

Magnolia Avenue / Rutledge Pike / Asheville Highway Interchange Study Technical Memorandum #6 Crash Analysis

Knoxville, TN

Executive Summary

Crash data from the most recent three full years of data were utilized in the analysis.

- The majority of the crashes were angle (48 percent) followed by rear-end (38 percent).
- 73 percent of the crashes were at intersections.
- The actual corridor crash rate along non-intersection locations is half the statewide average of similar corridors.
- Two (2) intersections had crash rates higher than the statewide average of similar intersections. Both were along Asheville Highway (SR 168). They were located at McCalla Avenue and Park Street.
- The Park Street intersection has the highest crash rate at close to 3x the statewide average of similar intersections.

For

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1.0 MAGNOLIA AVE. STUDY AREA CRASH ANALYSIS

Figure 1 provides a map of the Study Area. Crash data along Magnolia Avenue (SR 1), Rutledge Pike (SR 1), and Asheville Highway (SR 168) within the Study Area were obtained from the Tennessee Integrated Traffic Analysis Network (TITAN) database. Crash data from the most recent three (3) full years of data (2016, 2017, and 2018) were utilized in the analysis. In these years there were 60 reported crashes along the 1.4 miles between Beaman Street, Park Street, and the I-40 Eastbound Ramps / Timothy Street. There were no (0) fatal crashes, two (2) incapacitating injury crashes, 18 other injury crashes, and 40 property damage only crashes. Figure 2 plots the crash locations within the Study Area, including all sideroads. Figure 3 charts the crashes by time of day along Magnolia Avenue (SR 1), Rutledge Pike (SR 1), and Asheville Highway (SR 168). The majority of crashes occurred between 1:00 PM and 4:00 PM. This coincides with when traffic volumes are highest. Table 1 through Table 4 summarizes the crash statistics along Magnolia Avenue (SR 1), Rutledge Pike (SR 1), and Asheville Highway (SR 168).

Table 1 lists information concerning the types of crashes observed. The majority of the crashes were angle (48 percent) followed by rear-end (38 percent). These types of crashes are typically intersection-related, and the data demonstrate that 73 percent of the crashes were at intersections. Eighty-three (83) percent of the crashes occurred in dry road conditions and 87 percent during daylight hours. The data do not demonstrate any roadway condition in need of improvement.

Table 2 lists overall crash data. Twenty-seven (27) of the 60 crashes occurred along Magnolia Avenue (SR 1). Nine (9) were minor injury crashes and 18 were property damage only crashes. Twenty (20) of the 60 crashes occurred along Rutledge Pike (SR 1). Four (4) were minor injury crashes and 16 were property damage only crashes. Thirteen (13) of the 60 crashes occurred along Asheville Highway (SR 168). While Asheville Highway (SR 168) had the fewest crashes, they were the most severe crashes, with two (2) incapacitating injury crashes, five (5) minor injury crashes, and six (6) property damage only crashes.

Corridor crash rates are calculated with non-intersection crashes. Table 3 lists all non-intersection crashes and shows no segment of Magnolia Avenue (SR 1), Rutledge Pike (SR 1), and Asheville Highway (SR 168) in the Study Area had a crash rate above 0.933 crashes per million vehicle miles. The statewide rate for similar roadways (Urban 4-lane State Routes) is 1.994 crashes per million vehicle miles. Therefore, the actual corridor crash rate at non-intersection locations along Magnolia Avenue (SR 1), Rutledge Pike (SR 1), and Asheville Highway (SR 168) is half the statewide average of similar corridors.

Table 4 lists the crash rates of intersections that had three (3) or more crashes between 2016 and 2018 within the analysis area. Of the seven (7) intersections with three (3) or more crashes, two (2) had crash rates higher than the statewide average for similar intersections. Both were along Asheville Highway (SR 168) at McCalla Avenue and Park Street. The intersection of McCalla Avenue with Asheville Highway (SR 168) is stop-sign controlled on the McCalla Avenue approaches. This intersection has a median along Asheville Highway (SR 168) that prevents travel across Asheville Highway (SR 168). The crash rate is 1.64x higher than the statewide average of similar intersections. The intersection of Park Street with Asheville Highway (SR 168) is stop-sign controlled on the Park Street approaches. This intersection allows full movements and has left-turn lanes on the Asheville Highway (SR 168) approaches. The crash rate of Park Street with Asheville Highway (SR 168) is 2.94x higher than the statewide average of similar intersections.

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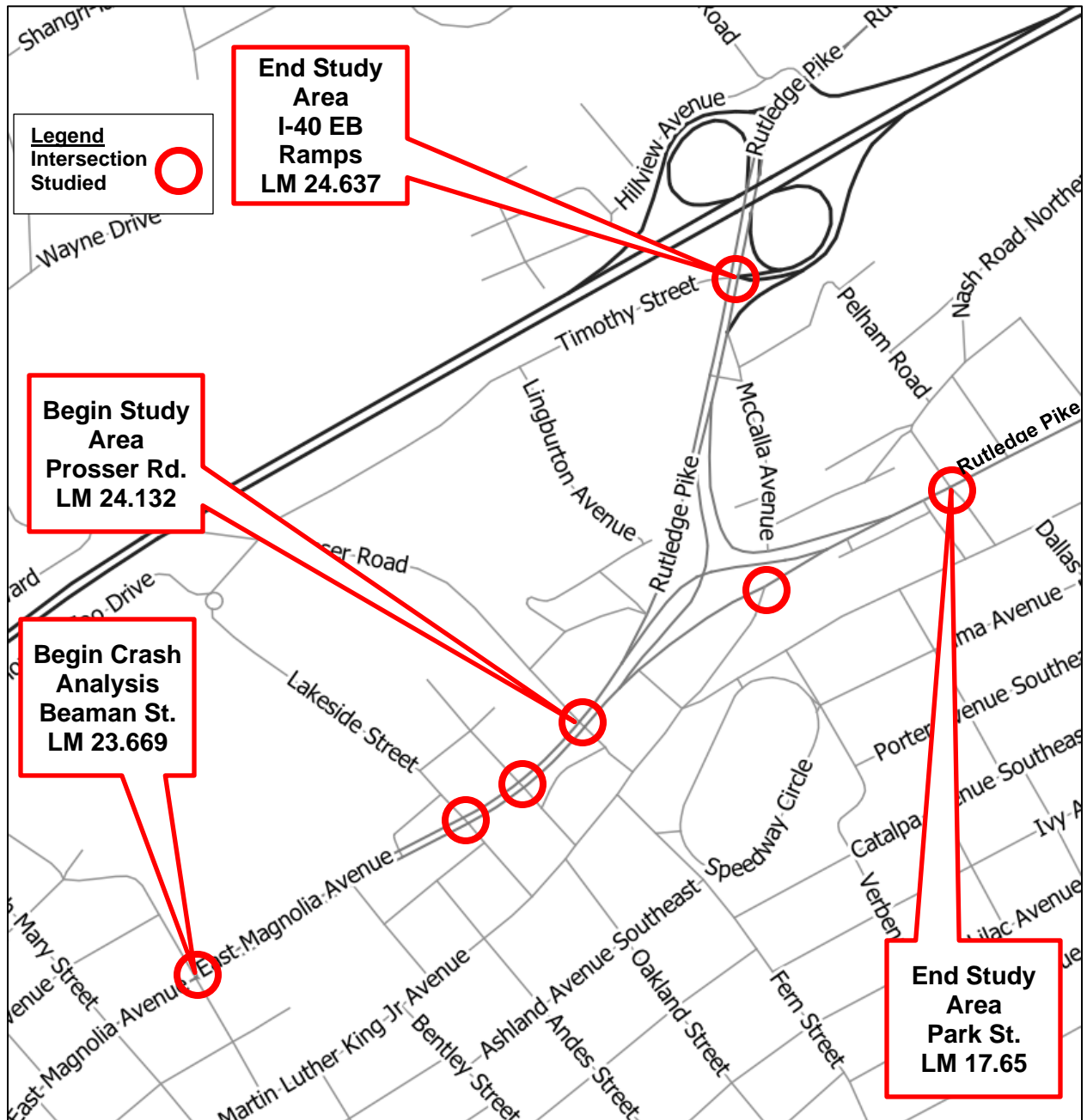


FIGURE 1: STUDY AREA WITH ADDITIONAL COVERAGE

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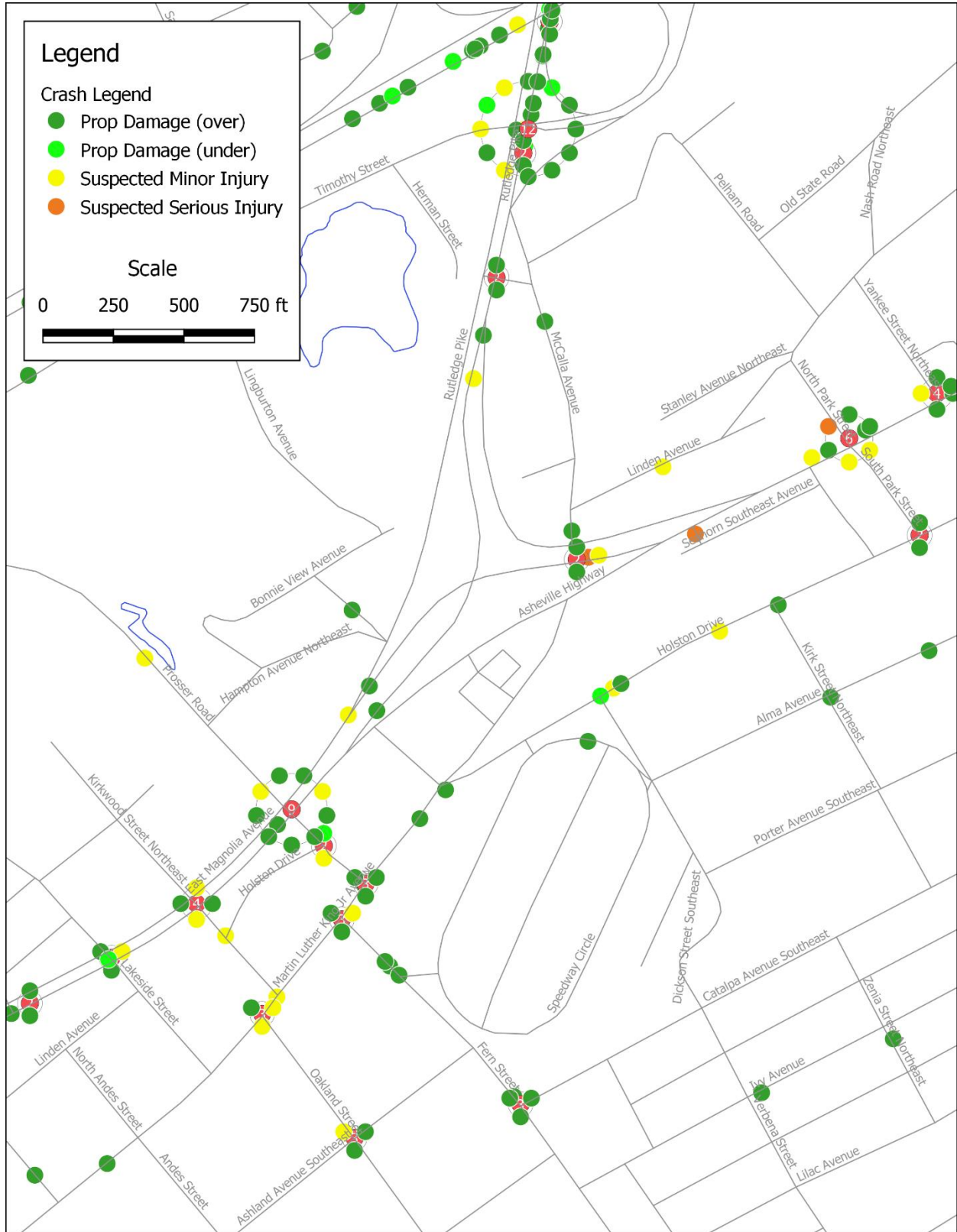


FIGURE 2: CRASH HISTORY (2016-2018)
Source: TITAN Database

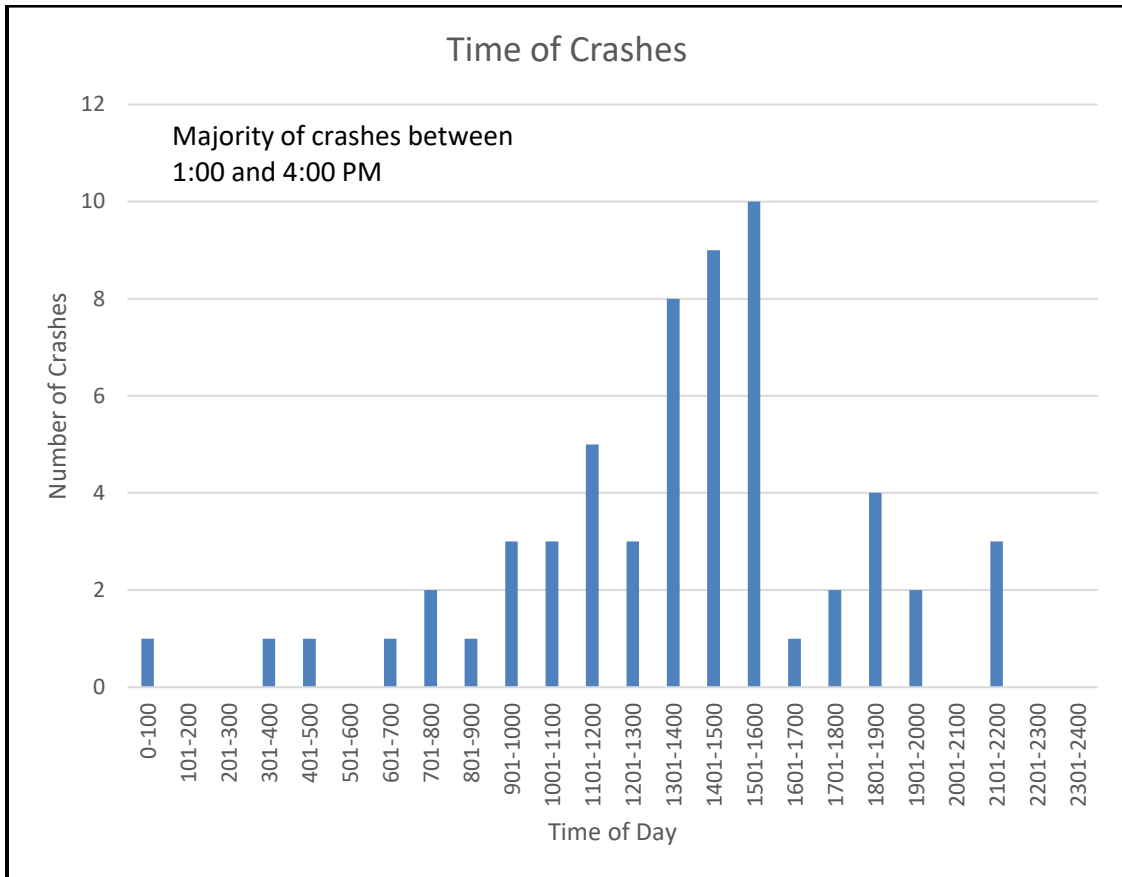


FIGURE 3: CRASHES BY TIME OF DAY (2016-2018)

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TABLE 1: CRASH STATISTICS, TYPE OF CRASHES (2016-2018)

Condition	Interchange Area	
	Number of Crashes	Percentage of Total
	Severity	
Fatal	0	0%
Incap. Injury	2	3%
Other Injury	18	30%
PDO	40	67%
	Manner of Collision	
Rear End	20	38%
Head On	2	4%
Rear-to-Side/Rear	1	2%
Angle	25	48%
Sideswipe Same Dir.	3	6%
Sideswipe Opp. Dir.	0	0%
Unknown	1	2%
	Road Conditions	
Ice	0	0%
Snow	0	0%
Sand/Mud/Dirt	0	0%
Wet	10	17%
Dry	50	83%
	Light Condition	
Dawn	0	0%
Daylight	52	87%
Dusk	0	0%
Dark/Lighted	7	12%
Dark/Not Lighted	0	0%
Not Indicated	1	2%
	Crash Location	
Along Roadway	13	22%
At Intersection	44	73%
Other	3	5%
Total	60	

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TABLE 2: CRASH STATISTICS (2016-2018), SUMMARY

Route	Begin		End		Dist.	AADT 2018	Crashes					Overall Rate	Severity Index
	LM	Description	LM	Description			Total	Fatal	Incap. Inj.	Other Inj.	PDO		
SR 1	23.669	Beaman St.	24.202	Rutledge Pk.	0.533	12,860	27	0	0	9	18	N/A	0.33
SR 1	24.202	Magnolia Ave.	24.637	I-40 EB Ramps	0.435	10,210	20	0	0	4	16	N/A	0.20
SR 168	17.650	Park St.	18.045	Magnolia Ave.	0.395	7,440	13	0	2	5	6	N/A	0.69
Total:					1.4		60	0	2	18	40		

TABLE 3: CRASH STATISTICS (2016-2018), NON-INTERSECTIONS

Route	Begin		End		Dist.	AADT 2018	Crashes					Overall Rate	Severity Index
	LM	Description	LM	Description			Total	Fatal	Incap. Inj.	Other Inj.	PDO		
SR 1	23.669	Beaman St.	24.202	Rutledge Pk.	0.533	12,860	7	0	0	2	5	0.933	0.29
SR 1	24.202	Magnolia Ave.	24.637	I-40 EB Ramps	0.435	10,210	4	0	0	0	4	0.822	0.00
SR 168	17.650	Park St.	18.045	Magnolia Ave.	0.395	7,440	3	0	1	1	1	0.932	1.00

Notes: Statewide average crash rate for similar facilities (Urban SR 4-Lane Divided) is 1.994 crashes per million vehicle miles

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TABLE 4: CRASH STATISTICS (2016-2018), INTERSECTIONS WITH 3 OR MORE CRASHES

ID	LM	Side Road	ADT Mainline		ADT Side Road		2016, 2017, 2018		Statewide Rate	Actual/Statewide
			West	East	North	South	# Crashes	Rate		
1	23.67	Magnolia (SR 1) at Beaman St.	12,860	12,860	660	380	3	0.20	0.721	0.28
2	23.97	Magnolia (SR 1) at Lakeside St.	12,860	12,860	390	830	3	0.20	0.721	0.28
3	24.04	Magnolia (SR 1) at Kirkwood St.	12,860	12,860	210	1,920	4	0.26	0.721	0.36
4	24.13	Magnolia (SR 1) at Prosser Rd.	12,860	12,860	2,520	2,500	9	0.53	0.721	0.74
5	24.64	Rutledge (SR 1) at I-40 EB Ramps*	1,950	15,370	10,210	10,210	12	0.58	0.721	0.81
6	17.86	Asheville Hwy. (SR 168) at McCalla Ave.	7,440	7,440	0	5,200	3	0.27	0.166	1.64
7	17.65	Asheville Hwy. (SR 168) at Park St.	7,440	7,440	1,420	2,400	5	0.49	0.166	2.94

Total Intersection Crashes:

Notes:

SW Rate for urban signalized intersections on multi-lane divided facilities (2014-2016): 0.721
 SW Rate for urban unsignalized intersections on multi-lane divided facilities (2014-2016): 0.166

2.0 SUMMARY

Crash data along Magnolia Avenue (SR 1), Rutledge Pike (SR 1), and Asheville Highway (SR 168) within the Study Area were obtained from the TITAN database. Crash data from the most recent three (3) full years of data (2016, 2017, and 2018) were utilized in the analysis. The majority of the crashes were angle (48 percent) followed by rear-end (38 percent). These types of crashes are typically intersection-related, and the data demonstrate that 73 percent of the crashes were at intersections. The actual corridor crash rate along non-intersection locations along Magnolia Avenue (SR 1), Rutledge Pike (SR 1), and Asheville Highway (SR 168) is half the statewide average. Two (2) intersections had crash rates higher than the statewide average of similar intersections. Both were along Asheville Highway (SR 168). They were located at McCalla Avenue and Park Street. The Park Street intersection has the highest crash rate at close to 3x the statewide average of similar intersections.

The raw crash data and statewide crash rate data are provided in the Attachments.