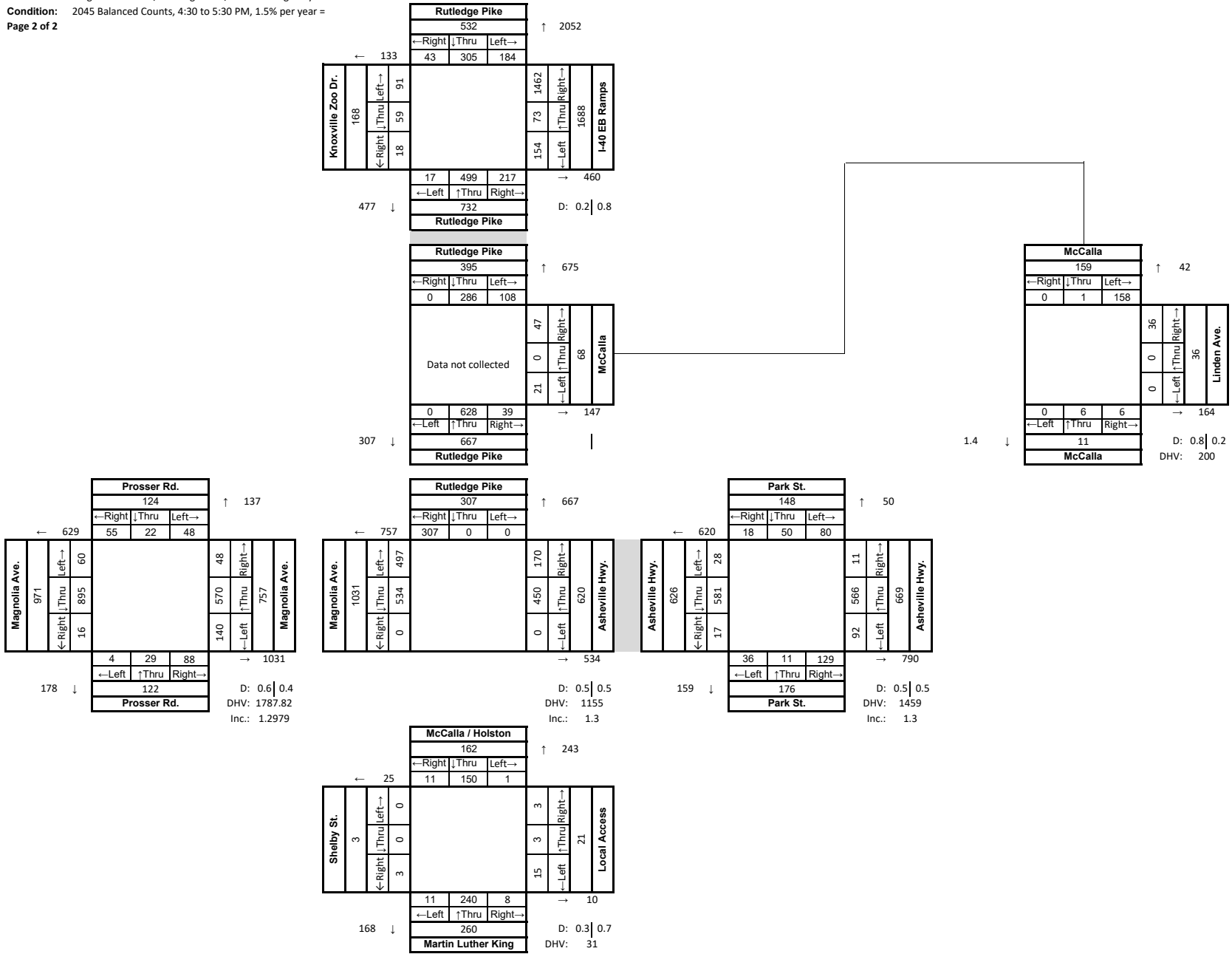
1.30 x 2025 Count Projections

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		76				
↑ 555		←-Right Thru Left→			↑ 22	
835		34 0 43			8	
←-Right Thru Left→		29 900 6			519	
29		4			4	
←-Left Thru Right→		3 8 16			532	
34 ↓		27			958	
Beaman St.		D: 0.6 0.4			Magnolia Ave.	
		DHV: 1490				
		Inc.: 1.29913				

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		51				
↑ 532		←-Right Thru Left→			↑ 20	
958		13 7 31			7	
←-Right Thru Left→		38 910 10			513	
38		46			566	
←-Left Thru Right→		7 3 31			972	
91 ↓		41			D: 0.6 0.4	
Lakeside St.		DHV: 1538			Magnolia Ave.	
		Inc.: 1.3				

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		20				
↑ 566		←-Right Thru Left→			↑ 30	
972		0 3 17			26	
←-Right Thru Left→		94 875 3			537	
94		66			629	
←-Left Thru Right→		29 1 80			971	
163 ↓		110			D: 0.6 0.4	
Kirkwood St.		DHV: 1600			Magnolia Ave.	
		Inc.: 1.299				

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Balanced Counts, 4:30 to 5:30 PM, 1.5% per year =
 Page 2 of 2



Traffic Data

Projected / Balanced Peak Hour Turning Movement Volumes - with Full Movement Intersection

2025 PM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Balanced Counts, 4:30 to 5:30 PM, 1.5% per year =
 Page 1 of 2

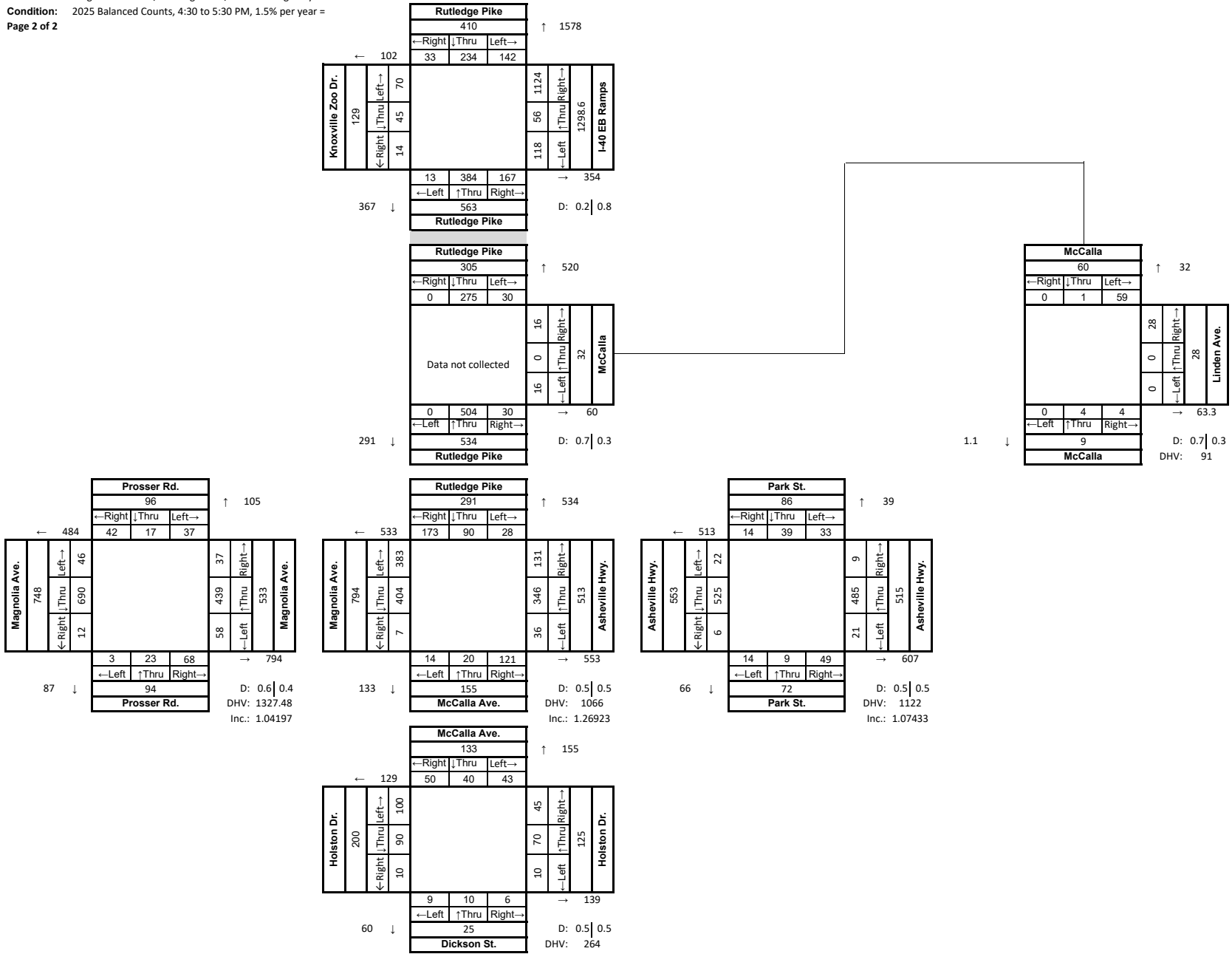
1.075 x Field Counts

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		59				
↑ 428		←-Right Thru Left→			↑ 17	
719		26 0 33			6	
←-Right Thru Left→		23 692 4			3 400 6	
26 ↓		2 6 12			3 400 6	
		←-Left Thru Right→			3 400 6	
		21			3 400 6	
		Beaman St.			3 400 6	
		D: 0.6 0.4			3 400 6	
		DHV: 1147			3 400 6	
		Inc.: 1.08615			3 400 6	

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		39				
↑ 410		←-Right Thru Left→			↑ 15	
737		10 5 24			5	
←-Right Thru Left→		29 700 8			35 395 5	
70 ↓		5 2 24			35 395 5	
		←-Left Thru Right→			35 395 5	
		32			35 395 5	
		Lakeside St.			35 395 5	
		D: 0.6 0.4			35 395 5	
		DHV: 1183			35 395 5	
		Inc.: 1.10493			35 395 5	

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		15				
↑ 435		←-Right Thru Left→			↑ 23	
748		0 2 13			20	
←-Right Thru Left→		72 674 2			51 413 20	
125 ↓		23 1 61			51 413 20	
		←-Left Thru Right→			51 413 20	
		85			51 413 20	
		Kirkwood St.			51 413 20	
		D: 0.6 0.4			51 413 20	
		DHV: 1232			51 413 20	
		Inc.: 1.0922			51 413 20	

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2025 Balanced Counts, 4:30 to 5:30 PM, 1.5% per year =
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Traffic Data

Projected / Balanced Peak Hour Turning Movement Volumes - with Full Movement Intersection

2045 PM

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Balanced Counts, 4:30 to 5:30 PM, 1.5% per year =
 Page 1 of 2

1.30 x 2025 Count Projections

Magnolia Ave.		Beaman St.			Magnolia Ave.	
		76				
↑ 555		←-Right Thru Left→			↑ 22	
835		34 0 43			8	
←-Right Thru Left→		29 900 6			519	
29		4			4	
←-Left Thru Right→		3 8 16			532	
34 ↓		27			958	
Beaman St.		D: 0.6 0.4			DHV: 1490	
		Inc.: 1.29913				

Magnolia Ave.		Lakeside St.			Magnolia Ave.	
		51				
↑ 532		←-Right Thru Left→			↑ 20	
958		13 7 31			7	
←-Right Thru Left→		38 910 10			513	
38		46			566	
←-Left Thru Right→		7 3 31			972	
91 ↓		41			D: 0.6 0.4	
Lakeside St.		DHV: 1538			Inc.: 1.3	

Magnolia Ave.		Kirkwood St.			Magnolia Ave.	
		20				
↑ 566		←-Right Thru Left→			↑ 30	
972		0 3 17			26	
←-Right Thru Left→		94 875 3			537	
94		66			629	
←-Left Thru Right→		29 1 80			971	
163 ↓		110			D: 0.6 0.4	
Kirkwood St.		DHV: 1600			Inc.: 1.299	

Location: Magnolia Avenue / Rutledge Pike / Asheville Highway
 Condition: 2045 Balanced Counts, 4:30 to 5:30 PM, 1.5% per year =
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