



INTERSECTION SAFETY STUDY

**SR 544 (HAVENDALE BOULEVARD NW) AT
US 17 (8TH STREET NW)**

**POLK COUNTY
SECTION NO.: 16140000
MILEPOST: 3.193**

FM No. 409224-1-32-91
Contract No. C9M86

April 2020

PREPARED FOR
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PROFESSIONAL ENGINEER ENDORSEMENT

I hereby certify that I am a Registered Professional Engineer in the State of Florida and practicing with HNTB Corporation. HNTB Corporation is authorized via Certificate Number EB-0006500 to operate as an Engineering Business by the Florida State Board of Professional Engineers, State of Florida Department of Professional Regulation. I have prepared or supervised the preparation of the evaluation, findings, conclusions, recommendations, or professional opinions/advice contained in this document. My endorsement constitutes my approval of these items.

PROJECT: District-Wide Safety Studies
FPN: 409224-1-32-91

LOCATION: Safety Study – Section No. 16140000
SR 544 (Havendale Boulevard NW) at US 17 (8th Street NW)
Milepost 3.193

CLIENT: Florida Department of Transportation
District One

The results contained in this report were developed using procedures and references standard to the transportation engineering practice. These references and procedures were applied using professional judgment and experience.

Name: Daniel M. D'Antonio, PE, PTOE

P.E. No.: 68399

Date: April 2020

Signature: _____

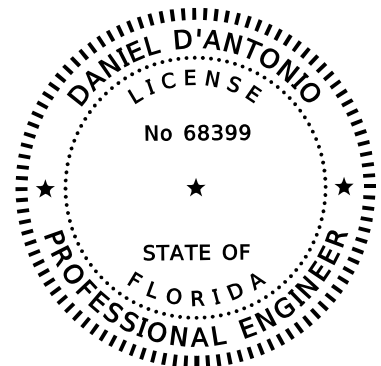


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EXECUTIVE SUMMARY

The Florida Department of Transportation District One (FDOT D1) Safety Office has retained HNTB Corporation as part of the district-wide traffic safety contract to perform a safety study for the intersection of SR 544 at US 17 (8th Street Northwest) in the City of Winter Haven, Polk County, Florida. Based on the results of the data collection, crash analysis, qualitative assessment, operational assessment and engineering judgment, the following recommendations were developed:

Recommendation: Consider closing the full median opening at SR 544 and 9th Street NW.

Justification: There are two full median openings on SR 544 between US 17 and the signalized intersection at 11th Street NW to the west. Between 11th Street and US 17, average full median opening spacing is approximately 325 feet. Regulatory signage restricts left turns on SR 544 from the RaceTrac Gas station and from 9th Street; however, drivers were observed making this movement from the RaceTrac. Based on historic aerial imagery, the RaceTrac was completed sometime in 2013. From 2014 to 2017, there were eight angle crashes and three left turn crashes. In addition to the crashes attributed to this location, the median opening spacing contributes to the complexity of this intersection. The eastbound left turn is the only movement permitted at this location with other movement restricted by signage. The eastbound left turn volume can be accommodated as U-turns at US 17. This will also allow additional storage for the eastbound left turn at US 17.

Recommendation: Consider increasing the northbound left turn control radius from approximately 50 feet to 60 feet by pulling the median nose 15 feet to the west.

Justification: Vehicles were observed to make slow northbound left turns due to the tight radius of the inside turn lane. Off-tracking wear to the median nose was observed. Two sideswipe crashes in 2017 were attributed to vehicles making a wide turn from the inside lane.

Recommendation: Consider installing dilemma zone detection on the eastbound and westbound approaches.

Justification: Sixty-three of the crashes were rear end type and occurred on the eastbound and westbound approaches. No dilemma zone detection is currently provided.

Recommendation: Consider installing TURNING VEHICLES YIELD TO PEDESTRIANS (R10-15) sign to all approaches.

Justification: One crash occurred when a vehicle traveling eastbound made a right turn and failed to yield right-of-way to the bicyclist traveling within the marked crosswalk. Pedestrian and bicycle count data was collected during an eight-hour count. The data collected showed 43 pedestrians and 12 bicyclists were observed crossing at the intersection. The south leg crosswalk was the heaviest pedestrian movement with 18 pedestrians and seven bicyclists observed. Land use adjacent to the intersection is mostly commercial, with a recreational park in the southeast quadrant. Currently, there are no signs advising the motorists to yield to pedestrians.

1. INTRODUCTION

The Florida Department of Transportation District One (FDOT D1) Safety Office has retained HNTB Corporation as part of the district-wide traffic safety contract to perform a safety study for the intersection of SR 544 at US 17 (8th Street Northwest) in the City of Winter Haven, Polk County, Florida.

2. EXISTING CONDITIONS

The intersection of SR 544 at US 17 is a four-legged signalized intersection. SR 544 is an east-west divided roadway with an urban typical section and 12-foot lanes with curb and gutter on both sides. It is a 6-lane roadway west of the intersection and 4-lane roadway east of the intersection. The posted speed limit along SR 544 is 45 miles per hour (mph) west of 9th Street and 35 mph east of 9th Street. The eastbound approach consists of an exclusive left-turn lane, two through lanes and an exclusive right turn lane. The eastbound approach has overhead signage for North US 17 – Lake Alfred and South US 17 – Legoland and Bartow. The westbound approach consists of an exclusive left-turn lane, one through lane and a shared through/right turn lane. Standard crosswalks are provided across all four legs of the intersection with stamped pavement in a brick herringbone pattern in the east crosswalk. There are sidewalks on both sides of the road. Additionally, there is street lighting present on both sides of SR 544. The left-turns operate with protected/permissive phasing at the east-west (SR 544) approaches.

US 17 (8th Street Northwest) is a north-south roadway with a 4-lane divided urban typical consisting of 11-foot lanes with a posted speed of 40 mph. The northbound approach consists of an exclusive left-turn lane, a shared left turn/through lane and an exclusive through lane. The southbound approach consists of an exclusive left-turn lane, a shared left turn/through lane and an exclusive through lane. The northbound and southbound approaches include overhead lane use signage with route signs for SR 544 east and west. There are sidewalks on both sides of the street. The north and south approaches operate with split signal phasing due to the shared left turn/through lanes. There is street lighting present on both sides of the street. The Straight-Line Diagrams of SR 544 and US 17 can be found in **Appendix A**.

There are no bicycle lanes in the vicinity of the intersection. The nearest signalized intersections are SR 544 at 1st Street North approximately 0.5 miles to the east and SR 544 at 11th Street Northwest approximately 1000 feet to the west. There is one transit bus stop near the intersection on the eastbound approach. Land uses adjacent to the intersection are primarily commercial with a recreational park in the southeast quadrant. **Figure 1** presents the Project Location Map. The Condition Diagram is provided in **Appendix B**.



Figure 1: Project Location Map

The Annual Average Daily Traffic (AADT) along SR 544 near the intersection is 24,000 vehicles per day. The AADT along US 17 (8th Street Northwest) is 26,250 (average of 28,000 and 24,500). **Table 1** shows portable traffic monitoring stations (PTMS) within the vicinity of the study intersection.

Table 1: Segment AADT

Street	PTMS	Mile Post	Year	AADT	T-Factor
SR 544	165151	3.40	2018	24,000	5.8
US 17	165148	30.59	2018	28,000	5.0
US 17	165149	30.77	2018	24,500	6.1

3. DATA COLLECTION

This section of the report presents the data that was obtained for this study. For the purposes of this study, it was determined that the following information would be required:

- Crash data from January 2013 through December 2017.
- Eight-hour turning movement counts.
- Vehicle count data from count stations located within the study limits.
- Field observations of the intersection operations during an average weekday.

- Recently-completed or future planned projects within the study limits.

3.1 Crash Data

Crash data from January 2013 to December 2017, as extracted from the State Crash Analysis Reporting System (CARS), and Signal 4 Analytics, were reviewed to identify any crash trends that could be mitigated as part of this intersection safety study. During this analysis period, a total of 267 crashes occurred within the vicinity of the intersection. **Table 2** shows the overall number of crashes by their injury severity and crash characteristics by year. The collision diagrams by year can be found in **Appendix C**.

Table 2: Crash Summary

Crash Information		Crash Year					5 Year	Mean Crashes per Year	%
		2013	2014	2015	2016	2017	Total		
Crash Type	Angle	1	6	6	5	2	20	4	7%
	Bicycle	1	0	1	0	1	3	0.6	1%
	Hit Fixed Object	0	0	0	0	0	0	0	0%
	Hit Non-Fixed Object	0	0	0	0	0	0	0	0%
	Head On	0	0	0	0	2	2	0.4	1%
	Left Turn	3	1	4	3	5	16	3.2	6%
	Right Turn	4	3	4	3	5	19	3.8	7%
	Off Road	1	2	0	1	1	5	1	2%
	Overtuned	0	0	0	0	0	0	0	0%
	Pedestrian	0	0	1	1	0	2	0.4	1%
	Rear End	31	37	26	23	26	143	28.6	54%
	Sideswipe	13	5	5	11	19	53	10.6	20%
	Rollover	0	0	0	0	0	0	0	0%
	Other	1	1	0	0	0	2	0.4	1%
	Backed Into	0	0	0	1	0	1	0.2	0%
	Unknown	0	0	0	1	0	1	0.2	0%
Total	55	55	47	49	61	267	53.4	100%	
Injury Severity	Fatal	0	0	0	1	0	1	0.2	0%
	Possible Injury	11	17	14	9	12	63	12.6	24%
	None	44	38	33	39	49	203	40.6	76%
	Total	55	55	47	49	61	267	53.4	
Lighting Condition	Day	37	42	34	40	47	200	40	75%
	Night	18	13	13	9	14	67	13.4	25%
	Total	55	55	47	49	61	267	53.4	
Surface Conditions	Dry	45	48	34	41	54	222	44.4	83%
	Wet	10	7	13	8	7	45	9	17%
	Total	55	55	47	49	61	267	53.4	

3.2 Turning Movement Count (TMC) Data

Eight hour turning movement counts were performed at the intersection of SR 544 and US 17 (8th Street Northwest) on Tuesday, September 17, 2019, from 7:00 am to 10:00 am, 11:00 am to 1:00 pm, and 3:00 pm to 6:00 pm. Pedestrian and bicycle count data was also collected concurrent with the turning movement counts. During the eight-hour count, 43 pedestrians and 12 bicyclists were observed crossing at the intersection. The south leg crosswalk was the heaviest pedestrian movement with 18 pedestrians and seven bicyclists observed.

The vehicular counts were adjusted by applying the peak-season conversion factor (PSCF) of 1.07 countywide obtained from FDOT’s Florida Traffic Online (2018). The peak-hour volume during AM, Mid-day, and PM peak hours for the intersection of SR 544 and US 17 (8th Street Northwest) are shown in **Figure 2, 3 and 4**. The raw counts are provided in **Appendix D**.

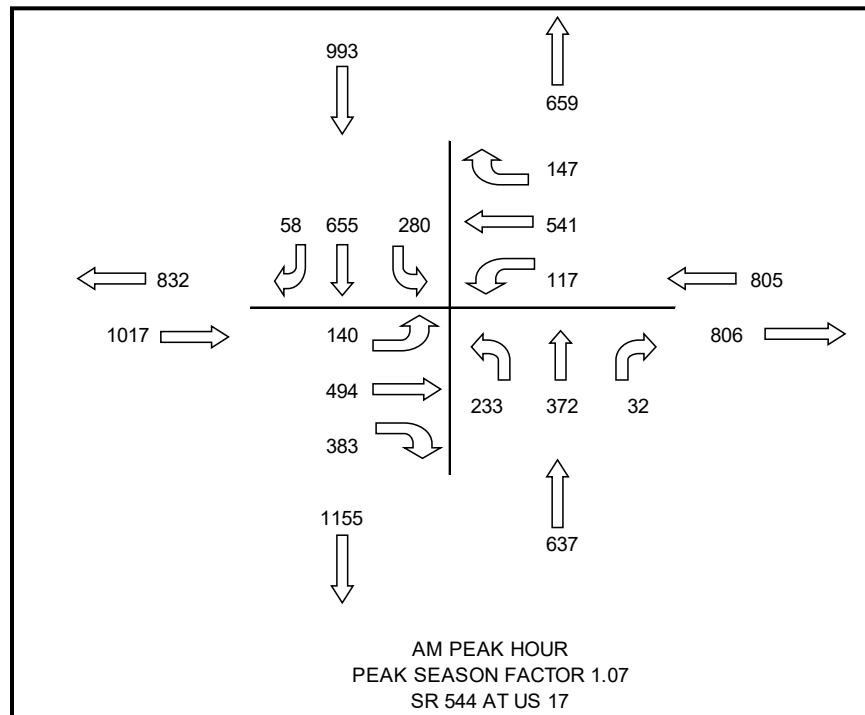


Figure 2: AM Peak-Hour Turning Movements

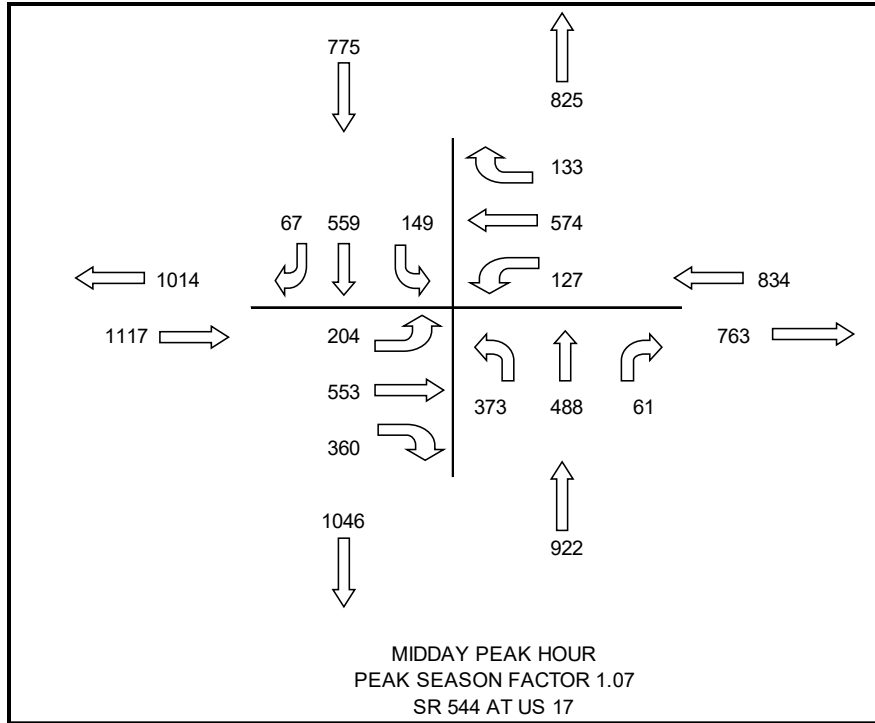


Figure 3: MID-DAY Peak-Hour Turning Movements

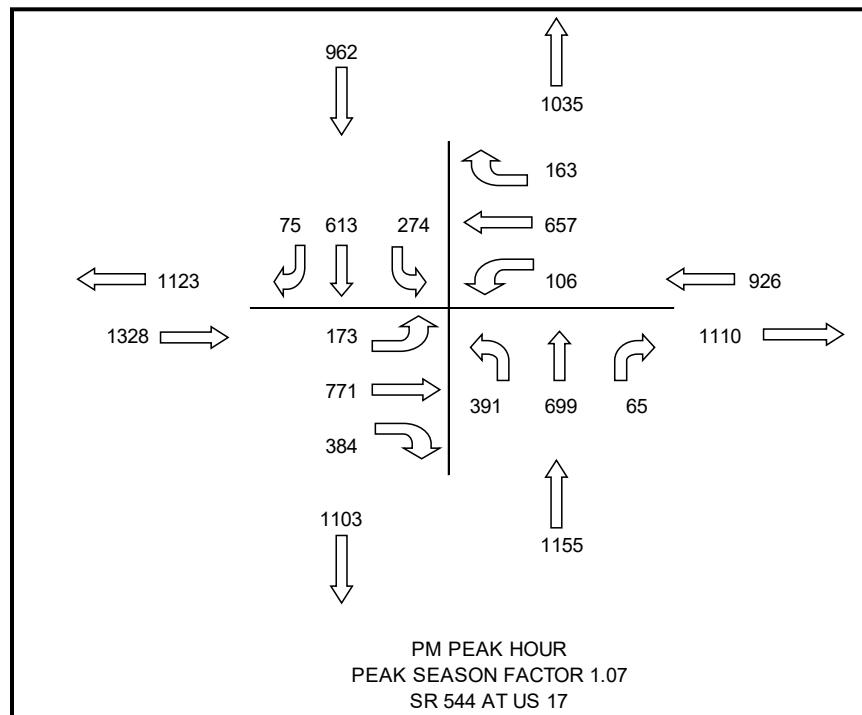


Figure 4: PM Peak-Hour Turning Movements

3.3 *Recently Completed/Future Projects*

Based on a review of FDOT’s Adopted Work Program, following projects are ongoing within the proximity of the study area:

- FPID 440273-1: SR 544 Project Development and Environment study from Martin Luther King Boulevard to SR 17. The study evaluates the widening of SR 544 from two lanes to four lanes within the project limits to enhance capacity, connectivity and safety.
- FPID 440339-1: US 17 Sidewalk project from SR 544 to Brigham Road with construction scheduled in FY 2022
- FPID 440349-1: SR 549 Sidewalk project from Central Ave to Avenue O with construction scheduled in FY 2022
- FPID 410666-2,3,4: SR 542 Add lanes and reconstruct from 1st Street to US 27 with construction scheduled in FY 2020 and FY 2021

4. QUALITATIVE ASSESSMENT

The intersection of SR 544 at US 17 (8th Street Northwest) was observed by a registered professional engineer during the morning and afternoon peak periods of an average weekday to assess the existing operating conditions and to determine what, if any, improvements could be made to improve the safety and efficiency at this intersection.

4.1 *Operational Analysis*

Operations include the efficiency of operations and interaction of motor vehicles, transit vehicles, pedestrians, and bicycles on the roadway. The results of these observations are summarized below.

- The intersection of SR 544 and US 17 is located approximately 1.5 miles north of downtown Winter Haven. Traffic was direction inbound in the am peak hour and outbound in the pm peak hour.
- The north-south signal phasing was split due to the lane geometry and left turn offset. There was good balanced between the dedicated left turn lane and the shared through/left turn lane on the US 17 approaches.
- The eastbound right turn has a relatively high volume and runs on an overlap with the northbound phase. There is a NO U-TURN sign in the median for the northbound approach. Drivers were observed to obey this regulatory signage.
- There are two full median openings on SR 544 between US 17 and the signalized intersection at Spring Lake Plaza. Between 11th Street and US 17, average full median opening spacing is approximately 325 feet. Regulatory signage restricts left turns on SR 544 from the RaceTrac Gas station and from 9th Street; however, drivers were observed making this movement from the RaceTrac. Based on historic aerial imagery, the RaceTrac appears to be completed sometime in 2013. From 2014 to 2017, there were eight angle crashes and three left turn crashes. In addition

to the crashes attributed to this location, the median opening spacing contributes to the complexity of this intersection. **Consider closing the full median opening at 9th Street NW.** The eastbound left turn is the only movement permitted at this location. The volume can be accommodated as U-turns at US 17. This will also allow additional storage for the eastbound left turn at US 17.

- The westbound queue was observed to extend from 11th Street to US 17.
- The eastbound and westbound approaches have one set of signal loops and do not provide dilemma zone detection.
- Vehicles were observed to make slow northbound left turns due to the tight radius of the inside turn lane. Off-tracking wear to the median nose was observed. **Consider increasing the northbound left turn control radius from approximately 50 feet to 60 feet by pulling the median nose 15 feet to the west.** Two sideswipe crashes in 2017 were attributed to vehicles making a wide turn from the inside lane.



4.2 Crash Analysis

As shown in **Table 2** the following crash trends were identified within the study intersection:

- Of the 267 total crashes within the vicinity of the intersection, there were 143 rear end crashes, 53 sideswipe crashes, 20 angle crashes, 16 left turn crashes, two pedestrian crashes, and three bicycle crashes.
- Of the 20 angle crashes, seven occurred at the intersection of SR 544 and US 17, eight occurred at the full median opening on SR 544 immediately west of US 17, and five occurred at other driveways within the vicinity.
- Of the 16 left turn crashes, 10 occurred at the intersection of SR 544 and US 17, three occurred at the full median opening on SR 544 immediately west of US 17, and three occurred at other driveways within the vicinity. At SR 544 and US 17, all 10 left turn crashes occurred on the east-west approaches with permissive phasing.
- Sixty-three of the crashes were rear end type and occurred on the eastbound and westbound approaches. To reduce the number of hard breaking stops, **consider installing dilemma zone detection on the eastbound and westbound approaches.**
- Of the 267 total crashes, 63 resulted in injuries and 203 resulted in property damage only.
- One crash resulted in a fatality when a vehicle traveling eastbound on SR 544 failed to stop behind the queue stopped at the red traffic signal. The driver was believed to have suffered from a medical condition prior to the crash and the fatality was not related to the crash.

- Sixty-seven (25%) crashes occurred during night conditions (including dusk until dawn), which is less than the statewide average of 30%.
- Forty-five (17%) crashes occurred during wet roadway conditions, which is below the statewide average of 18%.
- Five pedestrian/bicycle related crashes occurred within the vicinity of the study intersection of SR 544 and US 17. One pedestrian and one bicycle crash occurred at commercial driveways adjacent to the intersection. One pedestrian crash occurred on the north leg when a pedestrian was crossing between cars during a DO NOT WALK indication. One bicycle crash occurred on the south leg when a bicyclist was riding westbound in the south crosswalk when the light turned green for northbound drivers. One of the four crashes involved a juvenile on a bicycle when he was struck by a driver making a right turn on red. The driver of the car was issued a citation. **Consider installing TURNING VEHICLES YIELD TO PEDESTRIANS (R10-15) sign to all approaches.**

4.3 *Benefit-Cost and Net Present Value Analysis*

A benefit-cost (B/C) and net present value (NPV) analysis was performed for the recommended improvements of: closing the full median opening at 9th Street NW; and installing dilemma zone detection on the eastbound and westbound approaches, as shown in the recommendations. The procedures outlined in the Department’s Highway Safety Improvement Program (HSIP) Guide were used to determine the NPV. The average cost per crash of \$123,406 was used, as reported in the FDOT Florida Design Manual, Table 122.6.1, for 4-5 lanes urban divided roadway. A crash reduction factor of 43.5% was applied to angle and left turn crashes that occurred at the median opening of SR 544 and 9th Street NW for the improvement of closing the full median opening. A crash reduction factor of 1.2% was applied to rear end crashes that occurred on the eastbound and westbound approaches.

The cost for the proposed upgrades is \$67,595 or \$8,335 annually. This estimate also includes contingency, maintenance of traffic, mobilization costs, project unknowns, design and C.E.I. cost (35% of the construction cost per the Florida Department of Transportation). An Engineer’s Estimate is included in **Appendix E** of this report.

The proposed improvements provide the following net present value results:

- Number of crashes potentially reduced: total 74 over 5 years (15 annually)
- Annual Monetary Value of Benefits: \$806,871
- Annual Monetary Value of Cost: \$8,335
- Benefit/Cost Ratio: 96.81
- Net Present Value: \$6,469,714

The HSIP Guide states that a project can qualify for HSIP funds if it addresses a key highway safety problem area from the Florida Strategic Highway Safety Plan and a net present value (NPV) greater than zero. The benefit-cost analysis and net present values are summarized in **Appendix F** of this report.

4.4 Maintenance

In addition to observing operational and safety conditions during the field review, correctible maintenance items were also reviewed.

- At the time of the field review, the median nose delineator was missing from the south leg. **Consider installing a median nose delineator on the south leg.**
- The eastbound right turn lane has ONLY markings for all arrows except the last arrow. **Consider installing ONLY pavement message for the easternmost right turn arrow for the eastbound right turn.**
- A slotted concrete separator is provided along the north leg to provide positive drainage through the median. During the field review, many of the channels were blocked with debris. **Consider clearing debris from the slotted concrete median separator on the north leg.**
- A maintenance catwalk is provided along the full length of the overhead sign structure on the eastbound approach. The catwalk blocks the bottom of the sign and casts shadows from headlights. **Consider removing the maintenance catwalk from the overhead sign structure on the west leg.**

4.5 Best Practices

As part of this safety study, the intersection was evaluated for implementation of best safety practices.

Below is a list of improvements that can be made:

- Currently the intersection crosswalks consist of standard striping and are approximately ten feet wide. On the east leg, the crosswalk consists of stamped pavement in a brick herringbone pattern. **Consider standardizing the crosswalks using special emphasis thermoplastic pavement markings.**
- The Manual on Uniform Traffic Control Devices (MUTCD) provides guidance for placement of pedestrian detectors. General requirements are that the pushbuttons are located between 1.5 feet to 6.0 feet from the curb ramps and at least 10 feet apart from each other. This criterion is met on the east side of the intersection. **Consider relocating pedestrian pushbuttons on the west side of the intersection to meet MUTCD requirements.**
- **Consider installing retro-reflective backplates on all traffic signal heads.**
- Overhead guide signage on the eastbound approach does not have external lighting and does not appear to meet reflectivity standards. **Consider re-sheeting the overhead guide signs on the eastbound approach with retro-reflective sheeting.**

- There is a large right turn radius in the southeast quadrant that results in longer pedestrian crossing distances and more exposure to pedestrians. AutoTURN was used to evaluate a WB-62FL making the northbound right turn maneuver at this location. Based on the assessment, the radius can be reduced to 58 feet and still accommodate the design vehicle without off-tracking. **Consider reconstructing the radius in the southeast quadrant with a 58-foot radius that shortens the pedestrian crossing for the east and south crosswalks.** The embedded graphic below shows the turning radius of a WB-62FL.



5. RECOMMENTATIONS

Based on the results of the data collection, crash analysis, qualitative assessment, operational assessment and engineering judgment, the following recommendations were developed:

1. Consider closing the full median opening at SR 544 and 9th Street NW.
2. Consider increasing the northbound left turn control radius from approximately 50 feet to 60 feet by pulling the median nose 15 feet to the west.
3. Consider installing dilemma zone detection on the eastbound and westbound approaches.
4. Consider installing TURNING VEHICLES YIELD TO PEDESTRIANS (R10-15) sign to all approaches.

Maintenance

5. Consider installing a median nose delineator on the south leg.
6. Consider installing **ONLY** pavement message for the easternmost right turn arrow for the eastbound right turn.
7. Consider clearing debris from the slotted concrete median separator on the north leg.
8. Consider removing the maintenance catwalk from the overhead sign structure on the west leg.

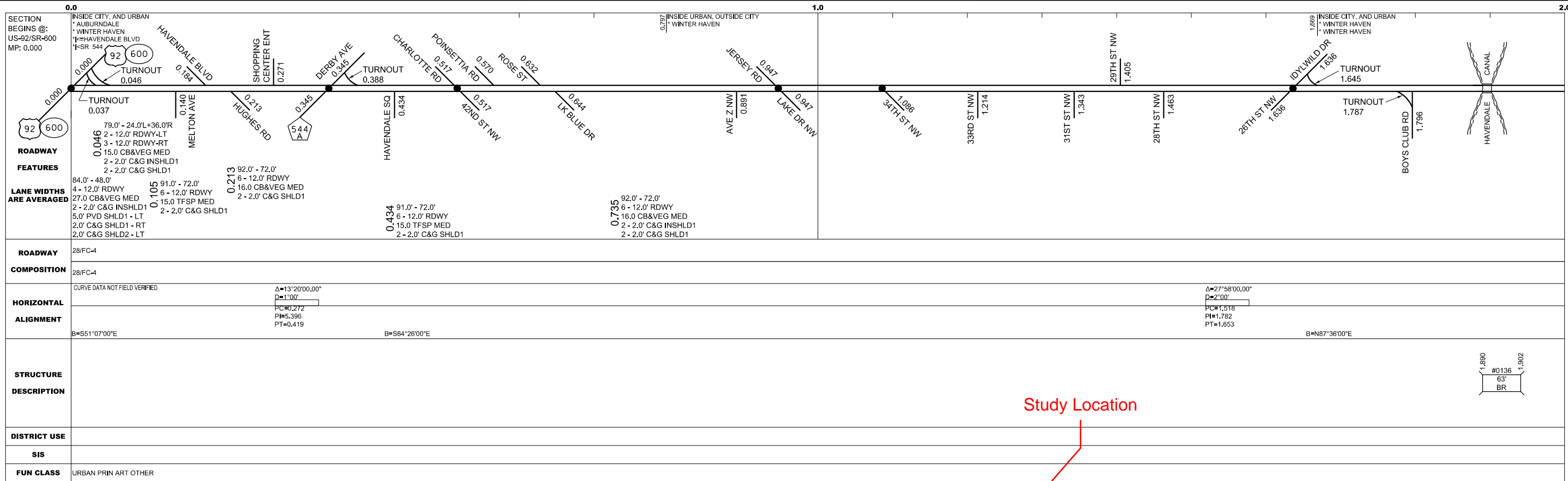
Best Practices

9. Consider standardizing the crosswalks using special emphasis thermoplastic pavement markings.
10. Consider relocating pedestrian pushbuttons on the west side of the intersection to meet MUTCD requirements.
11. Consider installing retro-reflective backplates on all traffic signal heads.
12. Consider re-sheeting the overhead guide signs on the eastbound approach with retro-reflective sheeting.
13. Consider reconstructing the radius in the southeast quadrant with a 58-foot radius that shortens the pedestrian crossing for the east and south crosswalks.

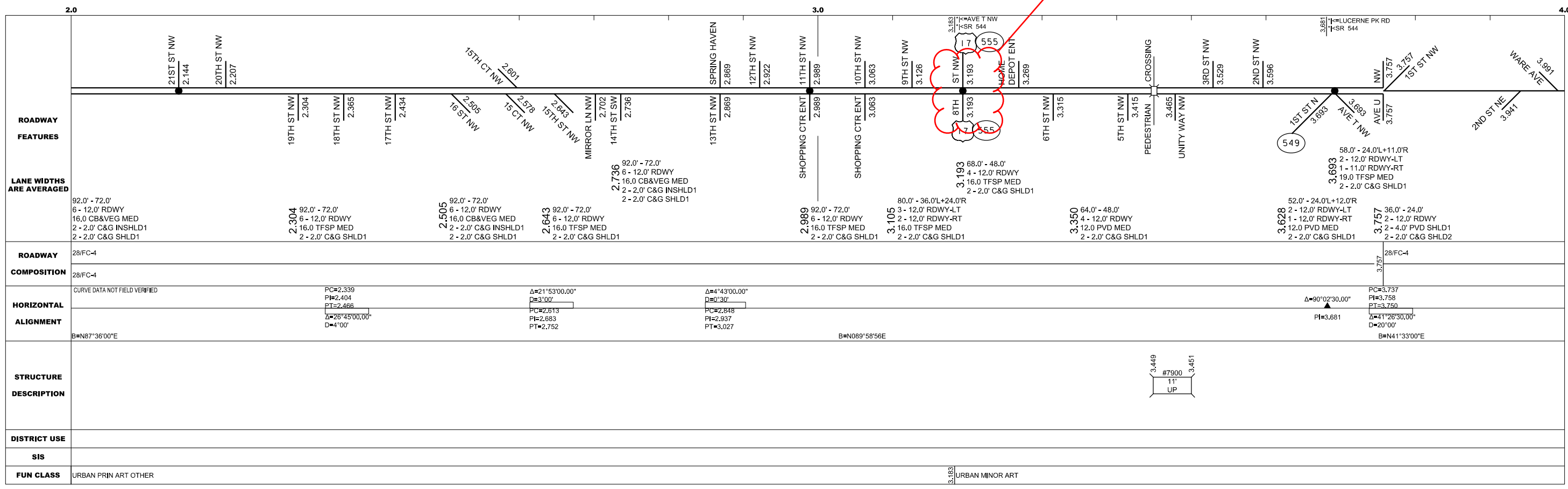
Refer to **Appendix G** for the Conceptual Improvement Plan.



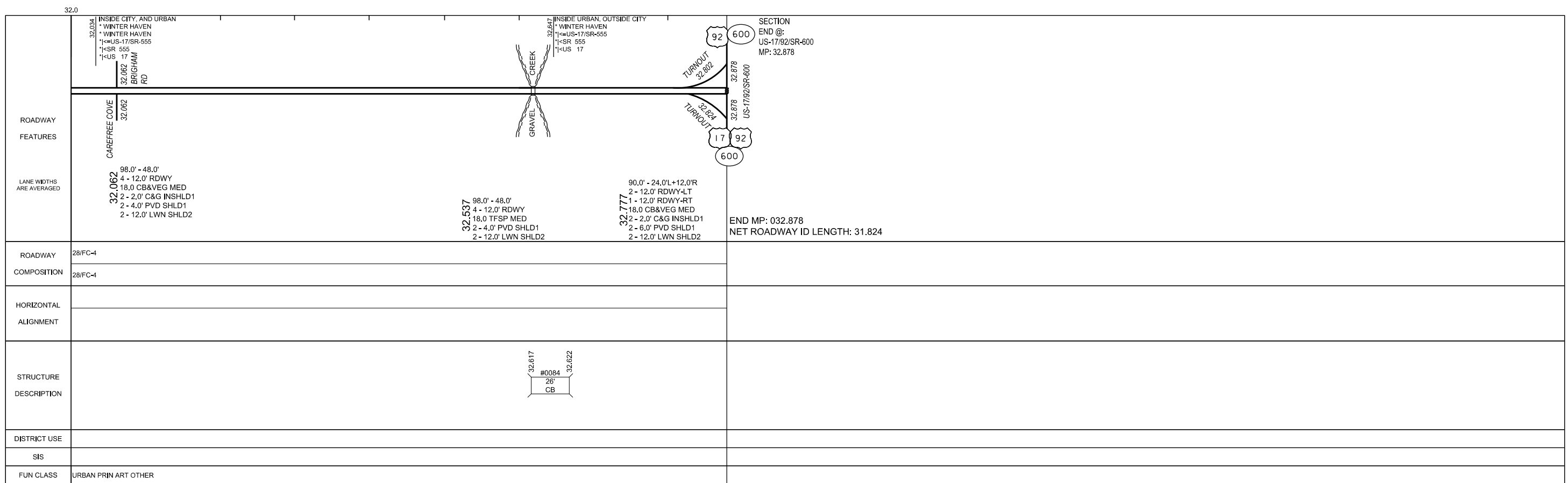
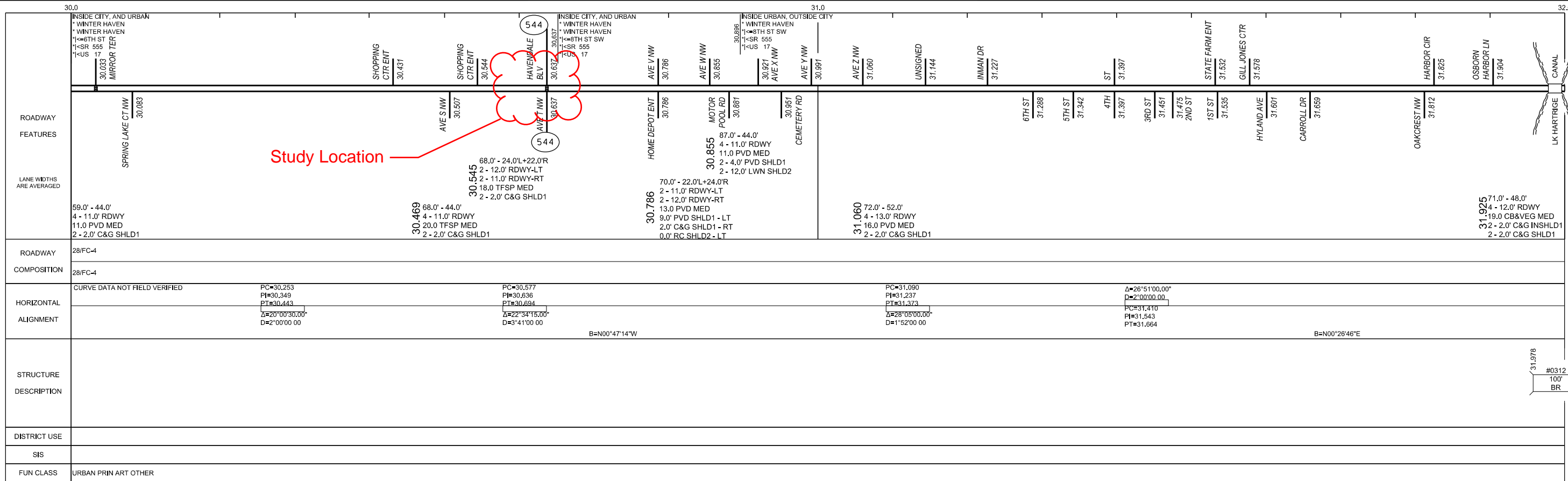
APPENDIX A: STRAIGHT LINE DIAGRAM



Study Location



3.183 URBAN MINOR ART

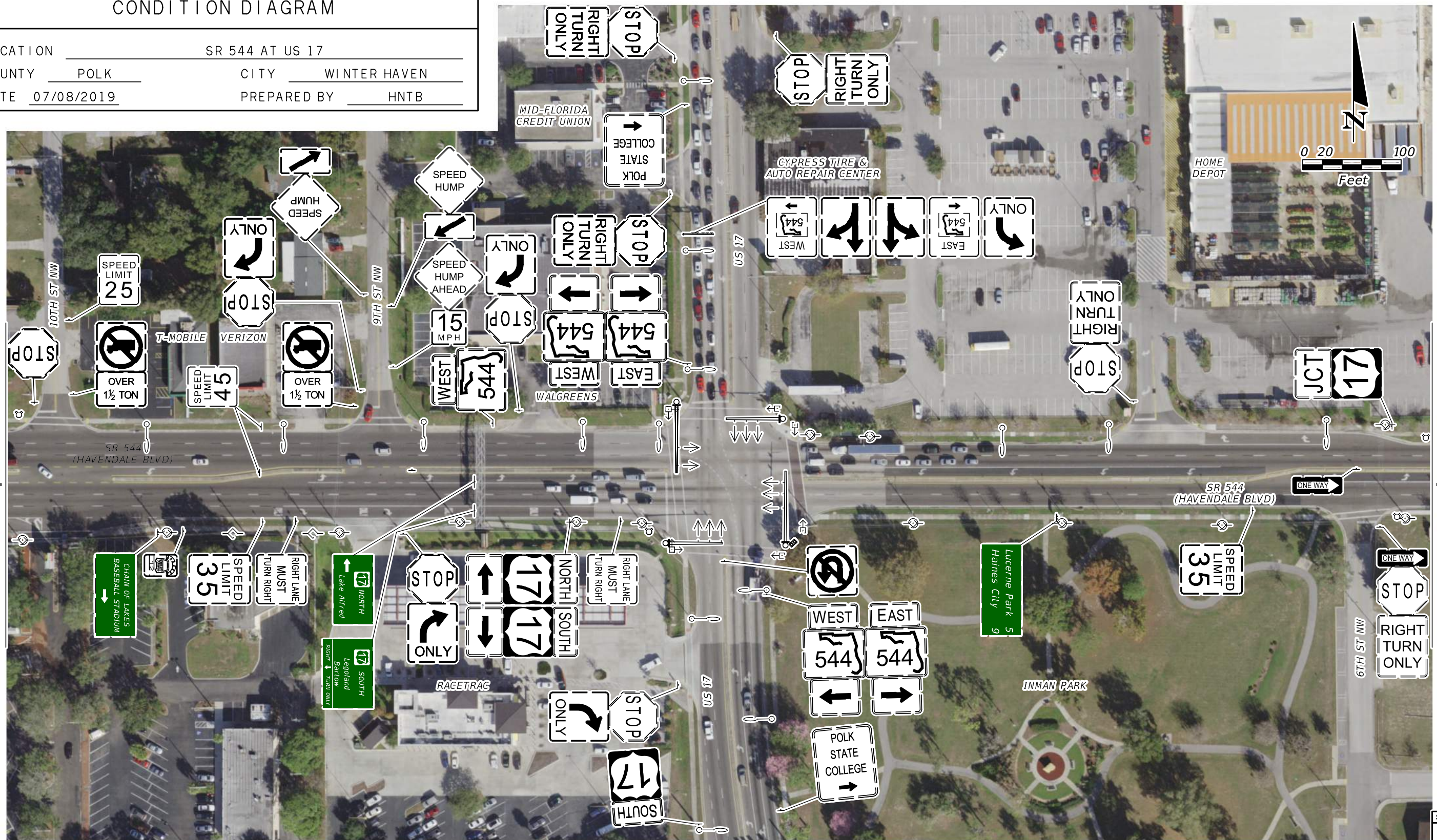




APPENDIX B: CONDITION DIAGRAM

CONDITION DIAGRAM

LOCATION SR 544 AT US 17
 COUNTY POLK CITY WINTER HAVEN
 DATE 07/08/2019 PREPARED BY HNTB



SYMBOLS

	FENCE		BUS STOP BENCH		CONTROLLER CABINET		SIGNAL STRAIN POLE		POWER POLE		SINGLE POST SIGN
	GUARDRAIL		HYDRANT		PED. SIGNAL PEDESTAL		SIGNAL MAST ARM		COMBINATION POLE		MULTI-POST SIGN
	BUILDING		STREET NAME SIGN		TRAFFIC SIGNAL PEDESTAL		SIGNAL HEAD		LIGHT POLE		OVERHEAD SIGN



APPENDIX C: CRASH DATA

COLLISION SUMMARY

Section: _____
 Location: SR 544 at US 17
 Study Period: 1/1/2013 to 12/31/2013
 No. of Years: 1

State Route: SR 544
 M.P.: -
 County: Polk

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
1	1/1/2013	Tue.	16:13	Sideswipe			x	Day	Dry	Improper Lane Change	83444855	
2	1/4/2013	Fri.	0:00	Rear End			x	Night	Dry	Careless Driving	83445032	
3	1/11/2013	Fri.	13:45	Rear End			x	Day	Dry	Careless Driving	83445246	Hit and Run
4	2/3/2013	Sun.	15:40	Rear End			x	Day	Dry	Careless Driving	83445402	
5	2/5/2013	Tue.	18:30	Sideswipe			x	Night	Dry	Careless Driving	83445337	
6	2/19/2013	Tue.	0:00	Right Turn			x	Night	Dry	Careless Driving	83445431	
7	2/22/2013	Fri.	15:02	Rear End			x	Day	Dry	Careless Driving	83445422	
8	2/28/2013	Thu.	13:07	Right Turn			x	Day	Dry	Careless Driving	83445396	
9	3/4/2013	Mon.	0:00	Rear End			x	Night	Dry	Careless Driving	83445486	
10	3/8/2013	Fri.	14:59	Sideswipe		x		Day	Dry	Careless Driving	83445491	Hit and Run
11	3/8/2013	Fri.	20:25	Rear End			x	Night	Dry	FTYRW	83445491	
12	3/10/2013	Sun.	1:16	Left Turn			x	Night	Dry	FTYRW	83445430	
13	3/17/2013	Sun.	11:32	Sideswipe			x	Day	Dry	Improper Lane Change	83445509	
14	3/21/2013	Thu.	17:21	Sideswipe			x	Night	Dry	Improper Lane Change	83445479	
15	3/22/2013	Fri.	11:04	Sideswipe			x	Day	Dry	Improper Lane Change	83445601	
16	3/24/2013	Sun.	21:36	Off Road			x	Night	Dry	DUI	83445592	
17	4/15/2013	Mon.	12:51	Bicycle		x		Day	Dry	FTYRW	83445711	
18	4/19/2013	Fri.	14:00	Right Turn			x	Day	Dry	Improper Turn	83921756	
19	4/26/2013	Fri.	17:54	Rear End			x	Night	Wet	Careless Driving	83445762	
20	5/8/2013	Wed.	15:10	Rear End			x	Day	Dry	Careless Driving	83445807	
21	5/15/2013	Wed.	16:23	Rear End		x		Day	Dry	Careless Driving	83445763	
22	5/16/2013	Thu.	13:44	Other			x	Day	Dry	Careless Driving	83445739	
23	5/22/2013	Wed.	11:30	Rear End			x	Day	Dry	Followed Too Closely	84110003	
24	5/23/2013	Thu.	10:39	Sideswipe			x	Day	Dry	Careless Driving	83445635	
25	5/24/2013	Fri.	11:42	Rear End			x	Day	Dry	Driver Distraction	83445912	
26	6/6/2013	Thu.	15:05	Rear End			x	Day	Wet	Careless Driving	84110020	
27	6/8/2013	Sat.	16:39	Rear End		x		Day	Wet	Careless Driving	83445941	Hit and Run
28	6/17/2013	Mon.	16:25	Sideswipe			x	Day	Dry	Careless Driving	84110037	Hit and Run
29	6/27/2013	Thu.	7:39	Sideswipe			x	Night	Wet	Improper Passing	83445915	
30	6/28/2013	Fri.	8:37	Rear End			x	Day	Dry	Careless Driving	83921398	
31	7/6/2013	Sat.	17:46	Rear End			x	Day	Dry	Followed Too Closely	83445935	
32	7/11/2013	Thu.	13:45	Rear End		x		Day	Dry	Careless Driving	84110069	
33	7/12/2013	Fri.	8:40	Rear End			x	Day	Dry	Driver Distraction	83445853	
34	7/13/2013	Sat.	14:28	Rear End		x		Day	Wet	Careless Driving	83445954	
35	7/17/2013	Wed.	11:30	Sideswipe			x	Day	Dry	Improper Lane Change	84110084	
36	7/26/2013	Fri.	14:57	Rear End			x	Day	Dry	Careless Driving	84056091	

COLLISION SUMMARY

Section: _____
 Location: SR 544 at US 17
 Study Period: 1/1/2013 to 12/31/2013
 No. of Years: 1

State Route: SR 544
 M.P.: -
 County: Polk

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
37	8/10/2013	Sat.	10:38	Rear End			x	Day	Dry	Careless Driving	84056106	
38	8/26/2013	Mon.	0:43	Left Turn			x	Night	Dry	Disregarded Traffic Control	84056141	
39	9/5/2013	Thu.	10:55	Right Turn			x	Day	Dry	FTYRW	84056080	
40	9/19/2013	Thu.	7:44	Rear End			x	Day	Dry	Careless Driving	84056103	
41	10/15/2013	Tue.	16:20	Rear End		x		Day	Dry	Careless Driving	84035785	
42	10/25/2013	Fri.	23:48	Rear End		x		Night	Dry	Careless Driving	84110335	Hit and Run
43	10/30/2013	Wed.	12:01	Sideswipe			x	Day	Dry	Improper Lane Change	84110355	
44	11/1/2013	Fri.	12:45	Rear End		x		Day	Dry	Followed Too Closely	84110392	
45	11/4/2013	Mon.	15:35	Sideswipe			x	Day	Dry	Improper Lane Change	84110382	
46	11/11/2013	Mon.	14:21	Sideswipe			x	Day	Dry	Careless Driving	84110470	
47	11/15/2013	Fri.	17:00	Rear End		x		Night	Wet	Careless Driving	84110447	
48	11/15/2013	Fri.	19:47	Left Turn			x	Night	Wet	FTYRW	84110447	
49	11/21/2013	Thu.	18:04	Rear End			x	Night	Wet	Careless Driving	84110504	
50	11/21/2013	Thu.	17:45	Rear End		x		Night	Wet	Careless Driving	84110504	
51	12/3/2013	Tue.	0:00	Rear End			x	Night	Wet	Careless Driving	84110527	
52	12/13/2013	Fri.	16:51	Rear End			x	Day	Dry	Followed Too Closely	84110570	
53	12/13/2013	Fri.	17:10	Angle			x	Night	Dry	FTYRW	84110570	
54	12/20/2013	Fri.	14:02	Rear End			x	Day	Dry	Followed Too Closely	84110593	
55	12/31/2013	Tue.	11:30	Rear End			x	Day	Dry	Careless Driving	84110629	

Total No.	Fatal	Injury	Property Damage	Angle	Left Turn	Head On	Right Turn	Rear End	Side Swipe	Collision w/ Sign	Overtuned	Collision w/ Pole	Hit Animal	Run Off Road	Other
55	0	11	44	1	3	0	4	31	13	0	0	0	0	1	1
%	0	20	80	2	5	0	7	56	24	0	0	0	0	2	2
One Vehicle	Ped/Bike	Day	Night	Dry	Wet	Careless Driving	FTYRW	Improper Turn	DUI	Improper Lane Change	Disregarded Traffic Signal	Failed to Maintain Vehicle	Improper Load	No Improper Driving	Other
0	1	37	18	45	10	31	6	1	1	7	0	0	0	0	0
0	2	67	33	82	18	56	11	2	2	13	0	0	0	0	0

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COLLISION DIAGRAM

LOCATION SR 544 AT US 17
 COUNTY POLK CITY WINTER HAVEN
 DATE RANGE 01/01/2013 TO 12/31/2013 PREPARED BY HNTB



SHEET
1

SYMBOLS

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> OVERTURNED VEHICLE BACKING VEHICLE OUT OF CONTROL | <ul style="list-style-type: none"> HEAD-ON COLLISION ANGLE COLLISION RIGHT TURN COLLISION | <ul style="list-style-type: none"> COLLISION W/ PED. COLLISION W/ BIKE LEFT TURN COLLISION | <ul style="list-style-type: none"> REAR-END COLLISION SIDE SWIPE PERSONAL INJURY FATALITY |
|--|---|--|---|

CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	29	8	0	37
NIGHTTIME	15	3	0	18
TOTAL	44	11	0	55

COLLISION SUMMARY

Section: _____
 Location: SR 544 at US 17
 Study Period: 1/1/2014 to 12/31/2014
 No. of Years: 1

State Route: SR 544
 M.P.: -
 County: Polk

Engineer: FDOT

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
1	1/11/2014	Sat.	18:50	Rear End			x	Night	Dry	Careless Driving	83668106	
2	1/11/2014	Sat.	14:45	Sideswipe			x	Day	Dry	FTYRW	84110700	
3	1/25/2014	Sat.	17:12	Rear End			x	Night	Dry	Careless Driving	84110753	
4	2/7/2014	Fri.	11:55	Rear End			x	Day	Dry	Careless Driving	84110797	
5	2/21/2014	Fri.	15:30	Rear End			x	Day	Dry	Careless Driving	84110864	
6	2/21/2014	Fri.	10:30	Rear End		x		Day	Dry	Followed Too Closely	84110860	
7	2/21/2014	Fri.	16:10	Right Turn			x	Day	Dry	FTYRW	84110869	
8	2/28/2014	Fri.	8:10	Rear End			x	Day	Dry	Followed Too Closely	84110948	
9	3/8/2014	Sat.	7:33	Rear End		x		Day	Dry	Careless Driving	84110938	
10	3/11/2014	Tue.	6:52	Rear End		x		Night	Dry	Careless Driving	84110953	Hit and Run
11	3/13/2014	Thu.	18:27	Rear End			x	Day	Dry	Careless Driving	84110971	Hit and Run
12	3/14/2014	Fri.	6:01	Angle			x	Night	Dry	Disregarded Traffic Control	84110982	westbound ran red mid-phase
13	3/22/2014	Sat.	10:16	Left Turn			x	Day	Dry	FTYRW	84111027	
14	3/26/2014	Wed.	15:01	Rear End		x		Day	Dry	Followed Too Closely	84111075	
15	4/2/2014	Wed.	14:45	Rear End			x	Day	Dry	Careless Driving	84111077	
16	4/4/2014	Fri.	10:30	Angle			x	Day	Dry	FTYRW	84111092	
17	4/7/2014	Mon.	8:28	Rear End		x		Day	Dry	Followed Too Closely	84111109	
18	4/15/2014	Tue.	11:35	Rear End		x		Day	Dry	Careless Driving	84111153	
19	4/19/2014	Sat.	0:42	Rear End		x		Night	Wet	Careless Driving	84111171	Hit and Run
20	4/28/2014	Mon.	14:35	Rear End			x	Day	Dry	Careless Driving	84111200	
21	5/9/2014	Fri.	12:25	Rear End			x	Day	Dry	Careless Driving	84111241	
22	5/14/2014	Wed.	12:30	Rear End			x	Day	Dry	Careless Driving	84111270	
23	5/17/2014	Sat.	22:10	Angle			x	Night	Dry	FTYRW	84111290	
24	5/23/2014	Fri.	23:10	Rear End			x	Night	Dry	Careless Driving	84111351	
25	5/27/2014	Tue.	16:25	Rear End			x	Day	Dry	Careless Driving	84111324	
26	5/29/2014	Thu.	16:02	Rear End			x	Day	Dry	Followed Too Closely	84111337	
27	6/9/2014	Mon.	17:11	Rear End		x		Day	Dry	No Improper Driving	84111384	
28	6/13/2014	Fri.	16:40	Rear End			x	Day	Dry	Careless Driving	84111410	
29	6/23/2014	Mon.	0:00	Right Turn			x	Day	Dry	FTYRW	84111434	
30	6/25/2014	Wed.	16:15	Rear End			x	Day	Dry	Careless Driving	84111443	
31	6/28/2014	Sat.	23:06	Rear End			x	Night	Wet	Careless Driving	84111450	
32	6/29/2014	Sun.	13:00	Rear End			x	Day	Dry	Careless Driving	84111481	
33	7/17/2014	Thu.	16:18	Rear End			x	Day	Dry	Careless Driving	84111523	
34	7/21/2014	Mon.	11:40	Right Turn		x		Day	Dry	FTYRW	84111536	
35	8/19/2014	Tue.	16:05	Rear End			x	Day	Dry	Careless Driving	84111623	
36	8/25/2014	Mon.	8:25	Angle		x		Day	Dry	Disregarded Traffic Control	84111644	eastbound ran the red end of phase

COLLISION SUMMARY

Section: _____
 Location: SR 544 at US 17
 Study Period: 1/1/2014 to 12/31/2014
 No. of Years: 1

State Route: SR 544
 M.P.: -
 County: Polk

Engineer: FDOT

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
37	9/4/2014	Thu.	9:23	Sideswipe		x		Day	Dry	Careless Driving	84111684	
38	9/4/2014	Thu.	14:32	Sideswipe		x		Day	Dry	Improper Lane Change	84111689	
39	9/5/2014	Fri.	20:10	Rear End			x	Night	Wet	Careless Driving	84111691	
40	9/16/2014	Tue.	14:12	Rear End			x	Day	Dry	Careless Driving	84111728	
41	9/17/2014	Wed.	7:35	Rear End			x	Day	Dry	Followed Too Closely	84111731	
42	9/30/2014	Tue.	16:11	Rear End			x	Day	Dry	Careless Driving	84111788	
43	10/3/2014	Fri.	16:47	Angle		x		Day	Dry	Careless Driving	84111802	
44	10/6/2014	Mon.	20:00	Rear End		x		Night	Dry	Careless Driving	84111829	
45	10/20/2014	Mon.	2:50	Rear End		x		Night	Dry	Careless Driving	84111880	
46	10/21/2014	Tue.	6:10	Rear End			x	Night	Dry	Careless Driving	84111872	
47	11/9/2014	Sun.	6:17	Off Road		x		Night	Wet	Careless Driving	84111952	
48	11/9/2014	Sun.	6:43	Other			x	Day	Wet	No Improper Driving	84111966	
49	11/19/2014	Wed.	18:10	Angle		x		Day	Dry	Disregarded Traffic Control	84996702	southbound ran the red, end of WB gr
50	12/1/2014	Mon.	9:15	Sideswipe			x	Day	Dry	FTYRW	84996756	
51	12/5/2014	Fri.	14:10	Rear End			x	Day	Wet	Careless Driving	84996776	
52	12/13/2014	Sat.	22:52	Off Road			x	Day	Dry	Failed To Maintain Vehicle	84996817	
53	12/17/2014	Wed.	12:02	Sideswipe			x	Day	Dry	Improper Lane Change	84996828	
54	12/17/2014	Wed.	9:15	Rear End			x	Day	Dry	Careless Driving	84996833	
55	12/31/2014	Wed.	15:44	Rear End			x	Day	Wet	Careless Driving	84996891	

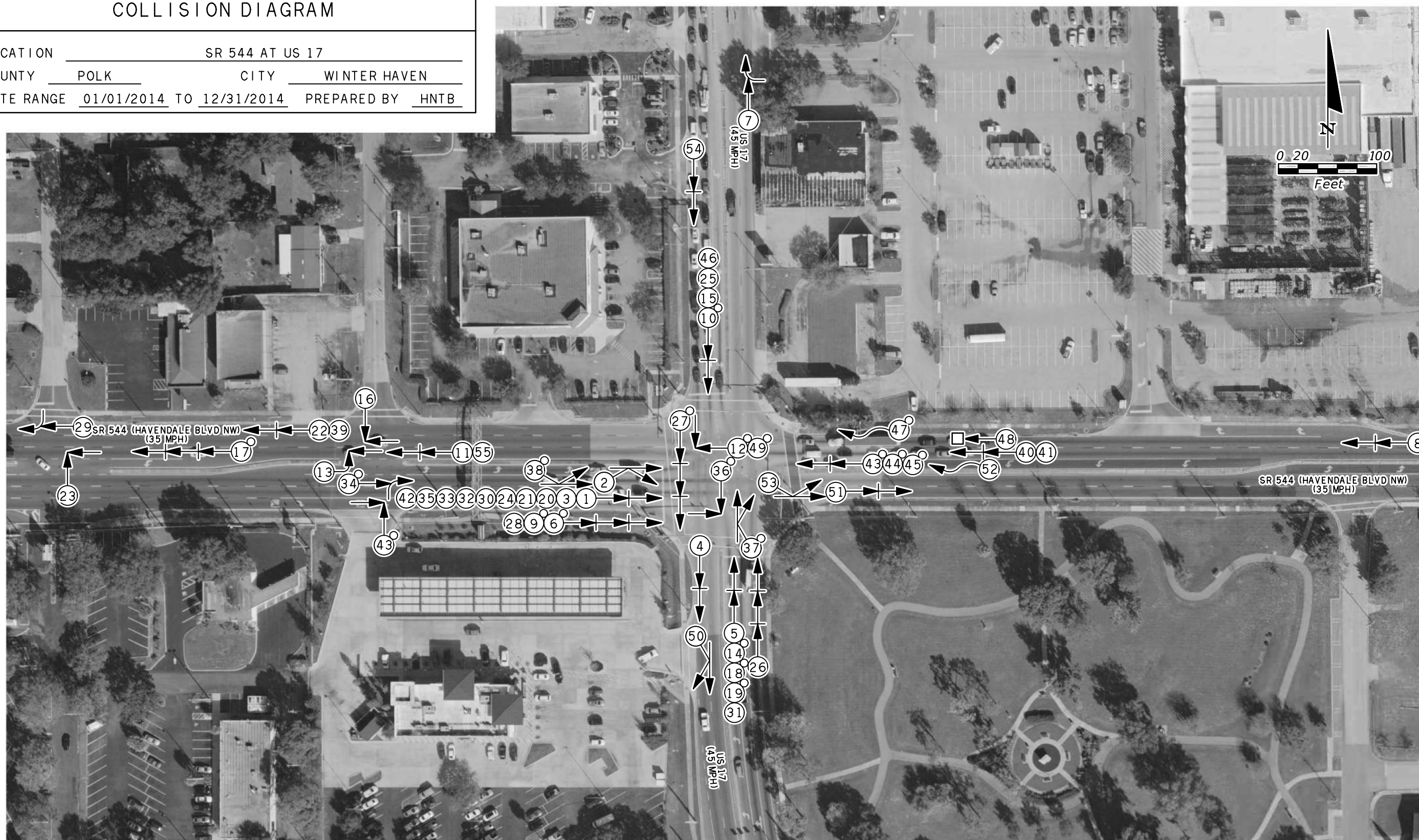
Total No.	Fatal	Injury	Property Damage	Angle	Left Turn	Head On	Right Turn	Rear End	Side Swipe	Collision w/ Sign	Overturned	Collision w/ Pole	Hit Animal	Run Off Road	Other
55	0	17	38	6	1	0	3	37	5	0	0	0	0	2	1
%	0	31	69	11	2	0	5	67	9	0	0	0	0	4	2
One Vehicle	Ped/Bike	Day	Night	Dry	Wet	Careless Driving	FTYRW	Improper Turn	DUI	Improper Lane Change	Disregarded Traffic Signal	Failed to Maintain Vehicle	Improper Load	No Improper Driving	Other
0	0	42	13	48	7	33	8	0	0	2	0	1	0	2	0
0	0	76	24	87	13	60	15	0	0	4	0	2	0	4	0

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COLLISION DIAGRAM

LOCATION SR 544 AT US 17
 COUNTY POLK CITY WINTER HAVEN
 DATE RANGE 01/01/2014 TO 12/31/2014 PREPARED BY HNTB



SHEET
2

SYMBOLS

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> OVERTURNED VEHICLE BACKING VEHICLE OUT OF CONTROL | <ul style="list-style-type: none"> HEAD-ON COLLISION ANGLE COLLISION RIGHT TURN COLLISION | <ul style="list-style-type: none"> COLLISION W/ PED. COLLISION W/ BIKE LEFT TURN COLLISION | <ul style="list-style-type: none"> REAR-END COLLISION SIDE SWIPE PERSONAL INJURY FATALITY |
|--|---|--|---|

CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	30	12	0	42
NIGHTTIME	8	5	0	13
TOTAL	38	17	0	55

COLLISION SUMMARY

Section: _____
 Location: SR 544 at US 17
 Study Period: 1/1/2015 to 12/31/2015
 No. of Years: 1

State Route: SR 544
 M.P.: -
 County: Polk

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
1	1/2/2015	Fri.	15:19	Rear End		x		Day	Dry	Careless Driving	84996898	
2	1/6/2015	Tue.	10:52	Rear End			x	Day	Dry	Followed Too Closely	84996915	Hit and Run
3	1/15/2015	Thu.	6:57	Right Turn			x	Night	Dry	Improper Turn	84996961	
4	1/23/2015	Fri.	14:00	Rear End			x	Day	Dry	Other	84996993	
5	2/6/2015	Fri.	9:20	Rear End		x		Day	Dry	Careless Driving	84997065	
6	2/10/2015	Tue.	14:30	Right Turn			x	Day	Dry	FTYRW	84997076	
7	3/9/2015	Mon.	9:33	Rear End		x		Day	Dry	Careless Driving	84997224	
8	3/19/2015	Thu.	7:14	Rear End			x	Night	Wet	Followed Too Closely	84997273	
9	3/30/2015	Mon.	17:41	Angle			x	Day	Dry	FTYRW	84997339	
10	4/6/2015	Mon.	14:55	Rear End			x	Day	Dry	Careless Driving	84997369	
11	4/11/2015	Sat.	14:39	Angle			x	Day	Dry	FTYRW	84997396	Hit and Run
12	4/14/2015	Tue.	17:40	Left Turn			x	Day	Dry	FTYRW	84997411	
13	4/20/2015	Mon.	7:49	Angle			x	Day	Dry	FTYRW	84997435	
14	4/29/2015	Wed.	9:50	Sideswipe			x	Day	Dry	Improper Lane Change	84997465	
15	4/29/2015	Wed.	14:30	Right Turn			x	Day	Dry	FTYRW	84997467	
16	5/8/2015	Fri.	11:57	Rear End		x		Day	Dry	Careless Driving	84997500	
17	5/8/2015	Fri.	19:10	Sideswipe			x	Night	Wet	Careless Driving	84997499	
18	5/20/2015	Wed.	11:45	Sideswipe			x	Day	Dry	Improper Lane Change	84997556	Hit and Run
19	5/29/2015	Fri.	17:56	Rear End		x		Day	Dry	Careless Driving	84997612	
20	6/1/2015	Mon.	17:15	Sideswipe			x	Day	Wet	Improper Turn	84545409	Hit and Run
21	6/5/2015	Fri.	3:29	Angle			x	Night	Dry	Careless Driving	84997645	WB ran the red, end of phase
22	7/5/2015	Sun.	6:25	Rear End		x		Day	Dry	Careless Driving	84997752	
23	7/6/2015	Mon.	17:39	Rear End		x		Night	Wet	Followed Too Closely	84997755	
24	7/15/2015	Wed.	18:18	Rear End			x	Day	Wet	Careless Driving	84997905	
25	7/27/2015	Mon.	12:00	Angle			x	Day	Dry	Careless Driving	84997835	
26	7/27/2015	Mon.	11:45	Left Turn			x	Night	Wet	FTYRW	84997843	
27	8/4/2015	Tue.	10:45	Pedestrian			x	Day	Dry	No Improper Driving	84998068	
28	8/10/2015	Mon.	13:05	Rear End			x	Day	Dry	Careless Driving	84997891	
29	8/10/2015	Mon.	9:45	Rear End			x	Day	Dry	Careless Driving	84997888	
30	8/27/2015	Thu.	17:38	Rear End			x	Day	Dry	Other	84997966	
31	9/13/2015	Sun.	11:07	Rear End		x		Day	Wet	Careless Driving	84998045	
32	9/29/2015	Tue.	15:10	Rear End		x		Day	Wet	Followed Too Closely	84998115	
33	10/6/2015	Tue.	17:46	Rear End			x	Day	Dry	Careless Driving	84998144	
34	10/8/2015	Thu.	12:48	Bicycle		x		Day	Dry	Disregarded Traffic Signal	84998153	Bicycle Failed to Obey Signal
35	10/13/2015	Tue.	8:51	Left Turn		x		Day	Dry	Disregarded Traffic Signal	84998212	Ran Red Light
36	10/15/2015	Thu.	11:30	Rear End			x	Day	Dry	Careless Driving	84998182	

COLLISION SUMMARY

Section: _____
 Location: SR 544 at US 17
 Study Period: 1/1/2015 to 12/31/2015
 No. of Years: 1

State Route: SR 544
 M.P.: -
 County: Polk

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/ Night	Wet/ Dry	Contributing Cause	Crash Report Number	Comments
37	10/22/2015	Thu.	14:15	Right Turn		x		Day	Dry	FTYRW	84998220	
38	10/22/2015	Thu.	7:46	Angle		x		Night	Wet	Careless Driving	84998223	
39	10/24/2015	Sat.	8:40	Rear End			x	Day	Dry	Careless Driving	84998228	
40	10/27/2015	Tue.	8:40	Sideswipe			x	Night	Wet	Improper Lane Change	84998248	
41	11/11/2015	Wed.	16:24	Rear End			x	Day	Dry	Careless Driving	84998320	
42	11/11/2015	Wed.	6:15	Left Turn		x		Night	Dry	FTYRW	84998319	
43	11/29/2015	Sun.	0:30	Rear End			x	Night	Dry	Careless Driving	84998405	DUI
44	12/3/2015	Thu.	15:49	Rear End			x	Night	Wet	Followed Too Closely	84998410	
45	12/18/2015	Fri.	8:29	Rear End			x	Day	Wet	Careless Driving	84998495	
46	12/27/2015	Sun.	18:46	Rear End			x	Night	Wet	Careless Driving	84998534	
47	12/31/2015	Thu.	18:23	Rear End			x	Night	Dry	Careless Driving	84998555	

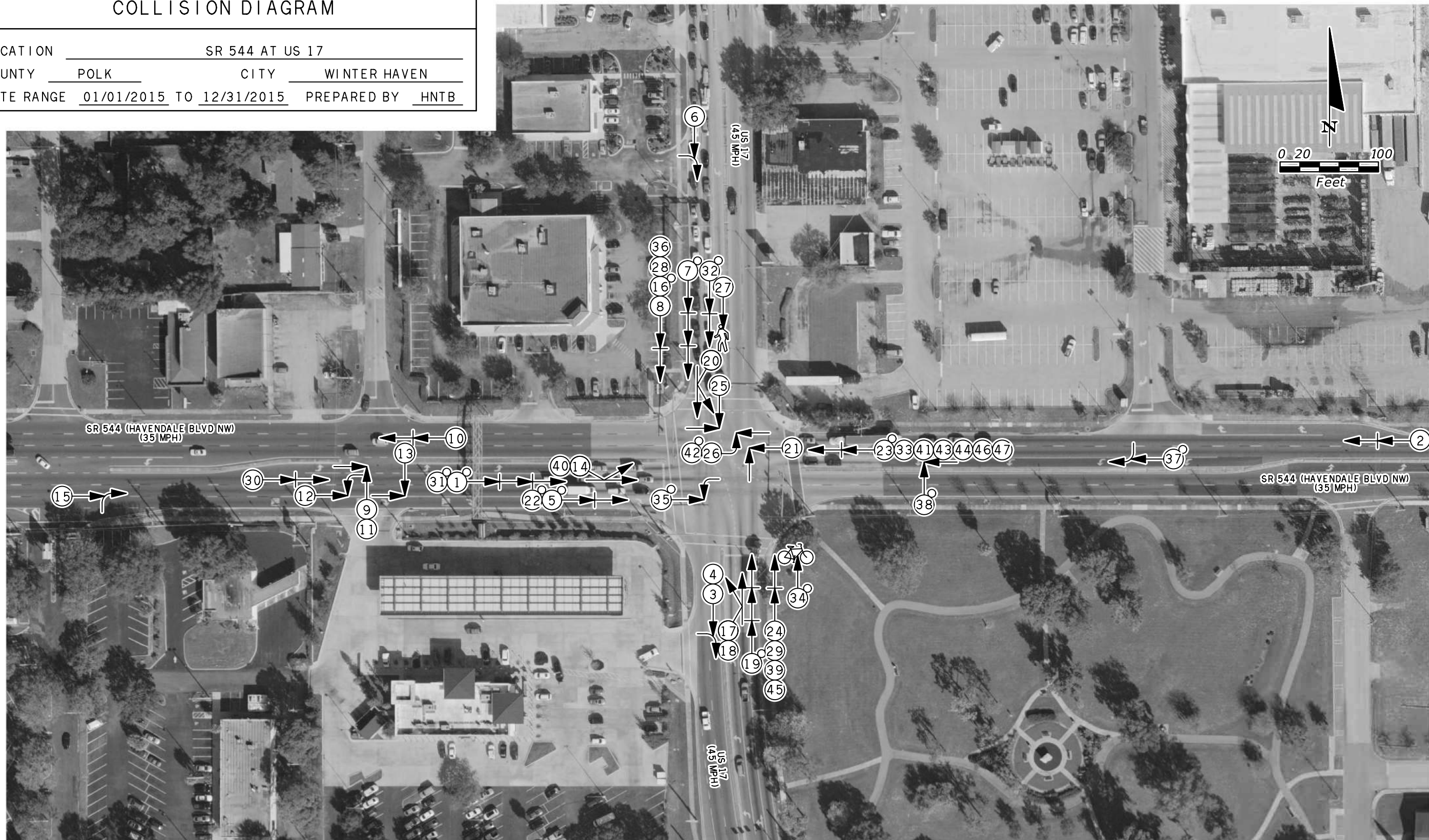
Total No.	Fatal	Injury	Property Damage	Angle	Left Turn	Head On	Right Turn	Rear End	Side Swipe	Collision w/ Sign	Overturned	Collision w/ Pole	Hit Animal	Run Off Road	Other
47	0	14	33	6	4	0	4	26	5	0	0	0	0	0	0
%	0	30	70	13	9	0	9	55	11	0	0	0	0	0	0
One Vehicle	Ped/ Bike	Day	Night	Dry	Wet	Careless Driving	FTYRW	Improper Turn	DUI	Improper Lane Change	Disregarded Traffic Signal	Failed to Maintain Vehicle	Improper Load	No Improper Driving	Other
0	2	34	13	34	13	23	9	2	0	3	2	0	0	1	2
0	4	72	28	72	28	49	19	4	0	6	4	0	0	2	4

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COLLISION DIAGRAM

LOCATION SR 544 AT US 17
 COUNTY POLK CITY WINTER HAVEN
 DATE RANGE 01/01/2015 TO 12/31/2015 PREPARED BY HNTB



SHEET
3

SYMBOLS

- | | | | | | | | |
|--|--------------------|--|----------------------|--|---------------------|--|--------------------|
| | OVERTURNED VEHICLE | | HEAD-ON COLLISION | | COLLISION W/ PED. | | REAR-END COLLISION |
| | BACKING VEHICLE | | ANGLE COLLISION | | COLLISION W/ BIKE | | SIDE SWIPE |
| | OUT OF CONTROL | | RIGHT TURN COLLISION | | LEFT TURN COLLISION | | PERSONAL INJURY |
| | | | | | | | FATALITY |

CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	23	11	0	34
NIGHTTIME	10	3	0	13
TOTAL	33	14	0	47

COLLISION SUMMARY

Section: _____
 Location: SR 544 at US 17
 Study Period: 1/1/2016 to 12/31/2016
 No. of Years: 1

State Route: SR 544
 M.P.: -
 County: Polk

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
1	1/22/2016	Fri.	11:24	Rear End			x	Day	Dry	Followed Too Closely	84998682	
2	2/6/2016	Sat.	15:01	Rear End			x	Day	Wet	Followed Too Closely	86440059	
3	2/23/2016	Tue.	7:50	Rear End			x	Day	Dry	Careless Driving	86440127	
4	3/14/2016	Mon.	10:20	Sideswipe			x	Day	Dry	FTYRW	86440237	
5	3/14/2016	Mon.	15:35	Rear End		x		Day	Dry	Followed Too Closely	86440235	
6	3/17/2016	Thu.	9:10	Rear End			x	Day	Dry	Careless Driving	86440251	
7	3/21/2016	Mon.	6:00	Rear End			x	Night	Dry	Careless Driving	86440412	
8	3/24/2016	Thu.	15:02	Rear End		x		Day	Dry	Followed Too Closely	86440293	
9	3/31/2016	Thu.	14:20	Sideswipe			x	Day	Dry	Improper Lane Change	86440331	
10	3/31/2016	Thu.	8:15	Rear End			x	Day	Dry	Careless Driving	86440326	
11	4/5/2016	Tue.	7:45	Rear End			x	Day	Dry	Followed Too Closely	86440357	
12	4/6/2016	Wed.	12:40	Angle		x		Day	Dry	FTYRW	86440354	
13	4/6/2016	Wed.	15:05	Sideswipe			x	Day	Dry	Improper Lane Change	86440367	
14	4/7/2016	Thu.	7:55	Rear End			x	Day	Dry	Careless Driving	86440363	
15	4/13/2016	Wed.	9:30	Sideswipe			x	Day	Dry	Careless Driving	86440404	
16	4/18/2016	Mon.	13:30	Sideswipe			x	Day	Dry	Improper Lane Change	86440431	
17	5/5/2016	Thu.	12:15	Angle			x	Day	Dry	FTYRW	86440551	
18	6/10/2016	Fri.	14:07	Pedestrian		x		Day	Dry	FTYRW	86440687	
19	6/20/2016	Mon.	13:10	Angle			x	Day	Dry	FTYRW	86440730	
20	6/22/2016	Wed.	12:56	Rear End		x		Day	Dry	Followed Too Closely	86440751	
21	6/23/2016	Thu.	15:59	Left Turn			x	Day	Dry	FTYRW	86440761	
22	7/22/2016	Fri.	18:06	Unknown			x	Night	Wet	Careless Driving	86440877	
23	7/25/2016	Mon.	15:12	Rear End	x			Day	Dry	Other	86440890	
24	7/27/2016	Wed.	13:00	Sideswipe			x	Day	Dry	No Improper Driving	86440892	Hit and Run
25	7/29/2016	Fri.	8:10	Sideswipe			x	Day	Dry	Improper Lane Change	86440901	
26	8/12/2016	Fri.	7:55	Rear End			x	Day	Dry	Careless Driving	86440972	
27	8/17/2016	Wed.	22:09	Right Turn			x	Night	Dry	Improper Lane Change	86440984	
28	8/21/2016	Sun.	12:06	Rear End			x	Night	Wet	Followed Too Closely	86441005	
29	8/25/2016	Thu.	14:47	Rear End			x	Day	Dry	Other	86441039	Hit and Run
30	8/28/2016	Sun.	22:02	Rear End		x		Night	Dry	Followed Too Closely	86441054	
31	8/29/2016	Mon.	11:30	Rear End			x	Day	Wet	Careless Driving	86441044	
32	9/2/2016	Fri.	14:00	Angle			x	Day	Dry	FTYRW	86441068	
33	9/2/2016	Fri.	8:25	Rear End			x	Day	Wet	Careless Driving	86441067	
34	9/17/2016	Sat.	8:25	Sideswipe			x	Day	Dry	Improper Lane Change	86441123	
35	9/20/2016	Tue.	14:50	Sideswipe			x	Day	Dry	Improper Lane Change	86441148	
36	9/22/2016	Thu.	16:02	Sideswipe			x	Day	Dry	Careless Driving	86441171	

COLLISION SUMMARY

Section: _____
 Location: SR 544 at US 17
 Study Period: 1/1/2016 to 12/31/2016
 No. of Years: 1

State Route: SR 544
 M.P.: -
 County: Polk

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
37	9/23/2016	Fri.	17:45	Rear End			x	Day	Dry	Followed Too Closely	86441167	
38	10/6/2016	Thu.	12:00	Rear End			x	Night	Wet	Careless Driving	86441238	
39	10/19/2016	Wed.	7:55	Right Turn			x	Day	Dry	FTYRW	86441296	
40	11/3/2016	Thu.	19:12	Angle		x		Night	Dry	FTYRW	86441370	
41	11/4/2016	Fri.	18:20	Rear End			x	Day	Dry	No Improper Driving	86441374	Hit and Run
42	11/17/2016	Thu.	17:48	Rear End			x	Night	Wet	Careless Driving	86441442	
43	11/23/2016	Wed.	21:39	Right Turn			x	Night	Dry	FTYRW	86441449	
44	12/1/2016	Thu.	7:39	Rear End			x	Day	Wet	Followed Too Closely	86441480	
45	12/6/2016	Tue.	17:19	Left Turn			x	Day	Dry	FTYRW	86441537	
46	12/12/2016	Mon.	9:51	Left Turn		x		Day	Dry	FTYRW	86441576	southbound ran the red
47	12/25/2016	Sun.	15:39	Sideswipe		x		Day	Dry	Improper Lane Change	86441606	
48	12/30/2016	Fri.	11:58	Off Road			x	Day	Dry	Careless Driving	86441623	
49	12/31/2016	Sat.	8:17	Backed Into			x	Day	Dry	Improper Backing	86441636	

Total No.	Fatal	Injury	Property Damage	Angle	Left Turn	Head On	Right Turn	Rear End	Side Swipe	Collision w/ Sign	Overtuned	Collision w/ Pole	Hit Animal	Run Off Road	Other
49	1	9	39	5	3	0	3	23	11	0	0	0	0	1	0
%	2	18	80	10	6	0	6	47	22	0	0	0	0	2	0
One Vehicle	Ped/Bike	Day	Night	Dry	Wet	Careless Driving	FTYRW	Improper Turn	DUI	Improper Lane Change	Disregarded Traffic Signal	Failed to Maintain Vehicle	Improper Load	No Improper Driving	Other
0	1	40	9	41	8	14	12	0	0	8	0	0	0	2	2
0	2	82	18	84	16	29	24	0	0	16	0	0	0	4	4

Notice:

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COLLISION DIAGRAM

LOCATION SR 544 AT US 17
 COUNTY POLK CITY WINTER HAVEN
 DATE RANGE 01/01/2016 TO 12/31/2016 PREPARED BY HNTB



SHEET
4

SYMBOLS

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> OVERTURNED VEHICLE BACKING VEHICLE OUT OF CONTROL | <ul style="list-style-type: none"> HEAD-ON COLLISION ANGLE COLLISION RIGHT TURN COLLISION | <ul style="list-style-type: none"> COLLISION W/ PED. COLLISION W/ BIKE LEFT TURN COLLISION | <ul style="list-style-type: none"> REAR-END COLLISION SIDE SWIPE PERSONAL INJURY FATALITY |
|--|---|--|---|

CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	32	7	1	40
NIGHTTIME	7	2	0	9
TOTAL	39	9	1	49

COLLISION SUMMARY

Section: _____
 Location: SR 544 at US 17
 Study Period: 1/1/2017 to 12/31/2017
 No. of Years: 1

State Route: _____
 M.P.: _____
 County: _____

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
1	1/5/2017	Thu.	20:50	Sideswipe			x	Night	Dry	Improper Lane Change	86441666	
2	1/7/2017	Sat.	14:05	Rear End		x		Day	Wet	Careless Driving	86441656	
3	1/21/2017	Sat.	7:57	Sideswipe			x	Day	Dry	Improper Lane Change	86441722	
4	1/22/2017	Sun.	9:42	Right Turn			x	Day	Dry	Followed Too Closely	86441744	
5	1/27/2017	Fri.	13:46	Sideswipe			x	Day	Dry	Improper Turn	86441758	
6	1/31/2017	Tue.	16:16	Rear End			x	Day	Dry	Careless Driving	86441774	
7	2/3/2017	Fri.	7:40	Sideswipe			x	Day	Dry	Improper Lane Change	86441779	
8	2/15/2017	Wed.	12:45	Sideswipe		x		Day	Dry	FTYRW	86441850	
9	2/19/2017	Sun.	14:00	Rear End		x		Day	Dry	Careless Driving	86441892	Hit and Run
10	2/22/2017	Wed.	13:56	Rear End		x		Day	Wet	Careless Driving	86441893	
11	3/1/2017	Wed.	7:50	Rear End			x	Day	Dry	Careless Driving	86441932	
12	3/4/2017	Sat.	13:27	Sideswipe			x	Day	Dry	Careless Driving	86441950	
13	3/8/2017	Wed.	18:15	Rear End			x	Night	Dry	Careless Driving	86441968	
14	3/15/2017	Wed.	9:50	Left Turn			x	Day	Dry	FTYRW	86993367	
15	3/21/2017	Tue.	12:40	Sideswipe			x	Day	Dry	Careless Driving	86993402	
16	3/28/2017	Tue.	13:57	Right Turn			x	Day	Dry	FTYRW	86993454	
17	3/28/2017	Tue.	9:21	Rear End			x	Day	Dry	Followed Too Closely	86993432	
18	4/1/2017	Sat.	2:21	Angle		x		Night	Dry	Disregarded Traffic Signal	86993462	
19	4/28/2017	Fri.	14:53	Bicycle		x		Day	Dry	FTYRW	86993624	
20	5/2/2017	Tue.	11:23	Rear End			x	Day	Dry	Followed Too Closely	86993615	
21	5/12/2017	Fri.	18:30	Left Turn		x		Day	Dry	FTYRW	86993710	
22	5/17/2017	Wed.	17:40	Rear End			x	Day	Dry	Careless Driving	86993719	
23	5/30/2017	Tue.	16:41	Rear End			x	Day	Dry	Followed Too Closely	86993791	
24	6/6/2017	Tue.	16:21	Rear End		x		Day	Dry	Followed Too Closely	86993839	
25	6/14/2017	Wed.	21:15	Sideswipe			x	Night	Wet	FTYRW	86993866	
26	6/21/2017	Wed.	18:48	Right Turn			x	Day	Dry	Careless Driving	86993902	
27	6/26/2017	Mon.	9:40	Rear End			x	Day	Dry	Careless Driving	86993923	
28	6/29/2017	Thu.	17:50	Left Turn			x	Night	Dry	FTYRW	86993928	
29	7/13/2017	Thu.	14:19	Sideswipe			x	Day	Dry	FTYRW	86993999	
30	7/24/2017	Mon.	13:44	Right Turn			x	Day	Dry	FTYRW	86994050	
31	7/28/2017	Fri.	12:19	Rear End			x	Day	Dry	Careless Driving	86994072	
32	7/31/2017	Mon.	18:09	Sideswipe			x	Day	Dry	Careless Driving	86994087	
33	8/8/2017	Tue.	13:42	Sideswipe			x	Day	Dry	FTYRW	86994112	
34	8/10/2017	Thu.	8:30	Rear End			x	Day	Dry	Followed Too Closely	86994140	
35	8/14/2017	Mon.	14:18	Rear End			x	Day	Wet	Followed Too Closely	86994146	
36	8/15/2017	Tue.	17:15	Rear End			x	Day	Dry	Followed Too Closely	86994155	

COLLISION SUMMARY

Section: _____
 Location: SR 544 at US 17
 Study Period: 1/1/2017 to 12/31/2017
 No. of Years: 1

State Route: _____
 M.P.: _____
 County: _____
 Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
37	8/21/2017	Mon.	14:05	Angle			x	Day	Dry	FTYRW	86994189	
38	8/24/2017	Thu.	7:26	Left Turn		x		Day	Dry	FTYRW	86994203	
39	8/26/2017	Sat.	20:14	Rear End		x		Night	Wet	Careless Driving	86994207	
40	9/1/2017	Fri.	9:50	Right Turn			x	Day	Dry	FTYRW	86994234	
41	9/6/2017	Wed.	12:27	Rear End			x	Day	Wet	Careless Driving	86994252	
42	9/14/2017	Thu.	18:15	Sideswipe			x	Night	Dry	Improper Turn	86994338	
43	9/18/2017	Mon.	11:59	Left Turn		x		Day	Dry	FTYRW	86994321	
44	9/20/2017	Wed.	20:38	Sideswipe			x	Night	Dry	Improper Lane Change	86994331	
45	9/21/2017	Thu.	11:35	Rear End			x	Day	Dry	Followed Too Closely	86994336	
46	9/29/2017	Fri.	13:12	Sideswipe			x	Day	Dry	Improper Lane Change	87549135	
47	9/30/2017	Sat.	18:54	Rear End			x	Night	Wet	Followed Too Closely	87549124	
48	10/6/2017	Fri.	6:47	Sideswipe			x	Night	Dry	Careless Driving	87549152	
49	10/9/2017	Mon.	18:47	Off Road			x	Day	Dry	Careless Driving	87549176	
50	11/16/2017	Thu.	14:25	Sideswipe			x	Day	Dry	FTYRW	87549347	
51	11/20/2017	Mon.	17:20	Sideswipe			x	Night	Dry	Improper Lane Change	87549368	
52	12/1/2017	Fri.	20:58	Rear End			x	Night	Dry	DUI	87549423	
53	12/8/2017	Fri.	14:53	Sideswipe			x	Day	Dry	Improper Lane Change	87549450	
54	12/9/2017	Sat.	10:16	Rear End			x	Day	Dry	Careless Driving	87549459	
55	12/13/2017	Wed.	18:11	Rear End			x	Night	Dry	Followed Too Closely	87549490	
56	12/14/2017	Thu.	8:05	Rear End			x	Day	Dry	Followed Too Closely	87549496	
57	12/18/2017	Mon.	13:09	Rear End			x	Day	Dry	Followed Too Closely	87549504	
58	12/18/2017	Mon.	6:46	Sideswipe			x	Day	Dry	Careless Driving	87549507	
59	12/19/2017	Tue.	10:15	Rear End			x	Day	Dry	Followed Too Closely	87549515	
60	12/20/2017	Wed.	16:45	Head On			x	Day	Dry	Drove Left Of Center	87549518	
61	12/21/2017	Thu.	5:34	Head On		x		Night	Dry	Driving Wrong Side/Way	87549558	

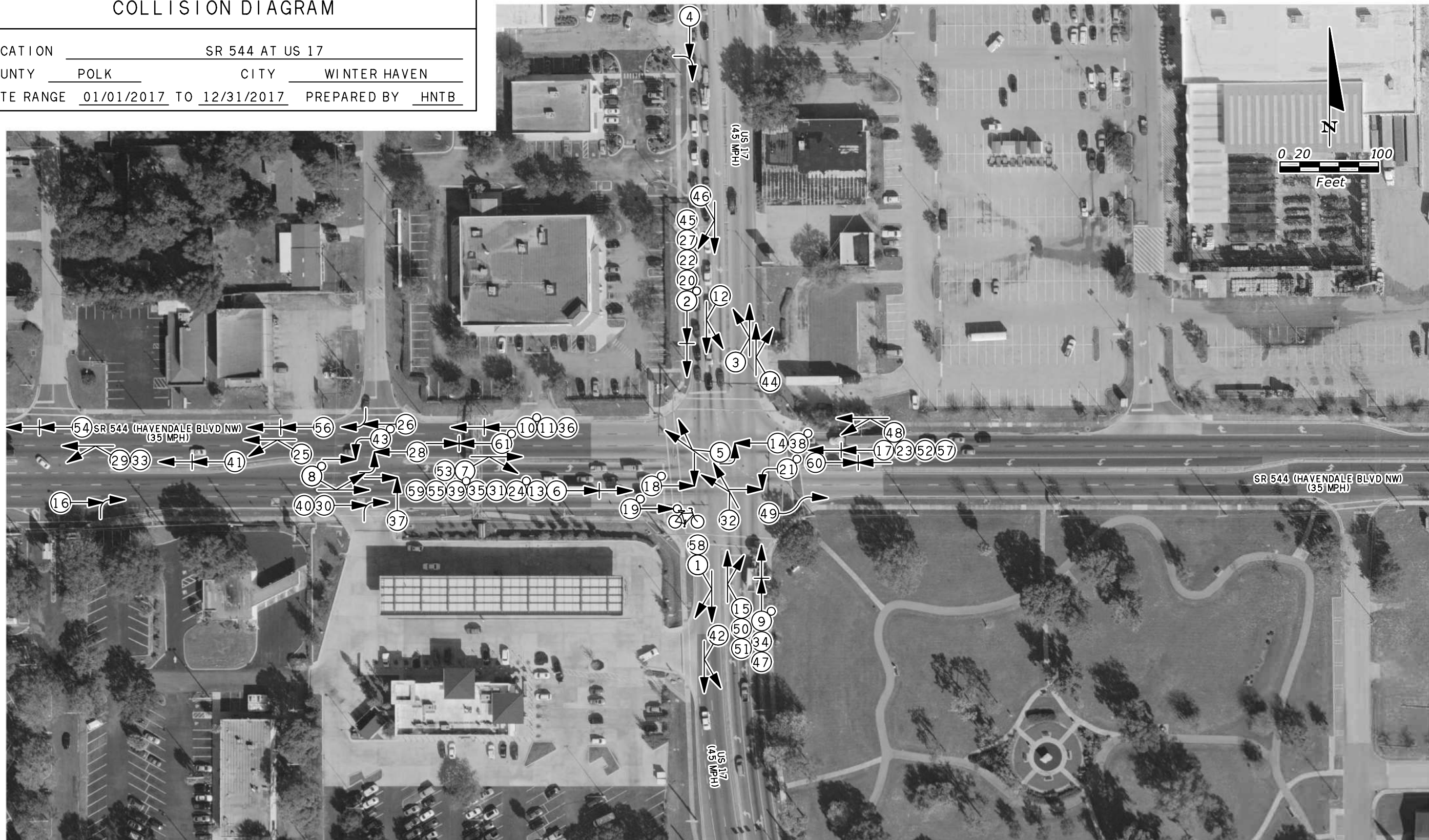
Total No.	Fatal	Injury	Property Damage	Angle	Left Turn	Head On	Ran Into Ditch	Rear End	Side Swipe	Collision w/ Sign	Overturned	Collision w/ Pole	Hit Animal	Run Off Road	Other
61	0	12	49	2	5	2	0	26	19	0	0	0	0	1	0
%	0	20	80	3	8	3	0	43	31	0	0	0	0	2	0
One Vehicle	Ped/Bike	Day	Night	Dry	Wet	Careless Driving	FTYRW	Improper Turn	DUI	Improper Lane Change	Disregarded Traffic Signal	Failed to Maintain Vehicle	Improper Load	No Improper Driving	Other
0	0	47	14	54	7	19	15	2	1	7	1	0	0	0	0
0	0	77	23	89	11	31	25	3	2	11	2	0	0	0	0

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COLLISION DIAGRAM

LOCATION SR 544 AT US 17
 COUNTY POLK CITY WINTER HAVEN
 DATE RANGE 01/01/2017 TO 12/31/2017 PREPARED BY HNTB



SHEET
5

SYMBOLS

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> OVERTURNED VEHICLE BACKING VEHICLE OUT OF CONTROL | <ul style="list-style-type: none"> HEAD-ON COLLISION ANGLE COLLISION RIGHT TURN COLLISION | <ul style="list-style-type: none"> COLLISION W/ PED. COLLISION W/ BIKE LEFT TURN COLLISION | <ul style="list-style-type: none"> REAR-END COLLISION SIDE SWIPE PERSONAL INJURY FATALITY |
|--|---|--|---|

CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	38	9	0	47
NIGHTTIME	11	3	0	14
TOTAL	49	12	0	61



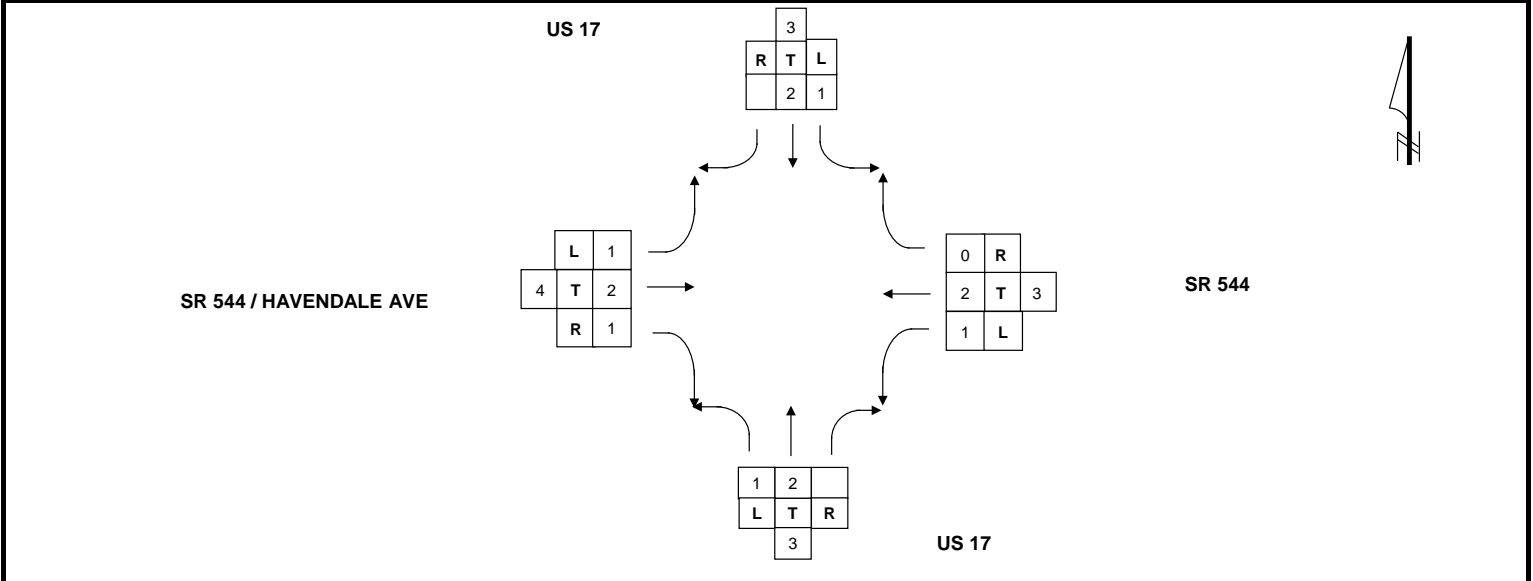
APPENDIX D: TURNING MOVEMENT COUNT DATA

FLORIDA DEPARTMENT OF TRANSPORTATION

SUMMARY OF VEHICLE MOVEMENTS

SECTION: N/A CITY: WINTER HAVEN COUNTY: POLK
 INTR ROUTE: SR 544 / HAVENDALE AVE STATE ROUTE: US 17
 OBSERVER: Video Cam2 DATE: 09/17/19
 WEATHER: SUNNY - CLEAR ROAD CONDITION: GOOD - DRY
 REMARKS:

FORM COMPLETED BY: TM DATE: 09/05/19



TIME	NORTHBOUND					SOUTHBOUND					TOTAL	EASTBOUND					WESTBOUND					TOTAL
	BEGIN/END	L	T	R	U	TOT	L	T	R	U		TOT	N/S	L	T	R	U	TOT	L	T	R	
7 - 8	199	330	35	0	564	222	583	52	1	858	1,422	118	463	306	1	888	102	525	130	0	757	1,645
8 - 9	218	315	28	0	561	236	552	54	2	844	1,405	140	416	316	3	875	103	496	115	0	714	1,589
9 - 10	260	372	22	0	654	206	444	62	12	724	1,378	138	424	320	1	883	105	431	113	0	649	1,532
11 - 12	309	421	56	0	786	127	468	84	0	679	1,465	154	446	312	1	913	110	511	142	1	764	1,677
12 - 1	360	465	58	1	884	145	523	62	0	730	1,614	206	509	312	4	1,031	130	517	114	0	761	1,792
3 - 4	336	530	64	0	930	202	502	67	1	772	1,702	155	529	299	0	983	93	509	151	2	755	1,738
4 - 5	338	538	55	0	931	204	555	70	1	830	1,761	164	555	276	0	995	111	545	145	0	801	1,796
5 - 6	326	626	79	0	1,031	273	586	60	1	920	1,951	170	739	334	0	1,243	103	591	138	3	835	2,078
TOTAL	2,346	3,597	397	1	6,341	1,615	4,213	511	18	6,357	12,698	1,245	4,081	2,475	10	7,811	857	4,125	1,048	6	6,036	13,847

TURNING MOVEMENT COUNT: SR 544 @ US 17
 EAST/WEST ST: SR 544
 DATE: 9/17/2019
 ALL VEHICLES

TIME: 7am-6pm
 NORTH/SOUTH ST: US 17
 COUNTED BY: Video Cam2

START TIME	NORTHBOUND					SOUTHBOUND					NS TOTAL	EASTBOUND					WESTBOUND					EW TOTAL	GRAND TOTAL
	LEFT	THRU	RIGHT	U-TURN	TOTAL	LEFT	THRU	RIGHT	U-TURN	TOTAL		LEFT	THRU	RIGHT	U-TURN	TOTAL	LEFT	THRU	RIGHT	U-TURN	TOTAL		
7:00	42	76	11	0	129	30	100	11	0	141	270	27	98	60	0	185	27	114	22	0	163	348	618
7:15	39	74	7	0	120	47	149	12	0	208	328	23	101	55	1	180	19	149	35	0	203	383	711
7:30	49	79	8	0	136	59	143	14	0	216	352	34	129	93	0	256	34	152	30	0	216	472	824
7:45	69	101	9	0	179	86	191	15	1	293	472	34	135	98	0	267	22	110	43	0	175	442	914
Total	199	330	35	0	564	222	583	52	1	858	1,422	118	463	306	1	888	102	525	130	0	757	1,645	3,067
8:00	50	88	4	0	142	65	146	5	0	216	358	36	107	85	0	228	28	110	36	0	174	402	760
8:15	50	80	9	0	139	52	132	20	0	204	343	27	91	82	1	201	25	134	28	0	187	388	731
8:30	55	90	10	0	155	54	132	13	0	199	354	38	113	87	1	239	23	137	32	0	192	431	785
8:45	63	57	5	0	125	65	142	16	2	225	350	39	105	62	1	207	27	115	19	0	161	368	718
Total	218	315	28	0	561	236	552	54	2	844	1,405	140	416	316	3	875	103	496	115	0	714	1,589	2,994
9:00	58	71	3	0	132	48	106	20	3	177	309	31	125	77	0	233	25	104	22	0	151	384	693
9:15	69	102	4	0	175	61	91	18	9	179	354	38	96	75	0	209	28	112	34	0	174	383	737
9:30	70	110	9	0	189	42	125	11	0	178	367	34	96	81	0	211	20	108	36	0	164	375	742
9:45	63	89	6	0	158	55	122	13	0	190	348	35	107	87	1	230	32	107	21	0	160	390	738
Total	260	372	22	0	654	206	444	62	12	724	1,378	138	424	320	1	883	105	431	113	0	649	1,532	2,910
11:00	73	87	12	0	172	33	107	27	0	167	339	36	117	83	0	236	34	133	22	0	189	425	764
11:15	79	99	15	0	193	33	109	12	0	154	347	42	96	65	1	204	23	125	38	1	187	391	738
11:30	77	118	15	0	210	27	127	28	0	182	392	36	101	76	0	213	28	111	40	0	179	392	784
11:45	80	117	14	0	211	34	125	17	0	176	387	40	132	88	0	260	25	142	42	0	209	469	856
Total	309	421	56	0	786	127	468	84	0	679	1,465	154	446	312	1	913	110	511	142	1	764	1,677	3,142
12:00	92	118	12	1	223	40	153	22	0	215	438	55	119	81	2	257	29	107	30	0	166	423	861
12:15	74	109	13	0	196	40	107	14	0	161	357	49	142	95	0	286	38	162	27	0	227	513	870
12:30	103	112	18	0	233	25	137	10	0	172	405	47	124	72	0	243	27	125	25	0	177	420	825
12:45	91	126	15	0	232	40	126	16	0	182	414	55	124	64	2	245	36	123	32	0	191	436	850
Total	360	465	58	1	884	145	523	62	0	730	1,614	206	509	312	4	1,031	130	517	114	0	761	1,792	3,406
15:00	80	140	22	0	242	55	121	15	1	192	434	30	133	71	0	234	24	125	52	1	202	436	870
15:15	87	145	16	0	248	32	137	19	0	188	436	32	113	90	0	235	25	112	24	1	162	397	833
15:30	95	138	12	0	245	68	141	15	0	224	469	39	139	86	0	264	21	116	41	0	178	442	911
15:45	74	107	14	0	195	47	103	18	0	168	363	54	144	52	0	250	23	156	34	0	213	463	826
Total	336	530	64	0	930	202	502	67	1	772	1,702	155	529	299	0	983	93	509	151	2	755	1,738	3,440
16:00	99	146	14	0	259	40	123	16	1	180	439	40	142	70	0	252	29	134	33	0	196	448	887
16:15	63	127	17	0	207	56	168	15	0	239	446	37	113	66	0	216	25	133	36	0	194	410	856
16:30	81	115	11	0	207	52	138	21	0	211	418	46	143	71	0	260	31	120	35	0	186	446	864
16:45	95	150	13	0	258	56	126	18	0	200	458	41	157	69	0	267	26	158	41	0	225	492	950
Total	338	538	55	0	931	204	555	70	1	830	1,761	164	555	276	0	995	111	545	145	0	801	1,796	3,557
17:00	96	163	11	0	270	73	147	16	0	236	506	34	195	87	0	316	31	146	43	2	222	538	1,044
17:15	94	179	10	0	283	55	154	21	0	230	513	49	196	110	0	355	16	155	39	1	211	566	1,079
17:30	80	161	27	0	268	72	146	15	0	233	501	38	173	93	0	304	26	155	29	0	210	514	1,015
17:45	56	123	31	0	210	73	139	8	1	221	431	49	175	44	0	268	30	135	27	0	192	460	891
Total	326	626	79	0	1,031	273	586	60	1	920	1,951	170	739	334	0	1,243	103	591	138	3	835	2,078	4,029

FLORIDA DEPARTMENT OF TRANSPORTATION

PEDESTRIAN MOVEMENT SUMMARY

SECTION: N/A
 INTER. ROUTE: SR 544 / HAVENDALE AVE
 OBSERVER: Video Cam2

CITY: WINTER HAVEN
 STATE ROUTE: US 17
 DATE: 09/17/19

COUNTY: POLK

REMARKS: _____

FORM COMPLETED BY: TM

DATE: 09/05/19

US 17



	7-8	8-9	9-10	11-12	12-1	3-4	4-5	5-6	Total
	0	0	0	0	1	0	0	0	1
	0	0	0	1	0	0	0	0	1
	1	1	2	0	0	0	1	1	6
	0	0	0	1	0	0	0	0	1
Total	1	1	2	2	1	0	1	1	9

	7-8	8-9	9-10	11-12	12-1	3-4	4-5	5-6	Total
	0	0	1	0	1	0	0	0	2
	0	0	0	0	0	0	0	0	0
	0	0	4	0	0	0	0	0	4
	1	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	2
	0	0	2	0	0	0	0	0	2
Total	3	0	7	0	0	0	0	0	10

SR 544 / HAVENDALE AVE

	7-8	8-9	9-10	11-12	12-1	3-4	4-5	5-6	Total
	0	0	0	0	0	0	0	0	0
	1	1	0	0	0	0	0	0	2
	3	0	0	0	0	0	0	0	3
	0	0	0	0	0	0	0	0	0
	0	0	2	0	0	0	0	0	2
	0	0	0	0	0	0	0	0	0
	1	0	0	1	0	0	0	0	2
	0	0	1	1	0	0	0	0	2
Total	5	1	3	2	0	0	0	0	11

	7-8	8-9	9-10	11-12	12-1	3-4	4-5	5-6	Total
	0	2	1	0	3	0	0	0	6
	3	0	0	0	0	0	0	1	4
	0	0	0	4	5	0	2	1	12
	0	1	0	0	0	1	0	1	3
Total	3	3	1	4	8	1	2	3	25

US 17

Cars

Street Name	SB (US 17)				WB (SR 544)				NB (US 17)				EB (SR 544)			
	Start Time	Left	Thru	Right	U Turn	Left	Thru	Right	U Turn	Left	Thru	Right	U Turn	Left	Thru	Right
7:00	29	92	11	0	27	113	22	0	41	71	10	0	26	90	60	0
7:15	44	145	12	0	19	143	32	0	38	71	7	0	23	94	55	1
7:30	59	139	13	0	34	146	29	0	49	72	7	0	34	124	92	0
7:45	85	180	15	1	21	106	42	0	67	96	8	0	33	128	97	0
8:00	65	143	5	0	26	104	34	0	50	80	4	0	34	99	84	0
8:15	49	128	18	0	25	126	28	0	48	77	8	0	27	85	80	1
8:30	53	127	12	0	22	128	30	0	55	81	10	0	37	105	83	1
8:45	62	134	16	2	26	107	18	0	63	52	5	0	39	94	60	1
9:00	48	100	20	3	24	96	21	0	57	64	2	0	29	115	75	0
9:15	58	87	15	9	26	106	32	0	66	95	4	0	38	91	71	0
9:30	41	112	10	0	20	100	36	0	68	98	9	0	33	87	78	0
9:45	52	111	13	0	30	98	18	0	63	83	4	0	34	101	84	1
11:00	30	103	27	0	34	123	20	0	73	77	11	0	33	109	83	0
11:15	32	103	12	0	22	117	37	0	76	96	15	0	41	89	64	1
11:30	25	123	28	0	28	106	37	0	75	110	14	0	35	96	75	0
11:45	34	120	16	0	24	137	40	0	80	110	12	0	36	122	84	0
12:00	37	142	21	0	28	100	29	0	90	111	11	1	52	115	80	2
12:15	40	104	12	0	38	152	27	0	71	106	12	0	47	140	95	0
12:30	24	123	10	0	27	114	23	0	102	105	17	0	47	114	70	0
12:45	36	120	15	0	36	114	30	0	90	114	14	0	52	115	61	2
15:00	55	117	15	1	23	115	51	1	76	135	22	0	29	123	68	0
15:15	31	134	19	0	23	101	24	1	83	136	15	0	32	107	89	0
15:30	67	137	15	0	21	110	40	0	94	131	12	0	39	127	85	0
15:45	46	99	17	0	22	146	34	0	74	103	13	0	52	136	50	0
16:00	37	117	16	1	27	127	31	0	96	143	14	0	40	136	67	0
16:15	55	162	15	0	24	130	33	0	62	122	17	0	35	109	64	0
16:30	51	133	20	0	29	116	35	0	81	112	11	0	46	139	71	0
16:45	55	126	18	0	25	149	39	0	94	145	13	0	39	151	69	0
17:00	72	142	16	0	31	145	40	2	96	162	9	0	34	191	86	0
17:15	53	149	21	0	16	152	39	1	90	174	9	0	47	195	109	0
17:30	69	143	15	0	25	148	28	0	80	155	27	0	36	169	91	0
17:45	70	134	8	1	30	131	26	0	55	118	29	0	49	172	44	0

Trucks

Street Name	SB (US 17)				WB (SR 544)				NB (US 17)				EB (SR 544)			
	Start Time	Left	Thru	Right	U Turn	Left	Thru	Right	U Turn	Left	Thru	Right	U Turn	Left	Thru	Right
7:00	1	8	0	0	0	1	0	0	1	5	1	0	1	8	0	0
7:15	3	4	0	0	0	6	3	0	1	3	0	0	0	7	0	0
7:30	0	4	1	0	0	6	1	0	0	7	1	0	0	5	1	0
7:45	1	11	0	0	1	4	1	0	2	5	1	0	1	7	1	0
8:00	0	3	0	0	2	6	2	0	0	8	0	0	2	8	1	0
8:15	3	4	2	0	0	8	0	0	2	3	1	0	0	6	2	0
8:30	1	5	1	0	1	9	2	0	0	9	0	0	1	8	4	0
8:45	3	8	0	0	1	8	1	0	0	5	0	0	0	11	2	0
9:00	0	6	0	0	1	8	1	0	1	7	1	0	2	10	2	0
9:15	3	4	3	0	2	6	2	0	3	7	0	0	0	5	4	0
9:30	1	13	1	0	0	8	0	0	2	12	0	0	1	9	3	0
9:45	3	11	0	0	2	9	3	0	0	6	2	0	1	6	3	0
11:00	3	4	0	0	0	10	2	0	0	10	1	0	3	8	0	0
11:15	1	6	0	0	1	8	1	1	3	3	0	0	1	7	1	0
11:30	2	4	0	0	0	5	3	0	2	8	1	0	1	5	1	0
11:45	0	5	1	0	1	5	2	0	0	7	2	0	4	10	4	0
12:00	3	11	1	0	1	7	1	0	2	7	1	0	3	4	1	0
12:15	0	3	2	0	0	10	0	0	3	3	1	0	2	2	0	0
12:30	1	14	0	0	0	11	2	0	1	7	1	0	0	10	2	0
12:45	4	6	1	0	0	9	2	0	1	12	1	0	3	9	3	0
15:00	0	4	0	0	1	10	1	0	4	5	0	0	1	10	3	0
15:15	1	3	0	0	2	11	0	0	4	9	1	0	0	6	1	0
15:30	1	4	0	0	0	6	1	0	1	7	0	0	0	12	1	0
15:45	1	4	1	0	1	10	0	0	0	4	1	0	2	8	2	0
16:00	3	6	0	0	2	7	2	0	3	3	0	0	0	6	3	0
16:15	1	6	0	0	1	3	3	0	1	5	0	0	2	4	2	0
16:30	1	5	1	0	2	4	0	0	0	3	0	0	0	4	0	0
16:45	1	0	0	0	1	9	2	0	1	5	0	0	2	6	0	0
17:00	1	5	0	0	0	1	3	0	0	1	2	0	0	4	1	0
17:15	2	5	0	0	0	3	0	0	4	5	1	0	2	1	1	0
17:30	3	3	0	0	1	7	1	0	0	6	0	0	2	4	2	0
17:45	3	5	0	0	0	4	1	0	1	5	2	0	0	3	0	0



APPENDIX E: ENGINEER'S ESTIMATE

ENGINEER'S ESTIMATE - SR 544 at US 17

PAY ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
101-1	MOBILIZATION	LS	1	10%	See Below
102-1	MAINTENANCE OF TRAFFIC	LS	1	10%	See Below
102-60	WORK ZONE SIGN	ED	700	\$0.25	\$175.00
102-74-1	CHANNELIZING DEVICE-TYPS I,II,DI,VP, DRUM OR LCD	ED	980	\$0.12	\$117.60
102-76	ARROW BOARD /ADVANCE WARNING ARROW PANEL	ED	84	\$6.19	\$519.96
104-18	INLET PROTECTION SYSTEM	EA	8	\$102.23	\$817.84
110-4-10	REMOVAL OF EXIST CONC	SY	15	\$19.65	\$294.75
327-70-6	MILLING EXIST ASPH PAVT, 1.5" AVG DEPTH	SY	35	\$2.05	\$71.75
337-7-25	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	TN	1	\$111.88	\$111.88
520-70	CONCRETE TRAFFIC SEPARATOR, SP- VAR WIDT	SY	40	\$73.66	\$2,946.40
630-2-11	CONDUIT (OPEN TRENCH)	LF	50	\$7.77	\$388.50
630-2-12	CONDUIT (DIRECTIONAL BORE)	LF	300	\$19.38	\$5,814.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	4	\$742.49	\$2,969.96
660-3-11	VEHICLE DETECTION SYSTEM- MICRO,F&I, CAB	EA	1	\$1,358.36	\$1,358.36
660-3-12	VEHICLE DETECTION SYSTEM- MICRO,F&I, ABO	EA	2	\$7,550.56	\$15,101.12
700-1-11	SINGLE POST SIGN, F&I, GM, <12	AS	2	\$346.51	\$693.02
700-1-60	SINGLE POST SIGN, REMOVE	AS	1	\$27.86	\$27.86
700-3-201	SIGN PANEL, FURNISH & INSTALL OVERHEAD MOUNT, UP TO 12 SF	EA	4	\$603.02	\$2,412.08
700-11-1	DELINEATOR, FLEXIBLE TUBULAR	EA	1	\$69.60	\$69.60
706-3	RETRO-REFLECTIVE/RAISED PAVEMENT MARKERS	EA	6	\$3.31	\$19.86
710-11-290	PAINTED PAVT MARK,STD,YELLOW,ISLAND NOSE	SF	10	\$2.75	\$27.50
711-11-224	THERMOPLASTIC, STD, YELLOW, SOLID, 18"	LF	10	\$2.57	\$25.70
711-16-201	THERMOPLASTIC, STD-OTH, YELLOW, SOLID, 6"	GM	0.050	\$4,085.78	\$204.29
711-17-1	THERMOPLASTIC, REMOVE EXISTING THERMOPLASTIC PAVEMENT MARKINGS- SURFACE TO REMAIN	SF	2.560	\$40.00	\$102.40
999-25	INITIAL CONTINGENCY (DO NOT BID)	LS	1	5%	See Below
	CONTINGENCY (PROJECT UNKNOWNNS)			15%	See Below
				SUBTOTAL:	\$34,269.43
(101-1) MOB (MOBILIZATION)				10%	\$3,426.94
				SUBTOTAL:	\$37,696.37
(101-1) MOT (MAINTENANCE OF TRAFFIC)				10%	\$3,769.64
				SUBTOTAL:	\$41,466.01
PU (PROJECT UNKNOWNNS)				15%	\$6,219.90
				SUBTOTAL:	\$47,685.91
(999-25) INITIAL CONTINGENCY (DO NOT BID)				5%	\$2,384.30
				SUBTOTAL:	\$50,070.21
RIGHT-OF-WAY					\$0.00
				PROJECT TOTAL:	\$50,070.21

12 Month Statewide Average Unit Costs 1/1/2019 - 12/31/2019



APPENDIX F: BENEFIT-COST AND NET PRESENT VALUE

Benefit-Cost Analysis

District: **One** County: **16 - Polk** Date Prepared: **3/16/2020**

Location: **SR 544 (Havendale Blvd. NW) at US 17 (8th St. NW)**

Section : **16140000** Beg. Milepost : **3.193** End Milepost :
Rdway Type: **4 - 5 Lanes Urban Divided**

Control Element: **Other (describe in box below)**

Close the full median opening at 9th St. NW, increase the northbound left turn control radius, install dilemma zone detection on the eastbound and westbound approaches, and install TURNING VEHICLES YIELD TO PEDESTRIANS (R10-15) sign on all approaches.

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Capital Recovery Factor	Total
ROW		100	0.0408	\$ -
P.E.C.E.I. Structure	\$ 17,525.00	10	0.1233	\$ 2,160.83
Roadway	\$ 50,070.00	10	0.1233	\$ 6,173.63
Drainage		20	0.0736	\$ -
Signal		20	0.0736	\$ -
Other		20	0.0736	\$ -
Sub-Total	\$ 67,595.00			\$ 8,334.46
Annual Cost =				\$ 8,334.46

Total number of crashes = 267	Primary crash reduction factor (%): 43.5
# of correctable crashes, PC = 74	MODIFY/CLOSE MEDIAN OPENINGS
# of years of crash data, YD = 5	
PC/YD = 14.80	Additional crash reduction factor: 1.2
Crash reduction factor, CRF = 44.18%	INSTALLATION OF DILEMMA ZONE DETECTION
CRF x (PC/YD) = 6.54	
Cost per crash, CPC = \$123,406.00	Additional crash reduction factor:
Benefit = \$806,871	

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$806,870.88}{\$8,334.46} = \mathbf{96.81}$$

COUNTERMEASURE: MODIFY/CLOSE MEDIAN OPENINGS was applied to angle and left turn crashes.
COUNTERMEASURE: INSTALLATION OF DILEMMA ZONE DETECTION was applied to rear end crashes.
The P.E.C.E.I. cost is 35% of the construction cost per the Florida Department of Transportation.

Net Present Value Evaluation

Year	CRF x (PC/YD)	Cost per Crash	Present Value
1	6.54	\$123,406.00	\$774,792.23
2	6.54	\$123,406.00	\$742,509.22
3	6.54	\$123,406.00	\$718,296.96
4	6.54	\$123,406.00	\$686,013.95
5	6.54	\$123,406.00	\$661,801.70
6	6.54	\$123,406.00	\$637,589.44
7	6.54	\$123,406.00	\$613,377.18
8	6.54	\$123,406.00	\$589,164.93
9	6.54	\$123,406.00	\$564,952.67
10	6.54	\$123,406.00	\$548,811.16

Total Present Value

Benefit \$6,537,309.44

Cost \$67,595.00

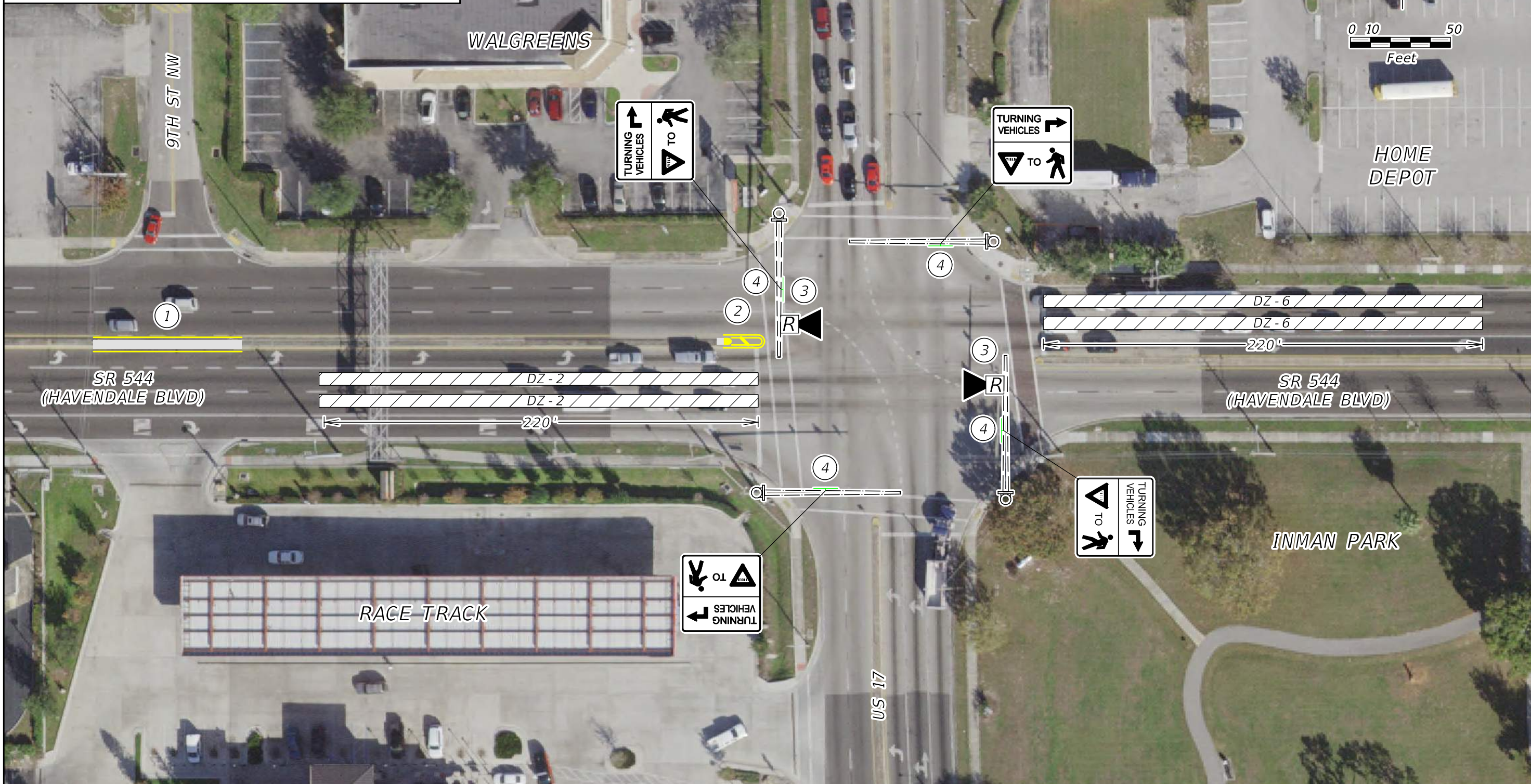
Net Present Value **\$6,469,714.44**



APPENDIX G: CONCEPTUAL IMPROVEMENT PLAN

RECOMMENDATIONS

- ① CONSIDER CLOSING THE FULL MEDIAN OPENING AT 9TH STREET NW.
- ② CONSIDER INCREASING THE NORTHBOUND LEFT TURN CONTROL RADIUS FROM APPROXIMATELY 50 FEET TO 60 FEET BY PULLING THE MEDIAN NOSE 15 FEET TO THE WEST.
- ③ CONSIDER INSTALLING DILEMMA ZONE DETECTION ON THE EASTBOUND AND WESTBOUND APPROACHES.
- ④ CONSIDER INSTALLING TURNING VEHICLES YIELD TO PEDESTRIANS (R10-15) SIGN ON ALL APPROACHES.



PREPARED BY:
 HNTB CORPORATION
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 TAMPA, FL 33602
 PHONE: (813) 402-4150
 CERTIFICATE OF AUTHORIZATION NO. 6500
 DANIEL D'ANTONIO, P.E. 68399

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	MANATEE/ SARASOTA	409224-1-32-91

CONCEPTUAL DIAGRAM
SR 544 AT US 17

SHEET NO.
 1