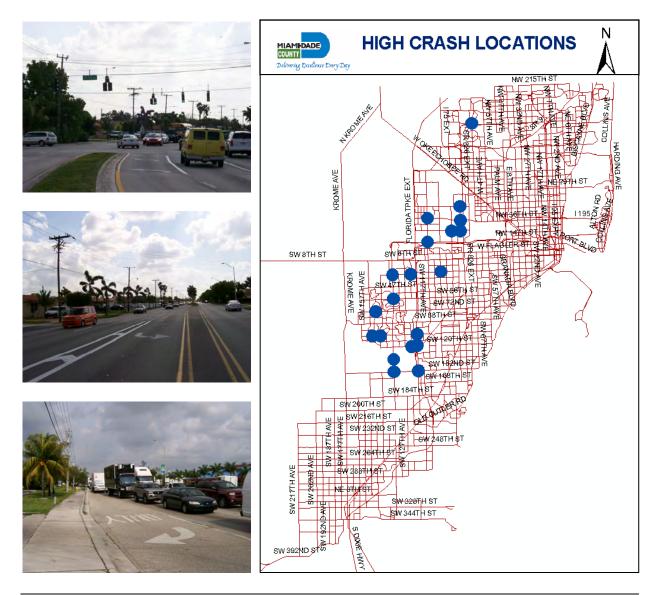


Miami Dade County Public Works Department



SAFETY STUDIES AT HIGH CRASH LOCATIONS COUNTYWIDE

Traffic Engineering Division February 2011



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EXECUTIVE SUMMARY

The Public Works Department (PWD) at Miami Dade County (MDC) undertook this traffic safety study based on a contract with the Metropolitan Planning Organization (MPO) and the Florida Department of Transportation (FDOT). The objective of this study is to identify traffic safety concerns and to recommend countermeasures to improve the operational safety of twenty (20) high-crash locations countywide. The following tasks have been performed to achieve the objective:

- 1. Acquiring and Processing of Data
- 2. Identifying High Crash Locations
- 3. Conducting Field Studies
- 4. Intersection Safety Assessment
- 5. Countermeasures and Potential Improvements
- 6. Preparation and Submission of Final Report

After conducting the safety analysis, the 20 locations as identified in the study are ranked in the following table:

Loc.	Address	COM.	RIF	Local	Crashes	Frequency	Safety	/ Ratio	Crash Sev	erity(EPDO)	Composite Rank	FINAL
No.	Address	Dist.	Dist.	Jurisdiction	Value	Rank (R1)	Value	Rank (R2)	Value	Rank (R3)		RANK
12	SW 117 AVE / SW 152 ST	9	5	Unincorp	78	1	3.278	1	1.345	6	8	1
14	SW 122 AVE / SW 120 ST	8,9	5	Unincorp	47	7	2.714	2	1.380	4	13	2
15	SW 137 AVE / SW 26 ST (Coral Way)	11	4	Unincorp	53	4	1.965	7	1.225	9	20	3
10	SW 117 AVE / SW 104 ST	8	5	Unincorpo	63	2	1.853	9	1.205	11	22	4
18	SW 137 AVE / SW 152 ST	9,11	5	Unincorp	60	3	1.861	8	1.182	13	24	5
6	NW 107 AVE / NW 12 ST	12	1	Doral/Unincor p	52	5	1.656	11	1.191	12	28	6
20	SW 152 AVE / SW 72 ST	11	5	Unincorp	30	16	2.112	6	1.333	7	29	7
3	NW 79 AVE / NW 36 ST	12	1	Doral	51	6	2.302	5	1.118	18	29	8
16	SW 137 AVE / SW 56 ST	10,11	5	Unincorp	45	9	1.418	16	1.370	5	30	9
2	NW 79 AVE / NW 25 ST	12	1	Doral	41	10	2.490	3	1.122	17	30	10
1	NW 67 AVE / NW 169 ST	13	3	Unincorp	47	7	1.587	14	1.214	10	31	11
19	SW 147 AVE / SW 104 ST	11	5	Unincorp	27	17	1.574	15	1.556	1	33	12
8	S. Hammocks Blvd. / SW 104 ST	11	5	Unincorp	21	20	1.591	13	1.524	2	35	13
5	NW 87 AVE / NW 25 ST	12	1	Doral	41	10	1.777	10	1.148	15	35	14
11	SW 117 AVE / SW 120 ST	8	5	Unincorp	34	13	2.437	4	1.088	20	37	15
17	SW 137 AVE / SW 136 ST	9,11	5	Unincorp	38	12	1.599	12	1.132	16	40	16
9	SW 97 AVE / SW 24 ST	10	1	Unincorp	22	19	1.174	19	1.448	3	41	17
13	SW 122 AVE / SW 26 ST (Coral Way)	10,11	4	Unincorp	26	18	1.395	17	1.308	8	43	18
4	NW 79 AVE / NW 58 ST	12	1	Doral/Unincor p	33	14	1.140	20	1.170	14	48	19
7	NW 107 AVE / NW 41 ST	12	1	Doral	32	15	1.197	18	1.094	19	52	20

Based on the safety concerns found during the development of this report, the field investigation, the collected traffic data and the traffic analysis performed, the following is a summary of the intersections safety/operational analysis and recommendations.



Summary of the Intersections Safety/Operational Analysis and Recommendations

Rank	Location	Signal ID	Com. Dist.	RIF Dist.	Local Jurisdiction	Abnormal Crash Types	Probable Causes	Recommended Countermeasures
1	SW 117 AVE / SW 152 ST	4764	9	5	Unincorp.	- Rear End - Left Turn - Sideswipe	- Large turning volumes - Inadequate signal timing - Restricted sight distance - Inadequate channelization - Inadequate signing	Realignment of the WBLT lane to reduce the offset . Provide turning guidelines for the WBLT lane. Cosing median opening on the east leg, and lengthen the WBLT lane. Converting the SB shared thru-right lane to a thru only lane.
2	SW 122 AVE / SW 120 ST	4867	8, 9	5	Unincorp.	- Angle - Left Turn - Sideswipe - Fixed Object	 Large turning volumes Inadequate signal timing Restricted sight distance Excessive vehicle speed Poor pavement/markings conditions 	Lengthen the WBLT lane to approximately 500 ft. Installing "No Turn on Red" (R10-11) signs for NB approach. Modifying the fences on the SE and SW corners to improve the sight distance triangles for NB approach.
3	SW 137 AVE / SW 26 ST (Coral Way)	5003	11	4	Unincorp.	- Left Turn - Sideswipe - Right Turn - Rear End	 Large turning volumes Restricted sight distance Inadequate road design Poor pavement/markings conditions Presence/Location of Drivew ays 	Provide WBRT lane (relocate lighting poles) Reduce the offset betw een NB/SB & EB/WB LT lanes Channelizing NB and EB right-turn lanes at the approach. Cosing the median openings on the north and w est legs
4	SW 117 AVE / SW 104 ST	4216	8	5	Unincorp.	- Rear End - Sideswipe - Fixed Object	Large turning volumes Excessive vehicle speed Inadequate roadw ay lighting Poor pavement/markings conditions	 Increase storage length for EBLT to approximately 350 ft. Replace the painted median on north leg with raised one Installing lane control (R3-8) signs for all approaches. Relocation of the stop bars to standard distances from crossw alks
5	SW 137 AVE / SW 152 ST	4637	9, 11	5	Unincorp.	- Rear End - Right Turn - Sideswipe	Presence/Location of Drivew ays Heavy Traffic and Heavy Vehicles Inadequate signal timing Poor pavement/markings conditions	Lengthen the WB double LT lanes to 475 ft each. Lengthen the SB double LT lanes to 300 ft each. Channelizing the WB and SB RT lanes for free flow operations. Extend the merge lane on the west leg receiving lanes
6	NW 107 AVE / NW 12 ST	4592	12	1	Doral/Unincorp.	- Rear End - Sideswipe	- Large turning volumes - Inadequate channelization - Inadequate signal timing - Poor pavement/markings conditions	Lengthen the NB double LT lanes to 250 ft each. Lengthen the EB double LT lanes to 300 ft each. Installing lane control (R3-8) signs for all lapproaches. Installing additional post mounted No U-Turn (R3-4) signs for all approaches.
7	SW 152 AVE / SW 72 ST	4982	11	5	Unincorp.	- Left Turn - Right Turn - Sideswipe	- Large turning volumes - Inadequate channelization - Restricted sight distance - Poor pavement/markings conditions	Realignment of the EBWB LT lanes to reduce the offset. Closing the median opening on west leg, and lengthen the EBLT lane to 200 ft. Also, provide a WBLT bay at the second median opening. Lengthen the WBLT lane to approximately 400 ft. Lengthen the NBLT lane to approximately 200 ft. Improve the turn radius at the NE and SE corners. hestalling "No U-Turn" (R3-4) signs for EB/WB approaches.
8	NW 79 AVE / NW 36 ST	3954	12	1	Doral	- Rear End - Sideswipe - Right Turn	- Inadequate signal timing - Large turning volumes - Inadequate channelization - Inadequate signing	 Add one through lane to the EB approach by converting the striped gore to a full lane. Installing advance guide signs for SR-826 for EB, NB and SB. Relocate the NB stop bar closer to the intersection.
9	SW 137 AVE / SW 56 ST	4595	10, 11	5	Unincorp.	- Rear End - Left Turn - Right Turn - Sideswipe	Presence/Location of Drivew ays Large turning volumes Pestricted sight distance Inadequate signing	 Add one LT lane to the NB approach. Reduce the offset betw een EB and WB LT lanes. Convert the full median opening at south leg to a directional median opening. Relocate the bus stop on NB approach aw ay from the intersection.
10	NW 79 AVE / NW 25 ST	5111	12	1	Doral	- Left Turn - Sideswipe	- Large turning volumes - Presence/Location of Drivew ays - Restricted sight distance - Poor pavement/markings conditions	 Lengthen the EBLT lane to approximately 350 ft. Closing the median opening east and w est of the intersection . Installing lane use (R3-8) signs for SB approach.
11	NW 67 AVE / NW 169 ST	3901	13	3	Unincorp.	- Rear End - Left Turn - Right Turn - Sideswipe	Restricted sight distance Poor visibility of signal Large turning volumes Inadequate road design Poor pavement/markings conditions	Lengthen the SBLT lane to approximately 450 ft. Lengthen the EB and WB LT lanes to approximately 300 ft each. Reducing the offset betw een NB and SB left turn lanes. Smoothing the curve return radii for the WBRT traffic. Extending the distance betw een the intersection and the add/drop lane tapers along the north leg. Installing Signal A head signs for EB and WB approaches. Installing warning signs for add/dropp lanes (W4-2) along the north leg.
12	SW 147 AVE / SW 104 ST	5021	11	5	Unincorp.	- Left Turn - Fixed Object	- Large turning volumes - Inadequate roadw ay lighting - Obstruction is close to roadw ay - Restricted sight distance	Lengthen the NB, SB and EB LT lanes to approximately 300 ft each. Lengthen the WBLT lane to approximately 200 ft. Reducing the offset between left turn lanes. Providing crossw alks, pedestrian features at all legs.



Summary of the Intersections Safety/Operational Analysis and Recommendations

Rank	Location	Signal ID	Com. Dist.	RIF Dist.	Local Jurisdiction	Abnormal Crash Types	Probable Causes	Recommended Countermeasures
13	S. Hammocks Blvd / SW 104 ST	5265	11	5	Unincorp.	- Left Turn - Fixed Object	- Large turning volumes - Restricted sight distance - hadequate roadw ay lighting - Excessive speed	Lengthen the EBLT lane to approximately 300 ft and closing the median opening. Lengthen the WBLT lane to approximately 450 ft. Reducing the offset betw een EB/WB LT lanes. Modifying the median noses for north/south legs to provide clear pedestrian paths. Installing curve w anning (W1-2R) and signal ahead (W3-3) signs for northbound approach.
14	NW 87 AVE / NW 25 ST	4333	12	1	Doral	- Right Turn - Sidesw ipe	- Large turning volumes - Presence/Location of Drivew ays - Inadequate channelization - Inadequate signing	Lengthen the NBLT lane to approximately 450 ft. Improving the EB approach lane alignment at the start of the taper. Modif ying the SBRT radius to better accommodate heavy vehicles. Installing lane use signs (R3-8) for all approaches.
15	SW 117 AVE / SW 120 ST	4866	8	5	Unincorp.	- Rear End - Angle - Left Turn - Sidesw ipe - Right Turn Fixed Object	Large turning volumes Inadequate signal timing hadequate channelization hadequate signing Excessive speed Poor pavement/markings conditions	Lengthen the EBLT lanes to approximately 600 ft each. Installing lane use signs (R3-8) for all approaches. Modifying the channelization of the eastbound right-turns. Provide/repair the pedestrian features including ADA approved pedestrian ramps.
16	SW 137 AVE / SW 136 ST	4825	9, 11	5	Unincorp.	- Rear End - Left Turn - Sideswipe	- Large turning volumes - hadequate signal timing - hadequate channelization - Poor pavement/markings conditions	Lengthen the WBLT lane to 300 ft and provide raised median. Reduce the offset betw een NB and SB LT lanes. Add pedestrian crossw alks, ADA approved pedestrian ramps and signal heads at east and south legs.
17	SW 97 AVE / SW 24 ST	3341	10	1	Unincorp.	- Fixed Object	- Inadequate roadw ay lighting - Excessive speed - Obstruction is close to roadw ay	Lengthen the WBLT lane to approximately 500 ft. Lengthen the SBLT lane to approximately 350 ft. horease the walk time for pedestrians crossing SW 24 Street. hstall lane end and merge signs (W9-2L & W4-2) on north leg NB.
18	SW 122 AVE / SW 26 ST (Coral Way)	4564	10, 11	4	Unincorp.	- Left Turn - Fixed Object	 hadequate signal timing hadequate roadw ay lighting Restricted sight distance Large turning volumes Excessive vehicle speed 	Lengthen the WBLT lane to approximately 350 ft. Lengthen the SBLT lane to approximately 350 ft. Reduce the offset between BB and WB left turn lanes. Installing curve warning signs (W1-2) for both EB and WB approaches and "Signal Ahead" signs (W3-3) for WB approach. Install lane end and merge signs (W9-2L & W4-2) on south leg SB. Provide pedestrian signal heads to cross the north and w est legs.
19	NW 79 AVE / NW 58 ST	4176	12	1	Doral/Unincorp.	- Right Turn - Sidesw ipe	- Large turning volumes - Restricted sight distance - Presence/Location of Drivew ays - Inadequate roadw ay design - Inadequate channelization	Convert the EBRT lane to be a shared through and right-turn. Add a third receiving lane to the EB movement. Install turn w anning and signal ahead signs (W1-1 & W3-3) at SB. Improve turning radius for both EB and WB RT.
20	NW 107 AVE / NW 41 ST	4887	12	1	Doral	- Sideswipe - Backing	Large turning volumes - hadequate signal timing - hadequate roadw ay design - Presence!Location of Drivew ays - hadequate channelization	Changing the lane configuration of the SB approach. This improvement will require additional right-of-way. Changing the lane configuration of the NB approach. Changing the current half quad north/south split phase to a full quad. Lengthen the EBLT lane to approximately 400 ft. Lengthen the WB outside LT lane to approximately 500 ft. Lengthen the proposed SBLT lanes to approximately 350 ft teach. Obsing of the median opening in the north leg.



1. INTRODUCTION

The Public Works Department (PWD) at Miami Dade County (MDC) undertook this traffic safety study based on a contract with the Metropolitan Planning Organization (MPO) and the Florida Department of Transportation (FDOT). The objective of this study is to identify traffic safety concerns and to recommend countermeasures to improve the operational safety of twenty (20) high-crash locations countywide. The top 20 crash locations countywide were identified for the study period from 2006 through 2008. A list of the 20 locations and their associated jurisdictions is presented in *Table 1*.

PWD has evaluated the crash data for the years 2006 through 2008, in which a review of the hard copy police reports was performed, and collision diagrams were prepared. Furthermore, a comprehensive traffic safety analysis was performed for all locations in order to identify the abnormal crash patterns. In addition, field reviews were conducted within the project limits. In some cases, Synchro/Simtraffic simulation was performed. As such, traffic data was also collected at these intersections. Based on these criteria, findings, and conclusions recommendations are presented. The improvements have been developed and sketched to clearly identify the modifications required. Finally, these efforts have been documented and presented in a report format. *Figure 1* presents the study intersection locations.

This report follows the procedures outlined in the Manual on Uniform Traffic Studies (MUTS), the Highway Capacity Manual – 2000 Update (HCM2000), the Manual of Uniform Traffic Control Devices (MUTCD), and the National Highway Institute (NHI) Safety Analysis guidelines. The report evaluates the following for each intersection:

- Site Description
- Safety Conditions and Analysis
- Traffic Operation Conditions and Analysis
- Recommendations
- Conceptual plan

2. METHODOLOGY

In order to determine high crash locations it is necessary to look at crash data collected throughout the county. First, a list of locations of 15 or more crashes per year during the last three years (2006, 2007 and 2008) was obtained from Miami Dade Police Department (MDPD), System Development Bureau. This data needed to be filtered and arranged so we can identify the highest 20 crash locations.

Once the candidate locations were determined, we performed review of the hard copy police reports, and prepared collision diagrams for the 20 locations. They were categorized by as many of the following features as possible: time of day, traffic control, alcohol involvement, weather conditions, etc. Additionally, 24-hour traffic volumes, turning movement volumes and signal timing data were collected for all locations. Also, field visits and evaluations were conducted for all locations.



Table 1 – Study Locations

(In alphabetical order)

Loc. #	Address	Commission District	RIF District	Jurisdiction
1	NW 67 Ave. / NW 169 St.	13	3	Unincorporated
2	NW 79 Ave. / NW 25 St.	12	1	Doral
3	NW 79 Ave. / NW 36 St.	12	1	Doral
4	NW 79 Ave. / NW 58 St.	12	1	Doral/Unincorporated
5	NW 87 Ave. / NW 25 St.	12	1	Doral
6	NW 107 Ave. / NW 12 St.	12	1	Doral/Unincorporated
7	NW 107 Ave. / NW 41 St	12	1	Doral
8	S. Hammocks Blvd. / SW 104 St.	11	5	Unincorporated
9	SW 97 Ave. / SW 24 St.	10	1	Unincorporated
10	SW 117 Ave. / SW 104 St.	8	5	Unincorporated
11	SW 117 Ave. / SW 120 St.	8	5	Unincorporated
12	SW 117 Ave. / SW 152 St.	9	5	Unincorporated
13	SW 122 Ave. / SW 26 St. (Coral Way)	10,11	4	Unincorporated
14	SW 122 Ave. / SW 120 St.	8,9	5	Unincorporated
15	SW 137 Ave. / SW 26 St. (Coral Way)	11	4	Unincorporated
16	SW 137 Ave. / SW 56 St.	10,11	5	Unincorporated
17	SW 137 Ave. / SW 136 St.	9,11	5	Unincorporated
18	SW 137 Ave. / SW 152 St.	9,11	5	Unincorporated
19	SW 147 Ave. / SW 104 St.	11	5	Unincorporated
20	SW 152 Ave. / SW 72 St.	11	5	Unincorporated

* Data obtained from Miami Dade Police Department (MDPD), System Development Bureau

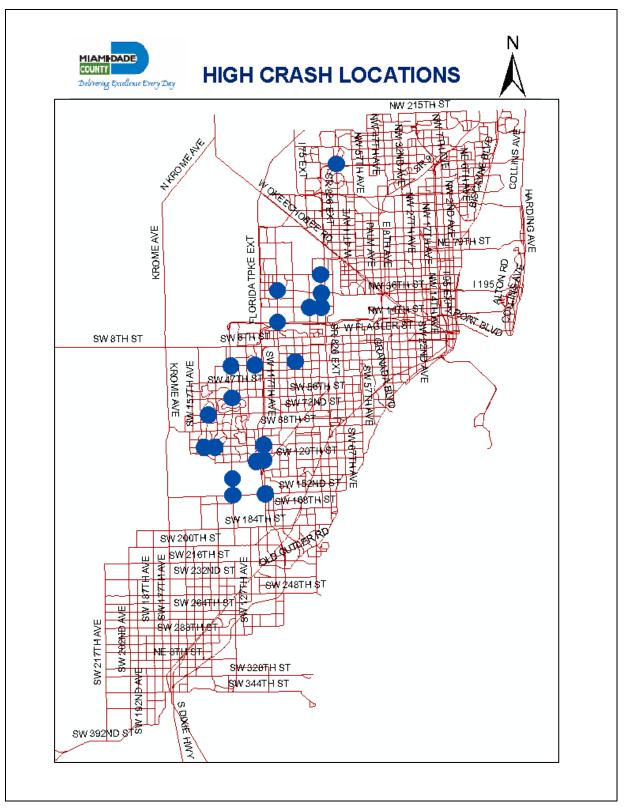


Figure 1: Study Locations Map



A three-phased ranking scheme is used as the basis to determine the high crash locations. Intersections were then ranked by the total number of crashes (Crash Frequency), crash rate (Safety Ratio), and crash severity index (Equivalent Property Damage Only – EPDO) methods. Finally, these intersections were ranked by a combination of these factors. The summary of the 20 high crash locations safety analysis is shown in *Table 2*.

2.1. Number of Crashes/Crash Frequency Method

In this method, we rank locations by the number (or frequency) of average annual relevant crashes for the three year study period. The location with the highest number of crashes ranks as number 1, the location with the next highest number of crashes ranks as number 2 and so on.

2.2. Crash Rate/Safety Ratio Method

The Crash Rate Method compares the number of crashes to the volume of traffic, with the later measured as the number of vehicles entering a spot in a given time period. The steps involved in this method are as follows.

1. Determine the location's actual crash rate. The actual spot crash rate is found as annual average number of crashes during the study period divided by the average daily traffic volume (AADT) during the study period in crashes per million vehicles.

Actual Crash Rate (RMEV) =	Number of Crashes	1,000,000
netual Crush Kale (RMEV) –	AADT	365

2. Find the critical crash rate for similar spot locations throughout the state

Critical Crash Rate = Avg.StateCrashRate +	$+ \frac{0.5}{+1.96}$	Avg.StateCrashRate
Critical Crush Kale – Avg.StateCrushKale	TrafficBase 1.90	TrafficBase

Where:

Traffic Base =	Years * AADT * 365
Traffic Dase –	1,000,000

3. Calculate the safety ratio by dividing the actual crash rate by the critical crash rate.

$$Safety Ratio = \frac{Actual Crash Rate}{Critical Crash Rate}$$

4. Rank locations by the safety ratio. The location with the highest safety ratio ranks as 1, the location with the next highest safety ratio ranks as 2 and so on.



Using the crash rate method in comparing the crash experience between different time periods or between locations provides a basis for more accurate and meaningful conclusions since it accounts for the numbers of vehicles "exposed" to the hazards of driving within a given time period. It also prevents the potentially misleading classification of a relatively safe highvolume location as "high-crash" simply because it has experienced a relatively large number of crashes. However, it tends to unfairly identify low-volume locations having relatively few crashes as high-crash locations.

2.3. Crash Severity Index/Equivalent Property Damage Only (EPDO) Method

Each site is ranked according to the financial loss from the crashes. This is determined by using values based on the injuries sustained in each crash type as found in the data provided. The crash severity index is calculated by the following formula based on the values obtained from FDOT:

Crash Severity Index = $\frac{(12 \times FatalCrashCount) + (4 \times InjuryCrashCount) + (\Pr opertyDamageOnlyCrashCount)}{(TotalCrashCount)}$

Then the location with the highest cost ranks as 1, the location with the next highest cost ranks as 2 and so on.

2.4. Composite Ranking

Each intersection was given a score based on its ranking of the crash frequency, safety ratio, and EPDO. For example, the intersection with the highest number of crashes was given a score of 1; the intersection with the next highest number of crashes was given a score of 2 and so on. The same scoring procedure was done with safety ratio and EPDO for each intersection. The sum of these individual scores represented the intersection's composite score. Accordingly, the highest rank (1) is given to the location with the lowest combined score and so on. In case of a tie, each location gets the same rank and the following ranking is skipped. *Table 3* provides complete details of the ranking methodology.

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w 137 AVE / SW 136 ST 32 39 43 14 36 5713 0.571 20.653 1.822 1.139 1.599 <	2		9		5 1	-		121	13	1		0	00012	1 10.0	CI 0.00	0.14.1	1.001	1.410	0/6.1
30 2 0 31 0 4 2 0 16 5 0 36 2 0 0.31 0.33 0.34	17		32		66		43		114		38		E7121	0 E 74	20 862	1 000	1 1 20	4 600	1 127
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Sw 122 AVE / SW 72 ST 34 32 24 90 30 30 38424 0.413 14.025 2.139 1.013 2.112	2		9					99	15			0	00001	2 + .0	060.01	004.1	0.900	1.014	000.1
30 4 0 27 5 0 23 1 0 80 10 0 27 3 0 27 1 0 80 10 0 27 3 0 27 1 0 80 10 0 27 3 0 27 1 0 10 0 10 0 10 0 10 0 10 0 10 0	2		34	.,	22		24		6	_	30		10101	0.413	11 0.25	0 130	1 013	0 110	1 222
	3		4			33	-	8	9	0		•	10424	0.410	020.41	5.133	610.1	7117	ccc.1

Table 2 – Summary of Safety Analysis



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Loc.	Address	COM.	RIF	Local	Crashes	Frequency	Safety	y Ratio	Crash Sev	erity(EPDO)	Composite Rank	FINAL
No.	Address	Dist.	Dist.	Jurisdiction	Value	Rank (R1)	Value	Rank (R2)	Value	Rank (R3)	(R1+R2+R3)	RANK
12	SW 117 AVE / SW 152 ST	9	5	Unincorp	78	1	3.278	1	1.345	6	8	1
14	SW 122 AVE / SW 120 ST	8,9	5	Unincorp	47	7	2.714	2	1.380	4	13	2
15	SW 137 AVE / SW 26 ST (Coral Way)	11	4	Unincorp	53	4	1.965	7	1.225	9	20	3
10	SW 117 AVE / SW 104 ST	8	5	Unincorpo	63	2	1.853	9	1.205	11	22	4
18	SW 137 AVE / SW 152 ST	9,11	5	Unincorp	60	3	1.861	8	1.182	13	24	5
6	NW 107 AVE / NW 12 ST	12	1	Doral/Unincor p	52	5	1.656	11	1.191	12	28	6
20	SW 152 AVE / SW 72 ST	11	5	Unincorp	30	16	2.112	6	1.333	7	29	7
3	NW 79 AVE / NW 36 ST	12	1	Doral	51	6	2.302	5	1.118	18	29	8
16	SW 137 AVE / SW 56 ST	10,11	5	Unincorp	45	9	1.418	16	1.370	5	30	9
2	NW 79 AVE / NW 25 ST	12	1	Doral	41	10	2.490	3	1.122	17	30	10
1	NW 67 AVE / NW 169 ST	13	3	Unincorp	47	7	1.587	14	1.214	10	31	11
19	SW 147 AVE / SW 104 ST	11	5	Unincorp	27	17	1.574	15	1.556	1	33	12
8	S. Hammocks Blvd. / SW 104 ST	11	5	Unincorp	21	20	1.591	13	1.524	2	35	13
5	NW 87 AVE / NW 25 ST	12	1	Doral	41	10	1.777	10	1.148	15	35	14
11	SW 117 AVE / SW 120 ST	8	5	Unincorp	34	13	2.437	4	1.088	20	37	15
17	SW 137 AVE / SW 136 ST	9,11	5	Unincorp	38	12	1.599	12	1.132	16	40	16
9	SW 97 AVE / SW 24 ST	10	1	Unincorp	22	19	1.174	19	1.448	3	41	17
13	SW 122 AVE / SW 26 ST (Coral Way)	10,11	4	Unincorp	26	18	1.395	17	1.308	8	43	18
4	NW 79 AVE / NW 58 ST	12	1	Doral/Unincor p	33	14	1.140	20	1.170	14	48	19
7	NW 107 AVE / NW 41 ST	12	1	Doral	32	15	1.197	18	1.094	19	52	20

Table 3 – Ranking of Locations

2.5. Possible Crash Causes and Probable Countermeasures

In this section, a description of possible cause(s) for each type of crash along with suggested countermeasure(s) is provided in *Table 4*.



Collision Type	Possible Causes	Probable Countermeasures
Rear End	 (1) Large number of turning vehicles (2) Slippery surface (3) Poor visibility of signal (4) Inadequate signal timing (5) Lack of signal coordination (6) Inadequate roadway lighting (7) Crossing pedestrians (8) Presence/Location of driveways 	 Prohibit turns Improve turn storage capacity Reduce speed limits Install or improve signs Improve pavement conditions Improve signal timing/coordination Improve pedestrian crossing Improve driveway design/location
Angle	 (9) Restricted sight distance (10) Excessive speed on approach (11) Inadequate advanced warning (12) Large total intersection volume In addition to #(3), #(4), #(6) and #(8) 	 9. Improve sight distance 10. Adjust amber phase 11. Install all red clearance phase 12. Improve roadway lighting In addition to #3, #4, #6 and #8
Left Turn	 (13) Large volume of left-turns (14) Too short amber phase (15) Absence of left-turning phase In addition to #(4), #(6), #(8), #(9) and #(10) 	 13. Provide/lengthen/add modify turn lanes 14. Provide protected phase if justified 15. Provide turning guidelines for multiple turn lanes 16. Reduce the offset between opposing left turn lanes 17. Install or improve warning signs In addition to #6, #9, #11 and #12
Sideswipe	 (16) Inadequate roadway design (17) Excessive vehicle Speed (18) Inadequate pavement markings (19) Inadequate channelization (20) Inadequate signing (21) Improper road maintenance 	 18. Provide wider lanes 19. Improve pavement markings 20. Improve alignment and grade 21. Install/improve channelization 22. Install direction/warning signs In addition to #3 and #4
Pedestrian with Vehicle	In addition to #(8) (22) Inadequate protection for pedestrians (23) Inadequate Signals (24) Inadequate Phasing Signal In addition to #(6), #(9), #(17) and #(18)	 23. Provide/improve sidewalks 24. Provide improve crosswalks 25. Provide pedestrian signal 26. Improve pedestrian phase 27. Provide raised median as refuge In addition to #3, #4 and #11
Fixed Object	 (25) Obstruction in/too close to roadway In addition to #(2), #(6), #(11), #(16), #(17), #(18), and #(20) 	28. Remove/relocate fixed object In addition to #3, #5, #12, #17, #18, #19 and #20

Table 4 – General (Crash Causes and	Countermeasures
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3. STUDY LOCATIONS

This section provides a crash analysis at each of the study intersections. Furthermore, this section includes field observation reports for each of the study intersections. The field observation reports are used to verify if field conditions such as signal operation, pavement markings, geometry of the intersection or any other existing condition supports the probable cause developed through the study.

3.1. SW 117 Avenue and SW 152 Street

3.1.1. Site Description

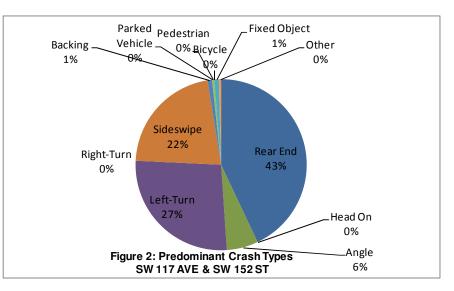
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 117 Avenue is a four lane urban arterial divided by a raised median that runs north-south, and SW 152 Street (Coral Reef Drive) is a four lane urban arterial divided by a raised median that runs east-west.

3.1.2. Safety Conditions and Analysis

The intersection of SW 117 Avenue and SW 152 Street is ranked number 1 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 235 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 78. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 2*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the study intersection in



relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 5* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.



							SW 152						
		(4 Lane	x 4 Lane,	Signaliz	ed, With Tu	irn Lanes,	4 Leg Inters	ection -Table	e 28) - URBAN	N Spot			
	TYPE OF CRASH	NUMBE	R OF CR YEAR	ASHES	3 YEAR TOTAL	% of	MEAN Accidents		ANNUAL CF	ASH VALUE		ALLY HIGH 90th	CRASHE 95th
		2006	2007	2008	CRASHE	Total	per Year	MEAN	Percentile	Percentile	Mean	Percentil	Percent
OLLISION TYPE	Rear End Head On	36 0	36 0	29 0	101 0	21% 0%	33.67 0.00	5.70 0.33	16.96 1.02	19.12 1.15	Х	X	X
	Angle	7	5	2	14	2%	4.67	3.05	7.08	7.85	х		
	Left Turn	15	20	28	63	11%	21.00	1.67	4.02	4.47	X	X	х
	Right Turn	0	0	0	0	0%	0.00	0.33	1.25	1.42			
	Sideswipe Backed Into	22	11	18	51	7% 0%	17.00 0.67	1.60	4.64 0.56	5.22	X	X	X
	Backed Into Coll. w/ Parked Car	2	0	0	2	0%	0.07	0.17	0.56	0.63	^	^	x
	Coll. w/ Pedestrian	Ő	0	1	1	0%	0.33	0.28	1.04	1.19	х		
	Coll. w/ Bicycle	0	0	0	0	0%	0.00	0.09	0.33	0.38			
	Fixed Object	1	0	1	2	0%	0.67	0.03	0.21	0.24	Х	Х	X
	Ran Off Road Overtuned	0	0	0	0	0% 0%	0.00	0.00	0.00	0.00			
	Other	0	1	0	1	0%	0.33	3.70	8.83	9.82			
	Total Crashes	83 📰	73 🖵	79 🗸	235	23%	78.33	17.77	40.96	45.39	Х	Х	Х
SEVERITY	PDO crashes	77	65	66	208	89%	69.33	9.93	22.30	24.67	X	X	X
	Fatal crashes Injury crashes	0	0	0	0 27	0% 11%	0.00 9.00	0.05	0.26 33.08	0.29 36.90			
IGHT CONDITIONS	Day Light	60	• 48	59	167	71%	9.00 55.67	12.40	29.18	36.90	х	x	x
	Dusk	4	1	0	5	2%	1.67	0.28	0.87	0.98	Х	Х	х
	Dawn	0	3	2	5	2%	1.67	0.17	0.56	0.63	X	X	X
	Dark	19	20	18	57	24%	19.00	4.56	10.53	11.68	Х	Х	X
SURFACE CONDITIONS	Unknown Dry	0 62	1 68	0 75	1 205	0% 87%	0.33 68.33	0.35	1.05 34.45	1.18 38.12	х	x	x
	Wet	5	4	4	13	6%	4.33	2.10	6.02	6.76	x	Ê	⊢ ^
	Others	16	1	0	17	7%	5.67	0.37	1.10	1.24	Х	Х	х
MONTH OF A YEAR	January	1	6	3	10	4%	3.33	1.42	3.33	3.69	X	X	,
	February March	8 10	9 14	9 8	26 32	11% 14%	8.67 10.67	1.42 1.67	3.53 4.12	3.93 4.59	X	X	X
	April	8	4	7	19	8%	6.33	1.30	3.21	3.57	x	x	- x
	May	7	6	7	20	9%	6.67	1.74	4.46	4.99	Х	х	Х
	June	6	5	8	19	8%	6.33	1.38	3.49	3.90	Х	Х	Х
	July	9	7	5	21	9%	7.00	1.35	3.22	3.58	X	X	X
	August September	9	7 6	7	23 20	10% 9%	7.67 6.67	1.56 1.46	3.99 3.73	4.46 4.16	X X	X X	X
	October	9	2	6	17	7%	5.67	1.47	3.59	4.00	X	x	x
	November	4	4	8	16	7%	5.33	1.39	3.53	3.94	Х	Х	Х
	December	5	3	4	12	5%	4.00	1.61	4.43	4.97	X		
DAY OF THE WEEK	Sunday Monday	14 6	15 6	9 10	38 22	16% 9%	12.67 7.33	2.70 2.49	6.42 6.18	7.13 6.88	X X	X X	X
	Tuesday	18	10	10	38	16%	12.67	2.49	5.84	6.47	X	x	Â
	Wednesday	8	10	13	31	13%	10.33	2.88	7.20	8.03	X	X	X
	Thursday	10	14	12	36	15%	12.00	3.07	7.50	8.35	X	X	X
	Friday	14	8	14	36	15%	12.00	2.61	6.40	7.13	X	X	X
HOUR OF THE DAY	Saturday 00:00-06:00	13	10 5	11 2	34 14	14% 6%	11.33 4.67	1.46 1.70	3.47 3.39	3.85 3.71	X	X	X
	06:00-09:00	8	6	10	24	10%	8.00	1.98	5.12	5.72	X	x	x
	09:00-11:00	9	6	10	25	11%	8.33	1.72	4.23	4.71	Х	Х	Х
	11:00-13:00	14	7	10	31	13%	10.33	2.40	6.30	7.05	X	X	X
	13:00-15:00 15:00-18:00	20	7 19	12 12	26 51	11% 22%	8.67 17.00	1.95 3.58	5.32 7.81	5.96 8.62	X X	X X	X X
	18:00-24:00	18	23	23	64	27%	21.33	4.42	10.63	11.82	X	x	x
						,.							
					1	YEAR		3-Year	1				
					1	2	3	Average					
Average Daily Traffic A	ADT (Vehicles ner F	lav)			78,058	79,651	81,277	79,662	1				
			Analas M.	hists - 1					4				
Iorida Average Crash	n rate (Urashes per l	villion En	tering Vel	iicies)	0.420	0.424	0.394	0.413	4				
Fraffic Base					28.491	29.073	29.666	29.077					
Actual Crash Rate (Cr	rashes per Million E	ntering V	ehicles)		2.913	2.511	2.663	2.696	1				
Critical Crash Rate (C	Crashes per Million E	ntering V	ehicles)		0.837	0.839	0.790	0.822	1				
Safety Ratio	,	3.	/		3.480	2.995	3.371	3.282	1				
									-				
High Crash Location	177				YES	YES	YES	YES					
Actual Crash	$Rate = \frac{A \times 1,00}{V}$	0,000			al number o rage Annua			fcrashes by	v type occurrin	ng in a 1 year	period.		
CriticalCrashRa	$ate = AVR + \frac{0.5}{TB} + 2$	$TF\sqrt{\frac{AVH}{TB}}$	R	TB = Trans	affic Base		ash Rate for	a particular	type of interse	ection or road		nt. Constant Z	٦
Traffic Base =	$\frac{Years \times ADT \times 30}{1,000,000}$	65		= 1.		95% Cor		el for RURAL Level for URL		68.30 86.60 90.00 95.00 95.50	D D D D D	1.00 1.50 1.64 1.96 2.00	1
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	h Rate h Rate	-							98.80 99.00 99.70 99.95	D D	2.50 2.58 3.00 3.29	

Table 5 – Crash Analysis – SW 117 Avenue and SW 152 Street



Table 6 – Abnormal Crash Details & CountermeasuresSW 117 Avenue and SW 152 Street

			17 Aven							
	(4 Lane x 4 L	ane, Signalized, V	Vith Turn La	anes, 4 Le	eg Interse	ction -Table	e 28) - UR	BAN Spot		
			NUMBE	ER OF CF	ASHES	3 YEAR	%	MEAN	Possible	Counte
				YEAR		TOTAL	of	Accidents	Cause(s)	measure
			2006	2007	2008	CRASHE	Total	per Year	000000(3)	measure
	Total Rear Er	nd Crashes	36	36	29	101	100%	33.67	(1)	2
		Day Light	28	26	25	79	78%	26.33	(4)	4
	Lighting Conditions	Dawn	2	1	0	3	3%	1.00	(8)	5
		Dark	6	9	4	19	19%	6.33	. ,	6
		00:00 - 06:00	2	3	1	6	6%	2.00		8
		06:00 - 09:00	4	3	2	9	9%	3.00		
		09:00 - 11:00	3	3	5	11	11%	3.67		
Rear End	Hours of Day	11:00 - 13:00	8	5	6	19	19%	6.33		
near Litu		13:00 - 15:00	3	4	5	12	12%	4.00		
		15:00 - 18:00	12	11	5	28	28%	9.33		
		18:00 - 24:00	4	7	5	16	16%	5.33		
		North	6	7	3	16	16%	5.33		
		South	7	5	4	16	16%	5.33		
	Direction	East	13	17	15	45	45%	15.00		
		West	10	7	7	24	24%	8.00		
		Unknown	0	0	0	0	0%	0.00		
			NUMB	ER OF CF	ASHES	3 YEAR	%	MEAN	Dessible	0
			-	YEAR		TOTAL	of	Accidents	Possible	Counte
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure
	Total Left Tu	m Crachoc	15	2007	28	63	100%	21.00	(4)	9
	Total Leit Tu			-	-				(4)	
	Lighting Conditions	Day Light Dawn	8	11	14 1	33 2	52% 3%	11.00 0.67	(9)	13 15
	Lighting Conditions	Dark	7	8	13	28	44%	9.33	(13)	15
		00:00 - 06:00	1	0 1	1	3	5%	1.00		10
		06:00 - 09:00	2	1	4	7	11%	2.33		
		09:00 - 11:00	1	0	4	2	3%	0.67		
	Hours of Day	11:00 - 13:00	1	1	1	3	5%	1.00		
Left Turn	riouis of Day	13:00 - 15:00	1	1	4	6	10%	2.00		
		15:00 - 18:00	1	4	3	8	13%	2.67		
		18:00 - 24:00	8	12	14	34	54%	11.33		
		$NB \rightarrow WB$	2	1	5	8	13%	2.67		
		$WB \rightarrow SB$	8	16	18	42	67%	14.00		
	Direction	$SB \rightarrow EB$	2	1	3	6	10%	2.00		
	Direction	$EB \rightarrow NB$	3	2	2	7	11%	2.33		
		Unknown	0	0	0	0	0%	0.00		
		C. I.	, i i i i i i i i i i i i i i i i i i i	, v	, v	Ŭ	0,0	0.00		
				ER OF CF			%	MEAN		
			NUMBE		ASHES	3 YEAR		MEAN	Possible	Counte
				YEAR		TOTAL	of	Accidents	Cause(s)	measure
	-		2006	2007	2008	CRASHE	Total	per Year	.,	
	Total Sideswi	1	22	11	18	51	100%	17.00	(8)	4
		Day Light	21	9	16	46	90%	15.33	(19)	19
	Lighting Conditions	Dawn	0	2	1	3	6%	1.00	(20)	20
		Dark	1	0	1	2	4%	0.67	(21)	22
		00:00 - 06:00	0	0	0	0	0%	0.00		
		06:00 - 09:00	2	1	4	7	14%	2.33		
	Linux (D)	09:00 - 11:00	4	2	2	8	16%	2.67		
Sidegwine	Hours of Day	11:00 - 13:00	4	1	4	9	18%	3.00		
Sideswipe	· · · ·	13:00 - 15:00	4	1	2	7	14%	2.33		
Sideswipe (Overtake)		15.00	4	3	3	10	20%	3.33		
-	, í	15:00 - 18:00					20%	3.33		l I
-		18:00 - 24:00	4	3	3	10				
-		18:00 - 24:00 North	4	4	2	9	18%	3.00		
-		18:00 - 24:00 North South	4 3 5	4 1	2 4	9 10	18% 20%	3.00 3.33		
-	Direction	18:00 - 24:00 North South East	4 3 5 12	4 1 3	2 4 7	9 10 22	18% 20% 43%	3.00 3.33 7.33		
-		18:00 - 24:00 North South	4 3 5	4 1	2 4	9 10	18% 20%	3.00 3.33		

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 3.480, 2.995, and 3.371, respectively. The safety ratio for the three years averaged 3.282. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.



From this analysis it was determined that rear end, left-turn, sideswipe and fixed object collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 6*.

3.1.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 117 Avenue and SW 152 Street were performed on a typical weekday on November 11, 2010. A summary of the traffic data is presented in *Figure 3*, and field review is presented in *Figure 4*.

Capacity analysis was conducted for AM and PM traffic peak hours to evaluate existing conditions as well as improvements. *Table 7* depicts the analysis performed using Synchro 6.0. An assessment of Level of Services (LOS) analysis for peak periods indicated that this intersection is operating at LOS D during both AM and PM peaks. In addition, these analyses indicated that the northbound movement is operating under substantial delay that generates failing conditions (LOS E & F) during the AM and PM peak hours. Also, the analyses concluded that in addition to the northbound, the eastbound is under failing condition (LOS E) during the AM peak.

The results of the improvement and signal retiming/optimization yielded benefits for both AM and PM periods. This was achieved by increasing the northbound/southbound split and modifying the left/through overlaps. Although the overall LOS remained at D during AM and PM peaks, the overall and the approaches delays were improved with minor degradation to the southbound/westbound approaches.

				EB		WB			NB				SB				Overall	
			L	TR	Арр	L	Т	R	Арр	L	Т	R	Арр	L	Т	R	Арр	
	Eviat	LOS	F	С	Е	D	Е	В	D	F	Е	С	Е	D	D	Α	С	D
АМ	Exist.	Delay	96	34	62	39	60	16	54	91	58	20	61	39	55	0	22	53
	Modif.	LOS	Е	С	D	D	Е	В	Е	F	Е	С	E	D	Е	А	С	D
		Delay	64	27	44	46	80	18	72	86	59	20	60	49	61	0	24	47
	Eviat	LOS	Е	С	D	D	D	Α	D	F	D	В	F	D	Е	Α	С	D
РМ	Exist.	Delay	68	30	40	40	37	10	40	256	49	11	107	36	61	4	24	44
	Modif.	LOS	Е	D	D	D	D	В	D	Е	D	Α	D	С	Е	Α	С	D
		Delay	66	39	46	49	50	13	49	60	42	7	41	34	59	4	20	38

Table 7 – Capacity Analysis – SW 117 Avenue and SW 152 Street





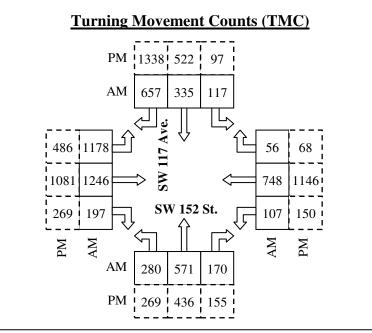
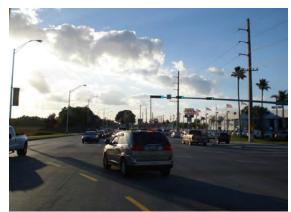


Figure 3: Traffic Data – SW 117 Avenue and SW 152 Street





Westbound approach: Sight distance obstruction to left-turn traffic.



Eastbound/Westbound: Left-turn lanes are not aligned to reduce the offset.



Eastbound approach: Tire skid marks.



Eastbound approach: Red light running.



Figure 4: Field Review – SW 117 Avenue and SW 152 Street



3.1.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 117 Avenue and SW 152 Street, the following is recommended:

- Realignment of the westbound left-turn lane south of its current location to reduce the offset and line-up with the opposite eastbound left-turn lane.
- Provide turning guidelines for the westbound left-turn lane.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Closing the median opening on the east leg, and lengthen the westbound left-turn lane.
- Converting the southbound shared thru-right lane to a thru only lane.
- Installing new lane use signs for southbound approach.
- Resurfacing the eastbound approach.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 5.



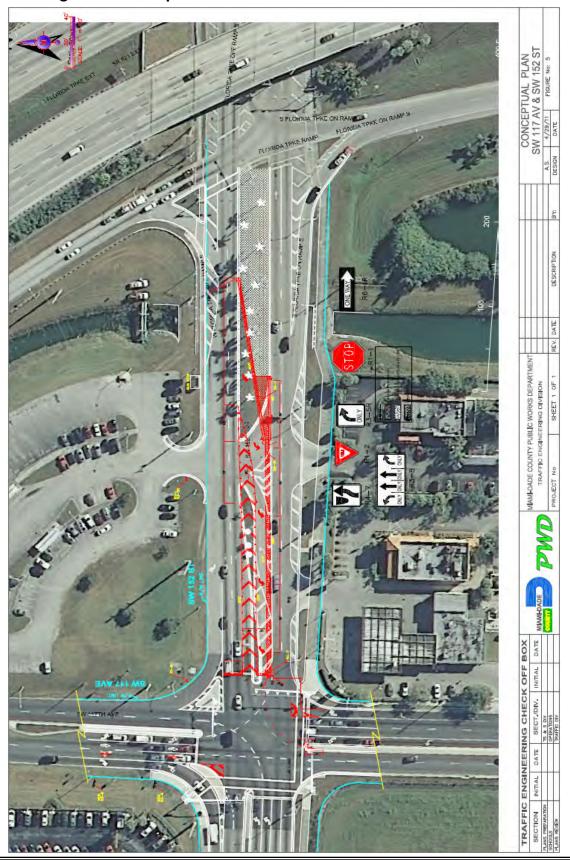


Figure 5: Conceptual Plan – SW 117 Avenue and SW 152 Street

Safety Studies at High Crash Locations Countywide



3.2. SW 122 Avenue and SW 120 Street

3.2.1. Site Description

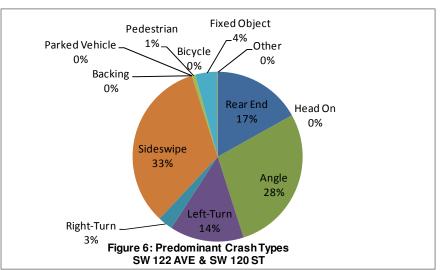
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 122 Avenue is a four lane major collector divided by a paved median that runs north-south, and SW 120 Street is a four lane major collector divided by a raised median that runs east-west.

3.2.2. Safety Conditions and Analysis

The intersection of SW 122 Avenue and SW 120 Street is ranked number 2 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 142 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 47. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 6*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 8* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 2.011, 3.656, and 2.453, respectively. The safety ratio for the three years averaged 2.707. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that angle, left-turn, sideswipe and fixed object collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 9*.



	· · ·	20110 / 1	Lune, oli	gnanzeu,		Lanes, 4 L	eg intersecti		abiezo) - 01 ii	BAN Spot			
		NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN	EXPECTED	ANNUAL CF	ASH VALUE	ABNORM	ALLY HIGH	CRASHES
	TYPE OF CRASH	2006	YEAR 2007	2008	TOTAL	of Total	Accidents per Year	MEAN	90th Percentile	95th Percentile	Mean	90th Percentil	95th Percenti
COLLISION TYPE	Rear End	4	12	8	24	8%	8.00	5.70	16.96	19.12	х	Fercentin	Fercenti
	Head On	0	0	0	0	0%	0.00	0.33	1.02	1.15			
	Angle	11	23	6	40	10%	13.33	3.05	7.08	7.85	X	X	X
	Left Turn Right Turn	8	5 2	7	20 4	6% 1%	6.67 1.33	1.67 0.33	4.02	4.47 1.42	X	X X	Х
	Sideswipe	10	23	14	4	11%	15.67	1.60	4.64	5.22	X	x	x
	Backed Into	0	0	0	0	0%	0.00	0.17	0.56	0.63	~	~	^
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.10	0.51	0.59			
	Coll. w/ Pedestrian	1	0	0	1	0%	0.33	0.28	1.04	1.19	Х		
	Coll. w/ Bicycle	0	0	0	0	0%	0.00	0.09	0.33	0.38			
	Fixed Object Ran Off Road	0	0	6 0	6 0	1% 0%	2.00 0.00	0.03	0.21	0.24 0.00	X	X	x
	Overtuned	0	0	0	0	0%	0.00	0.00	0.00	0.24			
	Other	0	0	0	ŏ	0%	0.00	3.70	8.83	9.82			
	Total Crashes	35	65	42	142	23%	47.33	17.77	40.96	45.39	Х	х	Х
SEVERITY	PDO crashes	31	57	36	124	87%	41.33	9.93	22.30	24.67	Х	Х	Х
	Fatal crashes	0	0	0	0	0%	0.00	0.05	0.26	0.29			
IGHT CONDITIONS	Injury crashes	4	8	6	18 93	13% 65%	6.00	13.14	33.08	36.90	х	x	I
	Day Light Dusk	18 0	45 2	30 0	93	65% 1%	31.00 0.67	12.40 0.28	29.18 0.87	32.39 0.98	X	*	
	Dawn	0	2	0	2	1%	0.87	0.28	0.87	0.98	X	<u> </u>	
	Dark	17	17	12	46	32%	15.33	4.56	10.53	11.68	X	x	x
	Unknown	0	0	0	0	0%	0.00	0.35	1.05	1.18			
SURFACE CONDITIONS		30	57	33	120	85%	40.00	15.30	34.45	38.12	Х	Х	Х
	Wet	5	8	7	20	14%	6.67	2.10	6.02	6.76	X	X	
	Others	0	0	2	2	1%	0.67	0.37	1.10	1.24	X		<u> </u>
MONTH OF A YEAR	January February	5 0	7	5 3	17 6	12% 4%	5.67 2.00	1.42 1.42	3.33 3.53	3.69 3.93	X	X	X
	March	2	5	7	14	4%	2.00	1.42	4.12	4.59	X	x	x
	April	1	2	4	7	5%	2.33	1.30	3.21	3.57	x	^	^
	May	2	8	4	14	10%	4.67	1.74	4.46	4.99	X	x	
	June	2	6	1	9	6%	3.00	1.38	3.49	3.90	Х		
	July	4	5	1	10	7%	3.33	1.35	3.22	3.58	Х	Х	
	August	1	8	2	11	8%	3.67	1.56	3.99	4.46	Х		
	September	4	3	4	11	8%	3.67	1.46	3.73	4.16	X		
	October	4	6	4	14	10%	4.67	1.47	3.59	4.00	X	X	X
	November December	5 5	5	5 2	15 14	11% 10%	5.00 4.67	1.39 1.61	3.53 4.43	3.94 4.97	X	X X	X
DAY OF THE WEEK	Sunday	4	6	2	14	8%	4.00	1.46	3.47	3.85	X	x	x
	Monday	3	9	3	15	11%	5.00	2.70	6.42	7.13	X	~	
	Tuesday	4	8	3	15	11%	5.00	2.49	6.18	6.88	Х		
	Wednesday	9	14	9	32	23%	10.67	2.56	5.84	6.47	Х	х	Х
	Thursday	6	9	9	24	17%	8.00	2.88	7.20	8.03	X	X	
	Friday	5 4	11 8	9 7	25 19	18% 13%	8.33 6.33	3.07 2.61	7.50 6.40	8.35 7.13	X	Х	
HOUR OF THE DAY	Saturday 00:00-06:00	4	• 4	2	19	5%	2.33	1.70	3.39	3.71	X		
	06:00-09:00	9	16	11	36	25%	12.00	1.98	5.12	5.72	X	x	x
	09:00-11:00	4	12	3	19	13%	6.33	1.72	4.23	4.71	Х	Х	х
	11:00-13:00	2	7	6	15	11%	5.00	2.40	6.30	7.05	Х		
	13:00-15:00	0	0	6	6	4%	2.00	1.95	5.32	5.96	Х		
	15:00-18:00	5	11	6	22	15%	7.33	3.58	7.81	8.62	X	v	
	18:00-24:00	14	15	8	37	26%	12.33	4.42	10.63	11.82	Х	X	X
						YEAR		2 Voor	1				
						-	0	3-Year					
					1	2	3	Average	-				
Average Daily Traffic A	DT (Vehicles per D	Day)			50,544	51,575	52,628	51,582					
Florida Average Crash	rate (Crashes per	Million En	tering Ve	hicles)	0.420	0.424	0.394	0.413	1				
Traffic Base			~		18.449	18.825	19.209	18.828	1				
			-hi-l···						-				
Actual Crash Rate (Cr		-	,		1.897	3.453	2.186	2.512	4				
Critical Crash Rate (C	rashes per Million E	ntering V	(ehicles)		0.944	0.944	0.891	0.926					
Safety Ratio					2.011	3.656	2.453	2.707	1				
High Crash Location	22				YES	YES	YES	YES	1				
0		0 000		Where:	,20	120	,20	.20	J				
Actual Crash	$Rate = \frac{A \times 1,00}{V}$	0,000			al number o rage Annua			f crashes by	type occurri	ng in a 1 year	period.		
CriticalCrashRa	$ate = AVR + \frac{0.5}{TB} + \frac{0.5}{TB}$	$TF\sqrt{\frac{AVH}{TB}}$	2		Average Sta affic Base	atewide Cr	ash Rate for	a particular	type of interse	ection or road	way segme	nt.	_
					апс ваse st Factor (z	-value)				Confidence I	evel (%)	Constant Z	1
							nfidence Lev	el for RI IDAI	areac)	68.30)	1.00	1
Traffic Pass -	$\frac{Years \times ADT \times 3}{1,000,000}$	65					Confidence Levi			86.60		1.50	1
1 rajjic Base =	1,000,000			= 3.	∠ə (assume	, 33.3 5% (Jonnuerice L	Level IOF URE	oniv areas)	90.00 95.00		1.64 1.96	
	1,000,000									95.00	,)	2.00	
	$= \frac{Actual Crash}{Critical Crash}$	n Rate								98.80)	2.50	1
Safety Ratio	$=\frac{ACTUAL}{Critical}$ Cras		_							99.00 99.70		2.58 3.00	

Table 8 – Crash Analysis – SW 122 Avenue and SW 120 Street



Table 9 – Abnormal Crash Details & Countermeasures SW 122 Avenue and SW 120 Street

	(4 Lane x 4 La	ane, Signalized, Wi	2 Aven th Turn La				e 28) - URI	BAN Spot		
	(*	,,		R OF CF		3 YEAR	%	MEAN		
			2006	YEAR 2007	2008	TOTAL	of Total	Accidents	Possible Cause(s)	Counter- measure(s)
	Total Angle	Crashes	11	23	6	40	100%	13.33	(4)	4
	Ŭ	Day Light	8	21	2	31	78%	10.33	(9)	6
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(10)	9
		Dark	3	2	4	9	23%	3.00	(12)	
		00:00 - 06:00 06:00 - 09:00	1	1 5	0	2 10	5% 25%	0.67 3.33		
		09:00 - 11:00	3	1	2	10	3%	0.33		
A	Hours of Day	11:00 - 13:00	0	4	2	6	15%	2.00		
Angle		13:00 - 15:00	0	0	0	0	0%	0.00		
		15:00 - 18:00	0	0	1	1	3%	0.33		
		18:00 - 24:00	7	12		20	50%	6.67		
		NB + EB	0	0	1	1	3%	0.33		
	Direction	NB + WB SB + EB	10 1	17 3	4	31 4	78% 10%	10.33 1.33		
	Direction	SB + WB	0	3	1	4	10%	1.33		
		Unknown	Ő	Ő	0	0	0%	0.00		
		•								
					401150	0.)/E4B				
			NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN	Possible	Counter-
			0000	YEAR	0000	TOTAL	of	Accidents	Cause(s)	measure(s)
	Total Latt Tor	n Crachec	2006	2007	2008	CRASHE	Total	per Year	(4)	
	Total Left Tur	n Crasnes Day Light	8 6	5	7 5	20 14	100% 70%	6.67 4.67	(4) (10)	2 6
	Lighting Conditions	DayLight	6 0	3	5	0	0%	4.67	(10)	13
	gg Sonditions	Dark	2	2	2	6	30%	2.00	(10)	15
		00:00 - 06:00	2	1	1	4	20%	1.33		
		06:00 - 09:00	0	0	0	0	0%	0.00		
		09:00 - 11:00	0	1	1	2	10%	0.67		
Left Turn	Hours of Day	11:00 - 13:00	1	0	0	1	5%	0.33		
		13:00 - 15:00	5	0	1	6	30%	2.00		
		15:00 - 18:00 18:00 - 24:00	0	2	3	5 2	25% 10%	1.67 0.67		
		$NB \rightarrow WB$	0	0	0	0	0%	0.00		
		$WB \rightarrow SB$	5	1	4	10	50%	3.33		
	Direction	$SB \rightarrow EB$	0	1	1	2	10%	0.67		
	Direction	$\begin{array}{c} SB \to EB \\ EB \to NB \end{array}$	0 3	1 3	1 2	2 8	10% 40%	0.67 2.67		
	Direction	$SB \rightarrow EB$	0	1	1	2	10%	0.67		
	Direction	$\begin{array}{c} SB \to EB \\ EB \to NB \end{array}$	0 3	1 3	1 2	2 8	10% 40%	0.67 2.67		
	Direction	$\begin{array}{c} SB \to EB \\ EB \to NB \end{array}$	0 3 0	1 3 0	1 2 0	2 8 0	10% 40% 0%	0.67 2.67 0.00	Beerlikk	
	Direction	$\begin{array}{c} SB \to EB \\ EB \to NB \end{array}$	0 3 0	1 3	1 2 0	2 8 0 3 YEAR	10% 40% 0%	0.67 2.67 0.00 MEAN	Possible	Counter-
	Direction	$\begin{array}{c} SB \to EB \\ EB \to NB \end{array}$	0 3 0	1 3 0 R OF CR	1 2 0	2 8 0 3 YEAR TOTAL	10% 40% 0%	0.67 2.67 0.00 MEAN Accidents	Possible Cause(s)	Counter- measure(s)
	Direction Total Sideswi	SB → EB EB → NB Unknown	0 3 0 NUMBE	1 3 0 R OF CF YEAR	1 2 0 ASHES	2 8 0 3 YEAR	10% 40% 0% % of	0.67 2.67 0.00 MEAN		
	Total Sideswi	SB → EB EB → NB Unknown pe Crashes Day Light	0 3 0 NUMBE 2006 10 9	1 3 0 ER OF CF YEAR 2007 23 20	1 2 0 ASHES 2008 14 11	2 8 0 3 YEAR TOTAL CRASHE 47 40	10% 40% 0% of Total 100% 85%	0.67 2.67 0.00 MEAN Accidents per Year 15.67 13.33	Cause(s) (1) (16)	measure(s) 4 19
		SB → EB EB → NB Unknown Dec Crashes DayLight Dawn	0 3 0 NUMBE 2006 10 9 0	1 3 0 ER OF CF YEAR 2007 23 20 0	1 2 0 ASHES 2008 14 11 0	2 8 0 3 YEAR TOTAL CRASHE 40 0	10% 40% 0% of Total 100% 85% 0%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00	Cause(s) (1)	measure(s) 4
	Total Sideswi	SB → EB EB → NB Unknown DayLight Dawn Dawn Dark	0 3 0 NUMBE 2006 10 9 0 1	1 3 0 ER OF CF YEAR 2007 23 20 0 3	1 2 0 ASHES 2008 14 11 0 3	2 8 0 3 YEAR TOTAL CRASHE 40 0 7	10% 40% 0% of Total 100% 85% 0% 15%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00 2.33	Cause(s) (1) (16)	measure(s) 4 19
	Total Sideswi	$SB \rightarrow EB$ $EB \rightarrow NB$ $Durknown$ Dee Crashes $Day Light$ $Dawn$ $Dark$ $Dark$ $(0:00 - 06:00$	0 3 0 2006 10 9 0 1 1 0	1 3 0 ER OF CF YEAR 2007 23 20 0 3 0	1 2 0 ASHES 2008 14 11 0 3 1	2 8 0 3 YEAR TOTAL CRASHE 40 0 7 7	10% 40% 0% of Total 100% 85% 0% 15% 2%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00 2.33 0.33	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
	Total Sideswi	$SB \rightarrow EB$ $EB \rightarrow NB$ $Durknown$ Dee Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	0 3 0 2006 10 9 0 1 0 1 0 4	1 3 0 ER OF CF YEAR 2007 23 20 0 3 0 5	1 2 0 ASHES 2008 14 11 0 3 1 3	2 8 0 3 YEAR TOTAL CRASHE 40 0 7 1 12	10% 40% 0% of Total 100% 85% 0% 15% 2% 26%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00 2.33 0.33 4.00	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
Sideswipe	Total Sideswi	$SB \rightarrow EB$ $EB \rightarrow NB$ $Durknown$ Dee Crashes $Day Light$ $Dawn$ $Dark$ $Dark$ $(0:00 - 06:00$	0 3 0 2006 10 9 0 1 1 0	1 3 0 ER OF CF YEAR 2007 23 20 0 3 0	1 2 0 ASHES 2008 14 11 0 3 1	2 8 0 3 YEAR TOTAL CRASHE 40 0 7 7	10% 40% 0% of Total 100% 85% 0% 15% 2%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00 2.33 0.33	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
Sideswipe (Overtake)	Total Sideswi	SB → EB EB → NB Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	0 3 0 NUMBE 2006 10 9 0 1 0 0 4 3 0 0	1 3 0 R OF CF YEAR 2007 23 20 0 3 0 5 7	1 2 0 ASHES 2008 14 11 0 3 1 3 2 3 1	2 8 0 3 YEAR TOTAL CRASHE 47 40 0 7 7 1 12 12 5 5 1	10% 40% 0% of Total 100% 85% 0% 15% 26% 26% 26% 11% 26%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00 2.33 0.33 4.00 4.00 1.67 0.33	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
•	Total Sideswi	SB → EB EB → NB Duknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 18:00	0 3 0 NUMBE 2006 10 9 0 1 0 4 3 0 0 2	1 3 0 FR OF CF YEAR 2007 23 20 0 3 0 5 7 2 0 6	1 2 0 ASHES 2008 14 11 0 3 1 3 2 3 1 2	2 8 0 3 YEAR TOTAL CRASHE 47 40 0 7 1 12 12 12 5 1 10	10% 40% 0% of Total 100% 85% 0% 15% 26% 26% 26% 26% 26% 26% 26% 21%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00 2.33 0.33 0.33 4.00 4.00 1.67 0.33 3.33	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
•	Total Sideswi	SB → EB EB → NB Unknown Unknown Day Light Dawn Dark 00:00 - 06:00 00:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 15:00 - 24:00	0 3 0 NUMBE 2006 10 9 0 1 1 0 4 3 0 0 0 2 2 1	1 3 0 FROFCF YEAR 2007 23 20 0 3 0 5 7 2 0 6 3 3	1 2 0 ASHES 2008 14 11 0 3 1 3 2 3 1 2 2 2	2 8 0 3 YEAR TOTAL CRASHE 47 40 0 7 7 1 12 12 5 1 1 10 6	10% 40% 0% of Total 100% 85% 0% 2% 2% 26% 11% 26% 11% 2% 21% 21% 13%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00 2.33 0.00 2.33 4.00 4.00 4.00 1.67 0.33 3.33 2.00	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
•	Total Sideswi	SB → EB EB → NB Duknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North	0 3 0 2006 10 9 0 1 1 0 4 3 0 0 2 1 5	1 3 0 7 2007 20 0 3 20 0 5 7 2 0 6 3 13	1 2 0 ASHES 2008 14 11 0 3 1 3 2 3 1 2 2 10	2 8 0 3 YEAR TOTAL CRASHE 47 40 0 7 7 1 12 12 12 12 1 1 0 6 6 28	10% 40% 0% of Total 100% 85% 0% 15% 26% 26% 26% 26% 26% 21% 11% 60%	0.67 2.67 0.00 MEAN Accidents per Year 15.67 13.33 0.00 2.33 0.00 2.33 4.00 4.00 4.00 4.00 4.00 4.00 9.33	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
•	Total Sideswi Lighting Conditions Hours of Day	SB → EB EB → NB Duknown DayLight Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South	0 3 0 NUMBE 2006 10 9 0 1 1 0 4 3 0 2 1 5 2	1 3 0 FR OF CF YEAR 2007 23 20 0 3 0 5 7 2 0 6 3 1 1	1 2 0 ASHES 2008 14 11 0 3 1 3 2 3 1 2 2 2	2 8 0 3 YEAR TOTAL CRASHE 47 40 0 7 1 12 12 12 12 12 1 10 6 28 6	10% 40% 0% of Total 100% 85% 0% 15% 26% 26% 26% 26% 26% 21% 13%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00 2.33 0.33 4.00 4.00 4.00 1.67 0.33 3.33 2.00	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
•	Total Sideswi	SB → EB EB → NB Unknown Unknown Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 15:00 - 18:00 15:00 - 24:00 North South East	0 3 0 2006 10 9 0 1 1 0 4 3 0 0 2 1 5	1 3 0 FR OF CFR YEAR 2007 23 200 0 3 0 5 7 2 0 6 3 13 1 3	1 2 0 ASHES 2008 14 11 0 3 1 2 3 3 1 2 2 2 10 3 1	2 8 0 3 YEAR TOTAL CRASHE 47 40 0 7 7 1 12 12 12 12 1 1 0 6 6 28	10% 40% 0% of Total 100% 85% 0% 25% 26% 26% 26% 26% 26% 11% 21% 21% 33%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00 2.33 0.33 4.00 4.00 4.00 4.00 1.67 0.33 3.33 2.00 9.33 2.00 9.30 2.00	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
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•	Total Sideswi Lighting Conditions Hours of Day	SB → EB EB → NB Duknown Day Light Dawn Dark 00:00 - 06:00 00:00 - 13:00 11:00 - 13:00 11:00 - 13:00 15:00 - 15:00 15:00 - 24:00 North South East West	0 3 0 2006 10 9 0 1 1 0 4 3 0 0 2 1 5 2 2 1	1 3 0 7 2007 20 0 3 20 0 3 5 7 2 0 6 3 13 1 3 6	1 2 0 8 3 14 11 1 0 3 2 3 1 2 2 10 3 1 0 0	2 8 0 3 YEAR TOTAL CRASHE 47 40 0 7 7 1 12 12 12 1 10 6 6 6 6 7	10% 40% 0% of Total 100% 85% 85% 0% 26% 26% 21% 26% 21% 13% 60% 13% 13% 15%	0.67 2.67 0.00 Accidents per Year 15.67 13.33 0.00 2.33 0.33 4.00 4.00 4.00 4.00 4.00 4.00 4	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
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•	Total Sideswi Lighting Conditions Hours of Day	SB → EB EB → NB Duknown Day Light Dawn Dark 00:00 - 06:00 00:00 - 13:00 11:00 - 13:00 11:00 - 13:00 15:00 - 15:00 15:00 - 24:00 North South East West	0 3 0 NUMBE 2006 10 9 9 0 1 1 0 4 3 0 0 2 2 2 2 2 1 0 0	1 3 0 7 2007 23 2007 23 2007 23 0 3 0 5 7 2 0 6 3 13 1 3 6 0 0 8 7 2 0 6 3 13 1 3 6 0 0 7 2 0 6 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8	1 2 0 ASHES 2008 14 11 0 3 1 2 3 1 2 2 3 1 2 2 0 3 1 0 3 0 0	2 8 0 3 YEAR TOTAL CRASHE 47 40 0 7 1 12 12 12 12 12 12 12 12 10 6 6 6 6 6 7 0 3 YEAR	10% 40% 0% of Total 100% 85% 2% 26% 26% 26% 26% 21% 13% 26% 21% 13% 13% 13% 13% 15% 0%	0.67 2.67 0.00 MEAN Accidents per Year 15.67 13.33 0.00 2.33 0.33 4.00 4.00 1.67 0.33 3.33 2.00 2.00 2.00 2.00 2.00 2.00	Cause(s) (1) (16)	<mark>measure(s)</mark> 4 19
•	Total Sideswi Lighting Conditions Hours of Day	SB → EB EB → NB Duknown Day Light Dawn Dark 00:00 - 06:00 00:00 - 13:00 11:00 - 13:00 11:00 - 13:00 15:00 - 15:00 15:00 - 24:00 North South East West	0 30 2006 10 9 0 1 1 0 4 4 3 0 0 0 2 2 1 1 5 5 2 2 1 1 0 0 8 1 0 0 0 1 0 1 0 1 0 0 0 1 0 1	1 3 0 7 2007 23 2007 23 2007 3 0 5 7 2 0 6 3 1 3 6 0 0 5 7 2 0 0 5 7 2 0 0 5 7 2 0 0 5 7 2 0 0 0 5 7 7 2 0 0 0 5 7 7 2 0 0 0 5 7 7 2 0 0 0 5 7 7 2 0 0 0 5 7 7 2 0 0 0 5 7 7 2 0 0 0 5 7 7 2 0 0 0 0 5 7 7 2 0 0 0 0 5 7 7 2 0 0 0 0 5 7 7 2 0 0 0 0 0 5 7 7 2 0 0 0 0 0 5 7 7 2 0 0 0 0 0 5 7 7 2 0 0 0 0 0 0 5 7 7 2 0 0 0 0 0 0 0 0 5 7 7 2 0 0 0 6 3 0 0 0 0 0 0 0 0 0 0 0 0 0	1 2 0 ASHES 2008 14 11 0 3 1 2 2 3 1 2 2 2 10 3 1 0 0 0 ASHES	2 8 0 3 YEAR TOTAL CRASHE 47 40 0 7 1 12 12 12 12 12 12 12 6 6 6 6 6 7 7 0 3 YEAR 70 7	10% 40% 0% of Total 100% 85% 0% 15% 26% 26% 26% 26% 26% 26% 21% 13% 13% 13% 13% 13% 0%	0.67 2.67 0.00 MEAN Accidents per Year 15.67 13.33 0.00 2.33 0.33 4.00 4.00 1.67 0.33 3.33 2.00 2.00 2.00 2.00 2.33 0.00	Cause(s) (1) (16) (19)	measure(s) 4 19 21
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3.2.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 122 Avenue and SW 120 Street were performed on a typical weekday on November 19, 2010. A summary of the traffic data is presented in *Figure 7*, and the field review is presented in *Figure 8*.

This intersection has single left-turn bays for all approaches, and the northbound approach has an exclusive right-turn lane. The signal operation has split phases for northbound and southbound traffic, and protected/permissive for eastbound and westbound left-turn traffic.

Long queues were observed for westbound left-turn with vehicles spilling back and blocking the through lane. Also, this westbound left-turn movement struggles to cross the opposing eastbound through movement. Additionally, red light running was observed at the intersection.

It was noticed that the northbound vehicles do not respect the left-turn red arrow. Also, vehicles were constantly changing lanes to access the exclusive right-turn lane.

3.2.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 122 Avenue and SW 120 Street, the following is recommended:

- Lengthen the westbound left-turn lane to approximately 500 ft.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Installing "No Turn on Red" (R10-11) signs for northbound approach.
- Modifying the fences on the southeast and southwest corners to improve the sight distance triangles for northbound approach.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 9.





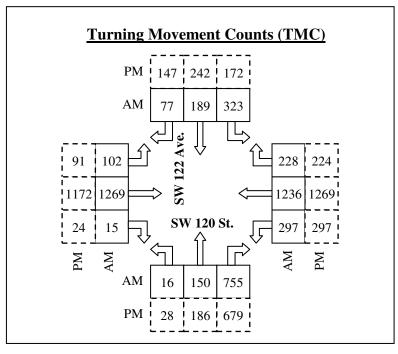


Figure 7: Traffic Data – SW 122 Avenue and SW 120 Street





Figure 8: Field Review – SW 122 Avenue and SW 120 Street



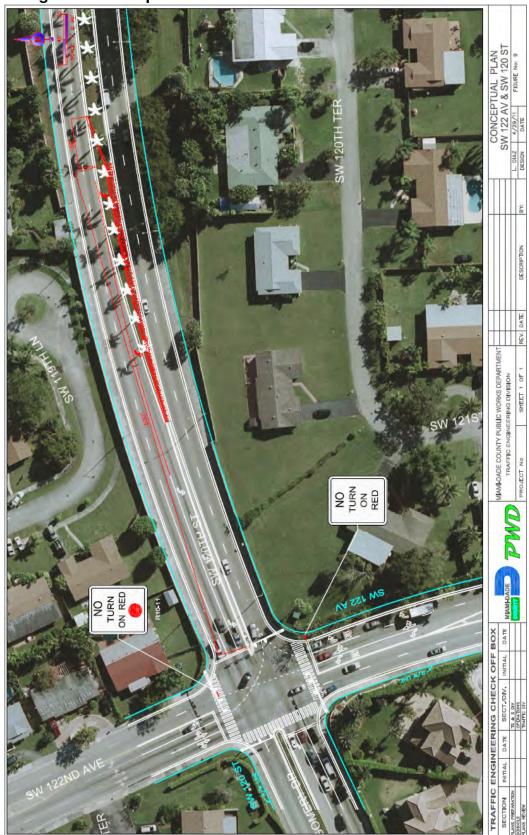


Figure 9: Conceptual Plan – SW 122 Avenue and SW 120 Street



3.3. SW 137 Avenue and SW 26 Street (Coral Way)

3.3.1. Site Description

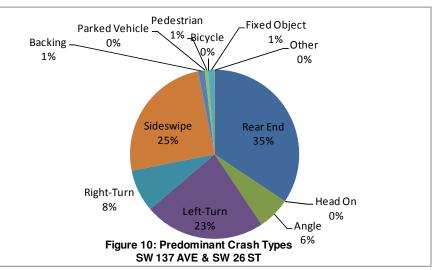
This intersection is a signalized four legged intersection located in the unincorporated area of the western part of Miami Dade County. SW 137 Avenue is a six lane urban arterial divided by a raised median that runs north-south, and SW 26 Street is a four lane urban arterial divided by a raised median that runs east-west.

3.3.2. Safety Conditions and Analysis

The intersection of SW 137 Avenue and SW 26 Street is ranked number 3 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 160 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 53. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 10*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 10* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.814, 2.367, and 1.717, respectively. The safety ratio for the three years averaged 1.966. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that left-turn, right-turn and sideswipe collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Also, rear end crash type exceeds the limit for 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 11*.



		(0.1					& SW 26 S			0			
		(6 Lane	x 4 Lane	Signaliz	ed, With Tu	urn Lanes,	4 Leg Inters	ection-Table	35) - URBAN	I Spot			
	TYPE OF CRASH	NUMBE	R OF CR	ASHES	3 YEAR TOTAL	% of	MEAN Accidents		ANNUAL CF	ASH VALUE		ALLY HIGH 90th	CRASHES 95th
		2006	2007	2008	CRASHE	Total	per Year	MEAN	Percentile	Percentile	Mean	Percentil	
OLLISION TYPE	Rear End	16 0	22 0	17 0	55 0	17% 0%	18.33 0.00	8.68 0.60	17.26	18.90	Х	Х	
	Head On Angle	0	5	5	10	2%	3.33	5.40	1.64 9.19	1.84 9.92			
	Left Turn	17	10	10	37	9%	12.33	3.00	6.13	6.73	Х	Х	Х
	Right Turn	4	6	3	13	3%	4.33	0.46	1.36	1.53	X	X	X
	Sideswipe Backed Into	10 1	20 0	10 1	40	8% 0%	13.33 0.67	2.58 0.28	4.92 0.84	5.37 0.94	X X	X	X
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.12	0.57	0.65	~		
	Coll. w/ Pedestrian	1	0	0	1	0%	0.33	0.74	1.80	2.00			
	Coll. w/ Bicycle Fixed Object	0	0	0	0	0% 0%	0.00	0.14 0.79	0.49 2.01	0.55			
	Ran Off Road	0	0	0	0	0%	0.00	0.01	0.11	0.13			
	Overtuned	0	0	0	0	0%	0.00	0.04	0.28	0.33			
	Other	0 49	0	0	0	0% 23%	0.00 53.33	8.67	21.05 54.94	23.42	x		
EVERITY	Total Crashes PDO crashes	49 45	64 63	47 40	160 148	23% 93%	49.33	31.51 19.21	36.95	59.43 40.35	X	x	x
	Fatal crashes	0	0	0	0	0%	0.00	0.16	0.56	0.63	~	~	~
	Injury crashes	4	1	7	12	8%	4.00	20.77	38.34	41.71			
IGHT CONDITIONS	Day Light Dusk	36 0	45 0	34 0	115 0	72% 0%	38.33 0.00	19.89 0.61	35.12 1.43	38.03 1.58	X	X	X
	Dusk Dawn	3	0	1	4	3%	1.33	0.61	1.43	1.58	x	x	x
	Dark	9	17	12	38	24%	12.67	10.22	18.94	20.61	Х		Ê
	Unknown	1	2	0	3	2%	1.00	0.41	1.15	1.30	X		
URFACE CONDITIONS	Dry Wet	28 4	51 11	42 5	121 20	76% 13%	40.33 6.67	26.41 4.41	45.71 8.78	49.41 9.62	X X		
	Others	4	2	0	19	13%	6.33	0.69	1.88	2.11	X	x	x
IONTH OF A YEAR	January	3	7	5	15	9%	5.00	2.57	5.04	5.52	X		
	February	5	6	5	16	10%	5.33	2.37	4.59	5.02	X	Х	X
	March April	2	5	4	11 7	7% 4%	3.67 2.33	3.09 2.57	5.92 5.30	6.46 5.82	X		
	May	5	4	6	15	9%	5.00	2.51.	4.81	5.25		x	
	June	6	3	2	11	7%	3.67	2.81	5.74	6.30	Х		
	July	5	5	4	14	9%	4.67	2.60	4.96	5.42	X		
	August September	1	3	3 5	21	4% 13%	2.33 7.00	3.00 2.48	5.66 4.92	6.17 5.39	x	x	x
	October	8	7	3	18	11%	6.00	2.89	5.40	5.88	X	X	x
	November	3	6	5	14	9%	4.67	2.41	4.85	5.32	X		
DAY OF THE WEEK	December	1 5	6 5	4	11	7% 10%	3.67 5.33	2.22 4.00	4.55 6.58	5.00 7.08	X		
AT OF THE WEEK	Sunday Monday	4	5 17	5	26	10%	8.67	4.00	9.23	10.11	x		
	Tuesday	10	10	6	26	16%	8.67	4.46	7.81	8.46	X	х	х
	Wednesday	6	5	7	18	11%	6.00	4.56	8.62	9.40	X		
	Thursday Friday	4	9 12	6 11	19 32	12% 20%	6.33 10.67	5.04 4.86	9.04 9.39	9.80 10.26	X	x	x
	Saturday	11	6	6	23	14%	7.67	3.98	8.10	8.89	x	^	<u>^</u>
IOUR OF THE DAY	00:00-06:00	1	2	0	3	2%	1.00	3.79	8.65	9.58			
	06:00-09:00	5	9	10	24	15%	8.00	3.44	6.94	7.61	X	X	X
	09:00-11:00 11:00-13:00	7	8	4 10	19 22	12% 14%	6.33 7.33	2.58 3.12	5.30 5.78	5.82 6.29	X	X	X
	13:00-15:00	7	12	1	20	13%	6.67	3.57	6.32	6.85	Х	X	
	15:00-18:00	10	13	9	32	20%	10.67	6.38	11.52	12.50	X		
	18:00-24:00	11	16	13	40	25%	13.33	8.60	15.51	16.83	X		
						YEAR		3-Year	1				
					1	2	3	Average					
verage Daily Traffic	ADT (Vehicles per D	Day)			66,914	68,280	69,673	68,289					
lorida Average Crasl	n rate (Crashes per	Million En	tering Ve	hicles)	0.579	0.568	0.566	0.571	1				
raffic Base			-		24.424	24.922	25.431	24.925	1				
ctual Crash Rate (C	rashes ner Million E	ntering V	ehicles		2.006	2.568	1.848	2.141	1				
		-	,				-		4				
Critical Crash Rate (C	Jasties per Million E	menng V	enicies)		1.106	1.085	1.076	1.089	4				
Safety Ratio					1.814	2.367	1.717	1.966	1				
ligh Crash Location	1??				YES	YES	YES	YES					
Actual Crash	$Rate = \frac{A \times 1,00}{V}$	0,000			al number o rage Annua			f crashes by	type occurri	ng in a 1 year	period.		
CriticalCrashR	$ate = AVR + \frac{0.5}{TB} + \frac{0.5}{TB}$	$TF\sqrt{\frac{AVI}{TB}}$	2	TB = Trans	affic Base		ash Rate for	a particular	type of interse	ection or road		nt. Constant Z	-1
Traffic Base =	$\frac{Y ears \times ADT \times 3}{1,000,000}$	65		= 1.		ə 95% Cor	nfidence Lev Confidence L			68.30 86.60 90.00 95.00)))	1.00 1.50 1.64 1.96	
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	n Rate h Rate	_							95.50 98.80 99.00 99.70 99.92)))	2.00 2.50 2.58 3.00 3.29	

Table 10 – Crash Analysis – SW 137 Avenue and SW 26 Street



Table 11 – Abnormal Crash Details & Countermeasures SW 137 Avenue and SW 26 Street

	(6 Lane x 4 L	ane, Signalized, W	37 Aven ith Turn La				e 35) - URI	BAN Spot		
	(0 2010 X 1 2			-	- -					
			NUMBE	R OF CR	ASHES	3 YEAR TOTAL	% of	MEAN Accidents	Possible	Counter-
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Left Tu	m Crashes Day Light	17	10 9	10	37 30	100%	12.33	(9) (13)	9 16
	Lighting Conditions	Day Light	14 0	0	0	0	81% 0%	10.00 0.00	(13)	17
		Dark	3	1	3	7	19%	2.33		
		00:00 - 06:00 06:00 - 09:00	1	0	0	1 5	3% 14%	0.33		
		09:00 - 11:00	3	3	0	6	16%	2.00		
Left Turn	Hours of Day	11:00 - 13:00 13:00 - 15:00	4	0	3 0	7 4	19% 11%	2.33 1.33		
		15:00 - 18:00	3	1	1	5	14%	1.67		
		18:00 - 24:00 NB → WB	4	1 7	4	9 14	24% 38%	3.00 4.67		
		$WB \rightarrow SB$	2	0	4	6	16%	2.00		
	Direction	$\frac{\text{SB} \rightarrow \text{EB}}{\text{EB} \rightarrow \text{NB}}$	8	2	3	13 4	35% 11%	4.33 1.33		
		Unknown	0	0	0	0	0%	0.00		
			NUMBE	R OF CR	ASHES	3 YEAR	%	MEAN	Possible	Counter-
				YEAR		TOTAL	of	Accidents	Cause(s)	measure(s)
	Total Sideswi	pe Crashes	2006 10	2007 20	2008 10	CRASHE 40	Total 100%	per Year 13.33	(8)	4
		Day Light	8	14	6	28	70%	9.33	(16)	19
	Lighting Conditions	Dawn Dark	0	0	0	0 12	0% 30%	0.00 4.00	(18) (19)	20 21
		00:00 - 06:00	1	1	4 0	2	5%	0.67	(20)	£1
		06:00 - 09:00	0	3	2	5	13% 5%	1.67	(21)	
Sideswipe	Hours of Day	09:00 - 11:00 11:00 - 13:00	2	1	2	2 5	13%	0.67		
(Overtake)		13:00 - 15:00	2	1	0	3	8%	1.00		
		15:00 - 18:00 18:00 - 24:00	1 4	9 4	1	11 12	28% 30%	3.67 4.00		
		North	6	4	4	14	35%	4.67		
	Direction	South East	0	5 6	2	7	18% 28%	2.33 3.67		
		West	1	5	2	8	20%	2.67		
		Unknown	0	0	0	0	0%	0.00		
							0/			
			NUMBE	R OF CR YEAR	ASHES	3 YEAR	% of	MEAN Accidents	Possible	Counter-
			2006	YEAR 2007	2008	3 YEAR TOTAL CRASHE	% of Total	MEAN Accidents per Year	Possible Cause(s)	Counter- measure(s)
	Total Right Tu		2006 4	YEAR 2007 6	2008 3	TOTAL CRASHE 13	of Total 100%	Accidents per Year 4.33	Cause(s) (1)	<mark>measure(s)</mark> 4
	Total Right Tu Lighting Conditions	urn Crashes Day Light Dawn	2006	YEAR 2007	2008	TOTAL CRASHE	of Total	Accidents per Year	Cause(s)	measure(s)
		Day Light Dawn Dark	2006 4 4 0 0	YEAR 2007 6 3 3 0	2008 3 0 0	TOTAL CRASHE 13 10 3 0	of Total 100% 77% 23% 0%	Accidents per Year 4.33 3.33 1.00 0.00	Cause(s) (1) (18)	<mark>measure(s)</mark> 4 19
		Day Light Dawn	2006 4 4 0	YEAR 2007 6 3 3	2008 3 0	TOTAL CRASHE 13 10 3	of Total 100% 77% 23%	Accidents per Year 4.33 3.33 1.00	Cause(s) (1) (18) (19)	measure(s) 4 19
	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	2006 4 4 0 0 0 0 0 3	YEAR 2007 6 3 3 0 0 0 0 1	2008 3 0 0 0 1 0	TOTAL CRASHE 10 3 0 0 1 4	of Total 100% 77% 23% 0% 0% 0% 8% 31%	Accidents per Year 4.33 3.33 1.00 0.00 0.00 0.33 1.33	Cause(s) (1) (18) (19)	<mark>measure(s)</mark> 4 19
Right Turn		Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	2006 4 4 0 0 0 0 3 1	YEAR 2007 6 3 3 0 0 0 0	2008 3 0 0 0 1 0 0 0	TOTAL CRASHE 13 10 3 0 0 0 1	of Total 100% 77% 23% 0% 0% 0% 8% 31% 8%	Accidents per Year 4.33 3.33 1.00 0.00 0.00 0.33 1.33 0.33	Cause(s) (1) (18) (19)	<mark>measure(s)</mark> 4 19
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00	2006 4 0 0 0 0 3 1 1 0 0	YEAR 2007 6 3 0 0 0 1 0 1 0 1 0	2008 3 0 0 0 1 0 0 0 2	TOTAL CRASHE 13 10 3 0 0 1 4 1 1 2	of Total 100% 77% 23% 0% 0% 0% 8% 31% 8% 8% 8% 15%	Accidents per Year 4.33 3.33 1.00 0.00 0.00 0.33 1.33 0.33 0	Cause(s) (1) (18) (19)	<mark>measure(s)</mark> 4 19
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00	2006 4 0 0 0 0 3 1 0	YEAR 2007 6 3 3 0 0 0 1 1 1	2008 3 0 0 0 1 0 0 0 0	TOTAL CRASHE 13 10 3 0 0 1 4 1 1	of Total 100% 77% 23% 0% 0% 0% 8% 31% 8% 8%	Accidents per Year 4.33 3.33 1.00 0.00 0.00 0.33 1.33 0.33 0	Cause(s) (1) (18) (19)	<mark>measure(s)</mark> 4 19
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB	2006 4 0 0 0 3 1 1 0 0 0 2 1	YEAR 2007 6 3 3 0 0 1 0 1 0 4 3 3 3	2008 3 0 0 1 0 0 0 0 2 0 0 1 1	TOTAL CRASHE 13 10 3 0 0 1 4 1 1 2 4 6 5	of Total 100% 77% 23% 0% 0% 8% 31% 8% 8% 15% 31% 31% 31% 33%	Accidents per Year 4.33 3.33 1.00 0.00 0.33 1.33 0.33 0.33 0	Cause(s) (1) (18) (19)	<mark>measure(s)</mark> 4 19
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 13:00 15:00 - 18:00 15:00 - 18:00 NB→EB	2006 4 0 0 0 0 3 1 0 0 0 0 0 2	YEAR 2007 6 3 0 0 0 1 0 1 0 4 3	2008 3 0 0 1 0 0 0 2 0 0 1	TOTAL CRASHE 13 10 3 0 0 1 1 1 1 2 4 6	of Total 100% 77% 23% 0% 0% 0% 8% 31% 8% 31% 8% 31% 46%	Accidents per Year 4.33 3.33 1.00 0.00 0.33 1.33 0.33 0.33 0	Cause(s) (1) (18) (19)	<mark>measure(s)</mark> 4 19
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB	2006 4 0 0 0 3 1 1 0 0 0 2 1	YEAR 2007 6 3 0 0 0 1 0 4 3 3 0	2008 3 0 0 1 0 0 0 0 2 0 0 1 1	TOTAL CRASHE 13 10 3 0 1 4 1 1 2 4 6 5 2 2	of Total 100% 77% 23% 0% 0% 0% 8% 8% 8% 8% 8% 15% 31% 31% 38% 15% 38%	Accidents per Year 4.33 3.33 1.00 0.00 0.33 0.33 0.33 0.33 0	Cause(s) (1) (18) (19)	<mark>measure(s)</mark> 4 19
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB	2006 4 4 0 0 0 0 3 1 0 0 0 0 2 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	YEAR 2007 6 3 3 0 0 1 0 1 0 4 3 3 0 0 0	2008 3 0 0 0 1 0 0 0 2 0 0 1 1 1 1 0	TOTAL CRASHE 13 0 0 1 1 4 1 1 2 4 6 5 2 0 0	of Total 100% 23% 0% 0% 8% 31% 8% 8% 8% 8% 31% 46% 31% 15% 0%	Accidents per Year 4.33 3.33 1.00 0.00 0.00 0.33 1.33 0.33 0	Cause(s) (1) (18) (19)	measure(s) 4 19
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB	2006 4 0 0 0 3 1 0 0 0 0 2 1 1 1 0 0 0 0 0 0 0 0 0 0 0	YEAR 2007 6 3 3 0 0 1 0 1 0 1 0 1 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	2008 3 0 0 0 0 0 0 2 0 1 1 1 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL <u>CRASHE</u> 13 10 3 0 1 1 1 1 1 2 4 6 5 2 0 0 0 3 YEAR	of Total 100% 77% 23% 0% 8% 8% 31% 8% 15% 31% 8% 15% 33% 15% 33% 0% 0%	Accidents per Year 4.33 3.33 1.00 0.00 0.03 1.33 0.33 0.33 0.67 1.33 2.00 1.67 0.67 0.00 0.00 0.00 0.67 0.00 0.00 0.00 0.03 0.33 0.33 0.33 0.67 1.33 2.00 1.67 0.67 0.00 0.03 0.03 0.03 0.03 0.067 0.67 0.67 0.00 0.00 0.00 0.67 0.67 0.00 0.00 0.00 0.67 0.00 0.67 0.00 0.00 0.00 0.67 0.00 0.00 0.00 0.00 0.67 0.00 0.00 0.00 0.67 0.00 0.00 0.00 0.00 0.67 0.00 0.00 0.00 0.00 0.00 0.67 0.00 0.	Cause(s) (1) (18) (19) (20)	measure(s) 4 19 21
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB	2006 4 4 0 0 0 0 0 0 0 2 1 1 0 0 0 2 1 1 0 0 0 0 2 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	YEAR 2007 6 3 0 0 0 1 0 1 0 1 0 4 3 0 0 0 0 0 0 CR OF CR YEAR	2008 3 0 0 1 0 0 0 0 2 0 1 1 1 0 0 0 8 ASHES	TOTAL <u>CRASHE</u> 10 3 0 1 1 1 1 1 1 1 1 1 2 4 4 6 5 2 0 0 3 YEAR TOTAL	of Total 100% 77% 23% 0% 0% 8% 8% 8% 8% 8% 8% 8% 31% 46% 31% 46% 0% 0%	Accidents per Year 4.33 3.33 1.00 0.00 0.00 0.33 0.33 0.33 0	Cause(s) (1) (18) (19)	measure(s) 4 19
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown	2006 4 0 0 0 3 1 0 0 0 0 2 1 1 1 0 0 0 0 0 0 0 0 0 0 0	YEAR 2007 6 3 3 0 0 1 0 1 0 1 0 1 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	2008 3 0 0 0 0 0 0 2 0 1 1 1 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL <u>CRASHE</u> 13 10 3 0 1 1 1 1 1 2 4 6 5 5 2 0 0 0 3 YEAR TOTAL <u>CRASHE</u>	of Total 100% 77% 23% 0% 8% 8% 8% 8% 8% 8% 8% 8% 31% 46% 33% 15% 0% 0% 0% 0%	Accidents per Year 4.33 3.33 1.00 0.00 0.00 0.33 1.33 0.33 0.33 0.33 0.67 1.33 2.00 1.67 0.67 0.00 0.00 0.00 MEAN Accidents per Year	Cause(s) (1) (18) (19) (20) Possible Cause(s)	Measure(s) 4 19 21 21
Right Turn	Lighting Conditions Hours of Day Direction	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 13:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown	2006 4 4 0 0 0 0 0 0 0 2 1 1 0 0 0 2 1 1 0 0 0 2 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	YEAR 2007 6 3 0 0 1 0 1 0 1 0 1 0 1 0 </td <td>2008 3 3 0 0 0 1 0 0 0 2 0 1 1 1 0 0 0 ASHES 2008 17 14</td> <td>TOTAL <u>CRASHE</u> 10 3 0 1 1 1 1 1 1 1 1 1 2 4 6 5 2 0 0 3 YEAR TOTAL <u>CRASHE</u> 55 44</td> <td>of Total 100% 77% 23% 0% 0% 8% 8% 8% 8% 8% 8% 31% 46% 38% 15% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%</td> <td>Accidents per Year 4.33 3.33 1.00 0.00 0.33 0.33 0.33 0.33 0.33 0.67 1.33 2.00 1.67 0.67 0.07 0.00 0.00 MEAN Accidents per Year 18.33 14.67</td> <td>Cause (s) (1) (18) (19) (20) (20) Possible Cause (s) (1) (2)</td> <td>Counter- mea sure (s)</td>	2008 3 3 0 0 0 1 0 0 0 2 0 1 1 1 0 0 0 ASHES 2008 17 14	TOTAL <u>CRASHE</u> 10 3 0 1 1 1 1 1 1 1 1 1 2 4 6 5 2 0 0 3 YEAR TOTAL <u>CRASHE</u> 55 44	of Total 100% 77% 23% 0% 0% 8% 8% 8% 8% 8% 8% 31% 46% 38% 15% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Accidents per Year 4.33 3.33 1.00 0.00 0.33 0.33 0.33 0.33 0.33 0.67 1.33 2.00 1.67 0.67 0.07 0.00 0.00 MEAN Accidents per Year 18.33 14.67	Cause (s) (1) (18) (19) (20) (20) Possible Cause (s) (1) (2)	Counter- mea sure (s)
Right Turn	Lighting Conditions Hours of Day Direction	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown	2006 4 0 0 0 0 1 0 0 0 2 1 1 0 0 0 2 1 1 0 0 0 2 1 1 1 1 1 1 1 1 1 1 1 1 1	YEAR 2007 6 3 0 0 1 0 1 0 1 0 1 0 1 0 1 0 </td <td>2008 3 0 0 1 0 0 2 0 1 1 0 0 1 1 0 0 ASHES 2008 17</td> <td>TOTAL <u>CRASHE</u> 13 0 0 1 1 1 1 2 4 6 5 2 0 0 3 YEAR TOTAL <u>CRASHE</u> 55</td> <td>of Total 100% 77% 23% 0% 8% 8% 31% 8% 8% 15% 8% 31% 46% 38% 15% 0% 0% 0%</td> <td>Accidents per Year 4.33 3.33 1.00 0.00 0.03 1.33 0.33 0.33 0.33 0.67 1.33 2.00 1.67 0.67 0.00 0.00 0.00 0.00 1.67 0.00 0.00 1.67 0.00 0.00 1.67 0.00 1.67 0.00 1.67</td> <td>Cause (s) (1) (18) (19) (20) (20) (20) (20) (20) (20) (20) (20</td> <td>Counter- measure(s)</td>	2008 3 0 0 1 0 0 2 0 1 1 0 0 1 1 0 0 ASHES 2008 17	TOTAL <u>CRASHE</u> 13 0 0 1 1 1 1 2 4 6 5 2 0 0 3 YEAR TOTAL <u>CRASHE</u> 55	of Total 100% 77% 23% 0% 8% 8% 31% 8% 8% 15% 8% 31% 46% 38% 15% 0% 0% 0%	Accidents per Year 4.33 3.33 1.00 0.00 0.03 1.33 0.33 0.33 0.33 0.67 1.33 2.00 1.67 0.67 0.00 0.00 0.00 0.00 1.67 0.00 0.00 1.67 0.00 0.00 1.67 0.00 1.67 0.00 1.67	Cause (s) (1) (18) (19) (20) (20) (20) (20) (20) (20) (20) (20	Counter- measure(s)
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3.3.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 137 Avenue and SW 26 Street were performed on a typical weekday on November 3, 2010. A summary of the traffic data is presented in *Figure 11*, and the field review is presented in *Figure 12*.

This intersection has single left-turn bays for all approaches, and the northbound and eastbound approaches have exclusive right-turn lanes. The left-turn signal operation is protected/permissive for all approaches.

A large number of right-turns were observed for northbound. Also, the eastbound/westbound left-turn movements struggle to cross the opposing through movements. Red light running was observed at the intersection. Vehicles were constantly changing lanes to access the exclusive northbound right-turn lane.

It was noticed that the pavement conditions are deteriorated and pavement markings are faded. The eastbound exclusive right-turn lane has no right arrows pavement markings.

3.3.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 137 Avenue and SW 26 Street, the following is recommended:

- Realignment of the westbound and southbound left-turn lanes to reduce the offset and line-up with the opposite left-turn lanes.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Providing an exclusive right-turn lane for the westbound approach.
- Channelizing northbound and westbound right-turn lanes at the approach.
- Closing the median openings on the north and west legs.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 13.





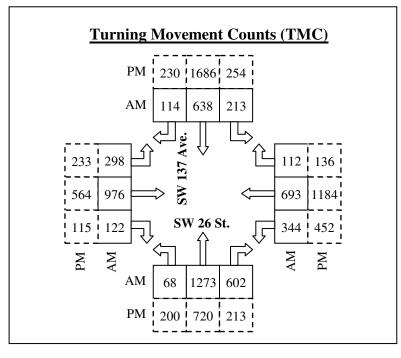


Figure 11: Traffic Data – SW 137 Avenue and SW 26 Street





Figure 12: Field Review – SW 137 Avenue and SW 26 Street





Figure 13: Conceptual Plan – SW 137 Avenue and SW 26 Street

Safety Studies at High Crash Locations Countywide



3.4. SW 117 Avenue and SW 104 Street

3.4.1. Site Description

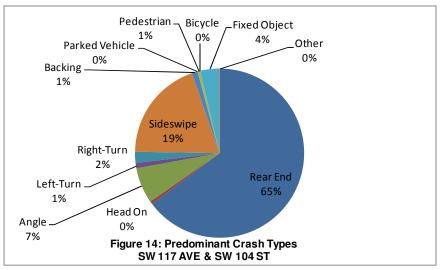
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 117 Avenue is a four lane urban arterial divided by a raised median that runs north-south, and SW 104 Street is a six lane urban arterial divided by a raised median that runs east-west.

3.4.2. Safety Conditions and Analysis

The intersection of SW 117 Avenue and SW 104 Street is ranked number 4 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 190 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 63. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 14*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 12* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.676, 1.880, and 2.001, respectively. The safety ratio for the three years averaged 1.852. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that rear end, sideswipe and fixed object collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 13*.



		(6 202	v 4 Lone				SW 104		e 35) - URBAN	Spot			
					ed, with it	Im Lanes,							
	TYPE OF CRASH		ER OF CF YEAR	RASHES	3 YEAR	%	MEAN	EXPECTED	ANNUAL CF		ABNORM		
	TTPE OF CRASH	2006	2007	2008	TOTAL CRASHE	of Total	Accidents per Year	MEAN	90th Percentile	95th Percentile	Mean	90th Percentil	95th Percent
OLLISION TYPE	Rear End	36	39	48	123	32%	41.00	8.68	17.26	18.90	Х	X	X
	Head On	0	1	0	1	0%	0.33	0.60	1.64	1.84			
	Angle Left Turn	7	4	2	13	3% 0%	4.33 0.67	5.40 3.00	9.19 6.13	9.92 6.73			
	Right Turn	1	2	1	4	1%	1.33	0.46	1.36	1.53	x		
	Sideswipe	10	15	12	37	6%	12.33	2.58	4.92	5.37	X	X	Х
	Backed Into	1	0	1	2	0%	0.67	0.28	0.84	0.94	X		
	Coll. w/ Parked Car Coll. w/ Pedestrian	0	0	0	0	0% 0%	0.00	0.12	0.57	0.65			
	Coll. w/ Bicycle	0	0	0	0	0%	0.00	0.14	0.49	0.55			
	Fixed Object	0	3	4	7	1%	2.33	0.79	2.01	2.24	Х	X	Х
	Ran Off Road	0	0	0	0	0%	0.00	0.01	0.11	0.13			
	Overtuned Other	0	0	0	0	0% 0%	0.00	0.04 8.67	0.28 21.05	0.33 23.42			
	Total Crashes	57	64	69	190	24%	63.33	31.51	54.94	59.43	х	x	x
EVERITY	PDO crashes	53	60	64	177	93%	59.00	19.21	36.95	40.35	X	X	X
	Fatal crashes	0	0	0	0	0%	0.00	0.16	0.56	0.63			
IGHT CONDITIONS	Injury crashes	4	4	5	13	7%	4.33	20.77	38.34	41.71	x	x	x
IGHT CONDITIONS	Day Light Dusk	41 4	49 3	57 4	147 11	77% 6%	49.00 3.67	19.89 0.61	35.12 1.43	38.03 1.58	X	X	X
	Dawn	0	0	0	0	0%	0.00	0.38	1.43	1.16		Ê	⊢ ^
	Dark	12	12	8	32	17%	10.67	10.22	18.94	20.61	X		
	Unknown	0	0	0	0	0%	0.00	0.41	1.15	1.30			<u> </u>
SURFACE CONDITION	S Dry Wet	49 7	47 15	58 10	154 32	81% 17%	51.33 10.67	26.41 4.41	45.71 8.78	49.41 9.62	X	X	X X
	Others	1	2	1	32	2%	1.33	0.69	1.88	2.11	X		<u>⊢</u> ^
IONTH OF A YEAR	January	9	8	7	24	13%	8.00	2.57	5.04	5.52	x	X	x
	February	2	1	7	10	5%	3.33	2.37	4.59	5.02	X		
	March	7	2	3	12	6%	4.00	3.09	5.92	6.46	X		
	April May	75	2	6 10	15 18	8% 9%	5.00 6.00	2.57 2.51.	5.30 4.81	5.82 5.25	^	x	x
	June	5	1	3	9	5%	3.00	2.81	5.74	6.30	х	~	<u>^</u>
	July	4	6	4	14	7%	4.67	2.60	4.96	5.42	X		
	August	4	3	6	13	7%	4.33	3.00	5.66	6.17	X		
	September October	5 2	18 10	6 9	29 21	15% 11%	9.67 7.00	2.48 2.89	4.92 5.40	5.39 5.88	X	X	X
	November	4	6	6	16	8%	5.33	2.05	4.85	5.32	x	x	Ŷ
	December	3	4	2	9	5%	3.00	2.22	4.55	5.00	X		
DAY OF THE WEEK	Sunday	3	5	5	13	7%	4.33	4.00	6.58	7.08	Х		
	Monday	12	9	16	37	19%	12.33	4.62	9.23	10.11	X	X	X
	Tuesday Wednesday	9 7	14 14	16 9	39 30	21% 16%	13.00 10.00	4.46 4.56	7.81 8.62	8.46 9.40	X	X	X
	Thursday	6	9	11	26	14%	8.67	5.04	9.02	9.40	x	^	<u>^</u>
	Friday	10	8	9	27	14%	9.00	4.86	9.39	10.26	Х		
	Saturday	10	5	3	18	9%	6.00	3.98	8.10	8.89	Х		
HOUR OF THE DAY	00:00-06:00 06:00-09:00	6 7	3 9	0 10	9 26	5% 14%	3.00 8.67	3.79 3.44	8.65 6.94	9.58 7.61	x	x	x
	09:00-11:00	6	9 4	8	18	9%	6.00	2.58	5.30	5.82	X	X	x
	11:00-13:00	6	3	8	17	9%	5.67	3.12	5.78	6.29	X	^	Â
	13:00-15:00	6	7	8	21	11%	7.00	3.57	6.32	6.85	Х	Х	Х
	15:00-18:00	10	25	18	53	28%	17.67	6.38	11.52	12.50	X	X	Х
	18:00-24:00	16	13	17	46	24%	15.33	8.60	15.51	16.83	X		
						YEAR		3-Year	1				
					1	2	3	Average					
Verage Daily Troff-	ADT (Vehicles per D	Dav)					-	92,365	1				
, ,	· ·				90,505	92,352	94,237		4				
Iorida Average Cras	h rate (Crashes per	Million En	tering Ve	nicles)	0.579	0.568	0.566	0.571	1				
Traffic Base					33.034	33.709	34.397	33.713					
Actual Crash Rate (C	Crashes per Million E	ntering V	ehicles)		1.725	1.899	2.006	1.877	1				
	Crashes per Million E				1.030	1.010	1.003	1.014	1				
,						1.880	2.001	1.852	4				
Safety Ratio	- 00				1.676				-				
High Crash Location	n??				YES	YES	YES	YES					
Actual Crash	$Rate = \frac{A \times 1,00}{V}$	0,000			al number o erage Annua			fcrashes by	/ type occurrin	ng in a 1 year	period.		
CriticalCrashK	$Rate = AVR + \frac{0.5}{TB} + \frac{0.5}{TB}$	R	TB = Tr	Average Sta affic Base est Factor (2		ash Rate for	a particular	type of interse	ection or road		nt. Constant Z]	
	$\frac{Years \times ADT \times 3}{1,000,000}$		= 1.	96 (assume	95% Cor	nfidence Lev Confidence I			68.3 86.6 90.0 95.0 95.5 98.8	0 0 0 0 0	1.00 1.50 1.64 1.96 2.00 2.50		
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	n Rate h Rate	-							99.0 99.7 99.9	0 0	2.58 3.00 3.29	

Table 12 – Crash Analysis – SW 117 Avenue and SW 104 Street



Table 13 – Abnormal Crash Details & Countermeasures SW 117 Avenue and SW 104 Street

r		SW 1	17 Aven	ue & S\	N 104 S	Street				
	(6 Lane x 4 L	ane, Signalized, W	/ith Turn La	anes, 4 Le	eg Interse	ection -Table	ə 35) - UR	BAN Spot		
			NUMBE	R OF CR YEAR	ASHES	3 YEAR TOTAL	% of	MEAN Accidents	Possible	Counter-
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Rear E	nd Crashes	36	39	48	123	100%	41.00	(1)	4
		Day Light	29	30	40	99	80%	33.00	(2)	5
	Lighting Conditions	Dawn	1	1	4	6	5%	2.00	(4)	6
	Lighting Conditions	Dark	6	8	4	18	15%	6.00		
		00:00 - 06:00	3	1	0	4	3%	1.33		
		06:00 - 09:00	4	4	9	17	14%	5.67		
		09:00 - 11:00	4	4	4	12	10%	4.00		
Rear End	Hours of Day	11:00 - 13:00	5	0	5	10	8%	3.33		
near Ellu		13:00 - 15:00	3	4	5	12	10%	4.00		
		15:00 - 18:00	7	16	13	36	29%	12.00		
		18:00 - 24:00	10	10	12	32	26%	10.67		
		North	6	5	11	22	18%	7.33		
		South	7	3	8	18	15%	6.00		
	Direction	East	13	10	17	40	33%	13.33		
		West	10	21	12	43	35%	14.33		
		Unknown	0	0	0	0	0%	0.00		

			NUMBE	R OF CR	ASHES	3 YEAR	%	MEAN	Possible	Counter-
				YEAR		TOTAL	of	Accidents		measure(s)
			2006	2007	2008	CRASHE	Total	per Year	Gause(s)	ineasure(s)
	Total Sideswi	pe Crashes	10	15	12	37	100%	12.33	(17)	4
		DayLight	8	14	10	32	86%	10.67	(18)	19
	Lighting Conditions	Dawn	2	1	1	4	11%	1.33	(20)	
		Dark	0	0	1	1	3%	0.33	(21)	
		00:00 - 06:00	0	0	0	0	0%	0.00		
		06:00 - 09:00	3	3	1	7	19%	2.33		
		09:00 - 11:00	0	0	1	1	3%	0.33		
Sideswipe	Hours of Day	11:00 - 13:00	1	2	2	5	14%	1.67		
(Overtake)		13:00 - 15:00	1	2	3	6	16%	2.00		
		15:00 - 18:00	3	6	3	12	32%	4.00		
		18:00 - 24:00	2	2	2	6	16%	2.00		
		North	3	3	2	8	22%	2.67		
		South	2	2	3	7	19%	2.33		
	Direction	East	3	6	6	15	41%	5.00		
		West	2	4	1	7	19%	2.33		
		Unknown	0	0	0	0	0%	0.00		

			NUMBE	R OF CR	ASHES	3 YEAR	%	MEAN	Dessible	Ocumber
				YEAR		TOTAL	of	Accidents	Possible Cause(s)	Counter- measure(s)
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Fixed Ob	ject Crashes	0	3	4	7	100%	2.33	(2)	5
		Day Light	0	1	2	3	43%	1.00	(6)	12
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(17)	
		Dark	0	2	2	4	57%	1.33		
		00:00 - 06:00	0	1	0	1	14%	0.33		
		06:00 - 09:00	0	0	0	0	0%	0.00		
		09:00 - 11:00	0	1	1	2	29%	0.67		
Fixed Object	Hours of Day	11:00 - 13:00	0	0	0	0	0%	0.00		
Tixed Object		13:00 - 15:00	0	0	1	1	14%	0.33		
		15:00 - 18:00	0	1	0	1	14%	0.33		
		18:00 - 24:00	0	0	2	2	29%	0.67		
		North Leg	0	0	1	1	14%	0.33		
		South Leg	0	0	1	1	14%	0.33		
	Direction	East Leg	0	1	1	2	29%	0.67		
		West Leg	0	2	1	3	43%	1.00		
		Unknown	0	0	0	0	0%	0.00		



3.4.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 117 Avenue and SW 104 Street were performed on a typical weekday on November 22, 2010. A summary of the traffic data is presented in *Figure 15*, and the field review is presented in *Figure 16*.

This intersection has double left-turn bays for all approaches, and the northbound approach has an exclusive right-turn lane. The signal operation is protected for all left-turn approaches.

Eastbound left-turn vehicles are spilled back at through lanes. Conflict was observed between northbound right-turns and eastbound thru movement. Also, stop bars are located too close to the crosswalks, and vehicles stop a few feet behind the stop bar to allow for the turning vehicles to safely maneuver the turn.

Vehicles exit the driveway in north leg cross the southbound five-lane approach to turn left heading northbound. Also, southbound vehicles drive over the marked median.

It was noticed that not all legs have crosswalks and no ADA compatible ramps are provided.

3.4.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 117 Avenue and SW 104 Street, the following are recommended:

- Lengthen the eastbound double left-turn lanes to 350 ft each.
- Replacement of the north leg painted median with a raised curbed median.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Installing lane control (R3-8) signs for all approaches.
- Relocation of the stop bars to standard distances from crosswalks to allow for safe left-turns.
- Providing ADA approved pedestrian ramps at all corners.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 17.





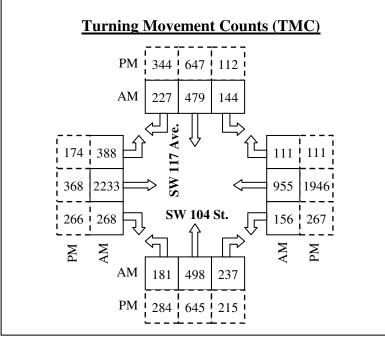








Figure 16: Field Review – SW 117 Avenue and SW 104 Street



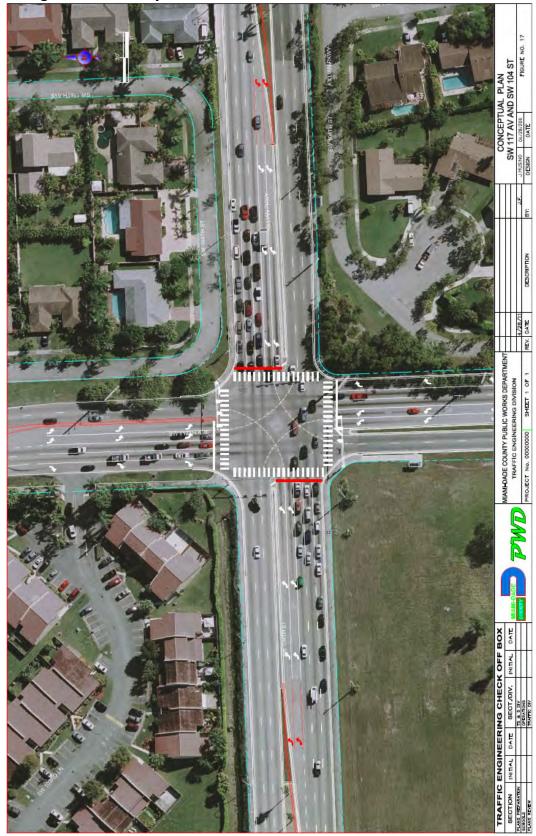


Figure 17: Conceptual Plan – SW 117 Avenue and SW 104 Street

Safety Studies at High Crash Locations Countywide



3.5. SW 137 Avenue and SW 152 Street

3.5.1. Site Description

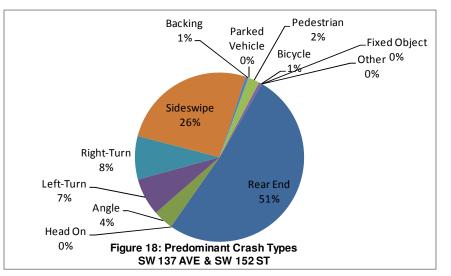
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 137 Avenue is a six lane urban arterial divided by a raised median that runs north-south, and SW 152 Street is a six lane urban arterial divided by a raised median that runs east-west.

3.5.2. Safety Conditions and Analysis

The intersection of SW 137 Avenue and SW 152 Street is ranked number 5 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 181 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 60. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 18*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 14* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 2.015, 1.734, and 1.834, respectively. The safety ratio for the three years averaged 1.861. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that rear end, right-turn and sideswipe collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 15*.



		(6 Lane	x 6 Lane.	Signaliz	ed, With Tu	Irn Lanes.	4 Leg Inters	ection -Table	e 36) - URBAN	V Spot			
			R OF CF		3 YEAR	%	MEAN			ASH VALUE			
	TYPE OF CRASH		YEAR		TOTAL	of	Accidents	MEAN	90th	95th	Mean	90th	95th
COLLISION TYPE	Rear End	2006 34	2007 33	2008 26	CRASHE 93	Total 26%	per Year 31.00	7.80	Percentile 17.12	Percentile 18.90	x	Percentil X	Percenti X
	Head On	0	0	0	0	0%	0.00	0.31	0.91	1.03			
	Angle	1	0	6	7	2%	2.33	4.11	8.06	8.82			
	Left Turn	8	2	3	13	3%	4.33	3.20	6.52	7.16	Х		
	Right Turn	5	6	4	15	3%	5.00	0.87	1.88	2.07	X	X	X
	Sideswipe Backed Into	15	15 0	17 0	47	8% 0%	15.67 0.33	2.98 0.44	6.83 1.26	7.57 1.42	Х	X	X
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.09	0.41	0.48			
	Coll. w/ Pedestrian	1	0	3	4	1%	1.33	0.44	1.34	1.51	Х		
	Coll. w/ Bicycle	0	0	1	1	0%	0.33	0.22	0.67	0.76	Х		
	Fixed Object	0	0	0	0	0%	0.00	0.62	1.52	1.69			
	Ran Off Road	0	0	0	0	0%	0.00	0.00	0.00	0.00			
	Overtuned	0	0	0	0	0%	0.00	0.07	0.29	0.34			
	Other Total Crashes	0 65	56	0 60	0 181	0% 23%	0.00 60.33	5.09 26.24	11.59 47.45	12.84 51.51	х	x	x
SEVERITY	PDO crashes	63	53	54	170	94%	56.67	14.33	26.64	28.99	x	x	Ŷ
	Fatal crashes	0	0	0	0	0%	0.00	0.20	0.85	0.97		<u> </u>	<u> </u>
	Injury crashes	2	3	6	11	6%	3.67	19.22	40.94	45.10			
LIGHT CONDITIONS	Day Light	49	44	47	140	77%	46.67	17.36	32.17	35.01	Х	Х	Х
	Dusk	0	0	1	1	1%	0.33	0.64	1.46	1.62	v		
	Dawn	16	0	1	17 23	9% 13%	5.67	0.18	0.59	0.66	x	X	X
	Dark Unknown	0	12 0	11 0	23	0%	7.67	7.36 0.09	15.05 0.47	16.53 0.55	^		
SURFACE CONDITIONS		36	53	57	146	81%	48.67	22.04	41.61	45.35	x	x	x
	Wet	3	2	3	8	4%	2.67	3.22	6.25	6.83			
	Others	26	1	0	27	15%	9.00	0.36	0.96	1.07	Х	Х	Х
MONTH OF A YEAR	January	7	6	6	19	10%	6.33	2.49	4.66	5.08	Х	X	X
	February	5	3	6	14	8%	4.67	1.91	4.01	4.41	X	X	X
	March April	8	5	6 6	19 17	10% 9%	6.33 5.67	2.33 1.89	5.43 4.46	6.02 4.95	X	X	X
	May	7	3	3	13	3 % 7%	4.33	2.16	4.40	4.90	x	x	^
	June	6	5	7	18	10%	6.00	1.93	4.00	4.39	X	X	x
	July	5	3	4	12	7%	4.00	2.38	5.17	5.70	X		
	August	2	6	3	11	6%	3.67	2.51	4.97	5.44	Х		
	September	6	4	6	16	9%	5.33	1.60	3.13	3.42	X	X	X
	October	5	4	5	14	8%	4.67	2.13	4.00	4.35	X	X	X
	November December	4 5	3	4	11 17	6% 9%	3.67 5.67	1.98 2.31	4.35 4.78	4.81.	X	x	x
DAY OF THE WEEK	Sunday	5 8	6	4	22	9% 12%	7.33	3.60	4.76	5.26 7.73	X	x	^
	Monday	13	8	9	30	17%	10.00	3.42	6.95	7.63	x	x	x
	Tuesday	9	8	7	24	13%	8.00	3.71	6.93	7.54	x	X	x
	Wednesday	6	14	6	26	14%	8.67	4.02	7.66	8.35	Х	х	х
	Thursday	11	7	10	28	15%	9.33	4.36	8.22	8.97	Х	Х	Х
	Friday	10	6	12	28	15%	9.33	4.16	8.40	9.21	X	X	X
HOUR OF THE DAY	Saturday	8	7	8	23	13%	7.67	2.36	5.17	5.71	Х	X	X
NUUR OF THE DAT	00:00-06:00 06:00-09:00	13	2	9	4 30	2% 17%	1.33 10.00	2.20 3.64	4.63 7.22	5.10 7.91	х	x	x
	09:00-11:00	3	3	6	12	7%	4.00	2.04	4.45	4.91	x	~	~
	11:00-13:00	4	6	3	13	7%	4.33	2.56	5.59	6.17	Х		
	13:00-15:00	15	8	7	30	17%	10.00	3.38	6.82	7.48	Х	Х	Х
	15:00-18:00	16	14	16	46	25%	15.33	5.09	9.37	10.19	X	X	X
	18:00-24:00	13	15	18	46	25%	15.33	6.71	13.41	14.69	Х	Х	X
						YEAR		3-Year	1				
							<u>^</u>						
					1	2	3	Average	4				
Average Daily Traffic A	DT (Vehicles per D	Day)			84,514	86,239	87,999	86,251					
Iorida Average Crash	rate (Crashes per	Million En	tering Ve	hicles)	0.579	0.568	0.566	0.571	1				
Traffic Base				,	30.848	31.477	32.120	31.482	1				
									4				
Actual Crash Rate (Cr	ashes per Million E	ntering V	ehicles)		2.107	1.779	1.868	1.918	1				
Critical Crash Rate (C	rashes per Million E	Entering V	ehicles)		1.046	1.026	1.018	1.030	1				
Safety Ratio		-			2.015	1.734	1.834	1.861	1				
· ·	22								1				
-	Rate = $\frac{A \times 1,00}{V}$	0 ,000				f crashes	or number o		type occurring	ng in a 1 year	period.		
High Crash Location Actual Crash I			2	A = Tota V = Ave <u>Where:</u>	YES al number o rage Annua	YES f crashes I Daily Tra	YES or number o affic X 365	YES		ng in a 1 year ection or road		nt	
		·		TB = Tr TF = Te	affic Base st Factor (z	-value)		el for RURAL		Confidence I	Level (%)	Constant Z]
Traffic Base =					Level for URE		86.60 90.00 95.00 95.50 98.80)))	1.50 1.64 1.96 2.00 2.50				
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	h Rate h Rate	-							98.80 99.00 99.70 99.95)	2.50 2.58 3.00 3.29	

Table 14 – Crash Analysis – SW 137 Avenue and SW 152 Street



Table 15 – Abnormal Crash Details & CountermeasuresSW 137 Avenue and SW 152 Street

(6 Lane x 6 Lane, Signalized, With Turn Lanes, 4 Lag Intersection -Table 36) - URBAN Spot NUMBER OF CRASHES 2005 3 YEAR ToTAL CRASHES 3 5 toTAL CRASHES 3 Machine Total Crashes Possible Total Accidents Total Dec. Possible Cause(s) (c) Counter- total (c) NUMBER OF CRASHES 1006 3 YEAR 21 5 total 7 Machine Accidents Total Dec. Possible Cause(s) (c) Counter- total (c) NUMBER OF CRASHES 1007 3 20% (c) 0			SW 1	37 Aven	ue & S	W 152 S	Street				
Veral of rati.	·	(6 Lane x 6						36) - URB	AN Spot		
Veral of rati.				NUMBE	B OF CB	ASHES	3 VEAR	⁰⁄_	MEAN		_
Total Pear End Crashes 2006 2007 2008 CRASHES Total Pervan Cause(s) measure() Lighting Condition Bay/Light 24 29 21 74 00% 24.67 (1) 1 1 25 (3) (2)											
Total Rear End Crashes 34 33 26 39.00 100% 21.00 (1) 1 Lighting Conditions Bay Lighting 24 29 21 74 80% 24.07 (1) 1 2 Lighting Conditions Dark 10 4 5 19 20% 6.33 (1) 5 5 6 10 20% 6.33 (1) 5 5 6 10 20% 6.33 (1) 1 5 5 6 10 5 25 7 <				2006		2008	-			Cause(s)	measure(s
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Rear End Hours of Day B = 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0		- · ·	Dark	10	4	5	19	20%	6.33		6
Rear End Hours of Day 0900-11300 1 1 1 3 3% 1.00 1300-1500 5 6 4 15 16% 5.00 1300-1800 8 10 5 6 4 15 16% 5.00 1800-24.00 9 7 9 25 27% 8.33 North 8 5 4 10 22 27% 8.33 West 12 8 2 23 25% 7.67 7.67 West 12 8 2 23 25% 7.67 7.67 Unknown 0 0 0 0 7.07 1.6% 5.00 7.07 1.6% 5.00 7.07 1.06 7.07 1.06 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0										(8)	8
Rear End Hours of Day 1100-11300 2 3 0 5 5% 1.87 1500-1500 5 6 4 15 16% 5.00 1500-1830 8 10 5 23 25% 7.67 1500-1830 8 10 10 25 27% 8.33 North 8 5 4 17 18% 5.67 North 8 10 10 25 27% 8.33 West 12 3 2 23 25% 7.67 Unknown 0											
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Number of Day $0000 - 06:00 \\ 06:00 - 09:00 \\ 00:00 - 01:00 \\ 00:00 -$		Lighting Conditions			0					(9)	
Normal Problem $06:00 - 09:00 \\ 09:00 - 11:00 \\ 09:00 - 11:00 \\ 11:00 - 13:00 \\ 11:00 - 13:00 \\ 11:00 - 13:00 \\ 11:00 - 13:00 \\ 11:00 - 13:00 \\ 11:00 - 12:00 \\ 11:00 - 13:00 \\ 11:00 - 12:00 \\ 11:00 - 12:00 \\ 11:00 - 13:00 \\ 11:00 - 12:00 \\ 11:00$					1						9
Network Number of Day $0 = 00 - 11 300$ 1 2 2 5 33% 1.67 11300 - 1500 2 2 0 4 27% 1.33 1500 - 18:00 1 0 2 3 20% 1.00 18:00 - 24:00 0 2 0 2 13% 0.67 NB EB 1 2 2 5 33% 1.67 NB EB 1 2 2 5 33% 1.67 NB EB 1 2 1 4 27% 1.33 Direction SB WB 1 1 3 20% 1.00 EB SB 1 2 1 4 27% 1.33 Unknown 0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>											
Number Hours of Day $1100 - 13300$ 1 2 2 5 33% 1.67 $1300 - 15300$ 2 2 0 4 27% 1.33 $1500 - 18300$ 1 0 2 3 20% 1.00 $1800 - 24300$ 0 2 0 2 13% 0.67 $WB \rightarrow NB$ 2 1 2 5 33% 1.67 $WB \rightarrow NB$ 2 1 1 3 20% 1.00 $BB \rightarrow WB$ 1 1 1 3 20% 1.00 $BB \rightarrow WB$ 1 2 1 4 27% 1.33 Unknown 0							-				
Night run 13:00 - 15:00 2 2 0 4 27% 1.33 15:00 - 18:00 1 0 2 3 20% 1.00 18:00 - 24:00 0 2 0 2 13% 0.67 NB \rightarrow EB 1 2 2 5 33% 1.67 Direction SB \rightarrow WB 1 1 1 3 20% 1.00 B \rightarrow SB 1 2 1 4 27% 1.33 Unknown 0 0 0 0 0 0 0 VEAR TOTAL CRASHES TOTAL Possible Counter-result 2006 2007 208 CRASHES Total Der Year Possible Cause(s) measure(s) 11ghting Conditions Day Light 12 9 12 33 70% 11.00 (17) 8 19 21 19 21 10 10 1 2%		Hours of Day									
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Image: Number of crashes Number of crashes <td></td> <td>Direction</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		Direction									
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$ \begin{array}{c c c c c c c c c c c c c c c c c c c $				12		12	33	70%	11.00	(17)	
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Sideswipe (Overtake) Hours of Day $09:00 - 11:00$ 0 1 3 4 9% 1.33 11:00 - 13:00 1 1 1 3 6% 1.00 13:00 - 15:00 5 0 2 7 15% 2.33 15:00 - 18:00 5 3 3 11 2.3% 3.67 18:00 - 24:00 1 6 6 13 28% 4.33 North 3 6 4 13 28% 4.33 South 5 5 5 15 32% 5.03 West 1 1 1 3 6% 1.00		3 - 3									1
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$ \begin{array}{c} \text{(Overtake)} \\ \hline \\ & 13:00 - 15:00 & 5 & 0 & 2 & 7 & 15\% & 2.33 \\ \hline 13:00 - 18:00 & 5 & 3 & 3 & 11 & 23\% & 3.67 \\ \hline 18:00 - 24:00 & 1 & 6 & 6 & 13 & 28\% & 4.33 \\ \hline \\ & 18:00 - 24:00 & 1 & 6 & 6 & 13 & 28\% & 4.33 \\ \hline \\ & \text{North} & 3 & 6 & 4 & 13 & 28\% & 4.33 \\ \hline \\ & \text{Direction} & \hline \\ & \text{East} & 6 & 3 & 7 & 16 & 34\% & 5.33 \\ \hline \\ & \text{West} & 1 & 1 & 1 & 3 & 6\% & 1.00 \\ \hline \end{array} $			00:00 - 06:00 06:00 - 09:00	3		2	8	17%	2.67	(20)	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Sideswipe		00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	3 0	3 1	2 3	8 4	17% 9%	2.67 1.33	(20)	
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South 5 5 15 32% 5.00 Direction East 6 3 7 16 34% 5.33 West 1 1 1 3 6% 1.00			00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00	3 0 1 5	3 1 1 0	2 3 1 2	8 4 3 7	17% 9% 6% 15%	2.67 1.33 1.00 2.33	(20)	
Direction East 6 3 7 16 34% 5.33 West 1 1 1 3 6% 1.00			00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00	3 0 1 5 5	3 1 1 0 3	2 3 1 2 3	8 4 3 7 11	17% 9% 6% 15% 23%	2.67 1.33 1.00 2.33 3.67	(20)	
West 1 1 1 3 6% 1.00			00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	3 0 1 5 5 1	3 1 1 0 3 6	2 3 1 2 3 6	8 4 7 11 13 13	17% 9% 6% 15% 23% 28% 28%	2.67 1.33 1.00 2.33 3.67 4.33 4.33	(20)	
		Hours of Day	00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South	3 0 1 5 5 1 3 5	3 1 0 3 6 6 5	2 3 1 2 3 6 4 5	8 4 7 11 13 13 15	17% 9% 6% 15% 23% 28% 28% 32%	2.67 1.33 1.00 2.33 3.67 4.33 4.33 5.00	(20)	
		Hours of Day	00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South East	3 0 1 5 5 1 3 5 6	3 1 0 3 6 6 5 3	2 3 1 2 3 6 4 5 7	8 4 7 11 13 13 15 16	17% 9% 6% 15% 23% 28% 28% 32% 34%	2.67 1.33 1.00 2.33 3.67 4.33 4.33 5.00 5.33	(20)	

3.5.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 137 Avenue and SW 152 Street were performed on a typical weekday on November 19, 2010. A summary of the traffic data is presented in *Figure 19*, and field review is presented in *Figure 20*.



This intersection has double left-turn bays for all approaches, and the northbound, southbound and westbound approaches have exclusive right-turn lanes. The signal operation is protected for all left-turn approaches.

Northbound approach lanes at this intersection present two through lanes and an exclusive right-turn while three receiving lanes exist for the approach lanes. This geometric condition and the lack of channelization for the northbound right-turn lane facilitate that several vehicles use the right-turn lane to circumvent the northbound through traffic in the middle of intersection during the AM and PM peak periods.

This intersection provides an extra receiving lane that facilitates both southbound and westbound right-turn movements. These movements were observed delayed during the opposite left-turns or perpendicular through movements that could operate concurrently. This issue could be associated to the lack of adequate channelization and markings within the intersection.

Vehicles exiting the south leg and north leg driveways were observed creating potential conflicts with northbound/southbound traffic. Also, large westbound and southbound left-turn traffic volumes spill back and block the through traffic. Red light running was frequently observed at eastbound/northbound and westbound directions.

3.5.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 137 Avenue and SW 152 Street, the following are recommended:

- Lengthen the westbound double left-turn lanes to 475 ft each.
- Lengthen the southbound double left-turn lanes to 300 ft each.
- Channelizing the westbound and southbound right-turn lanes for free flow operations.
- Extend the merge lane on the west leg receiving lanes to provide right-turn lane to the shopping plaza.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours. Also, coordinating with the downstream signal at the entrance of the shopping plaza (ID# 6155).
- Installing lane control (R3-8) signs for all approaches.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 21.

Traffic Engineering Division

MIAMIDADE

24-hr Approach Counts



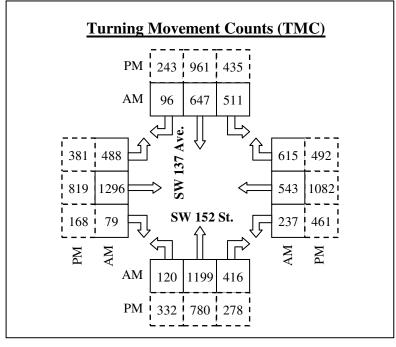


Figure 19: Traffic Data – SW 137 Avenue and SW 152 Street



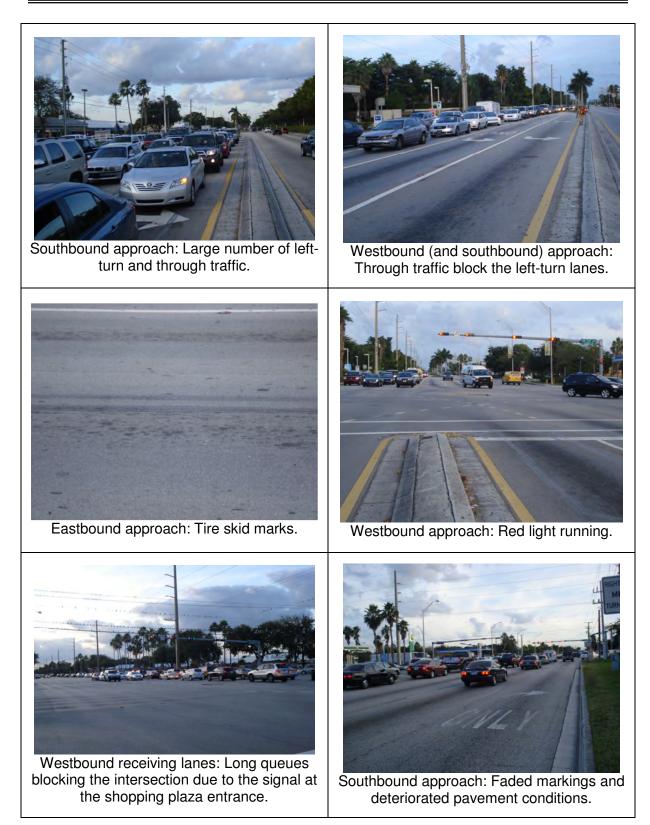


Figure 20: Field Review – SW 137 Avenue and SW 152 Street



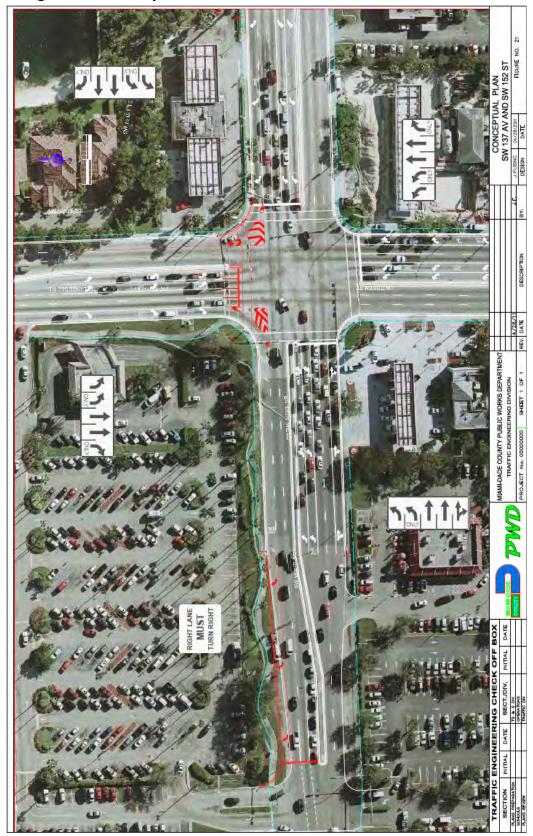


Figure 21: Conceptual Plan – SW 137 Avenue and SW 152 Street



3.6. NW 107 Avenue and NW 12 Street

3.6.1. Site Description

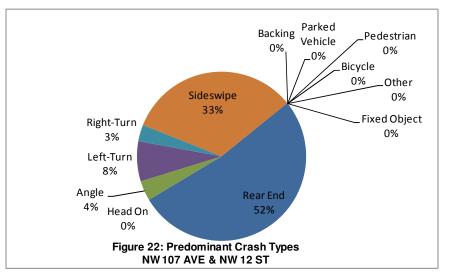
This intersection is a signalized four legged intersection located in the northwest part of unincorporated Miami Dade County with one corner in the City of Doral. NW 107 Avenue is a six lane urban arterial divided by a raised median that runs north-south, and NW 12 Street is a six lane major collector divided by a raised median that runs east-west.

3.6.2. Safety Conditions and Analysis

The intersection of NW 107 Avenue and NW 12 Street is ranked number 6 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period 157 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 52. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 22*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 16* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.527, 2.097, and 1.349, respectively. The safety ratio for the three years averaged 1.658. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that rear end and sideswipe collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 17*.



		(6	v 6				& NW 12 S			l Coot			
									e 36) - URBAN				ODACUE
	TYPE OF CRASH	2006	TR OF CF YEAR 2007	2008	3 YEAR TOTAL CRASHE	% of Total	MEAN Accidents per Year	MEAN	90th Percentile	ASH VALUE 95th Percentile	Mean	90th	95th Percenti
COLLISION TYPE	Rear End	2000	35	2000	82	26%	27.33	7.80	17.12	18.90	х	X	X
	Head On	0	0	0	0	0%	0.00	0.31	0.91	1.03			
	Angle	2	1	3	6	2%	2.00	4.11	8.06	8.82			
	Left Turn	2	4	6	12	3%	4.00	3.20	6.52	7.16	х		
	Right Turn	0	2	3	5	1%	1.67	0.87	1.88	2.07	X		
	Sideswipe	17	24	11	52	11%	17.33	2.98	6.83	7.57	X	X	X
	Backed Into Coll. w/ Parked Car	0	0	0	0	0% 0%	0.00	0.44 0.09	1.26 0.41	1.42 0.48			
	Coll. w/ Pedestrian	0	0	0	0	0%	0.00	0.44	1.34	1.51			
	Coll. w/ Bicycle	0	0	0	0	0%	0.00	0.22	0.67	0.76			
	Fixed Object	0	0	0	0	0%	0.00	0.62	1.52	1.69			
	Ran Off Road	0	0	0	0	0%	0.00	0.00	0.00	0.00			
	Overtuned	0	0	0	0	0%	0.00	0.07	0.29	0.34			
	Other	0	0	0	0	0%	0.00	5.09	11.59	12.84			
	Total Crashes	48	66	43	157	24%	52.33	26.24	47.45	51.51	X	X	X
SEVERITY	PDO crashes	47	61	39	147	94%	49.00	14.33	26.64	28.99	X	X	X
	Fatal crashes Injury crashes	0	0 5	0	0	0% 6%	0.00	0.20	0.85	0.97 45.10		<u> </u>	<u> </u>
LIGHT CONDITIONS	Day Light	37	48	33	118	75%	39.33	19.22	32.17	35.01	х	x	x
	Dusk	1	4	0	5	3%	1.67	0.64	1.46	1.62	X	X	x
	Dawn	0	0	2	2	1%	0.67	0.18	0.59	0.66	X	X	X
	Dark	10	14	8	32	20%	10.67	7.36	15.05	16.53	Х		
	Unknown	0	0	0	0	0%	0.00	0.09	0.47	0.55			
SURFACE CONDITIONS	Dry	38	52	31	121	77%	40.33	22.04	41.61	45.35	X	<u> </u>	<u> </u>
	Wet	4	10	7	21	13%	7.00	3.22	6.25	6.83	X	X	X
MONTH OF A YEAR	Others	6 3	4	5	15	10% 4%	5.00 2.00	0.36 2.49	0.96	1.07	X	X	X
MONTH OF A TEAK	January February	3 5	2	1	6 12	4% 8%	2.00	2.49	4.66	5.08 4.41	x	<u> </u>	<u> </u>
	March	6	8	1	12	10%	5.00	2.33	5.43	6.02	x		<u> </u>
	April	6	4	4	14	9%	4.67	1.89	4.46	4.95	X	X	
	May	1	7	5	13	8%	4.33	2.16	4.04	4.40	Х	Х	
	June	3	6	1	10	6%	3.33	1.93	4.00	4.39	Х		
	July	5	2	3	10	6%	3.33	2.38	5.17	5.70	X		
	August	7	11	5	23	15%	7.67	2.51	4.97	5.44	X	X	X
	September	4	5	2	11	7%	3.67	1.60	3.13	3.42	X	X	X
	October November	3	8	4	15 12	10% 8%	5.00 4.00	2.13 1.98	4.00 4.35	4.35 4.81.	X X	X	X
	December	2	3	6	12	8%	4.00	2.31	4.35	4.81.	X	x	x
DAY OF THE WEEK	Sunday	5	4	3	10	8%	4.00	3.60	7.06	7.73	x	<u> </u>	⊢ ^
	Monday	5	10	4	19	12%	6.33	3.42	6.95	7.63	x		
	Tuesday	9	11	8	28	18%	9.33	3.71	6.93	7.54	Х	х	х
	Wednesday	6	7	6	19	12%	6.33	4.02	7.66	8.35	Х		
	Thursday	10	12	2	24	15%	8.00	4.36	8.22	8.97	X		
	Friday	8	7	7	22 32	14% 21%	7.33	4.16	8.40	9.21	X X	x	⊢
HOUR OF THE DAY	Saturday 00:00-06:00	5 2	14 2	13 1	32	3%	10.67 1.67	2.36 2.20	5.17 4.63	5.71 5.10	X	X	Х
HOUR OF THE DAT	06:00-09:00	2	6	4	12	8%	4.00	3.64	7.22	7.91	х		
	09:00-11:00	1	6	3	10	6%	3.33	2.04	4.45	4.91	x		
	11:00-13:00	8	10	6	24	15%	8.00	2.56	5.59	6.17	Х	Х	Х
	13:00-15:00	7	7	5	19	12%	6.33	3.38	6.82	7.48	Х		
	15:00-18:00	14	15	14	43	27%	14.33	5.09	9.37	10.19	X	X	X
	18:00-24:00	14	20	10	44	28%	14.67	6.71	13.41	14.69	Х	Х	
						YEAR		3-Year	1				
							<u> </u>		1				
					1	2	3	Average	-				
Average Daily Traffic A	DT (Vehicles per D	Day)			81,719	83,387	85,089	83,399					
Iorida Average Crash	rate (Crashes per	Million En	tering Ve	hicles)	0.579	0.568	0.566	0.571	1				
Traffic Base				,	29.828	30.436	31.057	30.440	1				
									4				
Actual Crash Rate (Cr	ashes per Million E	ntering V	enicles)		1.609	2.168	1.385	1.721	1				
Critical Crash Rate (C	rashes per Million E	ntering V	(ehicles)		1.054	1.034	1.026	1.038	1				
Safety Ratio		-	,		1.527	2.097	1.349	1.658	1				
High Crash Location	22				YES	YES	YES	YES	1				
		0 000		Where:	123	123	123	123	J				
Actual Crash I	$Rate = \frac{A \times 1,00}{V}$	0,000			al number o rage Annua			f crashes by	type occurri	ng in a 1 year	period.		
CriticalCrashRa	$ate = AVR + \frac{0.5}{TB} + 2$	$TF\sqrt{\frac{AVH}{TB}}$	2		Average Sta affic Base	atewide Cr	ash Rate for	a particular	type of interse	ection or road	way segme	nt.	
	Years × ADT > 2	55		TF = Te	st Factor (z		nfidence Lev	el for RURAL	areas)	Confidence 1 68.3 86.6	0	Constant Z 1.00 1.50	-
Traffic Base = -	$\frac{Years \times ADT \times 30}{1,000,000}$			= 3.	29 (assume	99.95%	Confidence	Level for URE	3AN areas)	90.0 95.0 95.5	0 0	1.64 1.96 2.00	
Safety Ratio =	$= \frac{Actual Crash}{Critical Crash}$	n Rate	-							98.8 99.0 99.7	0 0	2.50 2.58 3.00	

Table 16 – Crash Analysis – NW 107 Avenue and NW 12 Street



Table 17 – Abnormal Crash Details & Countermeasures NW 107 Avenue and NW 12 Street

		NW ·	107 Aven	ue & N	W 12 S	treet				
	(6 Lane x 6 L	ane, Signalized, V	Vith Turn La	anes, 4 Le	eg Interse	ction -Table	e 36) - URI	BAN Spot		
			NUMBE	R OF CF YEAR	ASHES	3 YEAR TOTAL	% of	MEAN Accidents	Possible	Counter-
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Rear Er	nd Crashes	27	35	20	82	100%	27.33	(1)	1
		Day Light	23	24	17	64	78%	21.33	(2)	2
	Lighting Conditions	Dawn	0	3	1	4	5%	1.33	(4)	4
		Dark	4	8	2	14	17%	4.67	(5)	6
		00:00 - 06:00	1	1	0	2	2%	0.67	(8)	
		06:00 - 09:00	2	6	2	10	12%	3.33		
		09:00 - 11:00	0	2	2	4	5%	1.33		
Rear End	Hours of Day	11:00 - 13:00	6	6	2	14	17%	4.67		
near chu		13:00 - 15:00	4	1	3	8	10%	2.67		
		15:00 - 18:00	6	6	7	19	23%	6.33		
		18:00 - 24:00	8	13	4	25	30%	8.33		
		North	11	11	5	27	33%	9.00		
		South	3	7	3	13	16%	4.33		
	Direction	East	6	11	9	26	32%	8.67		
		West	7	6	3	16	20%	5.33		
		Unknown	0	0	0	0	0%	0.00		
			NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN		
			NOWIDE	YEAR	AOHEO	TOTAL	of	Accidents	Possible	Counter-
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Sideswi	pe Crashes	17	24	11	52	100%	17.33	(16)	4
		Day Light	12	20	8	40	77%	13.33	(17)	19
	Lighting Conditions	, ,								
		Dawn	1	0	0	-	2%		,	_
	Lighting Conditions	Dawn Dark	1 4	0	0	1	2% 21%	0.33	(18)	21
		Dark	4	4	3	1 11	21%	0.33 3.67	(18) (19)	_
		Dark 00:00 - 06:00	4	4 0	3 0	1 11 1	21% 2%	0.33 3.67 0.33	(18)	21
		Dark 00:00 - 06:00 06:00 - 09:00	4 1 1	4 0 1	3 0 0	1 11 1 2	21% 2% 4%	0.33 3.67 0.33 0.67	(18) (19)	21
Sideswipe		Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	4 1 1 0	4 0 1 3	3 0 0 1	1 11 1 2 4	21% 2% 4% 8%	0.33 3.67 0.33 0.67 1.33	(18) (19)	21
Sideswipe (Overtake)	Hours of Day	Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	4 1 1 0 2	4 0 1	3 0 0	1 11 1 2 4 7	21% 2% 4% 8% 13%	0.33 3.67 0.33 0.67 1.33 2.33	(18) (19)	21
Side <i>s</i> wipe (Overtake)		Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	4 1 1 0	4 0 1 3 2	3 0 0 1 3	1 11 1 2 4	21% 2% 4% 8%	0.33 3.67 0.33 0.67 1.33	(18) (19)	21
		Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00	4 1 1 0 2 3	4 0 1 3 2 4	3 0 0 1 3 0	1 11 2 4 7 7	21% 2% 4% 8% 13% 13%	0.33 3.67 0.33 0.67 1.33 2.33 2.33	(18) (19)	21
		Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00	4 1 1 0 2 3 7	4 0 1 3 2 4 8	3 0 0 1 3 0 3	1 11 2 4 7 7 18	21% 2% 4% 8% 13% 13% 35%	0.33 3.67 0.33 0.67 1.33 2.33 2.33 2.33 6.00	(18) (19)	21
		Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	4 1 1 0 2 3 7 3 3	4 0 1 3 2 4 8 6	3 0 0 1 3 0 3 4	1 11 2 4 7 7 7 18 13	21% 2% 4% 13% 13% 35% 25%	0.33 3.67 0.33 0.67 1.33 2.33 2.33 6.00 4.33	(18) (19)	21
		Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North	4 1 0 2 3 7 3 7 3 7	4 0 1 3 2 4 8 6 4	3 0 0 1 3 0 3 4 2	1 11 2 4 7 7 18 13 13	21% 2% 4% 13% 13% 35% 25% 25%	0.33 3.67 0.33 0.67 1.33 2.33 2.33 6.00 4.33 4.33	(18) (19)	21
	Hours of Day	Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South	4 1 0 2 3 7 3 7 3 7 6	4 0 1 3 2 4 8 6 4 4	3 0 0 1 3 0 3 4 2 4	1 11 2 4 7 7 18 13 13 13	21% 2% 4% 13% 13% 35% 25% 25% 25% 27%	0.33 3.67 0.33 0.67 1.33 2.33 2.33 6.00 4.33 4.33 4.67	(18) (19)	21

3.6.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at NW 107 Avenue and NW 12 Street were performed on a typical weekday on October 28, 2010. A summary of the traffic data is presented in *Figure 23*, and the field review is presented in *Figure 24*.

This intersection has double left-turn bays for all approaches, and the northbound, southbound and eastbound approaches have exclusive right-turn lanes. The signal operation is protected for all left-turn approaches.

Long queues were observed for northbound left-turn with vehicles spilling back and blocking the through lane. Also, northbound vehicles were observed weaving.



Several eastbound vehicles were observed weaving and overtaking the right-of-way from the outside lane that becomes a right turn only to the inside through lanes, bypassing the long queue. Also, weaving was observed for westbound traffic.

Several conflicts were observed between the eastbound right turns and traffic along the auxiliary lane for the SR-836/Dolphin Expressway on-ramp during the PM peak. Also, several conflicts between eastbound right turns and southbound through traffic

It was observed that multiple vehicles weaving south of the intersection use to bypass southbound queues from the auxiliary lane for the SR-836/Dolphin Expressway on-ramp along NW 107 Avenue.

It was noticed that no intersection lane control signs were provided for southbound and eastbound traffic. Also, red light running was observed at the intersection.

3.6.4. Recommendation

Based on the safety analysis, field observations and traffic operations for the intersection of NW 107 Avenue and NW 12 Street, the following are recommended:

- Lengthen the northbound double left-turn lanes to 250 ft. each.
- Lengthen the eastbound double left-turn lanes to 300 ft. each.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Installing lane control (R3-8) signs for all approaches.
- Installing additional post mounted No U-Turn (R3-4) signs for all approaches.
- Providing ADA approved pedestrian ramps at all corners.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 25.





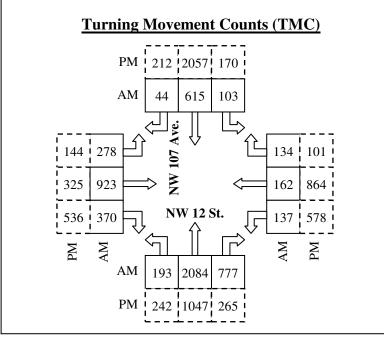


Figure 23: Traffic Data – NW 107 Avenue and NW 12 Street



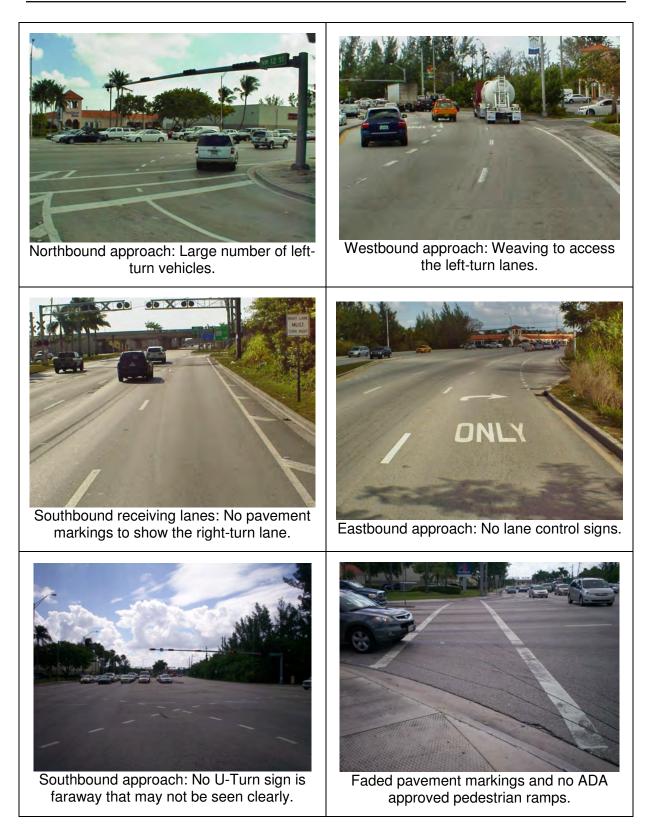


Figure 24: Field Review – NW 107 Avenue and NW 12 Street



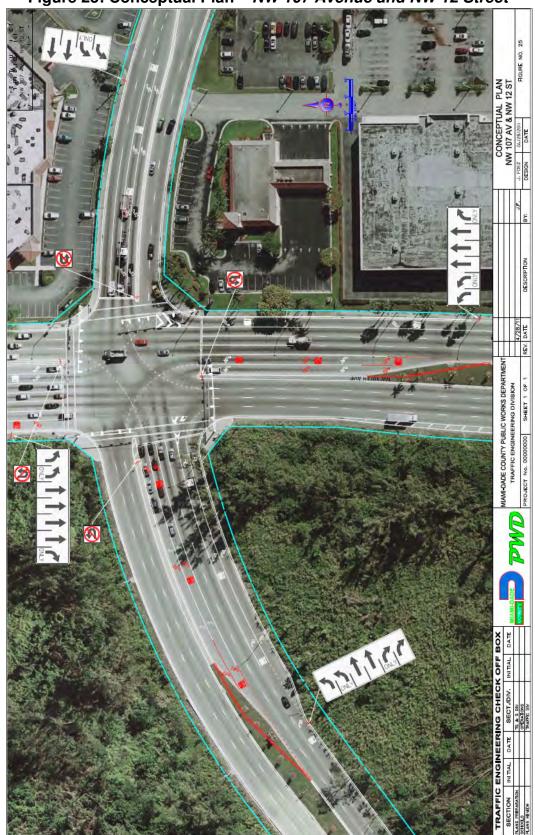


Figure 25: Conceptual Plan – NW 107 Avenue and NW 12 Street



3.7. SW 152 Avenue and SW 72 Street

3.7.1. Site Description

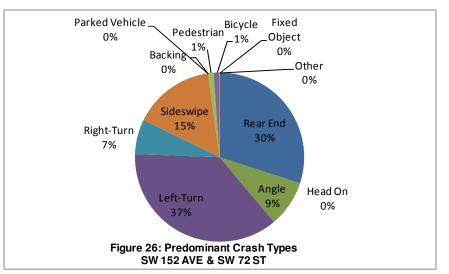
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 152 Avenue is a four lane urban arterial divided by a raised median that runs north-south, and SW 72 Street is a four lane urban arterial divided by a raised median that runs east-west.

3.7.2. Safety Conditions and Analysis

The intersection of SW 152 Avenue and SW 72 Street is ranked number 7 in our high crash locations list. A review of the hard copy police reports for the year 2006 through 2008 was performed. During the three-year analysis period, 90 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 30. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 26*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 18* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 2.398, 2.212, and 1.720, respectively. The safety ratio for the three years averaged 2.110. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that left-turn, right-turn and sideswipe collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 19*.



		(4 Lane	x 4 Lane.				& SW 72 S 4 Leg Inters		e 28) - URBAN	N Spot			
			R OF CF		3 YEAR	%				ASH VALUE	ABNORM	ALLY HIGH	CRASHES
	TYPE OF CRASH	2006	YEAR 2007	2008	TOTAL CRASHE	of Total	Accidents per Year	MEAN	90th Percentile	95th Percentile	Mean	90th Percentil	95th Percenti
COLLISION TYPE	Rear End	12	11	4	27	15%	9.00	5.70	16.96	19.12	Х		
	Head On	0	0	0	0	0% 3%	0.00	0.33	1.02	1.15			
	Angle Left Turn	4	2 13	2	8	3% 14%	2.67 11.00	3.05 1.67	7.08	7.85	х	x	x
	Right Turn	3	1	2	6	2%	2.00	0.33	1.25	1.42	X	x	X
	Sideswipe	2	5	7	14	6%	4.67	1.60	4.64	5.22	Х	Х	
	Backed Into Coll. w/ Parked Car	0	0	0	0	0% 0%	0.00	0.17	0.56	0.63 0.59			
	Coll. w/ Pedestrian	0	0	1	1	0%	0.00	0.10	1.04	1.19	х		
	Coll. w/ Bicycle	1	0	0	1	0%	0.33	0.09	0.33	0.38	X	Х	
	Fixed Object	0	0	0	0	0%	0.00	0.03	0.21	0.24			
	Ran Off Road Overtuned	0	0	0	0	0% 0%	0.00	0.00	0.00	0.00			
	Other	0	0	0	0	0%	0.00	3.70	8.83	9.82			
	Total Crashes	34	32	24	90	24%	30.00	17.77	40.96	45.39	Х		
SEVERITY	PDO crashes	30	27	23	80	89%	26.67	9.93	22.30	24.67	Х	X	Х
	Fatal crashes	0	0	0	0	0% 11%	0.00	0.05	0.26 33.08	0.29			
IGHT CONDITIONS	Injury crashes Day Light	4	5 19	1 16	10 53	11% 59%	3.33 17.67	13.14 12.40	33.08 29.18	36.90 32.39	x		ł
	Dusk	0	1	1	2	2%	0.67	0.28	0.87	0.98	x		
	Dawn	0	0	0	0	0%	0.00	0.17	0.56	0.63			
	Dark	16	12	7	35 0	39%	11.67	4.56	10.53	11.68	Х	X	I
URFACE CONDITIONS	Unknown Dry	0 23	0 28	0 22	0 73	0% 81%	0.00 24.33	0.35	1.05 34.45	1.18 38.12	x	<u> </u>	l
	Wet	2	4	2	8	9%	2.67	2.10	6.02	6.76	x		
	Others	9	0	0	9	10%	3.00	0.37	1.10	1.24	Х	X	X
NONTH OF A YEAR	January	1	3	2	6	7%	2.00	1.42	3.33	3.69	X		
	February March	4	2	1	7 9	8% 10%	2.33 3.00	1.42 1.67	3.53 4.12	3.93 4.59	x x		<u> </u>
	April	3	7	2	12	13%	4.00	1.30	3.21	3.57	x	х	х
	May	3	4	1	8	9%	2.67	1.74	4.46	4.99	Х		
	June	4	2	1	7	8%	2.33	1.38	3.49	3.90	X		
	July August	0	3	4	7 6	8% 7%	2.33 2.00	1.35 1.56	3.22 3.99	3.58 4.46	x x		
	September	7	1	1	9	10%	3.00	1.46	3.73	4.16	- x		
	October	3	1	1	5	6%	1.67	1.47	3.59	4.00	Х		
	November	2	0	5	7	8%	2.33	1.39	3.53	3.94	X		
DAY OF THE WEEK	December Sunday	4	0	3	7 6	8% 7%	2.33 2.00	1.61 1.46	4.43	4.97 3.85	x x		
	Monday	2	7	1	10	11%	3.33	2.70	6.42	7.13	- x		
	Tuesday	7	1	3	11	12%	3.67	2.49	6.18	6.88	Х		
	Wednesday	6	6	8	20	22%	6.67	2.56	5.84	6.47	X	Х	Х
	Thursday Friday	4	7	3	14 16	16% 18%	4.67 5.33	2.88 3.07	7.20	8.03 8.35	x		
	Saturday	7	2	3	12	13%	4.00	2.61	6.40	7.13	- x		
HOUR OF THE DAY	00:00-06:00	2	2	1	5	6%	1.67	1.70	3.39	3.71			
	06:00-09:00	2	4	3	9	10%	3.00	1.98	5.12	5.72	Х		
	09:00-11:00 11:00-13:00	1 2	1 0	1	3	3% 3%	1.00	1.72 2.40	4.23 6.30	4.71 7.05			
	13:00-15:00	6	2	3	11	12%	3.67	1.95	5.32	5.96	х		
	15:00-18:00	7	9	4	20	22%	6.67	3.58	7.81	8.62	X		
	18:00-24:00	14	14	11	39	43%	13.00	4.42	10.63	11.82	Х	X	Х
						YEAR		3-Year	1				
					1	2	3	Average					
Average Daily Traffic A	ADT (Vehicles per D	Day)			37,651	38,419	39,203	38,424					
Florida Average Crash			terina Ve	hicles)	0.420	0.424	0.394	0.413					
-	1.4.0 10.401100 per								-				
Fraffic Base					13.742	14.023	14.309	14.025	-				
Actual Crash Rate (Cr	rashes per Million E	ntering V	ehicles)		2.474	2.282	1.677	2.144	1				
Critical Crash Rate (C	rashes per Million E	Intering V	(ehicles)		1.032	1.032	0.975	1.013					
Safety Ratio					2.398	2.212	1.720	2.110					
High Crash Location	??				YES	YES	YES	YES	1				
CriticalCrashRa	$Rate = \frac{A \times 1,00}{V}$ $ate = AVR + \frac{0.5}{TB} + \frac{1}{V}$ $\frac{Years \times ADT \times 3}{1,000,000}$	2	V = Ave <u>Where:</u> AVR = D TB = Tr TF = Te = 1.	Average Annua Average Sta affic Base est Factor (z 96 (assume	al Daily Tra atewide Cr z-value) e 95% Cor	affic X 365	a particular el for RURAI	type of interso L areas)	ng in a 1 year ection or roadv Confidence I 68.30 86.60 90.00 95.00 95.00	way segme 	Constant Z 1.00 1.50 1.64 1.96		
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	n Rate h Rate	-							95.50 98.80 99.00 99.70 99.95)))	2.00 2.50 2.58 3.00 3.29	

Table 18 – Crash Analysis – SW 152 Avenue and SW 72 Street



Table 19 – Abnormal Crash Details & CountermeasuresSW 152 Avenue and SW 72 Street

		SW 1	52 Aver	nue & S	W 72 S	treet				
	(4 Lane x 4 L	ane, Signalized, W	/ith Turn L	anes, 4 L	eg Interse	ection -Table	28) - URE	BAN Spot		
			NUMBE	R OF CR	ASHES	3 YEAR	%	MEAN	Possible	Counter-
				YEAR		TOTAL	of	Accidents		
			2006	2007	2008	CRASHES	Total	per Year	Cause(s)	measure(s)
	Total Left Tur	n Crashes	12	13	8	33	100%	11.00	(9)	9
		Day Light	8	8	5	21	64%	7.00	(13)	13
	Lighting Conditions	Dawn	0	0	3	3	9%	1.00	(19)	16
		Dark	4	5	0	9	27%	3.00		
		00:00 - 06:00	0	0	0	03	0%	0.00		
		06:00 - 09:00 09:00 - 11:00	1	0	2	2	9% 6%	1.00 0.67		
	Hours of Day	11:00 - 13:00	1	0	1	2	6%	0.67		
Left Turn		13:00 - 15:00	4	Ő	1	5	15%	1.67		
		15:00 - 18:00	2	6	0	8	24%	2.67		
		18:00 - 24:00	4	6	3	13	39%	4.33		
		$NB \rightarrow WB$	2	1	2	5	15%	1.67		
	Dissetion	$WB \rightarrow SB$	5	7	3	15	45%	5.00		
	Direction	$SB \rightarrow EB$	1 4	0	1	2	6%	0.67		
		$\frac{EB \to NB}{Unknown}$	4	5 0	2	11 0	<u>33%</u> 0%	3.67 0.00		
		Unknown	U	U	0	U	0%	0.00		
			NUMBE	R OF CR	ASHES	3 YEAR	%	MEAN		
			NOWIDE	YEAR	ASHLS	TOTAL	of	Accidents	Possible	Counter-
			2006	2007	2008		Total		Cause(s)	measure(s
	Total Right Tu	Irn Crashes	3	1	2000	CRASHES 6	100%	per Year 2.00	(1)	9
	Total Hight H	DayLight	1	1	1	3	50%	1.00	(8)	21
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(9)	21
	3 . 3	Dark	2	0	1	3	50%	1.00	(16)	
		00:00 - 06:00	0	0	0	0	0%	0.00	· · /	
		06:00 - 09:00	0	1	0	1	17%	0.33		
		09:00 - 11:00	0	0	0	0	0%	0.00		
Right Turn	Hours of Day	11:00 - 13:00	1	0	0	1	17%	0.33		
•		13:00 - 15:00	0	0	0	0	0% 17%	0.00 0.33		
		15:00 - 18:00 18:00 - 24:00	1	0	2	3	50%	1.00		
		NB→EB	1	Ť	1	3	50%	1.00		
		EB→SB	1	0	0	1	17%	0.33		
	Direction	WB→NB	1	0	1	2	33%	0.67		
		SB→WB	0	0	0	0	0%	0.00		
		Unknown	0	0	0	0	0%	0.00		
			NUMBE	B OF CB	ASHES	2 VEAD	0/_	MEAN		
			NUMBE		ASHES	3 YEAR	% of	MEAN	Possible	Counter-
				YEAR		TOTAL	of	Accidents	Possible Cause(s)	Counter- measure(s
	Total Sideswi	ne Crashes	2006	YEAR 2007	2008	TOTAL CRASHES	of Total	Accidents per Year	Cause(s)	measure(s
	Total Sideswi			YEAR 2007 5	2008 7	TOTAL	of Total 100%	Accidents per Year 4.67	Cause(s) (8)	
	Total Sideswi	pe Crashes Day Light Dawn	2006 2	YEAR 2007	2008	TOTAL CRASHES	of Total	Accidents per Year	Cause(s)	<mark>measure(s</mark> 5
		DayLight Dawn Dark	2006 2 0	YEAR 2007 5 2	2008 7 5	TOTAL CRASHES 14 7 0 7	of Total 100% 50% 0% 50%	Accidents per Year 4.67 2.33 0.00 2.33	Cause(s) (8) (18)	<mark>measure(s</mark> 5
		Day Light Dawn Dark 00:00 - 06:00	2006 2 0 0 2 0	YEAR 2007 5 2 0	2008 7 5 0 2 1	TOTAL CRASHES 14 7 0 7 2	of Total 100% 50% 0% 50% 14%	Accidents per Year 4.67 2.33 0.00 2.33 0.67	Cause(s) (8) (18)	<mark>measure(s</mark> 5
		Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	2006 2 0 0 2 0 2 0 0	YEAR 2007 5 2 0 3 1 1	2008 7 5 0 2 1 0	TOTAL CRASHES 14 7 0 7 2 1	of Total 100% 50% 0% 50% 14% 7%	Accidents per Year 2.33 0.00 2.33 0.67 0.33	Cause(s) (8) (18)	measure(s
Sidomina	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	2006 2 0 2 2 0 0 0 0 0	YEAR 2007 5 2 0 3 1 1 1 0	2008 7 5 0 2 1 0 0	TOTAL CRASHES 14 7 0 7 2 1 0	of Total 100% 50% 0% 50% 14% 7% 0%	Accidents per Year 4.67 2.33 0.00 2.33 0.67 0.33 0.00	Cause(s) (8) (18)	<mark>measure(s</mark> 5
Sideswipe		Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	2006 2 0 2 0 0 0 0 0	YEAR 2007 5 2 0 3 1 1 0 0	2008 7 5 0 2 1 0 0 0 0	TOTAL CRASHES 14 7 0 7 2 1 0 0	of Total 100% 50% 0% 50% 14% 7% 0% 0%	Accidents per Year 2.33 0.00 2.33 0.67 0.33 0.00 0.00	Cause(s) (8) (18)	measure(s
Sideswipe (Overtake)	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00	2006 2 0 2 0 0 0 0 0 0 0 0 0	YEAR 2007 2 0 3 1 1 0 0 0	2008 7 5 0 2 1 0 0 0 0	TOTAL CRASHES 14 7 0 7 2 1 0 0	of Total 100% 50% 0% 50% 14% 7% 0% 0% 0%	Accidents per Year 2.33 0.00 2.33 0.67 0.33 0.00 0.00 0.00	Cause(s) (8) (18)	measure(s
	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00	2006 2 0 2 0 0 0 0 0 0 0 0 1	YEAR 2007 5 2 0 3 1 1 0 0 0 0 0	2008 7 5 0 2 1 0 0 0 0 0 1	TOTAL CRASHES 14 7 0 7 2 1 0 0 0 0 0 2	of Total 100% 50% 0% 50% 14% 7% 0% 0% 0% 0% 0% 14%	Accidents per Year 2.33 0.00 2.33 0.67 0.33 0.00 0.00 0.00 0.00 0.00	Cause(s) (8) (18)	measure(s
	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	2006 2 0 2 0 0 0 0 0 0 0 1 1	YEAR 2007 5 2 0 3 1 1 0 0 0 0 3 3	2008 7 5 0 2 1 0 0 0 0 0 1 5	TOTAL CRASHES 14 7 0 7 2 1 1 0 0 0 0 0 2 9	of Total 100% 50% 0% 50% 14% 7% 0% 0% 0% 0% 0% 14% 64%	Accidents per Year 4.67 2.33 0.00 2.33 0.67 0.33 0.00 0.00 0.00 0.00 0.67 3.00	Cause(s) (8) (18)	measure(s
	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 09:00 11:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North	2006 2 0 2 0 0 0 0 0 0 1 1 1 0	YEAR 2007 5 2 0 3 1 1 0 0 0 0 0	2008 7 5 0 2 1 0 0 0 0 0 1	TOTAL CRASHES 14 7 0 7 2 1 0 0 0 0 0 2	of Total 100% 50% 0% 50% 14% 0% 0% 0% 0% 0% 0% 14% 64% 36%	Accidents per Year 4.67 2.33 0.00 2.33 0.67 0.33 0.00 0.00 0.00 0.00 0.67 3.00 1.67	Cause(s) (8) (18)	<mark>measure(s</mark> 5
	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	2006 2 0 2 0 0 0 0 0 0 0 1 1	YEAR 2007 5 2 0 3 1 0 0 0 3 3 3 3	2008 7 5 0 2 1 0 0 0 0 0 1 5 2	TOTAL CRASHES 14 7 0 2 2 1 0 0 0 0 0 0 2 9 9 5	of Total 100% 50% 0% 50% 14% 7% 0% 0% 0% 0% 0% 14% 64%	Accidents per Year 4.67 2.33 0.00 2.33 0.67 0.33 0.00 0.00 0.00 0.00 0.67 3.00	Cause(s) (8) (18)	<mark>measure(s</mark> 5
	Lighting Conditions Hours of Day	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 11:00 - 13:00 11:00 - 13:00 15:00 - 18:00 18:00 - 24:00 North South	2006 2 0 2 0 0 0 0 0 0 1 1 0 0 0 0	YEAR 2007 5 2 0 3 1 0 0 0 3 1 1 0 0 3 3 1	2008 7 5 0 2 1 0 0 0 0 0 1 5 5 2 1	TOTAL CRASHES 14 7 0 7 2 1 0 0 0 2 5 2	of Total 100% 50% 0% 50% 14% 0% 0% 0% 0% 0% 14% 64% 36% 14%	Accidents per Year 2.33 0.00 2.33 0.67 0.33 0.00 0.00 0.00 0.00 0.00 0.67 3.00 1.67 0.67	Cause(s) (8) (18)	<mark>measure(s</mark> 5

3.7.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 152 Avenue and SW 72 Street were performed on a typical weekday on November 15, 2010. A summary of the traffic data is presented in *Figure 27*, and the field review is presented in *Figure 28*.

This intersection has single left-turn bays for all approaches. The signal operation is protected/permissive for all approaches left-turn traffic.



The gas station and Westlake Plaza located along the south side of SW 72 Street of this intersection presents many consecutive driveways that generate potential conflicts with the other movements.

The west leg has a median opening with a westbound left-turn lane 130 feet from the intersection. Several conflicts between eastbound traffic and vehicles entering and existing from that driveway were observed.

This intersection presents a large offset alignment between eastbound and westbound leftturn lanes. Although this intersection allows U-turns, it was perceived that potential conflicts between those vehicles ad through traffic could occur especially during the peak period.

It was noticed that the number of left-turn vehicles sometimes exceeds the storage capacity of the turn bays for eastbound, westbound and northbound approaches.

Red light running was observed at the intersection.

3.7.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 152 Avenue and SW 72 Street, the following is recommended:

- Realignment of the eastbound/westbound left-turn lanes to reduce the offset and lineup with the opposite left-turn lane.
- Closing the median opening on the west leg, and lengthen the eastbound left-turn lane to 200 ft. Also, provide a westbound left-turn bay at the second median opening.
- Lengthen the westbound left-turn lane to approximately 400 ft.
- Lengthen the northbound left-turn lane to approximately 200 ft.
- Improve the turn radius at the northeast and southeast corners.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Installing "No U-Turn" (R3-4) signs for eastbound/westbound approaches.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 29.





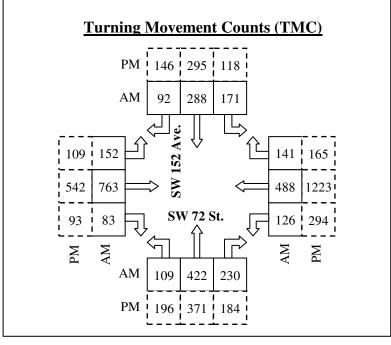


Figure 27: Traffic Data – SW 152 Avenue and SW 72 Street







Faded pavement markings and uneven pavement patches.

Figure 28: Field Review – SW 152 Avenue and SW 72 Street

Eastbound approach: Short left-turn bay.



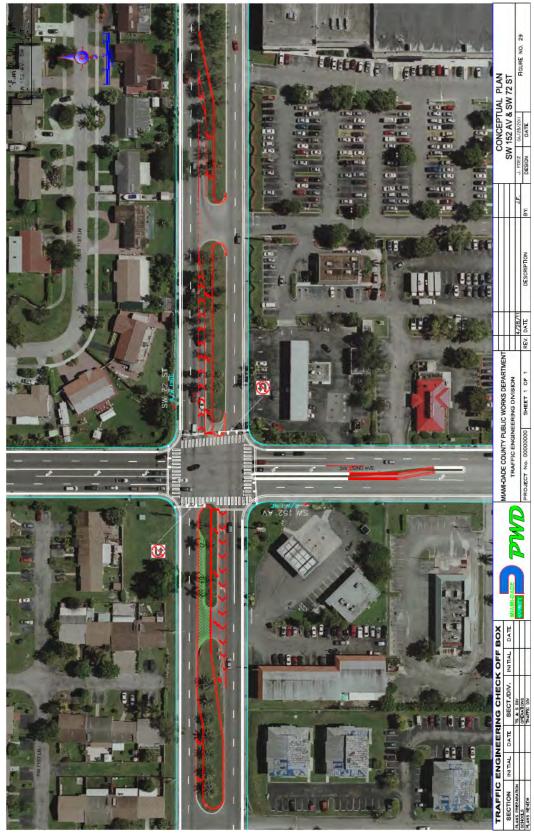


Figure 29: Conceptual Plan – SW 152 Avenue and SW 72 Street

Safety Studies at High Crash Locations Countywide



3.8. NW 79 Avenue and NW 36 Street

3.8.1. Site Description

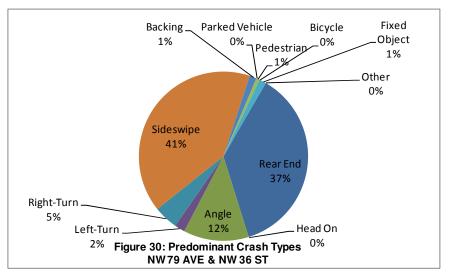
This intersection is a signalized four legged intersection located in the northwest part of Miami Dade County in the City of Doral. NW 79 Avenue is a four lane collector divided by a paved median that runs north-south, and NW 36 Street is a six lane urban arterial divided by a raised median that runs east-west.

3.8.2. Safety Conditions and Analysis

The intersection of NW 79 Avenue and NW 36 Street is ranked number 8 in our high crash locations list. A review of the hard copy police reports for the year 2006 through 2008 was performed. During the three-year analysis period, 152 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 51. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 30*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the study intersection in



relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 20* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 2.145, 2.189, and 2.568, respectively. The safety ratio for the three years averaged 2.301. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that rear end, right-turn and sideswipe collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 21*.



		(6 005	x 4 on-				NW 36 S		e 35) - URBAN	Al Spot			
	TYPE OF CRASH		R OF CF YEAR		3 YEAR TOTAL	% of	MEAN Accidents	EXPECTED MEAN	90th	ASH VALUE 95th	ABNORM. Mean	90th	95th
COLLISION TYPE	Rear End	2006 19	2007 18	2008 19	CRASHE 56	Total 18%	18.67	8.68	Percentile 17.26	Percentile 18.90	x	Percentil X	Percenti
	Head On	0	0	0	0	0%	0.00	0.60	1.64	1.84	~	^	
	Angle	2	6	11	19	5%	6.33	5.40	9.19	9.92	Х		
	Left Turn	2	1	0	3	1% 1%	1.00 2.33	3.00 0.46	6.13	6.73	x	x	x
	Right Turn Sideswipe	3 20	3 19	23	62	13%	2.33	2.58	1.36	1.53 5.37	x	x	- Â
	Backed Into	0	1	1	2	0%	0.67	0.28	0.84	0.94	x	~	
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.12	0.57	0.65			
	Coll. w/ Pedestrian	0	0	1	1	0%	0.33	0.74	1.80	2.00			
	Coll. w/ Bicycle Fixed Object	0	0	0	0 2	0% 0%	0.00	0.14 0.79	0.49	0.55			
	Ran Off Road	0	0	0	0	0%	0.00	0.01	0.11	0.13			
	Overtuned	0	0	0	0	0%	0.00	0.04	0.28	0.33			
	Other	0	0	0	0	0%	0.00	8.67	21.05	23.42			
SEVERITY	Total Crashes PDO crashes	47 45	48 45	57 56	152 146	23% 96%	50.67 48.67	31.51 19.21	54.94 36.95	59.43 40.35	X	x	x
JET EI 11 1	Fatal crashes	45 0	45	0	0	96%	0.00	0.16	0.56	40.35	^	<u>^</u>	<u>⊢ ^ </u>
	Injury crashes	2	3	1	6	4%	2.00	20.77	38.34	41.71			
LIGHT CONDITIONS	Day Light	36	36	45	117	77%	39.00	19.89	35.12	38.03	Х	Х	Х
	Dusk Dawn	0	0	1	1 5	1% 3%	0.33	0.61	1.43	1.58 1.16	x	x	x
	Dawn Dark	2 9	2	10	5 29	3% 19%	9.67	0.38	18.94	20.61	^	^	<u> </u>
	Unknown	0	0	0	0	0%	0.00	0.41	1.15	1.30			
SURFACE CONDITIONS	Dry	35	41	47	123	81%	41.00	26.41	45.71	49.41	X		
	Wet	2	7	9	18	12%	6.00	4.41	8.78	9.62	X	~	
MONTH OF A YEAR	Others January	10	0	1 5	11 17	7% 11%	3.67 5.67	0.69	1.88 5.04	2.11 5.52	X	X X	X
IN THE REAL	January February	7	3	5 6	17	11%	5.67	2.57	4.59	5.52	X	X	X
	March	5	5	4	14	9%	4.67	3.09	5.92	6.46	Х		
	April	7	3	6	16	11%	5.33	2.57	5.30	5.82	Х	Х	
	May	0	4 0	6	10	7%	3.33	2.51.	4.81	5.25			
	June July	0	3	5	8 10	5% 7%	2.67 3.33	2.81 2.60	5.74 4.96	6.30 5.42	x		
	August	3	3	5	11	7%	3.67	3.00	5.66	6.17	X		
	September	4	8	1	13	9%	4.33	2.48	4.92	5.39	Х		
	October	2	5	3	10	7%	3.33	2.89	5.40	5.88	X		
	November	7 4	4	0	11	7% 10%	3.67	2.41	4.85 4.55	5.32	X X	x	x
DAY OF THE WEEK	December Sunday	4	3	8	15 2	10%	5.00 0.67	2.22	6.58	5.00 7.08	^	^	<u> </u>
	Monday	9	9	13	31	20%	10.33	4.62	9.23	10.11	х	х	x
	Tuesday	8	4	5	17	11%	5.67	4.46	7.81	8.46	Х		
	Wednesday	10	9	7	26	17%	8.67	4.56	8.62	9.40	X	Х	
	Thursday	12 4	5 9	9 11	26 24	17% 16%	8.67 8.00	5.04 4.86	9.04 9.39	9.80 10.26	X		
	Friday Saturday	4	12	10	24	17%	8.67	3.98	8.10	8.89	x	x	
HOUR OF THE DAY	00:00-06:00	3	5	4	12	8%	4.00	3.79	8.65	9.58	X	~	
	06:00-09:00	4	6	7	17	11%	5.67	3.44	6.94	7.61	Х		
	09:00-11:00	4	5	5	14	9%	4.67	2.58	5.30	5.82	X		
	11:00-13:00 13:00-15:00	5 8	4	7 6	16 21	11% 14%	5.33 7.00	3.12 3.57	5.78 6.32	6.29 6.85	x	x	x
	15:00-18:00	16	13	11	40	26%	13.33	6.38	11.52	12.50	x	x	x
	18:00-24:00	7	8	17	32	21%	10.67	8.60	15.51	16.83	X		
					L	YEAR		3-Year					
					1	2	3	Average	1				
Average Daily Traffic A	ADT (Vehicles per D	Day)			50,468	51,498	52,549	51,505	1				
Florida Average Crash	rate (Crashes per	Million En	tering Ve	hicles)	0.579	0.568	0.566	0.571	1				
Traffic Base			3 -	-/	18.421	18.797	19.180	18.799	1				
			-hiel · · · ·						4				
Actual Crash Rate (Cr	1	<u> </u>	,		2.551	2.554	2.972	2.692	4				
Critical Crash Rate (C	rashes per Million E	Entering V	'ehicles)		1.189	1.167	1.157	1.171	1				
Safety Ratio					2.145	2.189	2.568	2.301	1				
, High Crash Location	??				YES	YES	YES	YES	1				
•	$Rate = \frac{A \times 1,00}{V}$	0,000				f crashes	or number of		type occurring	ng in a 1 year	period.		
CriticalCrashRa	$CriticalCrashRate = AVR + \frac{0.5}{TB} + TF \sqrt{\frac{AVR}{TB}} \qquad \qquad \frac{Where}{AVR} = TF = TF = TF$							·		Confidence I	Level (%)	Constant Z]
Traffic Base =				nfidence Lev Confidence L			68.30 86.60 90.00 95.00 95.50 98.80)))	1.00 1.50 1.64 1.96 2.00 2.50				
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	n Rate h Rate	-							98.80 99.00 99.70 99.95)	2.50 2.58 3.00 3.29	

Table 20 – Crash Analysis – NW 79 Avenue and NW 36 Street



Table 21 – Abnormal Crash Details & Countermeasures NW 79 Avenue and NW 36 Street

	(6 Lane v 4 L				V 36 St	CCI				
	U Lane X 4 L	ane, Signalized, V					e 35) - URI	BAN Spot		
1			NUMB	R OF CF	ASHES	3 YEAR	%	MEAN		
1				YEAR		TOTAL	of	Accidents	Possible	Counter-
1			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Rear Er	nd Crashes	19	18	19	56	100%	18.67	(1)	2
		Day Light	15	14	17	46	82%	15.33	(4)	4
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(5)	6
		Dark	4	4	2	10	18%	3.33	(8)	
		00:00 - 06:00	1	1	0	2	4%	0.67		
		06:00 - 09:00 09:00 - 11:00	2	4	4	10 8	18% 14%	3.33 2.67		
	Hours of Day	11:00 - 13:00	1	4	2	8 4	7%	1.33		
Rear End	riouro or Day	13:00 - 15:00	2	2	1	5	9%	1.67		
		15:00 - 18:00	8	3	5	16	29%	5.33		
		18:00 - 24:00	3	3	5	11	20%	3.67		
		North	4	3	1	8	14%	2.67		
		South	4	4	3	11	20%	3.67		
	Direction	East	6	8	7	21	38%	7.00		
		West	5	3	8	16	29%	5.33		
		Unknown	0	0	0	0	0%	0.00		
1			NUMB	R OF CF	ASHES	3 YEAR	%	MEAN	_	_
1				YEAR		TOTAL	of	Accidents	Possible	Counter-
l l			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Sideswi	ne Crashes	2000	19	23	62	100%	20.67	(16)	4
	10141 01063 WI	Day Light	16	16	20	52	84%	17.33	(10)	19
	Lighting Conditions	Dawn	2	1	2	5	8%	1.67	(20)	21
	gg = =	Dark	2	2	1	5	8%	1.67	(=0)	22
		00:00 - 06:00	0	0	0	0	0%	0.00		
		06:00 - 09:00	2	1	2	5	8%	1.67		
		09:00 - 11:00	1	2	1	4	6%	1.33		
Sideswipe	Hours of Day	11:00 - 13:00	2	2	3	7	11%	2.33		
(Overtake)		13:00 - 15:00	5	4	4	13	21%	4.33		
		15:00 - 18:00	7	6	4	17	27%	5.67		
		18:00 - 24:00	3	4	9	16	26%	5.33		
		North	4	8	10	22 9	35%	7.33 3.00		
	Direction	South East	3	4	2	9 21	15%	7.00		
	Direction	West	4	1	5	10	34% 16%	3.33		
		Unknown	0	0	0	0	0%	0.00		
							• / •			
			NUMB	R OF CF	ASHES	3 YEAR	%	MEAN	Possible	Counter-
				YEAR		TOTAL	of	Accidents	Cause(s)	measure(s)
			2006	2007			Total	per Year		. ,
	T_0.1 B(1) 7	Orreade a			2008	CRASHE			10	
	Total Right Tu		3	3	1	7	100%	2.33	(8)	4
	, , , , , , , , , , , , , , , , , , ,	Day Light	3	3 3	1 0	7 4	100% 57%	2.33 1.33	(9)	9
	Total Right Tu Lighting Conditions	Day Light Dawn	3 1 0	3 3 0	1	7 4 0	100% 57% 0%	2.33 1.33 0.00		
	, , , , , , , , , , , , , , , , , , ,	Day Light Dawn Dark	3 1 0 2	3 3 0 0	1 0 0 1	7 4 0 3	100% 57% 0% 43%	2.33 1.33 0.00 1.00	(9)	9
	, , , , , , , , , , , , , , , , , , ,	Day Light Dawn Dark 00:00 - 06:00	3 1 0 2 1	3 3 0 0 0	1 0 0 1 1	7 4 0	100% 57% 0% 43% 29%	2.33 1.33 0.00 1.00 0.67	(9)	9
	, , , , , , , , , , , , , , , , , , ,	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	3 1 0 2	3 3 0 0 0 1	1 0 0 1	7 4 0 3	100% 57% 0% 43%	2.33 1.33 0.00 1.00	(9)	9
	, , , , , , , , , , , , , , , , , , ,	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	3 1 0 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 3 0 0 0	1 0 1 1 0	7 4 0 3 2 1	100% 57% 0% 43% 29% 14%	2.33 1.33 0.00 1.00 0.67 0.33	(9)	9
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	3 1 0 2 1 0 0 0 0 0	3 0 0 0 1 0	1 0 1 1 0 0	7 4 0 3 2 1 0	100% 57% 0% 43% 29% 14% 0% 0% 0% 14%	2.33 1.33 0.00 1.00 0.67 0.33 0.00	(9)	9
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	3 1 0 2 1 0 0 0	3 0 0 0 1 0 0	1 0 1 1 0 0 0	7 4 0 3 2 1 0 0	100% 57% 0% 43% 29% 14% 0% 0%	2.33 1.33 0.00 1.00 0.67 0.33 0.00 0.00	(9)	9
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	3 1 0 2 1 0 0 0 1 0 1 0 1	3 0 0 1 0 0 0 2 0	1 0 1 1 0 0 0 0 0 0 0	7 4 0 3 2 1 0 0 1 2 1 2 1	100% 57% 0% 43% 29% 14% 0% 0% 14% 29% 14%	2.33 1.33 0.00 1.00 0.67 0.33 0.00 0.00 0.33 0.67 0.33	(9)	9
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB	3 1 0 2 1 0 0 0 1 0 1 1 1	3 3 0 0 1 0 0 0 2 0 1	1 0 1 1 0 0 0 0 0 0 0 0 0 0	7 4 0 3 2 1 0 0 1 2 1 2	100% 57% 0% 43% 29% 14% 0% 0% 14% 29% 14% 29%	2.33 1.33 0.00 1.00 0.67 0.33 0.00 0.00 0.33 0.67 0.33 0.67	(9)	9
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB	3 1 0 2 1 0 0 0 1 1 0 0 1 0	3 3 0 0 1 0 0 2 0 1 0 1 0	1 0 1 1 0 0 0 0 0 0 0	7 4 0 3 2 1 0 0 1 2 1 2 0 0 0 0 0 0 0 0 0 0 0 0	100% 57% 0% 43% 29% 14% 0% 0% 14% 29% 14% 29% 0%	2.33 1.33 0.00 1.00 0.67 0.33 0.00 0.00 0.33 0.67 0.33 0.67 0.00	(9)	9
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB	3 1 0 2 1 0 0 1 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	3 3 0 0 1 0 0 0 2 0 1 0 1 0 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	1 0 1 1 0 0 0 0 0 0 0 0 0 0 0 1	7 4 0 3 2 1 0 0 1 2 1 2 0 0 2 0 2	100% 57% 0% 43% 29% 14% 0% 0% 14% 29% 29% 0% 29%	2.33 1.33 0.00 1.00 0.67 0.33 0.00 0.00 0.33 0.67 0.33 0.67 0.00 0.67	(9)	9
Right Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB	3 1 0 2 1 0 0 0 1 1 0 0 1 0	3 3 0 0 1 0 0 2 0 1 0 1 0	1 0 1 1 0 0 0 0 0 0 0 0 0 0	7 4 0 3 2 1 0 0 1 2 1 2 0 0 0 0 0 0 0 0 0 0 0 0	100% 57% 0% 43% 29% 14% 0% 0% 14% 29% 14% 29% 0%	2.33 1.33 0.00 1.00 0.67 0.33 0.00 0.00 0.33 0.67 0.33 0.67 0.00	(9)	9

3.8.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at NW 79 Avenue and NW 36 Street were performed on a typical weekday on October 28, 2010. A summary of the traffic data is presented in *Figure 31*, and the field review is presented in *Figure 32*.



This intersection has single left-turn bays for northbound and eastbound approaches; with the westbound and southbound approaches having a double left-turn operation. The signal operation is split phases for northbound and southbound traffic, and protected for eastbound and westbound left-turn traffic.

Heavy traffic and long queues were observed for the eastbound approach. Also, the approach has three through lanes. However, there are four receiving lanes.

Due to the presence of the SR-826 highway ramps on the east leg, a considerable amount of weaving was observed in both east/west directions. Also, weaving and lane changes were noticed at northbound right-turns and southbound left-turns.

It was noticed that there are no signs to alert motorists that the southernmost lane of the eastbound receiving lanes is a right-turn only to access the SR-826 southbound.

The stop bar for the northbound approach is pulled away from the intersection which causes difficulties for right-turns on red.

The gas station driveways on the southwest corner present a conflict with the eastbound through traffic.

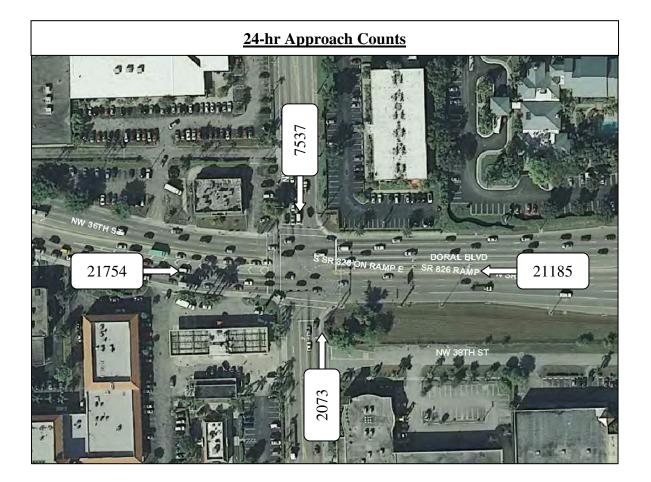
3.8.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of NW 79 Avenue and NW 36 Street, the following is recommended:

- Add one through lane to the eastbound approach by converting the striped gore to a full lane and make the necessary changes on the receiving lanes pavement markings.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Installing advance guide signs for SR-826 for eastbound and northbound (FTP-17-06 & R3-5f) and southbound (FTP-17-06 & R3-5e).
- Relocate the northbound stop bar closer to the intersection to improve the sight distance triangles for northbound approach.
- Provide ADA approved pedestrian ramps at all corners.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 33.





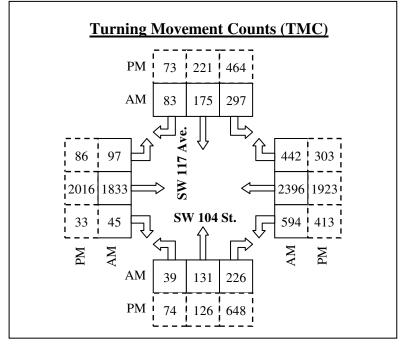
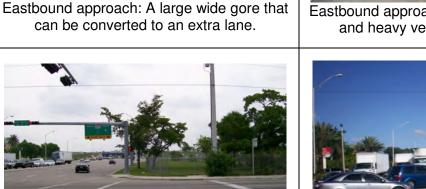


Figure 31: Traffic Data – NW 79 Avenue and NW 36 Street

Figure 32: Field Review – NW 79 Avenue and NW 36 Street





Northbound approach: Wide gap between

the stop bar and the intersection.



and heavy vehicles affect capacity.

Southbound left-turns: Considerable weaving to access the SR-826 ramps.

North side: Substandard sidewalks and pedestrian ramps.

Faded pavement markings.





MIAM



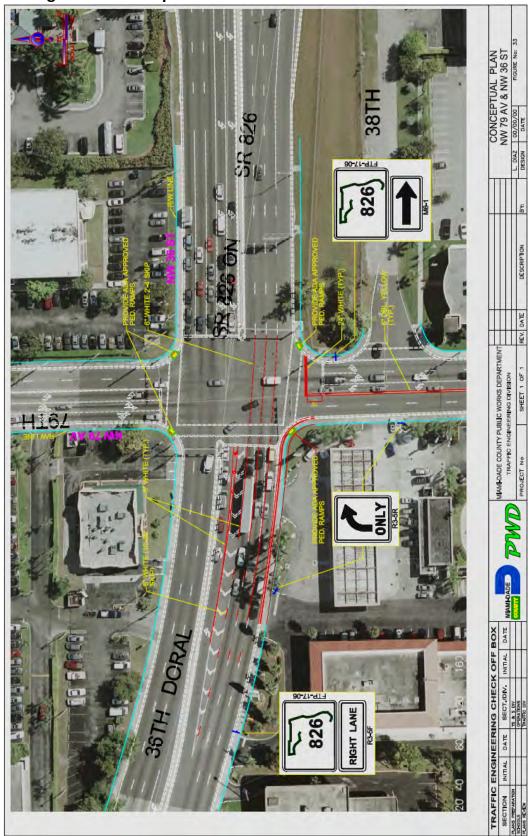


Figure 33: Conceptual Plan – NW 79 Avenue and NW 36 Street



3.9. SW 137 Avenue and SW 56 Street

3.9.1. Site Description

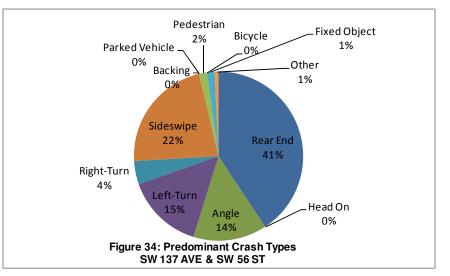
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 137 Avenue is a six lane urban arterial divided by a raised median that runs north-south, and SW 104 Street is a four lane urban arterial divided by a raised median that runs east-west.

3.9.2. Safety Conditions and Analysis

The intersection of SW 137 Avenue and SW 56 Street is ranked number 9 in our high crash locations list. A review of the hard copy police reports for the year 2006 through 2008 was performed. During the three-year analysis period, 135 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 45. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 34*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 22* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.267, 1.297, and 1.687, respectively. The safety ratio for the three years averaged 1.417. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that rear end, left-turn, right-turn and sideswipe collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 23*.



		(6 Lane	x 4 Lane,				4 Leg Inters		9 35) - URBAN	N Spot			
		NUMBER OF CRASHES			3 YEAR	%	MEAN	EXPECTED ANNUAL CR			ABNORM/		
	TYPE OF CRASH	2006	YEAR 2007	2008	TOTAL CRASHE	of Total	Accidents per Year	MEAN	90th Percentile	95th Percentile	Mean	90th Percentil	95th Percenti
COLLISION TYPE	Rear End	13	14	28	55	20%	18.33	8.68	17.26	18.90	Х	Х	
	Head On Angle	0 7	0 9	0	0	0% 6%	0.00 6.33	0.60 5.40	1.64 9.19	1.84 9.92	x		
	Left Turn	9	9	4	20	6%	6.67	3.00	6.13	6.73	X	x	
	Right Turn	0	2	4	6	1%	2.00	0.46	1.36	1.53	X	X	x
	Sideswipe	10	7	13	30	7%	10.00	2.58	4.92	5.37	Х	Х	Х
	Backed Into	0	0	0	0	0%	0.00	0.28	0.84	0.94			
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.12	0.57	0.65			
	Coll. w/ Pedestrian Coll. w/ Bicycle	1	1	0	2	0%	0.67	0.74 0.14	1.80 0.49	2.00 0.55			
	Fixed Object	0	1	1	2	0%	0.67	0.79	2.01	2.24			
	Ran Off Road	0	0	0	0	0%	0.00	0.01	0.11	0.13			
	Overtuned	0	0	0	0	0%	0.00	0.04	0.28	0.33			
	Other	0	0	1	1	0%	0.33	8.67	21.05	23.42			
SEVERITY	Total Crashes PDO crashes	40 34	41 35	54 52	135 121	23% 90%	45.00 40.33	31.51 19.21	54.94 36.95	59.43 40.35	X	x	
	Fatal crashes	0	1	0	1	1%	0.33	0.16	0.56	0.63	x	<u>^</u>	
	Injury crashes	6	5	2	13	10%	4.33	20.77	38.34	41.71			l — —
LIGHT CONDITIONS	Day Light	29	30	37	96	71%	32.00	19.89	35.12	38.03	Х		
	Dusk	1	1	1	3	2%	1.00	0.61	1.43	1.58	X		
	Dawn	0	1	1	2	1%	0.67	0.38	1.03	1.16	X		
	Dark Unknown	10 0	9	14 1	33	24% 1%	11.00 0.33	10.22 0.41	18.94 1.15	20.61 1.30	Х		I
		24	35	50	109	81%	36.33	26.41	45.71	49.41	х		
MONTH OF A YEAR	Wet	6	6	3	100	11%	5.00	4.41	8.78	9.62	x	l I	1
	Others	10	0	1	11	8%	3.67	0.69	1.88	2.11	Х	х	х
	January	5	3	3	11	8%	3.67	2.57	5.04	5.52	X		
	February	4	1	4	9 15	7%	3.00 5.00	2.37	4.59 5.92	5.02	X X		<u> </u>
	March April	2	2	11 3	15	11% 7%	3.33	3.09 2.57	5.92	6.46 5.82	X		
	May	5	2	3	10	7%	3.33	2.51.	4.81	5.25	^		
	June	2	4	3	9	7%	3.00	2.81	5.74	6.30	Х		
	July	4	3	1	8	6%	2.67	2.60	4.96	5.42	Х		
	August	2	9	6	17	13%	5.67	3.00	5.66	6.17	X	X	
	September	4	3	5	12	9%	4.00	2.48	4.92	5.39	X		
	October November	4	3	5 4	12 11	9% 8%	4.00 3.67	2.89 2.41	5.40 4.85	5.88 5.32	X X		
	December	2	3	6	11	8%	3.67	2.41	4.65	5.00	x		
DAY OF THE WEEK	Sunday	3	3	6	12	9%	4.00	4.00	6.58	7.08	X		
	Monday	8	8	6	22	16%	7.33	4.62	9.23	10.11	Х		
	Tuesday	6	3	7	16	12%	5.33	4.46	7.81	8.46	Х		
	Wednesday	6	5	10	21	16%	7.00	4.56	8.62	9.40	X		
	Thursday	5	5 10	8	18 26	13% 19%	6.00 8.67	5.04 4.86	9.04 9.39	9.80 10.26	X		
	Friday Saturday	0 4	7	o 9	20	19%	6.67	3.98	9.39 8.10	8.89	X		
HOUR OF THE DAY	00:00-06:00	2	1	4	7	5%	2.33	3.79	8.65	9.58	~		
	06:00-09:00	4	6	8	18	13%	6.00	3.44	6.94	7.61	Х		
	09:00-11:00	5	3	4	12	9%	4.00	2.58	5.30	5.82	X		
	11:00-13:00 13:00-15:00	6	3	8	17 21	13% 16%	5.67 7.00	3.12 3.57	5.78 6.32	6.29 6.85	X		- v
	15:00-18:00	8 5	9	10	21	18%	8.00	6.38	11.52	12.50	X X	X	x
	18:00-24:00	10	12	14	36	27%	12.00	8.60	15.51	16.83	X		
						YEAR 2	3	3-Year]				
Average Delle T. M. 1	DT (Vabiala C				1			Average	-				
Average Daily Traffic A					82,183	83,861	85,572	83,872	4	r			
Florida Average Crash rate (Crashes per Million Entering Vehicles)					0.579	0.568	0.566	0.571					
Traffic Base					29.997	30.609	31.234	30.613	1		•		
Actual Crash Rate (Cr	rashes ner Million F	nterina V	ahicles)		1.333	1.339	1.729	1.467	1				
		-	,						-				
Critical Crash Rate (C	rashes per Million E	ntering V	ehicles)		1.053	1.033	1.025	1.037	1				
Safety Ratio					1.267	1.297	1.687	1.417					
High Crash Location	??				YES	YES	YES	YES					
Actual Crash i	$Rate = \frac{A \times 1,00}{V}$	0,000			al number o rage Annua			f crashes by	type occurrin	ng in a 1 year	period.		
<i>TB</i> ↓ <i>TB</i> = Tra					Average Statewide Crash Rate for a particular type of interse affic Base st Factor (z-value)					Confidence Level (%) Constant Z			
$Y_{ears} \times ADT \times 365 = 1.4$					st Factor (2-value) 96 (assume 95% Confidence Level for RURAL areas) 29 (assume 99.95% Confidence Level for URBAN areas)					68:30 1.00 86:60 1.50 90:00 1.64 95:00 1.96 95:50 2.00			
$Safety Ratio = \frac{Actual Crash Rate}{Critical Crash Rate}$										98.8 99.0 99.7 99.9	D D D	2.50 2.58 3.00 3.29	

Table 22 – Crash Analysis – SW 137 Avenue and SW 56 Street



Table 23 – Abnormal Crash Details & Countermeasures SW 137 Avenue and SW 56 Street

			37 Aven							
	(6 Lane x 4 L	ane, Signalized, W	ith Turn La	anes, 4 Le	g Interse	ction -Table	935) - URE	BAN Spot		
			NUMB	R OF CR YEAR	ASHES	3 YEAR TOTAL	% of	MEAN Accidents	Possible	Counter-
	-		2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Rear Er		13	14	28	55	100%	18.33	(1)	2
	Lighting Conditions	Day Light	10	12	21	43 3	78%	14.33	(4) (8)	4 6
	Lighting Conditions	Dawn Dark	1 2	1	1 6	3	5% 16%	1.00 3.00	(8)	8
		00:00 - 06:00	1	0	1	2	4%	0.67	(12)	0
		06:00 - 09:00	1	0	3	4	7%	1.33		
	Lieure of Devi	09:00 - 11:00	2	2	3	7	13%	2.33		
Rear End	Hours of Day	11:00 - 13:00 13:00 - 15:00	2	0	5	7 10	13% 18%	2.33 3.33		
		15:00 - 18:00	2	3	5	10	18%	3.33		
		18:00 - 24:00	1	6	8	15	27%	5.00		
		North	5	1	6	12	22%	4.00		
	Direction	South East	8	7	9 11	24 14	44% 25%	8.00 4.67		
	Direction	West	0	3	2	5	9%	1.67		
		Unknown	0	0	0	0	0%	0.00		
			NUMB	R OF CR	ASHES	3 YEAR	%	MEAN	Possible	Counter-
				YEAR		TOTAL	of	Accidents		
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Right tu		0	2	4	6	100%	2.00	(1)	4
	Lighting Conditions	Day Light	0	2	2	4	67%	1.33	(9)	9
	Lighting Conditions	Dawn Dark	0	0	0	0 2	0% 33%	0.00 0.67	(16)	21
		00:00 - 06:00	0	0	0	0	0%	0.07		
		06:00 - 09:00	0	1	1	2	33%	0.67		
		09:00 - 11:00	0	0	0	0	0%	0.00		
Right Turn	Hours of Day	11:00 - 13:00	0	0	1 0	1	<u>17%</u> 0%	0.33		
		13:00 - 15:00 15:00 - 18:00	0	1	1	2	33%	0.00		
		18:00 - 24:00	Ő	0	1	1	17%	0.33		
		$WB \rightarrow NB$	0	2	1	3	50%	1.00		
	Direction	$SB \rightarrow WB$	0	0	1	1	17%	0.33		
	Direction	$EB \rightarrow SB$ NB $\rightarrow EB$	0	0	2	2	33% 0%	0.67		
		Unknown	0	0	0	0	0%	0.00		
			NUMB	B OF CB	ASHES	3 VEAR	%	ΜΕΔΝ		
			NUMB	R OF CR YEAR	ASHES	3 YEAR TOTAL	% of	MEAN Accidents	Possible	Counter-
			NUMBE 2006		ASHES	3 YEAR TOTAL CRASHE		MEAN Accidents per Year	Possible Cause(s)	Counter- measure(s)
	Total Left Tu		2006 9	YEAR 2007 7	2008 4	TOTAL	of Total 100%	Accidents per Year 6.67	Cause(s) (4)	<mark>measure(s)</mark> 9
		Day Light	2006 9 4	YEAR 2007 7 2	2008 4 1	TOTAL CRASHE 20 7	of Total 100% 35%	Accidents per Year 6.67 2.33	Cause(s) (4) (9)	measure(s) 9 13
	Total Left Tur	Day Light Dawn	2006 9 4 0	YEAR 2007 7 2 2	2008 4 1 2	TOTAL CRASHE 20 7 4	of Total 100% 35% 20%	Accidents per Year 6.67 2.33 1.33	Cause(s) (4)	measure(s) 9 13 15
		DayLight Dawn Dark	2006 9 4	YEAR 2007 7 2	2008 4 1	TOTAL CRASHE 20 7	of Total 100% 35% 20% 45%	Accidents per Year 6.67 2.33 1.33 3.00	Cause(s) (4) (9)	measure(s) 9 13
		Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	2006 9 4 0 5 0 1	YEAR 2007 2 2 3 1 1	2008 4 1 2 1 2 1	TOTAL CRASHE 20 7 4 9	of Total 100% 35% 20% 45% 15%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 1.00	Cause(s) (4) (9)	measure(s) 9 13 15
	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	2006 9 4 0 5 0 1 1	YEAR 2007 7 2 2 3 1 1 0	2008 4 1 2 1 2 1 0	TOTAL CRASHE 20 7 4 9 3 3 3 1	of Total 100% 35% 20% 45% 15% 15% 5%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 1.00 0.33	Cause(s) (4) (9)	measure(s) 9 13 15
Left Turn		Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	2006 9 4 0 5 0 1 1 0	YEAR 2007 7 2 3 1 1 0 0	2008 4 1 2 1 2 1 0 0 0	TOTAL CRASHE 20 7 4 9 3 3 1 0	of Total 100% 35% 20% 45% 15% 15% 5% 0%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 1.00 0.33 0.00	Cause(s) (4) (9)	measure(s) 9 13 15
Left Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	2006 9 4 0 5 0 1 1	YEAR 2007 7 2 2 3 1 1 0	2008 4 1 2 1 2 1 0	TOTAL CRASHE 20 7 4 9 3 3 3 1	of Total 100% 35% 20% 45% 15% 15% 5%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 1.00 0.33	Cause(s) (4) (9)	measure(s) 9 13 15
Left Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	2006 9 4 5 0 1 1 1 0 0 6	YEAR 2007 7 2 3 1 1 0 0 1 2 2 2	2008 4 1 2 1 2 1 0 0 0 0 0 0 1	TOTAL CRASHE 20 7 4 9 3 3 1 0 2 2 9	of Total 100% 35% 20% 45% 15% 5% 0% 10% 10% 45%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 0.33 0.00 0.67 0.67 3.00	Cause(s) (4) (9)	measure(s) 9 13 15
Left Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 01:00 11:00 - 13:00 13:00 - 13:00 13:00 - 13:00 15:00 - 18:00 18:00 - 24:00 NB → WB	2006 9 4 5 0 1 1 1 0 6 3	YEAR 2007 7 2 2 3 1 1 0 0 1 2 2 2 2 2	2008 4 1 2 1 2 1 0 0 0 0 0 1 0 0	TOTAL CRASHE 20 7 4 9 3 3 3 1 1 0 2 2 9 9 5	of Total 100% 35% 20% 45% 15% 5% 0% 10% 10% 10% 45% 25%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 1.00 0.33 0.00 0.67 0.67 3.00 1.67	Cause(s) (4) (9)	measure(s) 9 13 15
Left Turn	Lighting Conditions Hours of Day	$\begin{array}{c} \text{Day Light} \\ \hline \text{Dawn} \\ \text{Dark} \\ 00:00 - 06:00 \\ \hline 06:00 - 09:00 \\ \hline 11:00 - 13:00 \\ \hline 13:00 - 13:00 \\ \hline 15:00 - 15:00 \\ \hline 15:00 - 18:00 \\ \hline 18:00 - 24:00 \\ \hline \text{NB} \rightarrow \text{WB} \\ \hline \text{WB} \rightarrow \text{SB} \end{array}$	2006 9 4 0 5 0 1 1 0 1 0 6 3 3 1	YEAR 2007 7 2 3 1 1 0 0 1 2 2 2 0 0	2008 4 1 2 1 0 0 0 0 0 0 1 0 0 0	TOTAL CRASHE 20 7 4 9 3 3 3 1 0 2 2 2 9 9 5 5 1	of Total 100% 35% 20% 45% 15% 15% 0% 0% 0% 10% 10% 10% 25% 5%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 1.00 0.33 0.00 0.67 3.00 1.67 0.33	Cause(s) (4) (9)	measure(s) 9 13 15
Left Turn	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 13:00 - 24:00 NB → WB WB → SB SB → EB	2006 9 4 0 5 0 1 1 0 1 0 1 0 6 3 3 1 1	YEAR 2007 7 2 2 3 1 1 0 0 1 2 2 2 2 2	2008 4 1 2 1 2 1 0 0 0 0 0 1 0 0	TOTAL CRASHE 20 7 4 9 3 3 3 1 1 0 2 2 9 9 5	of Total 100% 35% 20% 45% 15% 5% 0% 10% 10% 10% 45% 25% 5% 5%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 1.00 0.33 0.00 0.67 0.67 3.00 1.67 0.33 0.33 0.33	Cause(s) (4) (9)	measure(s) 9 13 15
Left Turn	Lighting Conditions Hours of Day	$\begin{array}{c} \text{Day Light} \\ \hline \text{Dawn} \\ \text{Dark} \\ 00:00 - 06:00 \\ \hline 06:00 - 09:00 \\ \hline 11:00 - 13:00 \\ \hline 13:00 - 13:00 \\ \hline 15:00 - 15:00 \\ \hline 15:00 - 18:00 \\ \hline 18:00 - 24:00 \\ \hline \text{NB} \rightarrow \text{WB} \\ \hline \text{WB} \rightarrow \text{SB} \end{array}$	2006 9 4 0 5 0 1 1 0 1 0 6 3 3 1	YEAR 2007 7 2 3 1 1 0 0 1 2 2 2 0 0	2008 4 1 2 1 0 0 0 0 0 0 1 0 0 0	TOTAL CRASHE 20 7 4 9 3 3 3 1 0 2 2 2 9 9 5 5 1	of Total 100% 35% 20% 45% 15% 15% 0% 0% 0% 10% 10% 10% 25% 5%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 1.00 0.33 0.00 0.67 3.00 1.67 0.33	Cause(s) (4) (9)	measure(s) 9 13 15
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Left Turn	Lighting Conditions Hours of Day Direction	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB → WB WB → SB EB → NB EB → NB Day Light Dawn	2006 9 4 0 5 0 1 1 0 1 1 0 6 3 3 1 1 4 0 0 NUMBE 2006 10 9 9 0	YEAR 2007 7 2 3 1 0 1 2 2 3 1 0 1 2 2 0 5 0 5 0 5 0 5 0 5 0 7 4 0	2008 4 1 2 1 0 0 0 0 0 1 0 0 4 0 0 4 0 0 ASHES 2008 13 10 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL CRASHE 20 7 4 9 3 3 1 0 2 2 9 5 1 1 1 3 0 2 2 9 5 5 1 1 1 3 0 3 YEAR TOTAL CRASHE 30 2 3 0	of Total 100% 25% 20% 45% 15% 5% 15% 0% 0% 10% 45% 25% 5% 65% 0% 0% 0%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 0.33 0.00 0.67 0.67 0.67 3.00 1.67 0.33 0.33 4.33 0.00 MEAN Accidents per Year 10.00 7.67 0.00	Cause(s) (4) (9) (13) Possible Cause(s) (16)	Counter- measure(s)
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Sideswipe	Lighting Conditions Hours of Day Direction Total Sideswi Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB → WB SB → EB SB → EB EB → NB Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 18:00 - 24:00 North	2006 9 4 0 5 0 1 1 0 1 0 6 3 3 1 1 4 0 0 NUMBE 2006 10 9 9 0 1 1 0 0 1 1 2 206 10 9 2 2 2 2 2 2 2	YEAR 2007 7 2 3 1 0 1 0 1 2 2 0 1 2 0 5 0 5 0 5 0 7 4 0 3 1 0 0 3 3	2008 4 1 2 1 0 0 0 0 0 1 0 0 4 0 0 4 0 0 4 0 0 4 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL CRASHE 20 7 4 9 3 3 1 0 2 2 9 5 1 1 1 2 2 9 5 1 1 1 3 0 7 1 1 3 7 7 1 1 3 0 7 7 1 1 3 0 7 7 1 1 1 3 0 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	of Total 100% 35% 20% 45% 15% 5% 0% 10% 45% 25% 5% 65% 0% 0% 0% 0% 0% 0% 77% 25% 65% 0% 0% 10% 3% 3% 10% 3% 3%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 0.33 0.00 0.67 0.67 0.67 3.00 1.67 0.33 0.33 4.33 0.00 MEAN Accidents per Year 10.00 7.67 0.00 7.67 0.00 2.33 0.33 1.00 0.33 1.00 2.33 1.00 0.33 1.00 2.33	Cause(s) (4) (9) (13) (13) Possible Cause(s) (16) (19)	Counter- measure(s) 0 13 15 16 16 Counter- measure(s) 4 19
Sideswipe	Lighting Conditions Hours of Day Direction Lighting Conditions Hours of Day	Day Light Day Light Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB → WB WB → SB EB → NB Unknown Day Light Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South	2006 9 4 0 5 0 1 1 1 0 1 1 0 6 3 1 1 0 0 1 1 0 0 1 1 4 0 0 1 1 0 0 1 1 1 0 0 1 1 1 0 0 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1 0 0 0 0 1 1 1 0 0 0 0 0 1 1 1 1 0 0 0 0 0 1 1 1 1 0 0 0 0 0 1 1 1 1 0 0 0 0 0 0 0 1 1 1 1 0 0 0 0 0 0 0 0 0 1 1 1 1 0	YEAR 2007 7 2 3 1 0 1 2 3 0 1 2 2 0 1 2 0 5 0 5 0 5 0 5 0 5 0 3 1 0 3 3 3 1	2008 4 1 2 1 0 0 0 0 0 0 0 0 0 0 0 4 0 4 0 2 0 4 0 0 4 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL CRASHE 20 7 4 9 3 3 0 2 2 9 5 1 1 2 2 9 5 1 1 1 3 0 2 3 1 1 1 3 0 2 3 0 7 7 1 1 3 0 2 3 0 2 3 0 7 7 1 1 3 0 2 2 9 5 5 1 1 1 1 3 0 2 2 9 9 5 5 1 1 1 1 3 0 2 2 9 9 5 5 1 1 1 1 3 0 2 2 9 9 5 5 1 1 1 1 3 0 2 2 9 9 5 5 1 1 1 1 3 0 2 2 2 9 9 5 5 1 1 1 1 3 0 2 2 9 9 5 5 1 1 1 1 3 0 2 2 2 9 9 5 5 1 1 1 1 3 0 2 2 2 9 9 5 5 1 1 1 1 3 0 0 2 2 2 9 5 5 1 1 1 1 3 0 0 2 2 2 9 5 5 1 1 1 1 3 0 0 2 2 2 9 9 5 5 1 1 1 1 3 0 0 2 2 2 9 5 5 1 1 1 1 3 0 0 2 2 2 9 9 5 5 1 1 1 1 3 0 0 2 2 1 1 1 1 3 0 0 2 2 1 1 1 1 3 0 0 2 2 1 1 1 1 3 0 0 2 2 1 1 1 1 3 0 0 2 3 0 7 7 1 1 1 3 0 1 1 1 1 3 0 1 1 1 1 3 0 1 2 1 1 1 1 1 1 1 1 3 0 1 2 1 1 1 1 1 1 3 0 1 2 1 1 1 1 1 3 0 1 2 3 1 1 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1	of Total 100% 35% 20% 45% 15% 5% 5% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 1.00 0.67 0.67 0.67 0.67 0.67 0.33 0.00 1.67 0.33 4.33 0.00 MEAN Accidents per Year 10.00 7.67 0.00 0.33 1.33 1.33 1.67 2.67 2.67 3.33 3.33	Cause(s) (4) (9) (13) (13) Possible Cause(s) (16) (19)	Counter-measure(s) 4 19
Sideswipe	Lighting Conditions Hours of Day Direction Total Sideswi Lighting Conditions	Day Light Day Light Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 18:00 - 24:00 NB → WB WB → SB SB → EB EB → NB Unknown Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 15:00 - 15:00 15:00 - 15:00 15:00 - 15:00 15:00 - 15:00 15:00 - 15:00 15:00 - 15:00 North South East	2006 9 4 0 5 0 1 1 1 0 6 3 3 0 1 1 1 0 6 6 3 3 1 1 4 4 0 0 8 9 9 0 0 1 0 0 9 9 0 0 1 1 0 0 1 1 1 0 0 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1 1 0 0 0 0 0 1 1 1 1 1 0 0 0 0 0 0 0 0 1 1 1 1 1 0	YEAR 2007 7 2 3 1 0 1 2 2 2 3 0 1 2 0 5 0 5 0 5 0 5 0 7 4 0 3 1 0 3 3 1 2	2008 4 1 2 1 2 1 0 0 0 1 0 0 1 0 0 4 0 0 4 0 0 4 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL CRASHE 20 7 4 9 3 3 1 0 2 9 9 5 1 1 2 9 9 5 1 1 1 3 0 3 YEAR TOTAL CRASHE 30 23 0 7 7 1 1 3 3 1 1 4 5 5 8 8 8 10 6 6	of Total 100% 35% 20% 45% 15% 5% 0% 0% 0% 25% 5% 65% 0% 0% 0% 0% 0% 77% 0% 0% 77% 0% 23% 10% 33% 13% 17% 27% 23% 22%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 0.33 0.00 0.67 3.00 1.67 0.67 3.00 1.67 0.33 0.33 4.33 0.00 1.67 0.33 0.33 4.33 0.00 1.67 0.33 0.33 4.33 0.00 0.67 3.00 1.67 0.33 0.33 1.33 1.00 0.67 3.00 1.67 0.33 0.33 1.33 1.33 1.67 2.67 2.67 3.33 3.33 2.00	Cause(s) (4) (9) (13) (13) Possible Cause(s) (16) (19)	Counter-measure(s) 9 13 15 16
Sideswipe	Lighting Conditions Hours of Day Direction Lighting Conditions Hours of Day	Day Light Day Light Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB → WB WB → SB EB → NB Unknown Day Light Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South	2006 9 4 0 5 0 1 1 1 0 1 1 0 6 3 1 1 0 0 1 1 0 0 1 1 4 0 0 1 1 0 0 1 1 1 0 0 1 1 1 0 0 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1 0 0 0 0 1 1 1 0 0 0 0 0 1 1 1 1 0 0 0 0 0 1 1 1 1 0 0 0 0 0 1 1 1 1 0 0 0 0 0 0 0 1 1 1 1 0 0 0 0 0 0 0 0 0 1 1 1 1 0	YEAR 2007 7 2 3 1 0 1 2 3 0 1 2 2 0 1 2 0 5 0 5 0 5 0 5 0 5 0 3 1 0 3 3 3 1	2008 4 1 2 1 0 0 0 0 0 0 0 0 0 0 0 4 0 4 0 2 0 4 0 0 4 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL CRASHE 20 7 4 9 3 3 0 2 2 9 5 1 1 2 2 9 5 1 1 1 3 0 2 3 1 1 1 3 0 2 3 0 7 7 1 1 3 0 2 3 0 2 3 0 7 7 1 1 3 0 2 2 9 5 5 1 1 1 1 3 0 2 2 9 9 5 5 1 1 1 1 3 0 2 2 9 9 5 5 1 1 1 1 3 0 2 2 9 9 5 5 1 1 1 1 3 0 2 2 9 9 5 5 1 1 1 1 3 0 2 2 2 9 9 5 5 1 1 1 1 3 0 2 2 9 9 5 5 1 1 1 1 3 0 2 2 2 9 9 5 5 1 1 1 1 3 0 2 2 2 9 9 5 5 1 1 1 1 3 0 0 2 2 2 9 5 5 1 1 1 1 3 0 0 2 2 2 9 5 5 1 1 1 1 3 0 0 2 2 2 9 9 5 5 1 1 1 1 3 0 0 2 2 2 9 5 5 1 1 1 1 3 0 0 2 2 2 9 9 5 5 1 1 1 1 3 0 0 2 2 1 1 1 1 3 0 0 2 2 1 1 1 1 3 0 0 2 2 1 1 1 1 3 0 0 2 2 1 1 1 1 3 0 0 2 3 0 7 7 1 1 1 3 0 1 1 1 1 3 0 1 1 1 1 3 0 1 2 1 1 1 1 1 1 1 1 3 0 1 2 1 1 1 1 1 1 3 0 1 2 1 1 1 1 1 3 0 1 2 3 1 1 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1	of Total 100% 35% 20% 45% 15% 5% 5% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Accidents per Year 6.67 2.33 1.33 3.00 1.00 1.00 0.67 0.67 0.67 0.67 0.67 0.33 0.00 1.67 0.33 4.33 0.00 MEAN Accidents per Year 10.00 7.67 0.00 0.33 1.33 1.33 1.67 2.67 2.67 3.33 3.33	Cause(s) (4) (9) (13) (13) Possible Cause(s) (16) (19)	Counter-measure(s) 4 19



3.9.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 137 Avenue and SW 56 Street were performed on a typical weekday on November 3, 2010. A summary of the traffic data is presented in *Figure 35*, and the field review is presented in *Figure 36*.

This intersection has single left-turn bays for all approaches except the westbound which has double left-turn lanes. The southbound and westbound approaches have exclusive right-turn lanes. The signal operation is protected/permissive for all approaches except the westbound approach which has protected only left-turns.

Long queues were observed for northbound left-turn with vehicles spilling back and blocking the through lane. Also, the driveways for the shopping plaza in the south leg present conflict with the north/south traffic.

The eastbound left-turn movement struggles to cross the opposing westbound through movement. Red light running was observed at the intersection.

It was noticed that the bus stop at the northbound approach is so close to the intersection that it affects the through and right-turn movements.

3.9.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 137 Avenue and SW 56 Street, the following is recommended:

- Add one left turn lane to the northbound approach by converting the striped area on southbound receiving lanes to a full through lane and realigning the southbound.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Reduce the offset between eastbound and westbound left turn lanes by reducing the west leg median width and creating a striped gore.
- Convert the full median opening at south leg (Publix driveway) to a directional median opening.
- Install "Right Turn Only" sign (R3-5R) at the exit of the south leg driveways.
- Install new advance intersection lane control signs for northbound, southbound and westbound approaches.
- Relocate the bus stop on northbound approach away from the intersection.
- Provide ADA approved pedestrian ramps at all corners.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 37.





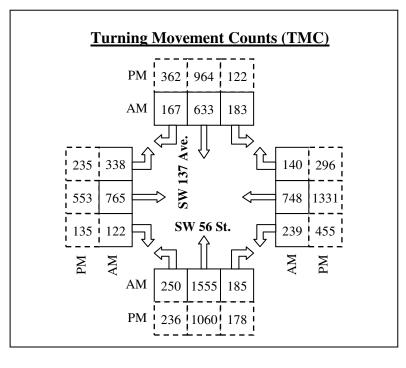




Figure 35: Traffic Data – SW 137 Avenue and SW 56 Street



Figure 36: Field Review – SW 137 Avenue and SW 56 Street



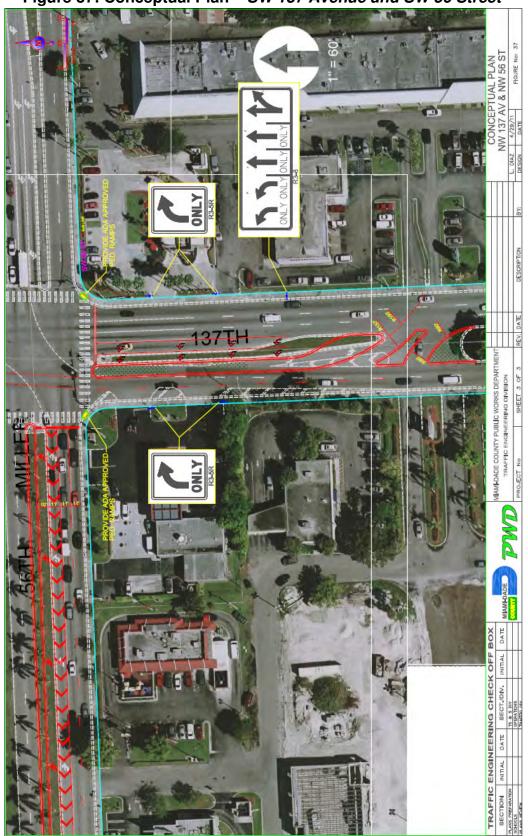


Figure 37: Conceptual Plan – SW 137 Avenue and SW 56 Street



3.10. NW 79 Avenue and NW 25 Street

3.10.1. Site Description

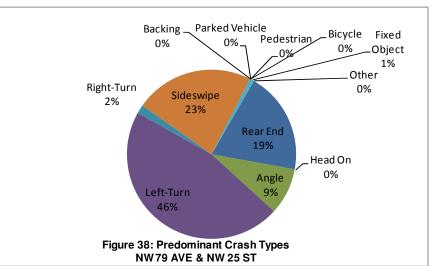
This intersection is a signalized four legged intersection located in the northwest part of Miami Dade County in the City of Doral. NW 79 Avenue is a four lane collector divided by a paved median that runs north-south, and NW 25 Street is a four lane urban arterial divided by a paved median that runs east-west.

3.10.2. Safety Conditions and Analysis

The intersection of NW 79 Avenue and NW 25 Street is ranked number 10 in our high crash locations list. A review of the hard copy police reports for the year 2006 through 2008 was performed. During the three-year analysis period, 123 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 41. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 38*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 24* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 2.251, 2.860, and 2.350, respectively. The safety ratio for the three years averaged 2.487. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that left-turn, sideswipe and fixed object collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 25*.



	(4	Lane x 4 I	Lane, Sig				k NW 25 S		Table 28) - UF	BAN Spot			
		NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN	EXPECTED	ANNUAL CF		ABNORM		
	TYPE OF CRASH	2006	YEAR 2007	2008	TOTAL CRASHE	of Total	Accidents per Year	MEAN	90th Percentile	95th Percentile	Mean	90th Percentil	95th Percenti
COLLISION TYPE	Rear End	9	9	6	24	10%	8.00	5.70	16.96	19.12	Х		
	Head On Angle	0	0	0	0	0% 3%	0.00 3.67	0.33 3.05	1.02 7.08	1.15 7.85	x		
	Left Turn	17	24	16	57	17%	19.00	1.67	4.02	4.47	x	x	x
	Right Turn	1	1	0	2	1%	0.67	0.33	1.25	1.42	X		
	Sideswipe Backed Into	7	9	12 0	28 0	7% 0%	9.33 0.00	1.60 0.17	4.64 0.56	5.22 0.63	X	X	X
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.10	0.50	0.59			
	Coll. w/ Pedestrian	0	0	0	0	0%	0.00	0.28	1.04	1.19			
	Coll. w/ Bicycle Fixed Object	0	0	0	0	0% 0%	0.00	0.09	0.33	0.38	x	x	x
	Ran Off Road	0	0	0	0	0%	0.00	0.00	0.00	0.00	~		^
	Overtuned	0	0	0	0	0%	0.00	0.03	0.21	0.24			
	Other Total Crashes	0 37	0 48	0 38	0 123	0% 23%	0.00	3.70 17.77	8.83 40.96	9.82 45.39	x	x	
EVERITY	PDO crashes	36	45	37	118	96%	39.33	9.93	22.30	24.67	x	x	x
	Fatal crashes	0	0	0	0	0%	0.00	0.05	0.26	0.29			
IGHT CONDITIONS	Injury crashes Day Light	1 34	3 43	1 35	5 112	4% 91%	1.67 37.33	13.14 12.40	33.08 29.18	36.90 32.39	x	x	x
	Dusk	2	43	1	4	3%	1.33	0.28	0.87	0.98	x	x	x
	Dawn	0	0	0	0	0%	0.00	0.17	0.56	0.63			
	Dark Unknown	1	4	2 0	7	6% 0%	2.33 0.00	4.56 0.35	10.53 1.05	11.68 1.18			I
URFACE CONDITIONS	Dry	28	37	35	100	0% 81%	33.33	15.30	34.45	38.12	x		
	Wet	5	9	3	17	14%	5.67	2.10	6.02	6.76	X		
NONTH OF A YEAR	Others January	4	2	0	6 11	5% 9%	2.00 3.67	0.37	1.10 3.33	1.24 3.69	X	X	X
IONTH OF A TEAN	February	4	5	4	10	9 % 8%	3.33	1.42	3.53	3.93	x	<u> </u>	
	March	3	6	5	14	11%	4.67	1.67	4.12	4.59	X	Х	Х
	April	1	3	5	9 12	7% 10%	3.00 4.00	1.30	3.21	3.57	X		
	May June	2	5	5	4	3%	1.33	1.74 1.38	4.46 3.49	4.99 3.90	^		
	July	2	1	Ō	3	2%	1.00	1.35	3.22	3.58			
	August	3	5	0	8	7%	2.67	1.56	3.99	4.46	X		
	September October	4	4	8	9 18	7% 15%	3.00 6.00	1.46 1.47	3.73 3.59	4.16 4.00	X	x	x
	November	5	5	5	15	12%	5.00	1.39	3.53	3.94	X	X	X
	December	3	3	4	10	8%	3.33	1.61	4.43	4.97	Х		
DAY OF THE WEEK	Sunday Monday	0	1	0	1 26	1% 21%	0.33 8.67	1.46 2.70	3.47 6.42	3.85 7.13	x	x	x
	Tuesday	7	8	8	23	19%	7.67	2.49	6.18	6.88	x	x	x
	Wednesday	6	6	5	17	14%	5.67	2.56	5.84	6.47	X		
	Thursday Friday	4	4	6 9	14 38	11% 31%	4.67 12.67	2.88 3.07	7.20	8.03 8.35	X	x	x
	Saturday	2	0	2	4	3%	1.33	2.61	6.40	7.13	^	<u>^</u>	<u> </u>
HOUR OF THE DAY	00:00-06:00	1	2	1	4	3%	1.33	1.70	3.39	3.71			
	06:00-09:00 09:00-11:00	1	3	0	4	3% 15%	1.33 6.33	1.98 1.72	5.12 4.23	5.72 4.71	x	x	x
	11:00-13:00	4	4	6	14	11%	4.67	2.40	6.30	7.05	x	<u> </u>	- ^
	13:00-15:00	12	7	11	30	24%	10.00	1.95	5.32	5.96	Х	Х	Х
	15:00-18:00 18:00-24:00	13 3	18	7	38 14	31% 11%	12.67 4.67	3.58 4.42	7.81	8.62 11.82	X X	X	X
	10.00-24.00	5	1	4	14	11/0	4.07	4.42	10.00	11.02	~	1	
						YEAR		3-Year					
	DT (())				1	2	3	Average	-				
Average Daily Traffic A					46,594	47,545	48,515	47,551	4				
-lorida Average Crash	rate (Crashes per	Million En	tering Ve	hicles)	0.420	0.424	0.394	0.413					
Traffic Base					17.007	17.354	17.708	17.356					
Actual Crash Rate (Cr	ashes per Million E	ntering V	ehicles)		2.176	2.766	2.146	2.362	1				
Critical Crash Rate (C	rashes per Million I	Entering V	(ehicles)		0.966	0.967	0.913	0.949	1				
Safety Ratio	· ·	-	,		2.251	2.860	2.350	2.487					
High Crash Location	??				YES	YES	YES	YES					
Actual Crash I	$Rate = \frac{A \times 1,00}{V}$	0,000			al number o rage Annua			f crashes by	v type occurrin	ng in a 1 year	period.		
CriticalCrashRo	$Rate = AVR + \frac{0.5}{TB} + TF \sqrt{\frac{AVR}{TB}}$ $\frac{Where:}{AVR} = Average Statewide Crash Rate}{TB} = Traffic Base}{TF = Test Factor (z-value)}$							a particular	type of interse	ection or road	, ,	ent. Constant Z	٦
	$\frac{Years \times ADT \times 3}{1,000,000}$			= 1.	96 (assume	ə 95% [°] Cor		el for RURAL Level for URE	,	68.3 86.6 90.0 95.0 95.5	0 0 0 0	1.00 1.50 1.64 1.96 2.00	
Safety Ratio	$= \frac{Actual Crass}{Critical Crass}$	h Rate h Rate	-							98.8 99.0 99.7 99.9	0 0	2.50 2.58 3.00 3.29	

Table 24 – Crash Analysis – NW 79 Avenue and NW 25 Street



Table 25 – Abnormal Crash Details & CountermeasuresNW 79 Avenue and NW 25 Street

		NW	79 Aver	nue & N	W 25 S	treet				
	(4 Lane x 4 Lane	e, Signalized, With	Turn Lanes	s, 4 Leg li	ntersectio	n, Divided -Ta	able 28) -	URBAN Spo	t	
			NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN	Possible	Counter-
				YEAR		TOTAL	of	Accidents	Cause(s)	measure(s)
			2006	2007	2008	CRASHES	Total	per Year	Cause(s)	measure(s)
	Total Left Tu		17	24	16	57	100%	19.00	(8)	13
		Day Light	16	24	15	55	96%	18.33	(9)	
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(13)	
		Dark	1	0	1	2	4%	0.67		
		00:00 - 06:00	0	1	1	2	4%	0.67		
		06:00 - 09:00	0	0	0	0	0%	0.00		
	Turn Hours of Day	09:00 - 11:00	1	5	3	9	16%	3.00		
Left Turn		11:00 - 13:00	0	3	3	6	11%	2.00		
		13:00 - 15:00	7	4	4	15	26%	5.00		
		15:00 - 18:00	6	9	2	17	30%	5.67		
		18:00 - 24:00	3	2	3	8	14%	2.67		
		$NB \rightarrow WB$	0	1	0	1	2%	0.33		
	Divertier	$WB \rightarrow SB$	17	23	16	56	98%	18.67		
	Direction	$\begin{array}{c} SB \to EB \\ EB \to NB \end{array} $	0	0	0	0	0% 0%	0.00		
				0		0		0.00		
				-		-				
		Unknown	0	0	0	0	0%	0.00		
			0	-	0	0 3 YEAR	0%	0.00	Possible	Counter-
	1		0 NUMBE	0 R OF CF YEAR	0 ASHES	0 3 YEAR TOTAL	0% % of	0.00 MEAN Accidents	Possible Cause(s)	Counter- measure(s)
	Total SideSw	Unknown	0	R OF CF	0	0 3 YEAR TOTAL CRASHES	0% of Total	0.00 MEAN Accidents per Year	Cause(s)	
	Total SideSw	Unknown ipe Crashes	0 NUMBE 2006	0 ER OF CF YEAR 2007	0 ASHES 2008	0 3 YEAR TOTAL	0% % of	0.00 MEAN Accidents	Cause(s) (8)	measure(s)
	Total SideSw	Unknown	0 NUMBE 2006 7	0 R OF CF YEAR 2007 9	0 ASHES 2008 12	0 3 YEAR TOTAL CRASHES 28	0% of Total 100%	0.00 MEAN Accidents per Year 9.33	Cause(s) (8) (19)	measure(s) 4
		Unknown ipe Crashes Day Light	0 NUMBE 2006 7 7	0 FR OF CF YEAR 2007 9 8	0 ASHES 2008 12 12	0 3 YEAR TOTAL CRASHES 28 27	0% of Total 100% 96%	0.00 MEAN Accidents per Year 9.33 9.00	(8) (19) (20)	measure(s) 4 19
		Unknown ipe Crashes Day Light Dawn	0 NUMBE 2006 7 7 0	0 TR OF CF YEAR 2007 9 8 0	0 ASHES 2008 12 12 0	0 3 YEAR TOTAL CRASHES 27 0	0% of Total 100% 96% 0%	0.00 MEAN Accidents per Year 9.33 9.00 0.00	Cause(s) (8) (19)	<mark>measure(s)</mark> 4 19
		Unknown ipe Crashes Day Light Dawn Dark	0 NUMBE 2006 7 7 0 0	0 ER OF CF YEAR 2007 9 8 0 1	0 ASHES 2008 12 12 0 0	0 3 YEAR TOTAL CRASHES 28 27 0 1	0% of Total 100% 96% 0% 4% 0%	0.00 MEAN Accidents per Year 9.33 9.00 0.00 0.33 0.00	(8) (19) (20)	measure(s) 4 19
		Unknown ipe Crashes Day Light Dawn Dark 00:00 - 06:00	0 NUMBE 2006 7 7 0 0 0 0	0 YEAR 2007 9 8 0 1 0	0 ASHES 2008 12 12 0 0 0	0 3 YEAR TOTAL CRASHES 28 27 0 1 1 0	0% of Total 100% 96% 0% 4%	0.00 MEAN Accidents per Year 9.33 9.00 0.00 0.33	(8) (19) (20)	<mark>measure(s)</mark> 4 19
Cide Ourie		Unknown ipe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	0 NUMBE 2006 7 7 0 0 0 1	0 P OF CF YEAR 2007 9 8 0 1 0 0 0	0 ASHES 2008 12 12 0 0 0 0	0 3 YEAR TOTAL CRASHES 28 27 0 1 0 1	0% of Total 100% 96% 0% 4% 0%	0.00 MEAN Accidents per Year 9.33 9.00 0.00 0.33 0.00 0.33	(8) (19) (20)	<mark>measure(s)</mark> 4 19
SideSwipe	Lighting Conditions	Unknown ipe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	0 NUMBE 2006 7 7 0 0 0 1 0	0 R OF CF YEAR 2007 9 8 0 1 0 0 2	0 ASHES 2008 12 12 0 0 0 0 0 2	0 3 YEAR TOTAL CRASHES 28 27 0 1 1 0 1 4	0% of Total 100% 96% 0% 4% 0% 4% 14%	0.00 MEAN Accidents per Year 9.33 9.00 0.00 0.33 0.33 0.33 1.33	(8) (19) (20)	<mark>measure(s)</mark> 4 19
SideSwipe	Lighting Conditions	Unknown ipe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	0 NUMBE 2006 7 7 0 0 0 1 0 4	0 R OF CF YEAR 2007 9 8 0 1 0 0 2 1	0 ASHES 2008 12 12 0 0 0 0 0 0 2 3	0 3 YEAR TOTAL CRASHES 28 27 0 1 1 0 1 4 8	0% of Total 100% 96% 0% 4% 0% 4% 14% 29%	0.00 MEAN Accidents per Year 9.33 9.00 0.00 0.33 0.00 0.33 1.33 2.67	(8) (19) (20)	<mark>measure(s)</mark> 4 19
SideSwipe	Lighting Conditions	Unknown ipe Crashes Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00	0 NUMBE 2006 7 7 0 0 0 1 0 4 1	0 R OF CF YEAR 2007 9 8 0 1 0 0 2 1 1 1	0 ASHES 2008 12 12 0 0 0 0 0 2 3 3 4	0 3 YEAR TOTAL CRASHES 28 27 0 1 1 0 1 4 8 6	0% of Total 100% 96% 0% 4% 0% 4% 0% 14% 29% 21%	0.00 MEAN Accidents per Year 9.33 0.00 0.33 0.00 0.33 1.33 2.67 2.00	(8) (19) (20)	<mark>measure(s)</mark> 4 19
SideSwipe	Lighting Conditions	Unknown ipe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00	0 NUMBE 2006 7 7 0 0 0 1 0 4 1 1	0 R OF CF YEAR 2007 9 8 0 1 0 0 2 1 1 3	0 ASHES 2008 12 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHES 28 27 0 1 1 0 1 1 4 8 6 6 6	0% of Total 100% 96% 0% 4% 0% 4% 0% 29% 21%	0.00 MEAN Accidents per Year 9.33 9.00 0.00 0.33 0.00 0.33 1.33 2.67 2.00 2.00	(8) (19) (20)	<mark>measure(s)</mark> 4 19
SideSwipe	Lighting Conditions	Unknown ipe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 13:00 - 18:00 18:00 - 24:00	0 NUMBE 2006 7 7 0 0 0 1 0 4 1 1 0	0 R OF CF YEAR 2007 9 8 0 1 0 0 2 1 1 3 2	0 ASHES 2008 12 12 0 0 0 0 0 2 3 4 2 1	0 3 YEAR TOTAL CRASHES 28 27 0 1 1 0 1 4 8 6 6 6 6 3	0% of Total 100% 96% 0% 4% 0% 4% 0% 4% 21% 21% 21% 11%	0.00 MEAN Accidents per Year 9.33 9.00 0.33 0.00 0.33 1.33 2.67 2.00 2.00 1.00	(8) (19) (20)	<mark>measure(s)</mark> 4 19
SideSwipe	Lighting Conditions	Unknown ipe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North	0 NUMBE 2006 7 7 0 0 0 1 0 4 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CF YEAR 2007 9 8 0 1 1 0 0 2 1 1 3 2 1 1	0 ASHES 2008 12 12 0 0 0 0 0 2 3 4 2 1 0 0 0 0 0 0 2 3 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHES 28 27 0 1 1 0 1 4 8 6 6 6 3 3 1	0% of Total 100% 96% 0% 4% 0% 4% 29% 21% 21% 11% 4%	0.00 MEAN Accidents per Year 9.33 9.00 0.00 0.33 0.00 0.33 1.33 2.67 2.00 2.00 1.00 0.33	(8) (19) (20)	measure(s) 4 19
SideSwipe	Lighting Conditions Hours of Day	Unknown pe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 13:00 - 15:00 13:00 - 24:00 North South	0 NUMBE 2006 7 7 0 0 0 1 0 1 0 4 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CF YEAR 2007 9 8 0 1 0 2 1 1 3 2 1 1 1 3 2 1 1 1	0 ASHES 2008 12 12 0 0 0 0 2 3 4 2 1 0 2 1 0 2 1 0 0 2 3 4 2 1 2 0 0 0 0 2 3 4 2 1 2 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHES 28 27 0 1 1 0 1 1 4 8 6 6 6 3 1 1 3	0% of Total 100% 96% 0% 4% 14% 29% 21% 21% 21% 4% 11%	0.00 MEAN Accidents per Year 9.33 9.00 0.00 0.33 0.00 0.33 1.33 2.67 2.00 2.00 2.00 1.00 0.33 1.00	(8) (19) (20)	measure(s) 4 19

3.10.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at NW 79 Avenue and NW 25 Street were performed on a typical weekday on October 28, 2010. A summary of the traffic data is presented in *Figure 39*, and the field review is presented in *Figure 40*.

This intersection has single left-turn bays for northbound, eastbound and westbound approaches; the southbound approach has double left-turn lanes. The signal operation is split phases for northbound and southbound traffic, and protected/permissive for eastbound and westbound left-turn traffic.

Long queues were observed for eastbound left-turn with vehicles spilling back and blocking the through lane. Also, heavy traffic and long queues were observed for eastbound approach.



Traffic turning left into the driveways in the south side of NW 25 Street east and west of NW 79 Avenue present conflict with the east/west traffic. The westbound left-turn movement struggles to cross the opposing eastbound through movement.

Considerable amount of weaving was observed in both east/west directions. Also, weaving and lane changes were noticed at southbound approach.

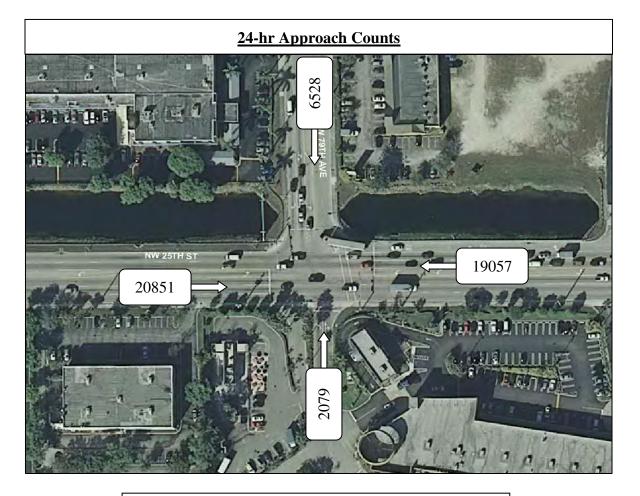
3.10.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of NW 79 Avenue and NW 25 Street, the following is recommended:

- Lengthen the eastbound left-turn lane to approximately 350 ft.
- Closing the median opening east and west of the intersection .
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Installing lane use (R3-8) signs for southbound approach.
- Provide ADA approved pedestrian ramps at all corners.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 41.





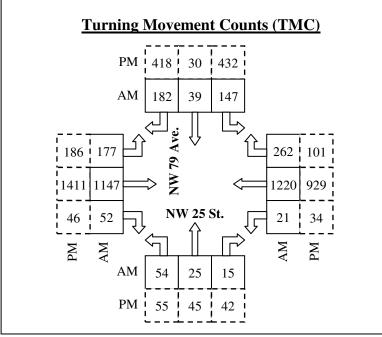










Figure 40: Field Review – NW 79 Avenue and NW 25 Street





Figure 41: Conceptual Plan – NW 79 Avenue and NW 25 Street



3.11. NW 67 Avenue and NW 169 Street

3.11.1. Site Description

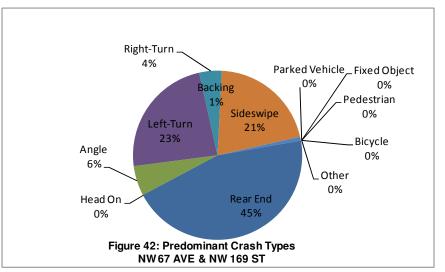
This intersection is a signalized four legged intersection located in the unincorporated area of northwest Miami Dade County. NW 67 Avenue is a six lane urban arterial divided by a raised median that runs north-south, and NW 169 Street is a four lane collector divided by a raised median that runs east-west.

3.11.2. Safety Conditions and Analysis

The intersection of NW 67 Avenue and NW 169 Street is ranked number 11 in our high crash locations list. A review of the hard copy police reports for the year 2006 through 2008 was performed. During the three-year analysis period, 140 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 47. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 42*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 26* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.469, 1.810, and 1.483, respectively. The safety ratio for the three years averaged 1.587. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that rear end, left-turn, right-turn and sideswipe collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 27*.



		(6 Lane	x 4 Lane,	, Signaliz	ed, With Tu	irn Lanes,	4 Leg Inters	ection -Table	e 35) - URBAN	N Spot			
	TYPE OF CRASH	NUMBE	R OF CF YEAR	RASHES	3 YEAR TOTAL	% of	MEAN Accidents		ANNUAL CF	ASH VALUE 95th		ALLY HIGH 90th	CRASHES 95th
		2006	2007	2008	CRASHE	Total	per Year	MEAN	Percentile		Mean	Percentil	
COLLISION TYPE	Rear End	20	25	18	63	23%	21.00	8.68	17.26	18.90	Х	Х	X
	Head On Angle	0	0	0	0	0% 2%	0.00 2.67	0.60 5.40	1.64 9.19	1.84 9.92			
	Left Turn	7	12	14	33	9%	11.00	3.00	6.13	6.73	х	x	x
	Right Turn	3	1	2	6	1%	2.00	0.46	1.36	1.53	X	x	x
	Sideswipe	11	8	10	29	7%	9.67	2.58	4.92	5.37	Х	Х	Х
	Backed Into	0	1	0	1	0%	0.33	0.28	0.84	0.94	X		
	Coll. w/ Parked Car Coll. w/ Pedestrian	0	0	0	0	0% 0%	0.00	0.12	0.57	0.65			
	Coll. w/ Bicycle	0	0	0	0	0%	0.00	0.14	0.49	0.55			
	Fixed Object	0	0	0	0	0%	0.00	0.79	2.01	2.24			
	Ran Off Road	0	0	0	0	0%	0.00	0.01	0.11	0.13			
	Overtuned	0	0	0	0	0%	0.00	0.04	0.28	0.33			
	Other Total Crashes	0 43	0 53	0 44	0	0% 24%	0.00 46.67	8.67 31.51	21.05 54.94	23.42 59.43	x		
SEVERITY	PDO crashes	41	49	40	130	93%	43.33	19.21	36.95	40.35	- Â	x	x
	Fatal crashes	0	0	0	0	0%	0.00	0.16	0.56	0.63			
	Injury crashes	2	4	4	10	7%	3.33	20.77	38.34	41.71			
LIGHT CONDITIONS	Day Light	30	39	28	97	69%	32.33	19.89	35.12	38.03	X		
	Dusk Dawn	2	0	2	4 8	3% 6%	1.33 2.67	0.61	1.43	1.58 1.16	X	x	x
	Dawn Dark	10	11	10	31	22%	10.33	10.22	18.94	20.61	x		⊢ ^
	Unknown	0	0	0	0	0%	0.00	0.41	1.15	1.30			
SURFACE CONDITIONS	Dry	29	30	23	82	59%	27.33	26.41	45.71	49.41	X		
	Wet	4	5	7	16	11%	5.33	4.41	8.78	9.62	X		
MONTH OF A YEAR	Others January	10 4	18 4	14 3	42	30% 8%	14.00 3.67	0.69 2.57	1.88 5.04	2.11 5.52	X	X	X
INCITING A TEAN	February	3	6	2	11	8%	3.67	2.37	4.59	5.02	x		<u> </u>
	March	5	2	5	12	9%	4.00	3.09	5.92	6.46	Х		
	April	6	5	4	15	11%	5.00	2.57	5.30	5.82	Х		
	May	1	5	3	9	6%	3.00	2.51.	4.81	5.25	v		
	June July	3	4	5 2	15 7	11% 5%	5.00 2.33	2.81 2.60	5.74 4.96	6.30 5.42	х		
	August	4	5	6	15	11%	5.00	3.00	5.66	6.17	Х		
	September	1	2	2	5	4%	1.67	2.48	4.92	5.39			
	October	8	2	5	15	11%	5.00	2.89	5.40	5.88	X		
	November December	2	6 5	4	12 13	9% 9%	4.00	2.41 2.22	4.85 4.55	5.32 5.00	<u>x</u>		
DAY OF THE WEEK	Sunday	3	5 7	3	13	9% 9%	4.33	4.00	6.58	7.08	x		
	Monday	3	3	5	11	8%	3.67	4.62	9.23	10.11	~		
	Tuesday	6	9	5	20	14%	6.67	4.46	7.81	8.46	Х		
	Wednesday	8	7	11	26	19%	8.67	4.56	8.62	9.40	X	X	
	Thursday Friday	10 5	6 10	7	23 23	16% 16%	7.67	5.04 4.86	9.04 9.39	9.80 10.26	X		
	Saturday	8	11	5	23	17%	8.00	3.98	8.10	8.89	- Â		
HOUR OF THE DAY	00:00-06:00	2	0	0	2	1%	0.67	3.79	8.65	9.58			
	06:00-09:00	9	8	8	25	18%	8.33	3.44	6.94	7.61	X	X	Х
	09:00-11:00	3	4	1	8	6%	2.67	2.58	5.30	5.82	X	x	
	11:00-13:00 13:00-15:00	76	6 9	5 3	18 18	13% 13%	6.00 6.00	3.12 3.57	5.78 6.32	6.29 6.85	X	×	
	15:00-18:00	7	8	10	25	18%	8.33	6.38	11.52	12.50	X		
	18:00-24:00	9	18	17	44	31%	14.67	8.60	15.51	16.83	Х		
					L	YEAR		3-Year					
					1	2	3	Average					
Average Daily Traffic A	DT (Vehicles per D	Day)			74,393	75,911	77,460	75,921	1				
-lorida Average Crash	rate (Crashes per l	Million En	tering Ve	hicles)	0.579	0.568	0.566	0.571	1				
Traffic Base			<u> </u>	,	27.153	27.707	28.273	27.711	1				
	ashaa nar Miller E	ntoric - 1/	obiol)						4				
Actual Crash Rate (Cr		-	,		1.584	1.913	1.556	1.684	4				
Critical Crash Rate (C	rashes per Million E	ntering V	ehicles)		1.078	1.057	1.049	1.061	4				
Safety Ratio					1.469	1.810	1.483	1.587					
High Crash Location	??				YES	YES	YES	YES	1				
Actual Crash	$Rate = \frac{A \times 1,000}{V}$	0,000			al number o rage Annua			f crashes by	v type occurrin	ng in a 1 year	period.		
CriticalCrashRa	$ate = AVR + \frac{0.5}{TB} + 2$	$TF\sqrt{\frac{AVH}{TB}}$	2	TB = Tr	Average Sta affic Base st Factor (z		ash Rate for	a particular	type of interse	Confidence I	.evel (%)	Constant Z	ו
Traffic Base =	$\frac{Years \times ADT \times 36}{1,000,000}$	65		= 1.	96 (assume	95% ⁽ Cor	nfidence Lev Confidence I		,	68.30 86.60 90.00 95.00 95.50)))	1.00 1.50 1.64 1.96 2.00	
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	n Rate h Rate	-							98.80 99.00 99.70 99.95)))	2.50 2.58 3.00 3.29	

Table 26 – Crash Analysis – NW 67 Avenue and NW 169 Street



Table 27 – Abnormal Crash Details & CountermeasuresNW 67 Avenue and NW 169 Street

	(6 Lane x 4 L	NW 6 ane, Signalized, Wi	7 Avenu th Turn La				ə 35) - URI	BAN Spot		
				R OF CR	-	3 YEAR	%	MEAN		
			2006	YEAR 2007	2008	TOTAL	of Total	Accidents per Year	Possible Cause(s)	Counter- measure(s)
	Total Rear Er		20	25	18	63	100%	21.00	(1)	2
	Lighting Conditions	Day Light	15	19	14	48	76%	16.00	(3)	4
	Lighting Conditions	Dawn Dark	1 4	0	1	2 13	3% 21%	0.67 4.33	(7) (12)	7
		00:00 - 06:00	0	0	0	0	0%	0.00	(12)	
		06:00 - 09:00	3	6	3	12	19%	4.00		
		09:00 - 11:00	2	2	1	5	8%	1.67		
Rear End	Hours of Day	11:00 - 13:00	3	1	1	5	8%	1.67		
		13:00 - 15:00 15:00 - 18:00	3 5	3	2	8 15	13% 24%	2.67 5.00		
		18:00 - 24:00	4	9	5	18	29%	6.00		
		North	3	9	6	18	29%	6.00		
		South	14	10	7	31	49%	10.33		
	Direction	East	3	5	3	11	17%	3.67		
		West Unknown	0	1	0	1 2	2% 3%	0.33 0.67		
		onalonn	Ŭ	Ŭ	-	-	0,0	0.07		
			NUMBE	R OF CR	ASHES	3 YEAR	%	MEAN	Possible	Counter-
			0000	YEAR	0000	TOTAL	of	Accidents	Cause(s)	measure(s)
	Total Left Tu	rn Crashes	2006 7	2007 12	2008 14	CRASHE 33	Total 100%	per Year 11.00	(9)	9
		DayLight	3	9	9	21	64%	7.00	(13)	13
	Lighting Conditions	Dawn	0	0	1	1	3%	0.33	/	17
		Dark	4	3	4	11	33%	3.67		
		00:00 - 06:00	0	0	2	2	6%	0.67		
		06:00 - 09:00 09:00 - 11:00	2	1	0	2	6% 3%	0.67		
1 . A T	Hours of Day	11:00 - 13:00	3	1	3	7	21%	2.33		
Left Turn		13:00 - 15:00	0	2	1	3	9%	1.00		
		15:00 - 18:00	0	3	3	6	18%	2.00		
		18:00 - 24:00 NB → WB	2	5 2	5	12 8	36% 24%	4.00 2.67		
		$WB \rightarrow SB$	0	0	0	° 0	0%	0.00		
	Direction	$SB \rightarrow EB$	2	10	12	24	73%	8.00		
		$EB \rightarrow NB$	•	•						
			0	0	1	1	3%	0.33		
		Unknown	0	0	0	0	3% 0%	0.33		
			0		0				Dessible	Counter
			0 NUMBE	0 ER OF CR YEAR	O	0	0% % of	0.00	Possible Cause(s)	Counter-
	Tatal Dight T	Unknown	0 NUMBE 2006	0 ER OF CR YEAR 2007	0 ASHES 2008	0 3 YEAR TOTAL CRASHE	0% % of Total	0.00 MEAN Accidents per Year	Cause(s)	measure(s)
	Total Right Tu	Unknown um Crashes	0 NUMBE 2006 3	0 FR OF CR YEAR 2007 1	0 ASHES 2008 2	0 3 YEAR TOTAL CRASHE 6	0% of Total 100%	0.00 MEAN Accidents per Year 2.00	Cause(s) (8)	measure(s) 9
	Total Right Tu	Unknown	0 NUMBE 2006	0 ER OF CR YEAR 2007	0 ASHES 2008	0 3 YEAR TOTAL CRASHE	0% % of Total	0.00 MEAN Accidents per Year	Cause(s)	measure(s)
		Unknown um Crashes Day Light Dawn Dark	0 NUMBE 2006 3 3	0 FR OF CR YEAR 2007 1 1 0 0	0 ASHES 2008 2 1 0 1	0 3 YEAR TOTAL CRASHE 6 5 0 1	0% of Total 100% 83% 0% 17%	0.00 MEAN Accidents ber Year 2.00 1.67 0.00 0.33	(8) (9)	measure(s) 9
		Unknown Jam Crashes Day Light Dawn Dark 00:00 - 06:00	0 NUMBE 2006 3 3 0 0 0 0	0 FR OF CR YEAR 2007 1 1 0 0 0	0 ASHES 2008 2 1 0 1 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0	0% of Total 100% 83% 0% 17% 0%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00	(8) (9)	measure(s) 9
		Unknown Jm Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	0 NUMBE 2006 3 0 0 0 2	0 FR OF CR YEAR 2007 1 1 0 0 1 1	0 ASHES 2008 2 1 0 1 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 3	0% of Total 100% 83% 0% 17% 0% 50%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00	(8) (9)	measure(s) 9
	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	0 NUMBE 2006 3 3 0 0 0 0	0 FR OF CR YEAR 2007 1 1 0 0 1 0 1 0	0 ASHES 2008 2 1 0 1 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0	0% of Total 100% 83% 0% 17% 0% 50% 0%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.00	(8) (9)	measure(s) 9
Right Turn		Unknown Jm Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	0 NUMBE 2006 3 0 0 0 2 0	0 FR OF CR YEAR 2007 1 1 0 0 1 1	0 ASHES 2008 2 1 0 1 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 1 0 3 0	0% of Total 100% 83% 0% 17% 0% 50%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00	(8) (9)	measure(s) 9
Right Turn	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00	0 NUMBE 2006 3 0 0 0 2 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR 2007 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2 1 0 1 0 0 0 0 0 1 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 1 0 3 0 1 1 1 0	0% of Total 100% 83% 0% 17% 0% 50% 0% 17% 17% 0%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.33 0.33 0.00	(8) (9)	measure(s) 9
Right Turn	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	0 NUMBE 2006 3 0 0 0 2 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR 2007 1 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 0 0 1 0 0 1	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 3 0 1 1 1 0 1	0% of Total 100% 83% 0% 17% 50% 0% 17% 17%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.00 0.33 0.33 0.00 0.33 0.00 0.33	(8) (9)	measure(s) 9
Right Turn	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB	0 NUMBE 2006 3 0 0 0 2 0 1 0 0 0 0 2 2	0 YEAR 2007 1 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 0 1 0 0 1 0 0 1 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 1 0 3 0 1 1 1 0	0% of Total 100% 83% 0% 17% 0% 50% 0% 17% 17% 17% 33%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.33 0.33 0.33 0.00 0.33 0.00 0.33 0.00	(8) (9)	measure(s) 9
Right Turn	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	0 NUMBE 2006 3 0 0 0 2 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR 2007 1 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 0 0 1 0 0 1	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 3 0 1 1 1 0 1 1 2	0% of Total 100% 83% 0% 17% 50% 0% 17% 17%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.00 0.33 0.33 0.00 0.33 0.00 0.33	(8) (9)	measure(s) 9
Right Turn	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB	0 NUMBE 2006 3 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 1 0 1 0 2	0 3 YEAR TOTAL CRASHE 6 5 0 1 1 0 3 0 0 1 1 1 0 0 1 1 2 4 0 0 0	0% of Total 100% 83% 0% 17% 0% 0% 17% 17% 17% 0% 67% 0% 0%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.03 0.33 0.33 0.00 0.33 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.00 0.00 0.33 0.00 0.0	(8) (9)	measure(s) 9
Right Turn	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB	0 NUMBE 2006 3 0 0 0 2 0 1 0 0 0 0 1 0 0 0 1 0 0 0 0 1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 1 0 1 0 1 0 1 0 1 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 1 0 1 0 1 1 1 2 4 0	0% of Total 100% 83% 0% 17% 0% 17% 0% 17% 0% 67% 0%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.33 0.33 0.00 0.33 0.33 0.00 0.33 0.67 1.33 0.00	(8) (9)	measure(s) 9
Right Turn	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB	0 NUMBE 2006 3 0 0 0 2 0 0 0 0 0 0 0 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR 2007 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 1 0 1 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 1 0 3 0 0 1 1 1 2 4 4 0 0 0 0	0% of Total 100% 83% 0% 17% 0% 50% 0% 0% 17% 17% 33% 67% 0% 0%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.33 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.0	(8) (9)	measure(s) 9
Right Turn	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB	0 NUMBE 2006 3 0 0 0 2 0 0 0 0 0 0 0 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 1 0 1 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 1 0 1 1 0 1 2 4 0 0 0 3 YEAR 3 YEAR	0% of Total 100% 83% 0% 17% 0% 17% 0% 17% 0% 17% 0% 67% 0% 0% 0%	0.00 MEAN Accidents Der Year 2.00 1.67 0.00 0.33 0.00 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.00 0.00 0.33 0.00 0.0	Cause(s) (8) (9) (12) (12)	9 21 Counter-
Right Turn	Lighting Conditions Hours of Day Direction	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown	0 NUMBE 2006 3 0 0 0 2 0 0 0 0 0 0 0 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 1 0 1 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 1 0 3 0 0 1 1 1 2 4 4 0 0 0 0	0% of Total 100% 83% 0% 17% 0% 50% 0% 0% 17% 17% 33% 67% 0% 0%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.33 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.0	Cause(s) (8) (9) (12) Possible Cause(s)	9 21 Counter- measure(s)
Right Turn	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown	0 NUMBE 2006 3 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 1 0 1 1 0 1 1 2 4 0 0 0 3 YEAR 1 0 3 3 0 1 1 0 3 0 1 1 0 3 0 1 1 0 3 0 1 0 3 0 1 0 3 0 1 0 3 0 1 0 3 0 1 0 3 0 1 0 3 0 1 0 3 0 1 0 3 0 1 0 1 0 3 0 1 0 1 0 1 0 3 0 1 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0% of Total 100% 83% 0% 17% 0% 17% 0% 17% 0% 17% 0% 0% 0% 0% 0% 0% 0%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.67 1.33 0.00 0.00 0.00 0.67 1.33 0.00 0.00 0.67 1.33 0.00 0.00 0.67 1.33 0.00 0.00 0.67 1.33 0.00 0.00 0.67 1.33 0.00 0.67 1.33 0.00 0.00 0.67 1.33 0.00 0.00 0.67 1.33 0.00 0.00 0.67 1.33 0.00 0.00 0.67 1.33 0.00 0.00 0.67 1.33 0.00 0.00 0.00 0.67 1.33 0.00 0.00 0.00 0.67 1.33 0.00 0.00 0.00 0.67 1.33 0.00 0.00 0.00 0.00 0.67 1.33 0.00 0.00 0.00 0.00 0.67 1.33 0.00 0.00 0.00 0.67 1.33 0.00 0.00 0.00 0.00 0.67 1.33 0.60 0.00 0.00 0.00 0.67 0.00 0.00 0.00 0.00 0.00 0.67 0.00 0.00 0.00 0.00 0.00 0.67 0.00 0.0	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16)	Counter- measure(s) 19
Right Turn	Lighting Conditions Hours of Day Direction	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown pe Crashes Day Light	0 NUMBE 2006 3 0 0 0 2 0 1 0 0 0 0 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 3 0 1 1 1 2 4 0 0 0 0 3 YEAR TOTAL CRASHE 2 2 4 3 3 4 5 5 5 1 1 1 1 1 1 1 1	0% of Total 100% 83% 0% 17% 0% 50% 0% 0% 17% 33% 67% 0% 0% 0% 0% 0% 0% 0% 83%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.33 0.00 0.33 0.33 0.00 0.33 0.33 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.0	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16) (18)	P 21 Counter- measure(s) 19 20
Right Turn	Lighting Conditions Hours of Day Direction	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown Day Light Dawn	0 NUMBE 2006 3 3 0 0 0 0 2 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 0 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 1 1 0 0 1 1 2 4 0 0 0 1 1 2 4 0 0 0 1 1 2 4 0 0 1 1 2 4 0 0 1 1 0 3 0 1 1 0 3 0 0 1 1 0 3 0 0 1 1 0 3 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 0 0 1 1 0 0 1 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0% of Total 100% 83% 0% 17% 0% 50% 0% 0% 17% 17% 17% 17% 0% 67% 0% 0% 0% 0% 0% 0% 0% 0% 0% 33%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.03 0.00 0.33 0.000 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.03 0.00 0.03 0.05 0.	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16) (18) (19)	Counter- measure(s) 19
Right Turn	Lighting Conditions Hours of Day Direction	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown pe Crashes Day Light	0 NUMBE 2006 3 0 0 0 2 0 1 0 0 0 0 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 3 0 1 1 1 2 4 0 0 0 0 3 YEAR TOTAL CRASHE 2 2 4 3 3 4 5 5 5 1 1 1 1 1 1 1 1	0% of Total 100% 83% 0% 17% 0% 50% 0% 0% 17% 33% 67% 0% 0% 0% 0% 0% 0% 0% 83%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 1.00 0.33 0.00 0.33 0.33 0.00 0.33 0.33 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.0	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16) (18)	Counter- measure(s) 19 20
Right Turn	Lighting Conditions Hours of Day Direction	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown Dark Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	0 NUMBE 2006 3 3 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 1 1 0 1 1 2 4 0 0 0 0 3 YEAR TOTAL CRASHE 29 24 1 1 1 1 1 1 1 1 1 1 1 1 1	0% of Total 100% 83% 0% 17% 0% 50% 0% 0% 17% 17% 33% 67% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 33% 33	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.00 0.33 0.00 0.00 0.00 0.00 0.33 0.00 0.33 0.35 0.5	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16) (18) (19) (20)	Counter- measure(s) 19 20
	Lighting Conditions Hours of Day Direction Total Sideswi Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown Day Light Dawk Dayk 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	0 NUMBE 2006 3 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 0 1 0 1 0 1 0 1 1 0 1 1 0 1 1 0 1 2 4 0 0 0 1 2 4 0 0 3 YEAR TOTAL CRASHE 6 5 5 0 1 1 0 1 1 0 1 1 1 1 1 1 1 1	0% of Total 100% 83% 0% 17% 0% 17% 0% 17% 0% 17% 0% 17% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	0.00 MEAN Accidents Der Year 2.00 1.67 0.00 0.33 0.00 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.00 0.00 0.00 0.33 0.00 0.03 0.00 0.00 0.00 0.00 0.03 0.00 0.00 0.03 0.00 0.03 0.00 0.03 0.03 0.33 0.33 0.33 0.67	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16) (18) (19) (20)	Counter- measure(s) 19 20
Sideswipe	Lighting Conditions Hours of Day Direction	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown Day Light Day Light Day Light Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	0 NUMBE 2006 3 0 0 0 2 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR 2007 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 7 0 3 0 5 0 1	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 1 1 0 1 1 0 1 1 2 4 0 0 0 1 3 YEAR TOTAL CPASHE 2 4 0 0 0 3 YEAR 1 1 1 2 4 1 0 0 3 YEAR 1 1 1 1 2 4 1 1 1 2 4 1 1 1 2 4 1 1 1 2 4 1 1 1 1 2 4 1 1 1 1 1 2 4 1 1 1 1 1 1 1 2 4 1 1 1 1 1 1 1 1 1 1 1 1 1	0% of Total 100% 83% 0% 17% 0% 50% 0% 17% 0% 17% 67% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 17% 83% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 14%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.33 0.33 0.33 0.33 0.33 0.33 0.67 1.67 1.67	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16) (18) (19) (20)	Counter- measure(s) 19 20
	Lighting Conditions Hours of Day Direction Total Sideswi Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown Dark 00:00 - 06:00 06:00 - 09:00 00:00 - 11:00 11:00 - 13:00 13:00 - 15:00	0 NUMBE 2006 3 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 0 1 0 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 1 1 0 1 1 2 4 0 0 0 0 3 YEAR TOTAL CPASHE 24 1 1 2 24 1 1 1 2 3 YEAR 1 1 1 1 2 3 YEAR 1 1 1 1 1 1 1 1	0% of Total 100% 83% 0% 17% 0% 50% 0% 17% 17% 17% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.33 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.33 1.33 0.33 0.33 1.33 0.33 0.33 0.33 1.33 0.67 1.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.35 0.57 1.67 1.33 0.05 0.05 0.05 0.33 0.33 0.33 0.35 0.55 0.5	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16) (18) (19) (20)	Counter- measure(s) 19 20
Sideswipe	Lighting Conditions Hours of Day Direction Total Sideswi Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown Day Light Day Light Day Light Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	0 NUMBE 2006 3 0 0 0 2 0 1 0 0 0 2 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR 2007 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 7 0 3 0 5 0 1	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 1 1 0 1 1 0 1 1 2 4 0 0 0 1 3 YEAR TOTAL CPASHE 2 4 0 0 0 3 YEAR 1 1 1 2 4 1 0 0 3 YEAR 1 1 1 1 2 4 1 1 1 2 4 1 1 1 2 4 1 1 1 2 4 1 1 1 1 2 4 1 1 1 1 1 2 4 1 1 1 1 1 1 1 2 4 1 1 1 1 1 1 1 1 1 1 1 1 1	0% of Total 100% 83% 0% 17% 0% 50% 0% 17% 0% 17% 67% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 17% 83% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 14%	0.00 MEAN Accidents per Year 2.00 1.67 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.33 0.67 1.33 0.00 0.00 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.33 0.33 0.33 0.33 0.33 0.33 0.67 1.67 1.67	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16) (18) (19) (20)	Counter- measure(s) 19 20
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Sideswipe	Lighting Conditions Hours of Day Direction Total Sideswi Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown DayLight Dawn Dark 00:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 13:00 - 15:00 15:00 - 18:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South East	0 NUMBE 2006 3 0 0 0 2 0 0 1 0 0 0 0 2 1 0 0 0 0 0 2 1 1 0 0 0 0	0 R OF CR YEAR 2007 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 1 0 0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 1 0 1 0 1 0 1 1 0 0 1 1 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0% of Total 100% 83% 0% 17% 0% 17% 0% 17% 0% 17% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	0.00 MEAN Accidents Der Year 2.00 0.33 0.00 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.00 0.33 0.00 0.03 0.33 1.33 0.67 1.67 1.67 1.67 1.67 2.00 6.33 1.33	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16) (18) (19) (20)	P 21 Counter- measure(s) 19 20
Sideswipe	Lighting Conditions Hours of Day Direction Total Sideswi Lighting Conditions Hours of Day	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 18:00 - 24:00 NB→EB EB→SB WB→NB SB→WB Unknown Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 11:00 - 13:00 11:00 - 15:00 15:00 - 15:00 15:00 - 15:00 15:00 - 15:00 15:00 - 15:00 North South	0 NUMBE 2006 3 3 0 0 0 2 0 1 0 0 0 2 0 0 0 0 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 R OF CR YEAR 2007 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 YEAR TOTAL CRASHE 6 5 0 1 0 1 1 0 1 1 2 4 0 0 0 1 1 2 4 0 0 0 1 1 2 4 1 1 2 4 1 1 2 5 5 6 6 5 0 1 1 2 5 6 6 5 0 1 1 1 2 5 6 6 5 0 1 1 1 2 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7	0% of Total 100% 83% 0% 17% 0% 50% 0% 0% 17% 17% 33% 67% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 17% 33% 67% 0% 17% 0% 17% 0% 50% 17% 0% 17% 0% 50% 17% 0% 17% 0% 17% 0% 50% 17% 0% 50% 17% 0% 0% 17% 0% 17% 0% 17% 0% 0% 17% 0% 17% 0% 17% 0% 17% 0% 0% 17% 0% 17% 0% 17% 0% 17% 0% 17% 0% 0% 17% 0% 0% 0% 17% 0% 0% 0% 17% 0% 0% 0% 0% 0% 17% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	0.00 MEAN Accidents per Year 2.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.33 0.67 1.33 0.00 0.00 0.33 0.00 0.00 0.00 0.33 0.00 0.33 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.00 0.33 0.00 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.67 1.67 1.67 1.67 1.67 1.67 1.67 1.67 1.67 1.67 1.67 1.67 1.67 1.67 1.67 1.67 1.00 0.63 0.63 0.63 0.57 0.50 0.5	Cause(s) (8) (9) (12) (12) Possible Cause(s) (16) (18) (19) (20)	Counter- measure(s) 19 20



3.11.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at NW 67 Avenue and NW 169 Street were performed on a typical weekday on November 30, 2010. A summary of the traffic data is presented in *Figure 43*, and the field review is presented in *Figure 44*.

This intersection has single left-turn bays for all approaches except the northbound which has double left-turn lanes. The eastbound approach has double right-turn lanes. The signal operation is protected/permissive for all approaches left-turns except northbound double left-turn lanes which are protected only.

Traffic spilling back along the outer most southbound through/right lane was observed blocking the through traffic. The outer most lanes on the northbound and southbound directions act as auxiliary lanes for SR-826 on/off ramps. Those lanes are transitioned to or from a six-lane road by adding or dropping (merge) a lane for the southbound and northbound traffic about 300 feet north of the intersection, respectively.

Considerable lane changing (weaving) was noticed on the northbound and southbound approaches. Consequently, lack of advance warning signs for northbound/southbound traffic transitioning from the outer lanes was observed.

Vehicles from driveways located along the west side of the south leg were identified as potential conflict with southbound traffic.

Several vehicles were observed trapped in the middle of the intersection during the left-turn permissive phase along southbound approach. Also, there is an offset between the northbound and southbound approaches.

It was observed that the length of the queue for northbound/southbound left-turns also spilled over the through traffic.

The westbound has a sharp right-turn curve return radii that promotes vehicles to turn into receiving internal lanes. Also, there is no advance warning of the approaching signal due to the curvature of the east leg.

3.11.4. Recommendations

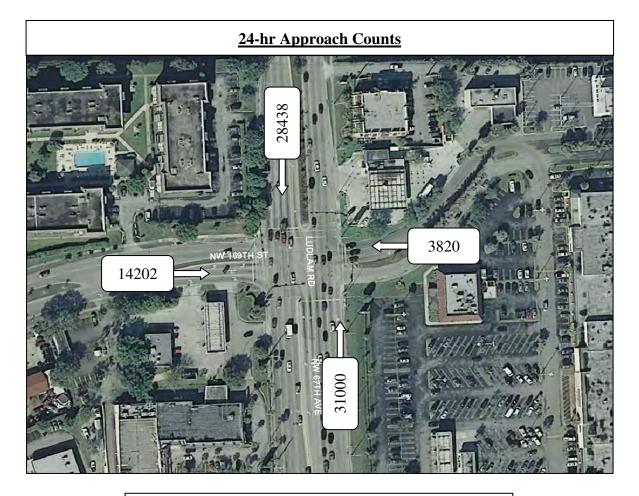
Based on the safety analysis, field observations and traffic operations for the intersection of NW 67 Avenue and NW 169 Street, the following is recommended:

- Lengthen the southbound left-turn lane to approximately 450 ft.
- Lengthen the eastbound and westbound left-turn lanes to approximately 300 ft each.
- Reducing the offset between northbound and southbound left turn lanes by reducing the north leg median width and creating a striped gore.

- Extending the distance between the intersection and the add/drop lane tapers along the north leg.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Smoothing the curve return radii for the westbound right-turn traffic.
- Installing "Signal Ahead" (W3-3) signs for eastbound and westbound approaches.
- Installing advance warning signs for adding and dropping lanes (W4-2) along the north leg.
- Installing regulatory signs to control northbound/southbound U-turns to yield to conflicting right-turns (R10-16).
- Providing pedestrian countdown signal heads and ADA approved pedestrian ramps.
- Providing sidewalks along the east leg of the intersection.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 45.





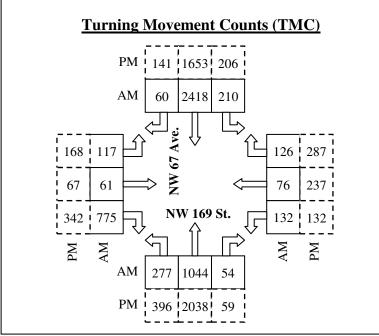


Figure 43: Traffic Data – NW 67 Avenue and NW 169 Street





Southbound approach: Long queues of rightturn vehicles and no warning signs for adding lanes.



Northbound/Southbound: Left-turn lanes are not aligned to reduce the offset.



Southbound approach: Long queues of leftturn traffic.



East leg: lack of ADA approved pedestrian ramps and sidewalks.



pavement markings.



Westbound approach: Faded pavement markings and deteriorated pavement conditions.

Figure 44: Field Review – NW 67 Avenue and NW 169 Street



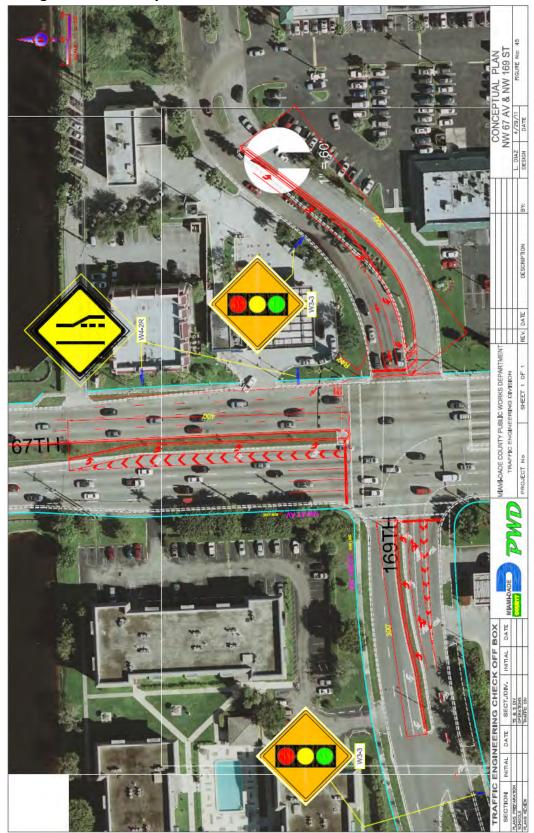


Figure 45: Conceptual Plan – NW 67 Avenue and NW 169 Street

Safety Studies at High Crash Locations Countywide



3.12. SW 147 Avenue and SW 104 Street

3.12.1. Site Description

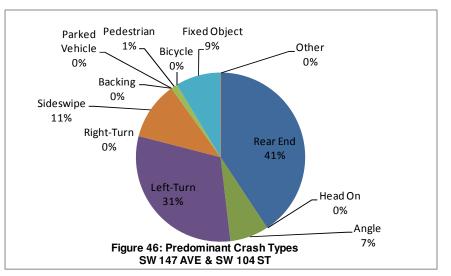
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 147 Avenue is a four lane major collector divided by a raised median that runs north-south, and SW 104 Street is a four lane urban arterial divided by a raised median that runs east-west.

3.12.2. Safety Conditions and Analysis

The intersection of SW 147 Avenue and SW 104 Street is ranked number 12 in our high crash locations list. A review of the hard copy police reports for the year 2006 through 2008 was performed. During the three-year analysis period, 81 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 27. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 46*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 28* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.636, 1.201, and 1.900, respectively. The safety ratio for the three years averaged 1.579. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that left-turn and fixed object collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 29*.



		(4 200	v 4 Lano				SW 104		28) - URBAN	l Spot			
			R OF CF		3 YEAR	%	MEAN			ASH VALUE	ABNORM	ALLY HIGH	CRASHE
	TYPE OF CRASH	2006	YEAR 2007	2008	TOTAL	of Total	Accidents per Year	MEAN	90th Percentile	95th	Mean	90th Percentil	95th
OLLISION TYPE	Rear End	9	11	13	33	20%	11.00	5.70	16.96	19.12	x	Fercentin	Feicent
	Head On	0	0	0	0	0%	0.00	0.33	1.02	1.15			
	Angle	1	1	4	6	3%	2.00	3.05	7.08	7.85			
	Left Turn	13	4	8	25	12%	8.33	1.67	4.02	4.47	х	х	Х
	Right Turn	0	0	0	0	0%	0.00	0.33	1.25	1.42			
	Sideswipe	3	3	3	9	4%	3.00	1.60	4.64	5.22	X		
	Backed Into	0	0	0	0	0%	0.00	0.17	0.56	0.63			
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.10	0.51	0.59			
	Coll. w/ Pedestrian	0	0	1	1	0%	0.33	0.28	1.04	1.19	X		
	Coll. w/ Bicycle Fixed Object	0	0	0	0	0%	0.00	0.09	0.33	0.38		- V	~
	Ran Off Road	2	2	3	7	2% 0%	2.33 0.00	0.03	0.21	0.24 0.00	Х	x	Х
	Overtuned	0	0	0	0	0%	0.00	0.00	0.00	0.24			
	Other	0	0	0	0 0	0%	0.00	3.70	8.83	9.82			
	Total Crashes	28	21	32	81	24%	27.00	17.77	40.96	45.39	х		
EVERITY	PDO crashes	22	19	25	66	81%	22.00	9.93	22.30	24.67	x		
	Fatal crashes	0	0	0	0	0%	0.00	0.05	0.26	0.29			
	Injury crashes	6	2	7	15	19%	5.00	13.14	33.08	36.90			
GHT CONDITIONS	Day Light	17	16	19	52	64%	17.33	12.40	29.18	32.39	Х	1	
	Dusk	0	0	0	0	0%	0.00	0.28	0.87	0.98			
	Dawn	0	1	0	1	1%	0.33	0.17	0.56	0.63	Х		
	Dark	11	4	13	28	35%	9.33	4.56	10.53	11.68	Х		
	Unknown	0	0	0	0	0%	0.00	0.35	1.05	1.18			
URFACE CONDITIONS		19	18	28	65	80%	21.67	15.30	34.45	38.12	X		
	Wet	2	3	4	9	11%	3.00	2.10	6.02	6.76	X		
	Others	7	0	0	7	9%	2.33	0.37	1.10	1.24	X	Х	Х
ONTH OF A YEAR	January	0	2	2	4	5%	1.33	1.42	3.33	3.69	v		
	February	2	1	2	5	6%	1.67	1.42	3.53	3.93	X		
	March	1	1	3	5	6% 9%	1.67 2.33	1.67	4.12 3.21	4.59	x		
	April May	4	1	2	7	9% 9%	2.33	1.30 1.74		3.57 4.99	x		
	June	4	2	1	3	9% 4%	2.33	1.74	4.46 3.49	4.99 3.90	^		
	July	4	2	4	10	12%	3.33	1.35	3.49	3.58	x	x	
	August	2	2	2	6	7%	2.00	1.56	3.99	4.46	X	^	
	September	3	1	5	9	11%	3.00	1.46	3.73	4.16	x		
	October	4	2	4	10	12%	3.33	1.47	3.59	4.00	X		
	November	1	1	3	5	6%	1.67	1.39	3.53	3.94	X		
	December	2	5	3	10	12%	3.33	1.61	4.43	4.97	X		
AY OF THE WEEK	Sunday	5	3	5	13	16%	4.33	1.46	3.47	3.85	X	х	х
	Monday	2	3	6	11	14%	3.67	2.70	6.42	7.13	х		
	Tuesday	4	6	1	11	14%	3.67	2.49	6.18	6.88	х		
	Wednesday	5	2	7	14	17%	4.67	2.56	5.84	6.47	х		
	Thursday	1	2	2	5	6%	1.67	2.88	7.20	8.03			
	Friday	7	2	7	16	20%	5.33	3.07	7.50	8.35	X		
	Saturday	4	3	4	11	14%	3.67	2.61	6.40	7.13	Х		
OUR OF THE DAY	00:00-06:00	6	1	3	10	12%	3.33	1.70	3.39	3.71	X		
	06:00-09:00	2	3	4	9	11%	3.00	1.98	5.12	5.72	X		
	09:00-11:00	1	3	2	6	7%	2.00	1.72	4.23	4.71	Х		
	11:00-13:00	4	3	0	7	9%	2.33	2.40	6.30	7.05	x		
	13:00-15:00 15:00-18:00	3	2	6 4	11	14% 19%	3.67 5.00	1.95	5.32 7.81	5.96	X		
	18:00-24:00	6 6	5 4	13	23	28%	7.67	3.58 4.42	10.63	8.62 11.82	x		
	10.00 2 1.00	Ŭ		10		YEAR		3-Year		11.02	~		
					1	2	3	Average					
verage Daily Traffic A	DT (Vehicles per D	Day)			51,405	51,405	51,405	51,405	1				
lorida Average Crash	rate (Crashes per	Million En	tering Ve	hicles)	0.420	0.424	0.394	0.413	1				
÷	. ,		J -	,					1				
raffic Base					18.763	18.763	18.763	18.763	4				
ctual Crash Rate (Cr	ashes per Million E	ntering V	ehicles)		1.492	1.119	1.706	1.439	1				
ritical Crash Rate (C	rashes ner Million P	nterina V	ehicles)		0.939	0.945	0.897	0.927	1				
)						-				
afety Ratio					1.589	1.184	1.900	1.558	4				
ligh Crash Location	??				YES	YES	YES	YES					
tigh Crash Location Actual Crash	$Rate = \frac{A \times 1,00}{V}$	0 ,000				f crashes	or number o		y type occurrin	ng in a 1 year	period.		
	$ate = AVR + \frac{0.5}{TB} + 2$ $Years \times ADT \times 30$	112	2	<i>TB</i> = Tr <i>TF</i> = Te = 1.	affic Base st Factor (z 96 (assume	z-value) e 95% Cor	nfidence Lev	el for RURAL	areas)	Confidence I	Level (%)	nt. Constant Z 1.00 1.50]
	Years × ADT × 30 1,000,000 Actual Crash							evel for URL	,	90.00 95.00 95.50 98.80)))	1.64 1.96 2.00 2.50	
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	h Rate	-							99.00 99.70 99.9)	2.58 3.00 3.29	

Table 28 – Crash Analysis – SW 147 Avenue and SW 104 Street



Table 29 – Abnormal Crash Details & CountermeasuresSW 147 Avenue and SW 104 Street

		SW 1	47 Aven	ue & S	W 104 S	Street					
	(4 Lane x 4	Lane, Signalized, V	/ith Turn L	anes, 4 L	eg Interse	ection-Table 2	28) - URB	AN Spot			
			NUMBE	R OF CF YEAR	RASHES	3 YEAR TOTAL	% of	MEAN Accidents	Possible Cause(s)	Counter measure(
			2006	2007	2008	CRASHES	Total	per Year	.,		
	Total Fixed Ob		2	2	3	7	100%	2.33	(6)	12	
		Day Light	2	1	0	3	43%	1.00	(16)	20	
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(17)	28	
		Dark	0	1	3	4	57%	1.33	(25)		
		00:00 - 06:00	0	1	0	1	14%	0.33			
		06:00 - 09:00	0	0	1	1	14%	0.33			
		09:00 - 11:00	0	1	0	1	14%	0.33			
Fixed Object	Hours of Day	11:00 - 13:00	0	0	0	0	0%	0.00			
		13:00 - 15:00	1	0	0	1	14%	0.33			
		15:00 - 18:00	1	0	0	1	14%	0.33			
		18:00 - 24:00	0	0	2	2	29%	0.67			
		North	2	1	1	4	57%	1.33			
		South	0	1	1	2	29%	0.67			
	Direction	East	0	0	1	1	14%	0.33			
		West	0	0	0	0	0%	0.00			
		West Unknown	0	0	0	0	0% 0%	0.00			
			-		-	-					
			0	0	0	0	0%	0.00			
			0	0 R OF CR	0	0 3 YEAR	0%	0.00	Possible	Counter	
			0 NUMBE	0 R OF CR YEAR	ORASHES	0 3 YEAR TOTAL	0% % of	0.00 MEAN Accidents	Possible Cause(s)	Counter	
		Unknown	0 NUMBE 2006	0 R OF CF YEAR 2007	0 RASHES 2008	0 3 YEAR TOTAL CRASHES	0% % of Total	0.00 MEAN Accidents per Year	Cause(s)	measure	
	Total Left Tu	Unknown rn Crashes	0 NUMBE 2006 13	0 R OF CF YEAR 2007 4	0 ASHES 2008 8	0 3 YEAR TOTAL CRASHES 25	0% 0f Total 100%	0.00 MEAN Accidents per Year 8.33	Cause(s) (9)	measure 9	
		Unknown rn Crashes Day Light	0 NUMBE 2006 13 5	0 R OF CF YEAR 2007 4 3	0 RASHES 2008 8 6	0 3 YEAR TOTAL CRASHES 25 14	0% of Total 100% 56%	0.00 MEAN Accidents per Year 8.33 4.67	Cause(s)	measure 9 13	
	Total Left Tu Lighting Conditions	Unknown rn Crashes Day Light Dawn	0 NUMBE 2006 13 5 0	0 R OF CF YEAR 2007 4 3 0	0 BASHES 2008 8 6 0	0 3 YEAR TOTAL CRASHES 25 14 0	0% of Total 100% 56% 0%	0.00 MEAN Accidents per Year 8.33 4.67 0.00	Cause(s) (9)	measure 9	
		Unknown rn Crashes Day Light Dawn Dark	0 NUMBE 2006 13 5 0 8	0 R OF CF YEAR 2007 4 3 0 1	0 BASHES 2008 8 6 0 2	0 3 YEAR TOTAL CRASHES 25 14 0 11	0% of Total 100% 56% 0% 44%	0.00 MEAN Accidents per Year 8.33 4.67 0.00 3.67	Cause(s) (9)	measure 9 13	
		Unknown rn Crashes Day Light Dawn Dark 00:00 - 06:00	0 NUMBE 2006 13 5 0 8 2	0 R OF CF YEAR 2007 4 3 0 1 0	0 BASHES 2008 8 6 0 2 0	0 3 YEAR TOTAL CRASHES 25 14 0 11 2	0% of Total 100% 56% 0% 44% 8%	0.00 MEAN Accidents per Year 8.33 4.67 0.00 3.67 0.67	Cause(s) (9)	measure 9 13	
		Unknown m Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	0 NUMBE 2006 13 5 0 8 2 1	0 FR OF CF YEAR 2007 4 3 0 1 0 2	0 ASHES 2008 8 6 0 2 0 1	0 3 YEAR TOTAL CRASHES 25 14 0 11 2 4	0% of Total 100% 56% 0% 44% 8% 16%	0.00 MEAN Accidents per Year 8.33 4.67 0.00 3.67 0.67 1.33	Cause(s) (9)	measure 9 13	
	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	0 NUMBE 2006 13 5 0 8 2 1 2 1 2	0 FR OF CF YEAR 2007 4 3 0 1 0 2 0	0 2008 8 6 0 2 0 1 1	0 3 YEAR TOTAL CRASHES 25 14 0 11 2 4 3	0% of Total 100% 56% 0% 44% 8% 16% 12%	0.00 MEAN Accidents per Year 8.33 4.67 0.00 3.67 0.67 1.33 1.00	Cause(s) (9)	measure 9 13	
Left Turn		Unknown The Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	0 NUMBE 2006 13 5 0 8 2 1 2 3	0 R OF CF YEAR 2007 4 3 0 1 0 2 0 0 0	0 BASHES 2008 8 6 0 2 0 1 1 0	0 3 YEAR TOTAL CRASHES 25 14 0 11 2 4 3 3 3	0% of Total 100% 56% 0% 44% 8% 8% 16% 12%	0.00 MEAN Accidents per Year 8.33 4.67 0.00 3.67 0.67 1.33 1.00 1.00	Cause(s) (9)	measure 9 13	
Left Turn	Lighting Conditions	Unknown The Crashes Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00	0 NUMBE 2006 13 5 0 8 2 1 2 3 1	0 R OF CF YEAR 2007 4 3 0 1 0 2 0 0 0 0	0 BASHES 2008 8 6 0 2 0 1 1 1 0 1	0 3 YEAR TOTAL CRASHES 25 14 0 111 2 4 3 3 3 2	0% of Total 100% 56% 0% 44% 8% 16% 12% 8%	0.00 MEAN Accidents per Year 8.33 4.67 0.00 3.67 1.33 1.00 1.00 0.67	Cause(s) (9)	measure 9 13	
Left Turn	Lighting Conditions	Unknown The Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00	0 NUMBE 2006 13 5 0 8 2 1 2 3 1 0	0 FR OF CF YEAR 2007 4 0 1 0 2 0 0 0 0 1 1	0 2008 8 6 0 2 0 1 1 0 1 1 1	0 3 YEAR TOTAL CRASHES 25 14 0 111 2 4 3 3 3 2 2 2	0% of Total 100% 56% 0% 44% 8% 16% 12% 8% 8%	0.00 MEAN Accidents per Year 8.33 4.67 0.00 3.67 0.67 1.33 1.00 1.00 0.67 0.67	Cause(s) (9)	measure 9 13	
Left Turn	Lighting Conditions	Unknown m Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	0 NUMBE 2006 13 5 0 8 2 1 2 3 1 0 4	0 R OF CF YEAR 2007 4 0 1 0 2 0 0 0 1 1 1	0 ASHES 2008 8 6 0 2 0 1 1 1 1 4	0 3 YEAR TOTAL CRASHES 25 14 0 111 2 4 3 3 2 2 2 9	0% of Total 100% 56% 0% 44% 8% 18% 18% 18% 8% 8% 36%	0.00 MEAN Accidents per Year 8.33 4.67 0.00 3.67 0.67 1.33 1.00 1.00 0.67 0.67 3.00	Cause(s) (9)	measure 9 13	
Left Turn	Lighting Conditions	Unknown Day Light Dawn Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 18:00 - 24:00 NB → WB	0 NUMBE 2006 13 5 0 8 2 1 2 3 1 0 4 1	0 FR OF CF YEAR 2007 4 3 0 1 0 2 0 0 0 1 1 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 8 6 0 2 0 1 1 0 1 4 0	0 3 YEAR TOTAL CRASHES 25 14 0 11 2 4 3 3 2 2 2 9 9 1	0% of Total 100% 56% 0% 44% 8% 16% 12% 12% 8% 36% 36% 4%	0.00 MEAN Accidents per Year 8.33 4.67 0.67 1.33 1.00 1.00 0.67 0.67 3.00 0.33	Cause(s) (9)	measure 9 13	
Left Turn	Lighting Conditions Hours of Day	Unknown m Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	0 NUMBE 2006 13 5 0 8 2 1 2 3 1 0 4 1 6	0 R OF CF YEAR 2007 4 0 1 0 2 0 0 0 1 1 1	0 ASHES 2008 8 6 0 2 0 1 1 1 1 4	0 3 YEAR TOTAL CRASHES 25 14 0 111 2 4 3 3 2 2 2 9	0% of Total 100% 56% 0% 44% 8% 16% 12% 12% 8% 8% 8% 8% 36% 4%	0.00 MEAN Accidents per Year 8.33 4.67 0.00 3.67 0.67 1.33 1.00 1.00 0.67 0.67 3.00	Cause(s) (9)	measure 9 13	
Left Turn	Lighting Conditions	Unknown Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 13:00 13:00 - 13:00 13:00 - 24:00 NB → WB WB → SB SB → EB	0 NUMBE 2006 13 5 0 8 2 1 2 3 1 0 4 1	0 FR OF CF YEAR 2007 4 3 0 1 0 2 0 0 0 1 1 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 8 6 0 2 0 1 1 0 1 4 0	0 3 YEAR TOTAL CRASHES 25 14 0 11 2 4 3 3 2 2 2 9 9 1	0% of Total 100% 56% 0% 44% 8% 16% 12% 12% 8% 36% 36% 4%	0.00 MEAN Accidents per Year 8.33 4.67 0.67 1.33 1.00 1.00 0.67 0.67 3.00 0.33	Cause(s) (9)	<mark>measure</mark> 9 13	
Left Turn	Lighting Conditions Hours of Day	Unknown Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 NB → WB WB → SB	0 NUMBE 2006 13 5 0 8 2 1 2 3 1 0 4 1 6	0 R OF CF YEAR 2007 4 3 0 1 0 2 0 0 0 1 1 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ASHES 2008 8 6 0 2 0 1 1 0 1 1 4 0 3	0 3 YEAR TOTAL CRASHES 25 14 0 111 2 4 3 3 2 4 3 3 2 2 9 9 1 1	0% of Total 100% 56% 0% 44% 8% 16% 12% 12% 8% 8% 8% 8% 36% 4%	0.00 MEAN Accidents per Year 8.33 4.67 0.00 3.67 1.33 1.00 1.00 1.00 0.67 0.67 3.00 0.33 3.67	Cause(s) (9)	<mark>measure</mark> 9 13	

3.12.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 147 Avenue and SW 104 Street were performed on a typical weekday on November 18, 2010. A summary of the traffic data is presented in *Figure 47*, and the field review is presented in *Figure 48*.

This intersection has single left-turn bays for all approaches. The signal operation is protected/permissive for all left-turns.

The intersection presents large offsets between all opposing left-turn bays where several permitted left-turn vehicles searching gaps in the opposing through traffic could be contained in the middle of the intersection. Higher potential conflicts between eastbound/westbound permitted left-turn movements and the opposing through traffic were noticed along SW 104 Street than SW 147 Avenue.



It was also noticed that the number of left-turn vehicles exceeds the storage capacity of the turn bays in all approaches and spills over the through lanes.

Red light running was observed at the intersection.

The landscape surroundings at the intersection, especially along the west leg present a conflict and should be modified.

3.12.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 147 Avenue and SW 104 Street, the following is recommended:

- Lengthen the northbound, southbound and eastbound left-turn lanes to approximately 300 ft. each.
- Lengthen the westbound left-turn lanes to approximately 200 ft.
- Reducing the offset between left turn lanes by reducing the median width and creating a striped gore at all approaches.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Providing crosswalks, pedestrian features and ADA approved pedestrian ramps at all legs.
- Modifying the landscape in the west leg to improve the sight distance.
- Refurbishing of pavement markings using thermoplastic painting.
- Improving lighting system at the intersection.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 49.





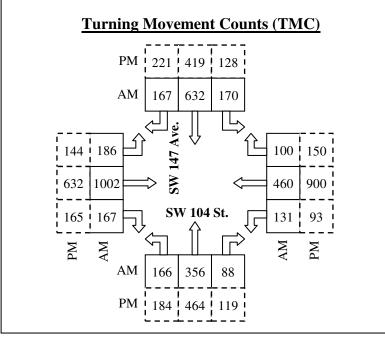


Figure 47: Traffic Data – SW 147 Avenue and SW 104 Street





Figure 48: Field Review – SW 147 Avenue and SW 104 Street



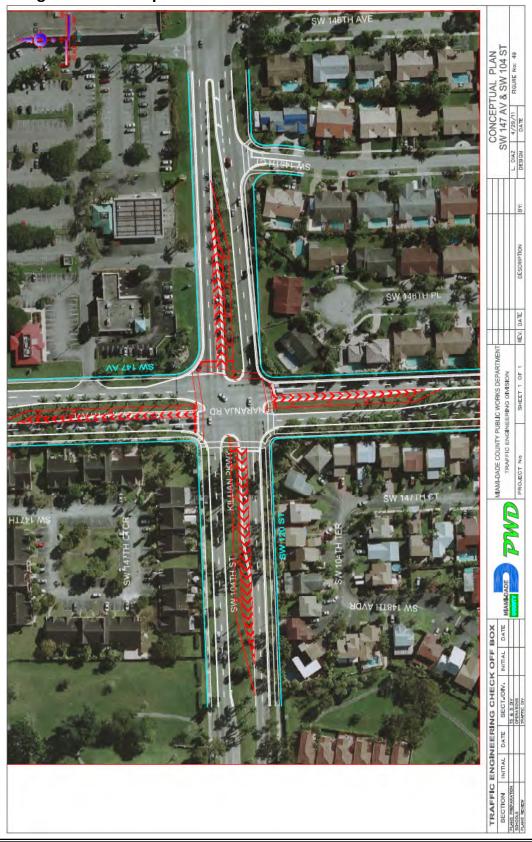


Figure 49: Conceptual Plan – SW 147 Avenue and SW 104 Street



3.13. S. Hammocks Boulevard and SW 104 Street

3.13.1. Site Description

This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. S. Hammocks Boulevard is a four lane collector divided by a raised median that runs north-south, and SW 104 Street is a four lane urban arterial divided by a raised median that runs east-west.

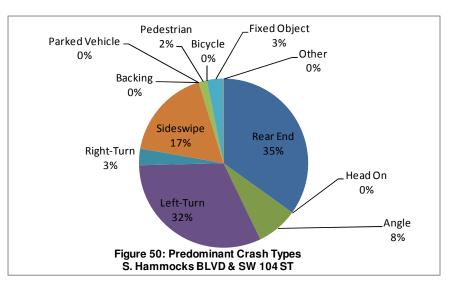
3.13.2. Safety Conditions and Analysis

The intersection of S. Hammocks Boulevard and SW 104 Street is ranked number 13 in our high crash locations list. A review of the hard copy police reports for the year 2006 through 2008 was performed. During the three-year analysis period, 63 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 21. The crash summaries, crash statistics and collision diagrams for the intersection are

documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 50*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the



safety conditions at the study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 30* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.822, 1.562, and 1.388, respectively. The safety ratio for the three years averaged 1.591. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that left-turn and fixed object collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 31*.



	(4	Lane x 4	Lane, Si	Hanalized,	With Turn I	anes. 4 L	eq Intersecti	on-Divided-T	able28) - URF	B) - URBAN Spot					
	(.						J.						ODACUE		
	TYPE OF CRASH		TR OF CF		3 YEAR TOTAL	% of	MEAN Accidents	MEAN	90th	ASH VALUE 95th	Mean	90th	95th		
COLLISION TYPE	Rear End	2006	2007 8	2008	CRASHE 22	Total 17%	per Year 7.33	5.70	Percentile 16.96	19.12	x	Percentil	Percent		
	Head On	0	Ō	0	0	0%	0.00	0.33	1.02	1.15					
	Angle	1	1	3	5	3%	1.67	3.05	7.08	7.85					
	Left Turn Right Turn	6 1	9 1	5	20 2	12% 1%	6.67 0.67	1.67 0.33	4.02	4.47 1.42	X	X	x		
	Sideswipe	6	2	3	11	6%	3.67	1.60	4.64	5.22	X				
	Backed Into	0	0	0	0	0%	0.00	0.17	0.56	0.63					
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.10	0.51	0.59					
	Coll. w/ Pedestrian Coll. w/ Bicycle	1	0	0	1	1% 0%	0.33 0.00	0.28	1.04 0.33	1.19 0.38	X				
	Fixed Object	2	0	0	2	1%	0.00	0.09	0.33	0.38	x	х	x		
	Ran Off Road	0	0	0	0	0%	0.00	0.00	0.00	0.00	~	~	- ^		
	Overtuned	0	0	0	0	0%	0.00	0.03	0.21	0.24					
	Other	0	0	0	0	0%	0.00	3.70	8.83	9.82					
SEVERITY	Total Crashes PDO crashes	24 19	21 17	18 16	63 52	23% 83%	21.00 17.33	17.77 9.93	40.96 22.30	45.39 24.67	X				
	Fatal crashes	0	0	0	0	0%	0.00	0.05	0.26	0.29	^				
	Injury crashes	5	4	2	11	17%	3.67	13.14	33.08	36.90			l —		
IGHT CONDITIONS	Day Light	16	8	11	35	56%	11.67	12.40	29.18	32.39					
	Dusk	0	1	1	2	3%	0.67	0.28	0.87	0.98	X				
	Dawn	0	1	0	1	2%	0.33	0.17	0.56	0.63	X				
	Dark Unknown	8 0	11 0	6 0	25 0	40% 0%	8.33 0.00	4.56 0.35	10.53	11.68 1.18	Х		I		
SURFACE CONDITIONS		10	17	15	42	67%	14.00	15.30	34.45	38.12					
	Wet	1	4	3	8	13%	2.67	2.10	6.02	6.76	х				
	Others	13	0	0	13	21%	4.33	0.37	1.10	1.24	X	х	х		
MONTH OF A YEAR	January	1	0	0	1	2%	0.33	1.42	3.33	3.69					
	February	4	1	3	8	13%	2.67	1.42	3.53	3.93	X				
	March April	5	5	1	11	17% 11%	3.67 2.33	1.67 1.30	4.12 3.21	4.59 3.57	X				
	May	3	2	2	8	13%	2.33	1.30	4.46	4.99	x				
	June	0	2	1	3	5%	1.00	1.38	3.49	3.90	~				
	July	1	2	3	6	10%	2.00	1.35	3.22	3.58	Х				
	August	2	2	2	6	10%	2.00	1.56	3.99	4.46	Х				
	September	1	4	0	5	8%	1.67	1.46	3.73	4.16	X				
	October	2	0	0	2	3%	0.67	1.47	3.59	4.00					
	November December	1	1	2	4	6% 3%	1.33 0.67	1.39 1.61	3.53 4.43	3.94 4.97					
DAY OF THE WEEK	Sunday	3	2	0	5	8%	1.67	1.46	3.47	3.85	х				
	Monday	3	3	7	13	21%	4.33	2.70	6.42	7.13	X				
	Tuesday	7	4	3	14	22%	4.67	2.49	6.18	6.88	Х				
	Wednesday	2	3	1	6	10%	2.00	2.56	5.84	6.47					
	Thursday	4	1	3	8	13%	2.67	2.88 3.07	7.20	8.03	x				
	Friday Saturday	3	5	4	12 5	19% 8%	4.00 1.67	2.61	7.50 6.40	8.35 7.13	^		<u> </u>		
HOUR OF THE DAY	00:00-06:00	0	1	2	3	5%	1.00	1.70	3.39	3.71					
	06:00-09:00	1	0	1	2	3%	0.67	1.98	5.12	5.72					
	09:00-11:00	0	1	1	2	3%	0.67	1.72	4.23	4.71					
	11:00-13:00	4	2	2	8	13%	2.67	2.40	6.30	7.05	X		L		
	13:00-15:00 15:00-18:00	2	1	3	6 15	10% 24%	2.00 5.00	1.95 3.58	5.32 7.81	5.96 8.62	X				
	18:00-24:00	9	13	5	27	43%	9.00	4.42	10.63	11.82	X				
					· · ·							•			
						YEAR		3-Year							
					1	2	3	Average							
Average Daily Traffic A	DT (Vehicles per D	ay)			33,810	34,500	35,204	34,505	1						
-lorida Average Crash	rate (Crashes per I	Million En	tering Ve	hicles)	0.420	0.424	0.394	0.413	1						
	- ,		3 -	-7					1						
Traffic Base	,				12.341	12.592	12.849	12.594	4						
Actual Crash Rate (Cr	ashes per Million El	ntering V	enicles)		1.945	1.668	1.401	1.671	1						
Critical Crash Rate (C	rashes per Million E	Intering V	(ehicles)		1.067	1.067	1.009	1.048	1						
Safety Ratio		-			1.822	1.562	1.388	1.591	1						
	22				YES	YES			1						
		0.000		Where:	123	123	123	123							
High Crash Location Actual Crash I	$Rate = \frac{A \times 1,000}{V}$	0,000				f crashes		YES	y type occurrin	ng in a 1 year	period.				
	$ate = AVR + \frac{0.5}{TB} + T$		2	TB = Tr TF = Te	affic Base st Factor (z	-value)	rash Rate for Infidence Leve			Confidence I	Level (%)	Constant Z]		
Traffic Base =	$\frac{Years \times ADT \times 36}{1,000,000}$	00					Confidence L			86.60 90.00 95.00 95.50)))	1.50 1.64 1.96 2.00			
Safety Ratio	= <u>Actual Crash</u> Critical Crash	Rate	_							98.80 99.00 99.70)	2.50 2.58 3.00			

Table 30 – Crash Analysis – S. Hammocks Boulevard and SW 104 Street



Table 31 – Abnormal Crash Details & CountermeasuresS. Hammocks Boulevard and SW 104 Street

		Hamm	ocks Bl	vd & S\	N 104 S	Street				
	(4 Lane x 4 Lane	, Signalized, With	Turn Lanes	s, 4 Leg li	ntersectio	n-Divided-T	able28) - I	URBAN Spo	t	
						1	1			
			NUMBE	ROFCR	ASHES	3 YEAR	%	MEAN	Possible	Counter-
			2006	YEAR 2007	0000	TOTAL	of	Accidents	Cause(s)	measure(s)
	Total Left Tu	n Crachoc	2006	2007	2008 5	CRASHE	Total	per Year	(6)	9
	TOLAI LEIL TUI	Day Light	4	9 4	- 5 - 1	20 9	100% 45%	6.67 3.00	(8)	9 12
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(13)	13
	Lighting conditions	Dark	2	5	4	11	55%	3.67	(10)	10
		00:00 - 06:00	0	0	0	0	0%	0.00		
		06:00 - 09:00	0	0	0	0	0%	0.00		
		09:00 - 11:00	0	0	0	0	0%	0.00		
	Hours of Day	11:00 - 13:00	1	1	1	3	15%	1.00		
Left Turn		13:00 - 15:00	1	0	1	2	10%	0.67		
		15:00 - 18:00	2	1	1	4	20%	1.33		
		18:00 - 24:00	2	7	2	11	55%	3.67		
		$NB \rightarrow WB$	0	1	0	1	5%	0.33		
		$WB \rightarrow SB$	1	6	2	9	45%	3.00		
	Direction	$SB \rightarrow EB$	3	0	1	4	20%	1.33		
		$EB \rightarrow NB$	2	2	2	6	30%	2.00		
		Unknown	0	0	0	0	0%	0.00		
			NUMBE	ROFCR	ASHES	3 YEAR	%	MEAN	Possible	Counter-
			0000	YEAR	0000	TOTAL	of	Accidents	Cause(s)	measure(s)
	Total Fixed Ob	iaat Craabaa	2006	2007	2008	CRASHE	Total	per Year	(0)	
	Total Fixed Ob	·	2	0	0	2	100% 50%	0.67	(2)	5 12
	Lighting Conditions	Day Light Dawn	0	0	0	0	50% 0%	0.33	(6) (17)	12
	Lighting Conditions	Dawn Dark	1	0	0	0	0% 50%	0.00	(17)	17
		00:00 - 06:00	0	0	0	0	0%	0.33		
		06:00 - 09:00	0	0	0	0	0%	0.00		
				0	U	0				
			0	0	0	0	0%	0.00		
	Hours of Day	09:00 - 11:00	0	0	0	0	0%	0.00		
Fixed Object	Hours of Day	09:00 - 11:00 11:00 - 13:00	0	0	0	0	0%	0.00		
Fixed Object	Hours of Day	09:00 - 11:00 11:00 - 13:00 13:00 - 15:00	0	0	0	0	0% 0%	0.00		
Fixed Object	Hours of Day	09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00	0 0 1	0 0 0	0 0 0	0 0 1	0% 0% 50%	0.00 0.00 0.33		
Fixed Object	Hours of Day	09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	0 0 1 1	0 0 0 0	0	0 0 1 1	0% 0% 50% 50%	0.00 0.00 0.33 0.33		
Fixed Object	Hours of Day	09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North	0 0 1 1 0	0 0 0 0 0	0 0 0 0	0 0 1 1 0	0% 0% 50% 50% 0%	0.00 0.00 0.33 0.33 0.00		
Fixed Object	Hours of Day	09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South	0 0 1 1	0 0 0 0	0 0 0 0 0	0 0 1 1	0% 0% 50% 50%	0.00 0.00 0.33 0.33		
Fixed Object		09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North	0 0 1 1 0 1	0 0 0 0 0 0	0 0 0 0 0 0	0 0 1 1 0 1	0% 0% 50% 50% 0% 50%	0.00 0.00 0.33 0.33 0.00 0.33		

3.13.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at S. Hammocks Boulevard and SW 104 Street were performed on a typical weekday on November 18, 2010. A summary of the traffic data is presented in *Figure 51*, and the field review is presented in *Figure 52*.

This intersection has single left-turn bays for all approaches. The signal operation is protected/permissive for all left-turns.

The intersection presents large offsets between eastbound/westbound opposing left-turn bays where several permitted left-turn vehicles searching gaps in the opposing through traffic could be contained in the middle of the intersection. Higher potential conflicts between eastbound/westbound permitted left-turn movements and the opposing through traffic were noticed along the intersection.



It was also noticed that the number of left-turn vehicles exceeds the storage capacity of the turn bays in eastbound and westbound approaches and spills over the through lanes.

Lack of lighting was observed at the intersection.

The driveways at the northeast corner and the corresponding median openings present conflict between the vehicles in/out of the driveway and the through traffic.

3.13.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of S. Hammocks Boulevard and SW 104 Street, the following is recommended:

- Lengthen the eastbound left-turn lane to approximately 300 ft and closing the median opening.
- Lengthen the westbound left-turn lane to approximately 450 ft.
- Reducing the offset between eastbound/westbound left turn lanes by reducing the median width and creating a striped gore at all approaches.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Modifying the median noses for north/south legs to provide clear pedestrian paths.
- Installing curve warning (W1-2R) and signal ahead (W3-3) signs for northbound approach.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.
- Improving lighting system at the intersection.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 53.





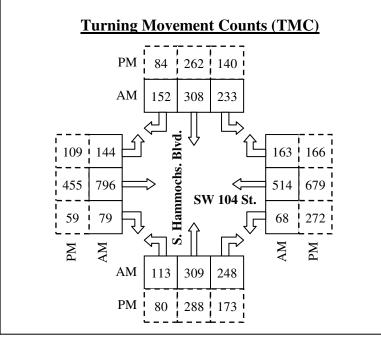








Figure 52: Field Review – S. Hammocks Boulevard and SW 104 Street





Figure 53: Conceptual Plan – S. Hammocks Boulevard and SW 104 Street



3.14. NW 87 Avenue and NW 25 Street

3.14.1. Site Description

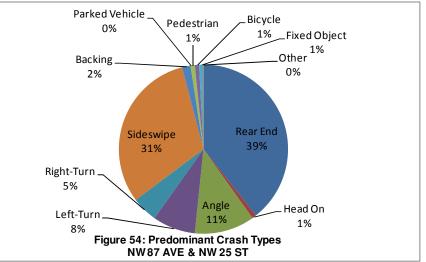
This intersection is a signalized four legged intersection located in the northwest part of Miami Dade County in the City of Doral. NW 87 Avenue is a four lane urban arterial divided by a raised median that runs north-south, and NW 25 Street is a six lane urban arterial divided by a paved median that runs east-west.

3.14.2. Safety Conditions and Analysis

The intersection of NW 87 Avenue and NW 25 Street is ranked number 14 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 122 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 41. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 54*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 32* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.493, 1.798, and 2.037, respectively. The safety ratio for the three years averaged 1.776. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that right-turn and sideswipe collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 33*.



		(6 ano	v 4 Lano				A Leg Inters		9 35) - URBAN	Spot			
										-			0040115
	TYPE OF CRASH		R OF CF YEAR		3 YEAR TOTAL	% of	MEAN Accidents	MEAN	90th	ASH VALUE	Mean	90th	95th
OLLISION TYPE	Rear End	2006	2007 20	2008 16	CRASHE 48	Total 20%	16.00	8.68	Percentile 17.26	Percentile 18.90	x	Percentil	Percent
	Head On	1	0	0	1	0%	0.33	0.60	1.64	1.84			
	Angle	5	3	6	14	5%	4.67	5.40	9.19	9.92			
	Left Turn	3	1	6	10	3%	3.33	3.00	6.13	6.73	X		
	Right Turn	1	3 13	2 14	6 38	2% 10%	2.00 12.67	0.46	1.36 4.92	1.53	X X	X X	X
	Sideswipe Backed Into	0	13	14	2	10%	0.67	2.58 0.28	0.84	5.37 0.94	x	^	^
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.12	0.57	0.65	~		
	Coll. w/ Pedestrian	0	0	1	1	0%	0.33	0.74	1.80	2.00			
	Coll. w/ Bicycle	0	0	1	1	0%	0.33	0.14	0.49	0.55	Х		
	Fixed Object	1	0	0	1	0%	0.33	0.79	2.01	2.24			
	Ran Off Road	0	0	0	0	0%	0.00	0.01	0.11	0.13			
	Overtuned Other	0	0	0	0	0% 0%	0.00	0.04 8.67	0.28 21.05	0.33 23.42			
	Total Crashes	34	41	47	122	24%	40.67	31.51	54.94	59.42	x		
EVERITY	PDO crashes	34	40	42	116	95%	38.67	19.21	36.95	40.35	X	Х	
	Fatal crashes	0	0	0	0	0%	0.00	0.16	0.56	0.63			
	Injury crashes	0	1	5	6	5%	2.00	20.77	38.34	41.71			
IGHT CONDITIONS	Day Light	26	36	37	99	81%	33.00	19.89	35.12	38.03	Х		
	Dusk	0	1	0	1	1%	0.33	0.61	1.43	1.58			
	Dawn Dark	0	0	0 10	0 22	0% 18%	0.00 7.33	0.38	1.03 18.94	1.16 20.61			I
	Unknown	8	4	0	22	0%	0.00	0.41	18.94	1.30			
URFACE CONDITIONS		26	35	43	104	85%	34.67	26.41	45.71	49.41	x		
	Wet	2	6	3	11	9%	3.67	4.41	8.78	9.62			1
	Others	6	0	1	7	6%	2.33	0.69	1.88	2.11	Х	х	х
IONTH OF A YEAR	January	3	2	1	6	5%	2.00	2.57	5.04	5.52			
	February	4	3	4	11	9%	3.67	2.37	4.59	5.02	X		
	March	2	6	3	11	9%	3.67	3.09	5.92	6.46	X		
	April May	2	4	4 5	10	8% 6%	3.33 2.33	2.57 2.51.	5.30 4.81	5.82	Х		
	June	0	9	6	15	12%	5.00	2.51.	5.74	5.25 6.30	x		
	July	4	3	3	10	8%	3.33	2.60	4.96	5.42	- Â		
	August	4	3	4	11	9%	3.67	3.00	5.66	6.17	X		
	September	4	0	6	10	8%	3.33	2.48	4.92	5.39	Х		
	October	3	4	5	12	10%	4.00	2.89	5.40	5.88	Х		
	November	4	3	4	11	9%	3.67	2.41	4.85	5.32	X		
	December	3	3	2	8	7%	2.67	2.22	4.55	5.00	Х		
AY OF THE WEEK	Sunday	1	2	3 10	6 27	5% 22%	2.00 9.00	4.00 4.62	6.58 9.23	7.08	x		
	Monday Tuesday	4	9 4	3	11	9%	9.00 3.67	4.62	9.23	8.46	^		
	Wednesday	5	10	9	24	20%	8.00	4.56	8.62	9.40	х		
	Thursday	2	8	7	17	14%	5.67	5.04	9.04	9.80	X		
	Friday	9	6	12	27	22%	9.00	4.86	9.39	10.26	Х		
	Saturday	5	2	3	10	8%	3.33	3.98	8.10	8.89			
IOUR OF THE DAY	00:00-06:00	2	1	4	7	6%	2.33	3.79	8.65	9.58			
	06:00-09:00 09:00-11:00	8	1	9	18 15	15% 12%	6.00 5.00	3.44	6.94	7.61	X		
	11:00-13:00	4	5 5	6 4	15	12%	4.00	2.58 3.12	5.30 5.78	5.82 6.29	x		
	13:00-15:00	7	4	6	17	14%	5.67	3.57	6.32	6.85	x		
	15:00-18:00	6	13	13	32	26%	10.67	6.38	11.52	12.50	X		
	18:00-24:00	4	12	5	21	17%	7.00	8.60	15.51	16.83			
								<u></u>	-				
					<u> </u>	YEAR		3-Year					
					1	2	3	Average	-				
verage Daily Traffic A	ADT (Vehicles per D	lay)			53,217	54,303	55,411	54,310					
lorida Average Crash	rate (Crashes per l	Million En	tering Ve	hicles)	0.579	0.568	0.566	0.571	1				
raffic Base	,		3 -	-/				19.823	1				
					19.424	19.821	20.225		4				
ctual Crash Rate (Cr	rashes per Million E	ntering V	ehicles)		1.750	2.069	2.324	2.048	1				
Critical Crash Rate (C	rashes per Million E	ntering V	ehicles)		1.173	1.150	1.141	1.155	1				
afety Ratio		-	,		1.493	1.798	2.037	1.776	1				
	22								1				
ligh Crash Location	77				YES	YES	YES	YES					
Actual Crash	$Rate = \frac{A \times 1,000}{V}$	0,000			al number o rage Annua			f crashes by	type occurri	ng in a 1 year	period.		
CriticalCrashR	$ate = AVR + \frac{0.5}{TB} + 7$	$TF\sqrt{\frac{AVH}{TB}}$	2	TB = Tr	affic Base		ash Rate for	a particular	type of interse	ection or road			-11
Traffic Base =	$\frac{Years \times ADT \times 36}{1,000,000}$	<u>65</u>		= 1.		95% Cor	nfidence Lev Confidence L			Confidence I 68.30 86.60 90.00 95.00 95.00)))	Constant Z 1.00 1.50 1.64 1.96 2.00	
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	n Rate h Rate	-							95.50 98.80 99.00 99.70 99.95)))	2.00 2.50 2.58 3.00 3.29	

Table 32 – Crash Analysis – NW 87 Avenue and NW 25 Street



Table 33 – Abnormal Crash Details & CountermeasuresNW 87 Avenue and NW 25 Street

		NW	87 Aven	ue & N	W 25 St	treet				
	(6 Lane x 4 I	Lane, Signalized,	With Turn L	anes, 4 L	eg Interse	ection -Table	35) - URE	SAN Spot		
			_	R OF CR		3 YEAR TOTAL	% of	MEAN Accidents	Possible Cause(s)	Counter- measure(s)
			2006	2007	2008	CRASHES	Total	per Year	()	
	Total Right Tu		1	3	2	6	100%	2.00	(8)	13
		Day Light	1	3	2	6	100%	2.00	(9)	21
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(13)	
		Dark	0	0	0	0	0%	0.00		
		00:00 - 06:00	0	0	0	0	0%	0.00		
		06:00 - 09:00	1	1	0	2	33%	0.67		
		09:00 - 11:00	0	0	1	1	17%	0.33		
Right Turn	Hours of Day	11:00 - 13:00	0	0	0	0	0%	0.00		
night fuill		13:00 - 15:00	0	1	0	1	17%	0.33		
		15:00 - 18:00	0	1	1	2	33%	0.67		
		18:00 - 24:00	0	0	0	0	0%	0.00		
		NB→EB	0	1	0	1	17%	0.33		
		EB→SB	0	0	0	0	0%	0.00		
	Direction	WB→NB	0	2	0	2	33%	0.67		
		SB→WB	1	0	2	3	50%	1.00		
		SB→WB Unknown	1 0	0	2 0	3 0	50% 0%	1.00 0.00		
				-						
			0	0	0	0	0%	0.00		
			0	0 R OF CF	0	0 3 YEAR	0%	0.00 MEAN	Possible	Counter-
			0 NUMBE	0 R OF CR YEAR	0 ASHES	0	0%	0.00		Counter-
		Unknown	0 NUMBE 2006	0 R OF CR YEAR 2007	0 ASHES 2008	0 3 YEAR	0% % of Total	0.00 MEAN Accidents per Year	Cause(s)	measure(s
	Total Sideswi	Unknown pe Crashes	0 NUMBE 2006 11	0 R OF CR YEAR 2007 13	0 ASHES 2008 14	0 3 YEAR TOTAL CRASHES 38	0% % of Total 100%	0.00 MEAN Accidents per Year 12.67	Cause(s) (8)	measure(s
		Unknown pe Crashes Day Light	0 NUMBE 2006 11 10	0 R OF CR YEAR 2007	0 ASHES 2008 14 11	0 3 YEAR TOTAL CRASHES 38 33	0% of Total 100% 87%	0.00 MEAN Accidents per Year 12.67 11.00	Cause(s) (8) (19)	measure(s) 4 19
	Total Sideswi	Unknown pe Crashes	0 NUMBE 2006 11	0 R OF CR YEAR 2007 13	0 ASHES 2008 14 11 0	0 3 YEAR TOTAL CRASHES 38 33 0	0% of Total 100% 87% 0%	0.00 MEAN Accidents per Year 12.67	(8) (19) (20)	measure(s
		Unknown pe Crashes Day Light	0 NUMBE 2006 11 10	0 R OF CF YEAR 2007 13 12	0 ASHES 2008 14 11	0 3 YEAR TOTAL CRASHES 38 33	0% of Total 100% 87%	0.00 MEAN Accidents per Year 12.67 11.00	Cause(s) (8) (19)	measure(s) 4 19
		Unknown pe Crashes Day Light Dawn	0 NUMBE 2006 11 10 0	0 R OF CF YEAR 2007 13 12 0	0 ASHES 2008 14 11 0	0 3 YEAR TOTAL CRASHES 38 33 0	0% of Total 100% 87% 0%	0.00 MEAN Accidents per Year 12.67 11.00 0.00	(8) (19) (20)	<mark>measure(s</mark> 4 19
		Unknown pe Crashes Day Light Dawn Dark	0 NUMBE 2006 11 10 0 1	0 FR OF CF YEAR 2007 13 12 0 1	0 ASHES 2008 14 11 0 3	0 3 YEAR TOTAL CRASHES 38 33 0 5	0% of Total 100% 87% 0% 13%	0.00 MEAN Accidents per Year 12.67 11.00 0.00 1.67	(8) (19) (20)	measure(s) 4 19
		Unknown pe Crashes Day Light Dawn Dark 00:00 - 06:00	0 NUMBE 2006 11 10 0 1 0	0 FR OF CF YEAR 2007 13 12 0 1 0 1 0	0 ASHES 2008 14 11 0 3 1	0 3 YEAR TOTAL CRASHES 38 33 0 5 1	0% of Total 100% 87% 0% 13% 3%	0.00 MEAN Accidents per Year 12.67 11.00 0.00 1.67 0.33	(8) (19) (20)	measure(s) 4 19
Sideswipe		Unknown pe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	0 NUMBE 2006 11 10 0 1 0 2	0 R OF CF YEAR 2007 13 12 0 1 0 1 0 1	0 ASHES 2008 14 11 0 3 1 3	0 3 YEAR TOTAL CRASHES 38 33 0 5 1 1 6	0% of Total 100% 87% 0% 13% 3% 16%	0.00 MEAN Accidents per Year 12.67 11.00 0.00 1.67 0.33 2.00	(8) (19) (20)	measure(s) 4 19
Sideswipe (Overtake)	Lighting Conditions	Unknown pe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	0 NUMBE 2006 11 10 0 1 0 2 2 2	0 R OF CF YEAR 2007 13 12 0 1 0 1 2	0 ASHES 2008 14 11 0 3 1 3 2	0 3 YEAR TOTAL CRASHES 38 33 0 5 5 1 6 6	0% of Total 100% 87% 0% 13% 3% 16% 16%	0.00 MEAN Accidents per Year 12.67 11.00 0.00 1.67 0.33 2.00 2.00	(8) (19) (20)	measure(s) 4 19
	Lighting Conditions	Unknown pe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	0 2006 11 10 0 1 0 2 2 1	0 YEAR 2007 13 12 0 1 0 1 0 1 2 1	0 2008 14 11 0 3 1 3 2 1	0 3 YEAR TOTAL CRASHES 38 33 0 5 1 6 6 6 3	0% of Total 100% 87% 0% 13% 3% 16% 16% 8%	0.00 MEAN Accidents per Year 12.67 11.00 0.00 1.67 0.33 2.00 2.00 1.00	(8) (19) (20)	measure(s) 4 19
	Lighting Conditions	Unknown pe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00	0 2006 11 10 0 1 0 2 2 1 4	0 FR OF CFR 2007 13 12 0 1 0 1 2 1 0 1 2 1 0	0 ASHES 2008 14 11 0 3 1 3 2 1 1 1	0 3 YEAR TOTAL CRASHES 38 33 0 5 1 6 6 6 3 5 5	0% of Total 100% 87% 0% 13% 3% 16% 16% 8% 13%	0.00 MEAN Accidents per Year 12.67 11.00 0.00 1.67 0.33 2.00 2.00 1.00 1.67	(8) (19) (20)	<mark>measure(s</mark> 4 19
-	Lighting Conditions	Unknown pe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00	0 NUMBE 2006 11 10 0 1 0 2 2 1 4 1	0 FR OF CF 2007 13 12 0 1 0 1 2 1 0 4	0 ASHES 2008 14 11 0 3 1 1 3 2 1 1 4	0 3 YEAR TOTAL CRASHES 38 33 0 5 1 6 6 6 3 3 5 9	0% of Total 100% 87% 0% 13% 3% 16% 8% 13% 24%	0.00 MEAN Accidents per Year 12.67 11.00 0.00 1.67 2.00 2.00 1.00 1.67 3.00	(8) (19) (20)	<mark>measure(s</mark> 4 19
•	Lighting Conditions	Unknown pe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 15:00 - 24:00 North	0 NUMBE 2006 11 10 0 1 0 2 2 1 4 1 1 1	0 FR OF CR 2007 13 12 0 1 0 1 0 1 0 1 0 4 5	0 ASHES 2008 14 11 0 3 1 3 2 1 1 4 2	0 3 YEAR TOTAL CRASHES 38 33 0 5 1 1 6 6 6 3 5 9 8 8 7	0% of Total 100% 87% 0% 13% 3% 16% 16% 8% 16% 8% 24% 24% 24% 21% 18%	0.00 MEAN Accidents per Year 12.67 11.00 0.00 1.67 0.33 2.00 2.00 1.00 1.67 3.00 2.67 2.33	(8) (19) (20)	measure(s) 4 19
	Lighting Conditions	Unknown pe Crashes Day Light Dawn Dark 00:00 - 06:00 09:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 13:00 - 18:00 18:00 - 24:00 North South	0 NUMBE 2006 11 10 0 1 0 2 2 1 4 1 1 4 1 1 4 1	0 FROF CFR 2007 13 12 0 1 0 1 2 1 0 4 5 2	0 ASHES 2008 14 11 0 3 1 3 2 1 1 4 2 1 4	0 3 YEAR TOTAL CRASHES 38 33 0 5 1 6 6 6 3 5 9 8 7 9 9	0% of Total 100% 87% 0% 13% 3% 16% 16% 8% 16% 16% 8% 24%	0.00 MEAN Accidents per Year 12.67 11.00 0.00 1.67 0.33 2.00 2.00 1.00 1.67 3.00 2.67 2.33 3.00	(8) (19) (20)	measure(s) 4 19
	Lighting Conditions Hours of Day	Unknown pe Crashes Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 15:00 - 24:00 North	0 NUMBE 2006 11 10 0 1 0 2 2 1 4 1 1 4	0 FROFCFR 2007 13 12 0 1 0 1 2 1 0 1 2 1 0 4 5 2 4	0 ASHES 2008 14 11 0 3 1 3 2 1 1 4 2 1 1	0 3 YEAR TOTAL CRASHES 38 33 0 5 1 1 6 6 6 3 5 9 8 8 7	0% of Total 100% 87% 0% 13% 3% 16% 16% 8% 16% 8% 24% 24% 24% 21% 18%	0.00 MEAN Accidents per Year 12.67 11.00 0.00 1.67 0.33 2.00 2.00 1.00 1.67 3.00 2.67 2.33	(8) (19) (20)	<mark>measure(s)</mark> 4 19

3.14.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at NW 87 Avenue and NW 25 Street were performed on a typical weekday on October 28, 2010. A summary of the traffic data is presented in *Figure 55*, and the field review is presented in *Figure 56*.

This intersection has double left-turn bays for eastbound/westbound approaches, and these two approaches, plus the northbound approach have exclusive right-turn lanes. The signal operation is split phases protected/permissive for left-turn lanes except for eastbound and westbound double left-turns which are protected only.

This intersection handles a large number of heavy vehicles and trucks. Long queues were observed for northbound left-turn with vehicles spilling back and blocking the through lane.



The southbound right-turning vehicles suffer an inadequate turning radius due to the presence of the canal.

Additionally, considerable weaving was observed in the eastbound approach due to the alignment of the through and left turn lanes.

3.14.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of NW 87 Avenue and NW 25 Street, the following is recommended:

- Lengthen the northbound left-turn lane to approximately 450 ft.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Improving the eastbound approach lane alignment at the start of the taper.
- Modifying the southbound right-turn radius to better accommodate heavy vehicles.
- Installing lane use signs (R3-8) for all approaches.
- Replacing the damaged pedestrian push buttons.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 57.





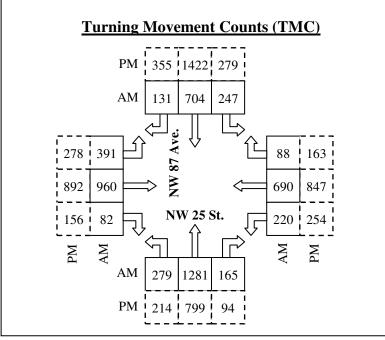


Figure 55: Traffic Data – NW 87 Avenue and NW 25 Street





Figure 56: Field Review – NW 87 Avenue and NW 25 Street



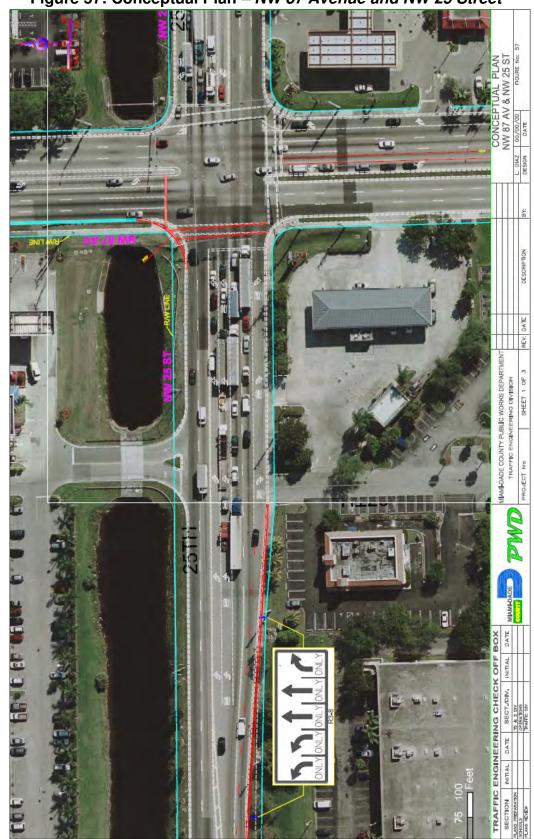


Figure 57: Conceptual Plan – NW 87 Avenue and NW 25 Street

Safety Studies at High Crash Locations Countywide



3.15. SW 117 Avenue and SW 120 Street

3.15.1. Site Description

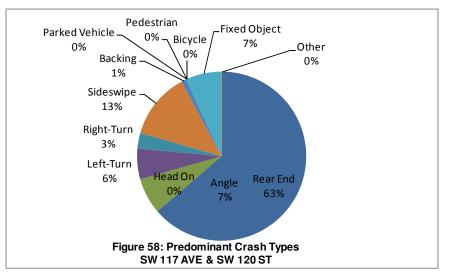
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 117 Avenue is a four lane urban arterial divided by a raised median that runs north-south, and SW 120 Street is a four lane major collector divided by a raised median that runs east-west.

3.15.2. Safety Conditions and Analysis

The intersection of SW 117 Avenue and SW 120 Street is ranked number 15 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 102 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 34. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 58*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 34* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 2.741, 1.893, and 2.697, respectively. The safety ratio for the three years averaged 2.444. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that rear end, angle, left-turn, right-turn, sideswipe, backing and fixed object collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 35*.



		(4 Lar	ne x 4 Lar	ne, Signal	ized, With	Turn Lane	s, T Intersec	tion -Table 2	27) - URBAN S	Spot			
		NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN	EXPECTED	ANNUAL CF	ASH VALUE	ABNORM		CRASHES
	TYPE OF CRASH		YEAR		TOTAL	of	Accidents	MEAN	90th	95th	Mean	90th	95th
COLLISION TYPE	Rear End	2006 27	2007	2008 21	CRASHE 65	Total 32%	21.67	0.45	1.78	2.04	х	Percentil X	Percenti X
	Head On	0	0	0	0	0%	0.00	0.09	0.45	0.51			
	Angle	1	1	5	7	3%	2.33	0.58	1.88	2.13	Х	X	X
	Left Turn	2	2	2	6	3%	2.00	0.18	0.56	0.63	Х	X	Х
	Right Turn	0	2	1	3	1%	1.00	0.18	0.75	0.86	X	X	X
	Sideswipe Backed Into	5	4	4	13	4% 0%	4.33 0.33	0.18	0.69	0.79 0.23	X	X	X
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.03	0.13	0.23	~	^	<u>^</u>
	Coll. w/ Pedestrian	0	0	0	0	0%	0.00	0.09	0.34	0.39			
	Coll. w/ Bicycle	0	0	0	0	0%	0.00	0.00	0.00	0.00			
	Fixed Object	3	1	3	7	2%	2.33	0.00	0.00	0.00	Х	Х	Х
	Ran Off Road	0	0	0	0	0%	0.00	0.00	0.00	0.00			
	Overtuned	0	0	0	0	0%	0.00	0.00	0.00	0.00			
	Other Total Crashes	0 38	0 27	0 37	0 102	0% 23%	0.00 34.00	1.03 3.09	3.78 9.10	4.30 10.25	x	x	- v
EVERITY	Total Crashes PDO crashes	36	27	37	99	97%	33.00	1.67	5.72	6.49	X	x	X
	Fatal crashes	0	0	0	99 0	0%	0.00	0.39	1.90	2.19	^		<u>⊢ ^ </u>
	Injury crashes	2	0	1	3	3%	1.00	1.73	5.11	5.75		1	
IGHT CONDITIONS	Day Light	33	18	28	79	77%	26.33	1.79	6.11	6.94	Х	х	х
	Dusk	0	1	2	3	3%	1.00	0.15	0.60	0.69	Х	Х	Х
	Dawn	0	0	0	0	0%	0.00	0.12	0.63	0.72			
	Dark	5	8	7	20	20%	6.67	0.51	1.54	1.73	Х	х	х
URFACE CONDITIONS	Unknown	0	0	0	0	0%	0.00	0.18	0.75	0.86	v		
UNPAGE CONDITIONS	Dry Wet	35 3	22 5	31 6	88 14	86% 14%	29.33 4.67	2.33 0.33	7.67	8.69 1.16	X	X X	X X
	Others	3 0	0	<u>ь</u>	0	0%	4.67	0.33	0.63	0.72	^	<u> </u>	⊢ ^
IONTH OF A YEAR	January	6	4	4	14	14%	4.67	0.15	0.53	0.60	х	x	x
	February	4	2	1	7	7%	2.33	0.06	0.28	0.32	X	X	x
	March	2	1	3	6	6%	2.00	0.24	0.94	1.07	Х	х	Х
	April	1	1	4	6	6%	2.00	0.42	1.44	1.63	Х	X	Х
	May	2	1	6	9	9%	3.00	0.30	0.97	1.10	X	X	X
	June	5	5	3	13	13%	4.33	0.33	1.07 0.97	1.21	X	X	X
	July August	4	1	2	9	7% 9%	2.33 3.00	0.30	1.47	1.10 1.67	X	x	X X
	September	2	1	3	9 6	9 % 6%	2.00	0.45	0.53	0.60	x	x	-
	October	2	1	4	7	7%	2.33	0.42	1.28	1.44	X	X	X
	November	5	4	2	11	11%	3.67	0.30	1.05	1.20	X	X	X
	December	2	3	2	7	7%	2.33	0.15	0.60	0.69	Х	х	Х
AY OF THE WEEK	Sunday	5	4	1	10	10%	3.33	0.58	1.67	1.88	Х	Х	Х
	Monday	4	0	4	8	8%	2.67	0.42	1.38	1.56	Х	х	X
	Tuesday	4	5	6	15	15%	5.00	0.30	0.88	0.99	X	X	X
	Wednesday	8	6	10	24	24%	8.00	0.27	0.81	0.91	X	X	X
	Thursday Friday	4 9	5	9 3	18 13	18% 13%	6.00 4.33	0.36 0.79	1.36 2.91	1.55 3.32	X	X	X
	Saturday	4	6	4	14	14%	4.67	0.39	1.16	1.31	x	x	Ŷ
OUR OF THE DAY	00:00-06:00	2	1	0	3	3%	1.00	0.36	1.29	1.47	X	~	
	06:00-09:00	9	6	4	19	19%	6.33	0.15	0.66	0.76	Х	х	Х
	09:00-11:00	7	2	2	11	11%	3.67	0.18	0.69	0.79	Х	х	Х
	11:00-13:00	5	3	5	13	13%	4.33	0.39	1.43	1.63	X	х	Х
	13:00-15:00	5	3	5	13	13%	4.33	0.48	1.74	1.98	X	X	X
	15:00-18:00	4	3	10	17	17%	5.67	0.70	2.59	2.95	X	X	X
	18:00-24:00	6	9	11	26	25%	8.67	0.39	1.43	1.63	Х	X	Х
								2 1/2-24	1				
					<u> </u>	YEAR	1	3-Year					
					1	2	3	Average					
verage Daily Traffic A	ADT (Vehicles per L	Day)			59,557	59,556	60,771	59,961	1				
Iorida Average Crash	rate (Crashes ner	Million En	terina Ve	hicles)	0.257	0.268	0.248	0.258	1				
0									4				
raffic Base					21.738	21.738	22.181	21.886	4				
Actual Crash Rate (Cr	rashes per Million E	Intering V	ehicles)		1.748	1.242	1.668	1.553	1				
Critical Crash Rate (C	rashes per Million B	Enterina V	(ehicles)		0.638	0.656	0.618	0.637	1				
)		2.741				1				
Safety Ratio			_			1.893	2.697	2.444	-				
ligh Crash Location	??				YES	YES	YES	YES					
	$Rate = \frac{A \times 1,00}{V}$		_	V = Ave	al number o rage Annua			f crashes by	/ type occurrin	ng in a 1 year	period.		
CriticalCrashRo	$ate = AVR + \frac{0.5}{TB} +$	$TF\sqrt{\frac{AVI}{TB}}$	2	TB = Trans	affic Base		ash Rate for	a particular	type of interse	ection or road	, ,	nt. Constant Z	ר
Traffic Base =	$\frac{Years \times ADT \times 3}{1,000,000}$	65		= 1.		e 95% Cor		el for RURAI Level for URI		68.30 86.60 90.00 95.00 95.50	0 0 0 0	Constant Z 1.00 1.50 1.64 1.96 2.00	1
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	h Rate sh Rate	-							95.50 98.80 99.00 99.70 99.92	D D D	2.00 2.50 2.58 3.00 3.29	

Table 34 – Crash Analysis – SW 117 Avenue and SW 120 Street



Table 35 – Abnormal Crash Details & CountermeasuresSW 117 Avenue and SW 120 Street

	(4 J ane x 4	Lane, Signalized,	With Turn			on -Table 2		N Spot		
	(4 Lane X 4	Larie, Olgrialized,		ER OF CR		3 YEAR	%	MEAN		
				YEAR		TOTAL	of	Accidents	Possible Cause(s)	Counter- measure(s
	Total Rear Er		2006 27	2007 17	2008 21	CRASHE 65	Total 100%	per Year 21.67	(1)	4
	Lighting Conditions	Day Light Dawn	26 0	10	18	54 2	83%	18.00 0.67	(2) (4)	5 6
		Dark 00:00 - 06:00	1	6 1	2	9	14% 3%	3.00 0.67	(8)	
		06:00 - 09:00 09:00 - 11:00	8	4	3	15 7	23% 11%	5.00 2.33		
Rear End	Hours of Day	11:00 - 13:00	5	2	3	10	15%	3.33		
		13:00 - 15:00 15:00 - 18:00	3	2	4	9	14% 14%	3.00 3.00		
		18:00 - 24:00 North	4	5	4	13 8	20% 12%	4.33 2.67		
	Direction	South East	4	2	5 16	11 45	17% 69%	3.67 15.00		
		West Unknown	1	0	0	1	2% 0%	0.33		
		Unknown	v	v	v	0	078	0.00		1
			NUMB	ER OF CR YEAR	ASHES	3 YEAR TOTAL	% of	MEAN Accidents	Possible	Counter-
	Total Angle	Crashas	2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s
		Day Light	1	1	5	7	100% 100%	2.33 2.33	(4) (12)	6
	Lighting Conditions	Dawn Dark	0	0	0	0	0% 0%	0.00		
		00:00 - 06:00 06:00 - 09:00	0	0	0	0	0% 29%	0.00 0.67		
	Hours of Day	09:00 - 11:00 11:00 - 13:00	0	0	1	1	14% 0%	0.33		
Angle	riburs of Day	13:00 - 15:00	0	0	1	1	14%	0.33		
		15:00 - 18:00 18:00 - 24:00	0	0	1 2	1 2	14% 29%	0.33 0.67		
		NB + EB NB + WB	1	1	2	4	57% 0%	1.33 0.00		
	Direction	SB + EB SB + WB	0	0	3	3	43%	1.00		
		SB + WB Unknown	0	0	0	0	0% 0%	0.00		
				ER OF CR YEAR		3 YEAR TOTAL	% of	MEAN Accidents	Possible Cause(s)	Counter- measure(s
	Total Left Tu	n Crashes	2006 2	2007 2	2008	CRASHE 6	Total 100%	per Year 2.00	(4)	6
	Lighting Conditions	Day Light Dawn	1	2	0	3	50% 0%	1.00 0.00	(13)	13
		Dark 00:00 - 06:00	1	0	2	3	50%	1.00		
		06:00 - 09:00	0	0	0	0	0% 0%	0.00		
Left Turn	Hours of Day	09:00 - 11:00 11:00 - 13:00	1	0	0	1 2	17% 33%	0.33 0.67		
Lett Turn		13:00 - 15:00	0	0	0	0	0% 17%	0.00		
		18:00 - 24:00	1	0	1	2	33%	0.67		
		18:00 - 24:00 $NB \rightarrow WB$ $WB \rightarrow SB$	2	0 2 0	2	6	100%	2.00 0.00		
	Direction	$NB \rightarrow WB$	2	2	2	6	100%	2.00		
	Direction	$NB \rightarrow WB$ $WB \rightarrow SB$ $SB \rightarrow EB$	2 0 0	2 0 0	2 0 0	6 0 0	100% 0% 0%	2.00 0.00 0.00		
	Direction	$\begin{array}{c} NB \rightarrow WB \\ WB \rightarrow SB \\ SB \rightarrow EB \\ EB \rightarrow NB \end{array}$	2 0 0 0	2 0 0 0	2 0 0 0	6 0 0 0	100% 0% 0% 0%	2.00 0.00 0.00 0.00 0.00	Pageible	Counter
	Direction	$\begin{array}{c} NB \rightarrow WB \\ WB \rightarrow SB \\ SB \rightarrow EB \\ EB \rightarrow NB \end{array}$	2 0 0 0 0	2 0 0 0 ER OF CR	2 0 0 0 0 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	6 0 0 0 3 YEAR TOTAL	100% 0% 0% 0% 0%	2.00 0.00 0.00 0.00 0.00 MEAN Accidents	Possible Cause(s)	Counter- measure(s
	Direction	NB → WB WB → SB SB → EB EB → NB Unknown	2 0 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 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 8 ASHES 2008 4	6 0 0 0 3 YEAR TOTAL CRASHE 13	100% 0% 0% 0% 0% 0% 0% 0%	2.00 0.00 0.00 0.00 0.00 MEAN Accidents per Year 4.33	(8)	measure(s
		NB → WB WB → SB SB → EB EB → NB Unknown pe Crashes DayLight Dawn	2 0 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 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 ASHES 2008 4 3 1	6 0 0 0 3 YEAR TOTAL CRASHE 13 12 1	100% 0% 0% 0% 0% of Total 100% 92% 8%	2.00 0.00 0.00 0.00 0.00 MEAN Accidents per Year 4.33 4.00 0.33	(8) (18) (19)	measure(s
	Total Sideswi	NB → WB WB → SB SB → EB EB → NB Unknown Unknown Day Light	2 0 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 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 8 ASHES 2008 4	6 0 0 0 3 YEAR TOTAL CRASHE 13 12	100% 0% 0% 0% 0% 0% 0% 100% 92% 8% 0% 0%	2.00 0.00 0.00 0.00 MEAN Accidents per Year 4.33 4.00	(8) (18)	measure(s 19 21
_	Total Sideswi	NB → WB SB → EB SB → EB EB → NB Unknown Day DayLight Dawn Dark 00:00 - 06:00 06:00 - 09:00	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 ER OF CF YEAR 2007 4 4 0 0 0 2	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 3 YEAR TOTAL CRASHE 13 12 1 0	100% 0% 0% 0% 0% 0% 0% 5 7 7 7 7 7 7 7 7 7 7	2.00 0.00 0.00 0.00 Accidents per Year 4.33 4.00 0.33 0.00 0.67	(8) (18) (19) (20)	measure(s 19 21
Sideswips	Total Sideswi	NB → WB WB → SB SB → EB EB → NB Unknown DayLight Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 ER OF CR YEAR 2007 4 4 4 0 0 0 0 2 0 0 1	2 0 0 0 0 0 0 0 2008 4 3 1 0 0 0 0 0 0 0 0	6 0 0 0 3 YEAR TOTAL CRASHE 13 12 1 0 0 2 2 1	100% 0% 0% 0% 0% 0% 0% 0% 100% 92% 8% 0% 0% 15% 15% 8%	2.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.33 0.00 0.67 0.67 0.33	(8) (18) (19) (20)	measure(s 19 21
Sideswipe (Overtake)	Total Sideswi	NB → WB WB → SB SB → EB EB EB → NB Unknown Unknown DayLight Dawn Dawn Dark 00.90 - 06.00 06.90 - 09.90 11.90 11.300 - 11.300 11.300 11.500 - 115.00 115.00	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 7 7 7 8 7 8 7 8 7 7 8 7 8 7 7 8 7 8	2 0 0 0 2 2008 4 3 1 0 0 0 0 0 0 0 0 2	6 0 0 0 0 3 YEAR TOTAL CRASHE 13 12 1 2 0 0 0 2 2 1 1 1 4	100% 0% 0% 0% 0% 0% 0% 100% 92% 8% 0% 15% 8% 8% 8% 31%	2.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	(8) (18) (19) (20)	measure(s 19 21
	Total Sideswi	NB → WB WB → SB SB → EB EB → NB Unknown DayLight Dawn Dark 00:00 - 06:00 06:30 - 09:30 09:30 - 11:30 11:30 - 13:50	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 ER OF CR 2007 4 4 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 0 0 0 0 0 0 0 0 0	6 0 0 0 3 YEAR TOTAL CRASHE 12 1 1 0 0 2 2 1 1	100% 0% 0% 0% 0% 0% 0% 100% 92% 8% 0% 0% 15% 15% 8%	2:00 0:00 0:00 0:00 0:00 0:00 0:00 0:00 0:00 0:00 0:00 0:00 0:07 0:33 0:33	(8) (18) (19) (20)	measure(s 19 21
	Total Sideswi	NB → WB WB WB SB → EB SB → CB	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 0 3 YEAR TOTAL CRASHE 13 12 1 0 0 0 2 2 2 1 1 4 4 3 6 4	100% 0% 0% 0% 0% 10% 92% 8% 92% 8% 92% 8% 8% 15% 15% 15% 15% 15% 31% 23%	2.00 0.00 0.00 0.00 0.00 0.00 MEAN Accidents per Year 4.33 4.00 0.03 0.00 0.00 0.67 0.67 0.67 0.33 1.33 1.00 1.00	(8) (18) (19) (20)	measure(s 19 21
	Total Sideswi Lighting Conditions Hours of Day	NB → WB WB → SB SB → EB EB → NB Unknown DayLight Dawn Dog 0.0 06 00 00 900 - 01300 11 300 - 1300 15 300 - 18:00 North South East West	2 0 1 1 0	2 0 0 0 0 0 0 7 7 8 0 7 4 4 0 0 0 0 0 0 0 0 1 0 0 0 1 1 0 0 0 1 1 0 0 0 0 0 1 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 0 3 YEAR TOTAL CRASHE 13 12 1 0 0 0 2 2 1 1 1 4 4 3 6 6 4 3 0	100% 0% 0% 0% 0% 0% 100% 92% 8% 8% 8% 8% 8% 8% 8% 8% 8% 8% 31% 23% 46% 31% 23%	2.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	(8) (18) (19) (20)	measure(s 19 21
	Total Sideswi Lighting Conditions Hours of Day	NB → WB WB → SB SB → EB EB → NB Unknown Day Light Dawn Dawn Dawn Dawn Dar 10:00 00:00 - 00:00 D6:00 - 00:00 00:00 - 00:00 D6:00 - 00:00 10:00 - 11:00 Display 11:00 <	2 0 0 0 0 0 0 2006 5 5 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 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 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 0 3 YEAR TOTAL CRASHE 12 1 1 1 0 0 0 2 2 1 1 1 1 1 1 0 0 2 2 1 1 1 1	100% 0% 0% 0% 0% 0% 1% 100% 92% 8% 0% 0% 0% 0% 0% 0% 0% 31% 8% 31% 31% 23%	2.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	(8) (18) (19) (20)	measure(s 19 21
	Total Sideswi Lighting Conditions Hours of Day	NB → WB WB → SB SB → EB EB → NB Unknown DayLight Dawn Dog 0.0 06 00 00 900 - 01300 11 300 - 1300 15 300 - 18:00 North South East West	2 0 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 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 0 3 YEAR TOTAL CRASHE 13 12 1 0 0 2 2 1 1 0 0 2 2 1 1 1 4 3 6 4 4 3 0 0 0 3 YEAR	100% 0% 0% 0% 0% of Total 100% 92% 8% 92% 8% 15% 15% 15% 8% 23% 23% 0% 0%	2.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	(8) (18) (19) (20)	measure(s 19 21
	Total Sideswi Lighting Conditions Hours of Day Direction	NB → WB WB → SB SB → EB EB → NB Unknown Day Light Dawn Dawn Dawn Dawn 1300-01100 15,00-115,00 15,00-115,00 15,00-24,90 North South East West Unknown	2 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 0 3 YEAR TOTAL CRASHE 13 12 1 1 0 0 2 2 1 1 1 1 0 0 2 2 1 1 4 3 6 6 4 3 0 0 0 3 YEAR 7 7 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	100% 0% 0% 0% 0% 0% 0% 10% 92% 92% 92% 92% 15% 15% 15% 15% 15% 15% 15% 15% 15% 23% 0% 0% 0%	2.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Cause(s) (8) (19) (20) (21) (21) Possible Cause(s)	Counter- measure(s
	Total Sideswi Lighting Conditions Hours of Day Direction	NB → WB WB → SB SB → EB EB → NB Unknown Day Light Dawn Unknown	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 0 0 0 0 7 7 7 8 7 7 8 7 7 7 7 7 7 7 7 7	2 0 0 0 0 0 0 3 1 1 0 0 0 0 0 0 0 0 0 0 0	6 0 0 0 3 YEAR TOTAL CRASHE 12 12 12 0 0 0 2 2 1 1 1 0 0 0 2 2 1 1 1 4 3 6 6 4 3 0 0 0 0 0 2 2 1 1 1 4 5 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7	100% 0% 0% 0% 0% of Total 100% 92% 8% 8% 8% 8% 8% 8% 8% 8% 31% 23% 8% 8% 8% 0% 0% 0% 0% 0%	2.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Cause(s) (8) (18) (19) (20) (21) (21) Possible	neasure(s
	Total Sideswi Lighting Conditions Hours of Day Direction	NB → WB WB → SB SB → LB SB → LB EB → NB WB Junknown Junknown DayLight Dawn Dawn Junknown Jark 00.00 - 06.00 09.00 - 11.00 11.00 11.300 - 13.00 15.00 15.00 - 18.00 IS.00-24.00 North South East West Unknown Junknown	2 0 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 7 2007 4 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 0 3 YEAR TOTAL CRASHE 12 1 1 0 0 0 2 2 1 1 1 4 3 6 6 4 3 0 0 0 0 0 3 YEAR 12 12 12 12 1 0 0 0 2 1 1 1 1 1 1 1 1 1	100% 0% 0% 0% 0% 0% 0% 100% 92% 8% 0% 15% 8% 0% 15% 8% 0% 15% 8% 31% 23% 46% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	2.00 0.00 0.00 0.00 0.00 MEAN Accidents 4.33 0.00 0.67 0.67 0.00 0.67 0.33 1.33 1.00 0.00 0.67 0.00 0.00 0.67 0.00 0.00 0	Cause(s) (8) (19) (20) (21) (21) Possible Cause(s) (1)	Counter- measure(s 22
	Total Sideswi Lighting Conditions Hours of Day Direction	NB → WB WB → SB SB → EB EB → NB Unknown DayLight Dawn Dog 00:00:09:00 00:00:00:09:00 00:00:00:10:00 11:300-11:300 11:300-11:500 Dayt Light Dawn Dawn Dark 00:500-66:00	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 2007 2 0 0 0 0 0 1 0 1 0 0 1 0 0 0 1 0 0 1 1 0 0 1 1 1 1 1 1 1 0	2 2 0 0 0 0 0 0 0 2 2 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 0 CRASHE 13 12 10 0 2 2 2 1 1 1 0 0 2 2 2 1 1 1 4 3 6 6 4 4 3 0 0 0 2 2 2 1 1 1 1 1 3 1 1 2 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	100% 0% 0% 0% 0% 0% 0% 100% 8% 0% 100% 15% 8% 8% 0% 15% 8% 8% 0% 15% 8% 31% 23% 46% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	2.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Cause(s) (8) (19) (20) (21) (21) Possible Cause(s) (1)	Counter- measure(s 22
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(Overtake)	Total Sideswi Lighting Conditions Hours of Day Direction Total Right Tr Lighting Conditions Hours of Day	NB → WB WB → SB SB → EB EB → NB SB → EB EB → NB Unknown DayLight Dawn Dawn Dawn Dawn 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South East West Unknown Dark 00:00 - 00:00 13:00 - 15:00 18:00 - 24:00 Narh Dawn Dark 00:00 - 00:00 13:00 - 15:00 11:00 13:00 - 15:00 11:00 13:00 - 15:00 11:00 13:00 - 15:00 11:00 13:00 - 15:00 11:00 13:00 - 15:00 11:00 15:00 - 18:00 11:00 15:00 - 18:00 11:00 15:00 - 18:00 11:00 15:00 - 18:00 11:00 15:00 - 18:00 11:00	2 0 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 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 0 0 0 0 0 0 0 0 0 0 12 13 12 13 0 2 1 1 1 0 1 <td>100% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%</td> <td>2.00 0.00 0.00 0.00 0.00 MEAN Accidents per Year 4.33 0.00 0.67 0.67 0.67 0.67 0.33 1.00 0.67 1.33 1.00 0.00 0.67 1.33 1.00 0.00 0.00 0.00 0.00 0.00 0.00</td> <td>Cause(s) (8) (19) (20) (21) (21) Possible Cause(s) (1)</td> <td>Counter- measure(s 22</td>	100% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	2.00 0.00 0.00 0.00 0.00 MEAN Accidents per Year 4.33 0.00 0.67 0.67 0.67 0.67 0.33 1.00 0.67 1.33 1.00 0.00 0.67 1.33 1.00 0.00 0.00 0.00 0.00 0.00 0.00	Cause(s) (8) (19) (20) (21) (21) Possible Cause(s) (1)	Counter- measure(s 22
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(Overtake)	Total Sideswi Lighting Conditions Hours of Day Direction Total Right Tr Lighting Conditions Hours of Day	NB → WB WB → SB SB → EB EB → NB Junknown Junknown Day Light Dawn Jark Op 0: 06:00 Bit Jark Op 0: 06:00 Bit Jark Op 0: 06:00 Bit Jark Jark Op 0: 06:00 Bit Jark Jark Jark Jark Jark Jark Jark Jark<	2 0 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 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 3 YEAR 3 YEAR 3 YEAR 3 YEAR 3 YEAR 3 YEAR 3 YEAR	100% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	2.00 0.00 0.00 0.00 MEAN Accidents or Year 4.33 0.00 0.67 0.67 0.33 0.00 0.67 1.33 1.30 1.00 0.00 1.33 1.00 0.00 1.33 1.00 0.00 0	Cause(s) (8) (10) (20) (21) (21) (21) (21) (21) (21) (21) (21	Counter- measure(s 21 22 22 33 21 3 21
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(Overtake)	Total Sideswi Lighting Conditions Hours of Day Direction Lighting Conditions Hours of Day Direction Total Fixed Ob Total Fixed Ob	NB → WB WB → SB SB → EB EB → NB Day Light Dawn Bawn Dawn Dawn Bawn Dawn Bis00 - 24:00 NB - 450 Bis00 - 24:00 NB - 450 Bis00 - 24:00 NB - 550 WB - 580 WB - 880 Wes - NB SB - WB Dawn	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 0 0 0 0 3 YEAR 12 1 0 0 2 1 1 0 0 2 1 1 0 0 2 1 1 0 0 0 0	1007% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	2.00 0.00 0.00 0.00 MEAN Accidents per Year 4.33 0.00 0.67 0.67 0.67 0.67 0.67 1.33 1.00 0.67 1.33 1.00 0.00 0.67 1.33 1.00 0.00 0.00 0.00 0.00 0.00 0.00	Cause(s) (8) (18) (20) (21) (21) (21) (21) (21) (21) (2) (2) (2) (2) (2) (2) (2) (2	Counter-measure(s 19 21 22 31 21 21
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3.15.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 117 Avenue and SW 120 Street were performed on a typical weekday on November 17, 2010. A summary of the traffic data is presented in *Figure 59*, and the field review is presented in *Figure 60*.

This T-intersection has double left-turn lanes for northbound and eastbound approaches, and the southbound and eastbound approaches have exclusive right-turn lanes. The signal operation is protected for northbound left-turn traffic.

Heavy traffic and long queues were observed for eastbound approach and northbound leftturn traffic. Also, vehicles were observed changing lanes and weaving at these approaches.

Red light running was observed at the intersection, especially northbound left-turns.

Speeding was observed for northbound and southbound approaches. Additionally, southbound right-turn vehicles were observed taking the curve at a high rate of speed.

Further, it was observed that the eastbound right-turn traffic conflict with the southbound through traffic and a better channelization needs to be implemented.

3.15.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 117 Avenue and SW 120 Street, the following is recommended:

- Lengthen the eastbound left-turn lanes to approximately 600 ft. each.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Installing lane use signs (R3-8) for all approaches.
- Modifying the channelization of the eastbound right-turns.
- Provide/repair the pedestrian features including ADA approved pedestrian ramps.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 61.





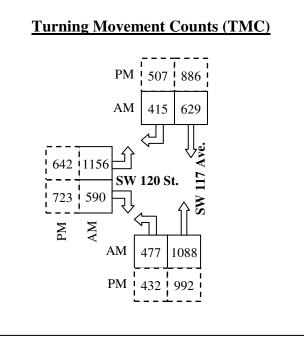


Figure 59: Traffic Data – SW 117 Avenue and SW 120 Street



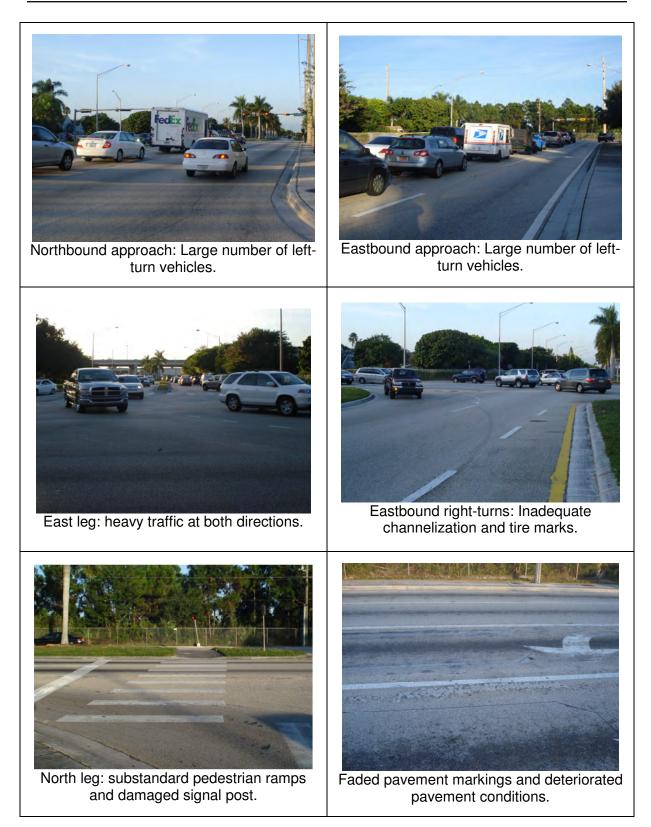


Figure 60: Field Review – SW 117 Avenue and SW 120 Street



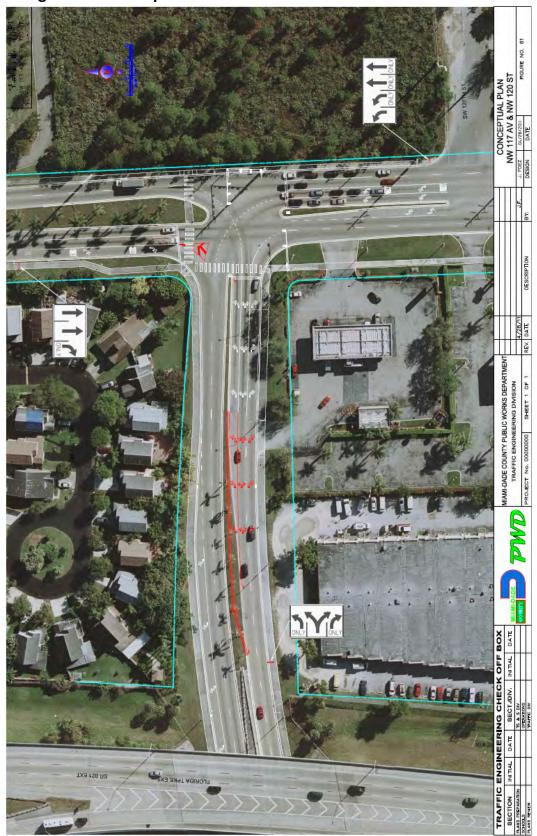


Figure 61: Conceptual Plan – SW 117 Avenue and SW 120 Street

Safety Studies at High Crash Locations Countywide



3.16. SW 137 Avenue and SW 136 Street

3.16.1. Site Description

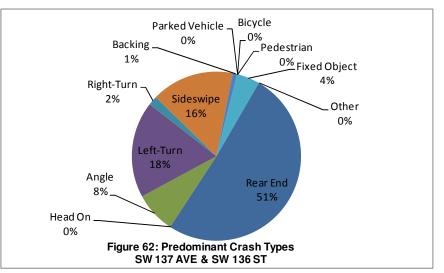
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 137 Avenue is a six lane urban arterial divided by a raised median that runs north-south, and SW 136 Street is a four lane major collector divided by a raised median that runs east-west.

3.16.2. Safety Conditions and Analysis

The intersection of SW 137 Avenue and SW 136 Street is ranked number 16 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 114 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 38. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 62*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 36* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.353, 1.648, and 1.795, respectively. The safety ratio for the three years averaged 1.599. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that rear end, left-turn and sideswipe collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 37*.



		(6 Lane	x 4 Lane.				4 Leg Inters		e 35) - URBAN	N Spot			
	[R OF CF		3 YEAR	%	MEAN			ASH VALUE	ABNORM	ALLY HIGH	CRASHES
	TYPE OF CRASH	2006	YEAR 2007	2008	TOTAL	of Total	Accidents	MEAN	90th Percentile	95th Percentile	Mean	90th Percentil	95th Percenti
	Rear End	18	20	20	58	25%	19.33	8.68	17.26	18.90	Х	X	X
	Head On	0	0	0	0	0%	0.00	0.60	1.64	1.84			
	Angle	2	1 7	6	9 21	3% 8%	3.00 7.00	5.40 3.00	9.19 6.13	9.92 6.73	x	x	x
	Left Turn Right Turn	2	0	8 0	21	8% 1%	0.67	0.46	1.36	1.53	X	<u>^</u>	^
	Sideswipe	2	8	8	18	5%	6.00	2.58	4.92	5.37	X	X	x
	Backed Into	1	0	0	1	0%	0.33	0.28	0.84	0.94	X		
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.12	0.57	0.65			
	Coll. w/ Pedestrian	0	0	0	0	0%	0.00	0.74	1.80	2.00			
	Coll. w/ Bicycle	0	0	0	0	0%	0.00	0.14	0.49	0.55			
	Fixed Object Ran Off Road	1	3	1	5	1% 0%	1.67 0.00	0.79 0.01	2.01 0.11	2.24 0.13	X		
	Overtuned	0	0	0	0	0%	0.00	0.01	0.28	0.33			
	Other	0	0	0	0 0	0%	0.00	8.67	21.05	23.42			
	Total Crashes	32	39	43	114	24%	38.00	31.51	54.94	59.43	Х		
SEVERITY	PDO crashes	30	38	41	109	96%	36.33	19.21	36.95	40.35	Х		
	Fatal crashes	0	0	0	0	0%	0.00	0.16	0.56	0.63			
	Injury crashes	2	1	2	5	4%	1.67	20.77	38.34	41.71		I	ļ
	Day Light	26	33	31	90	79%	30.00	19.89	35.12	38.03	х		
	Dusk Dawn	1	0	0	1	1% 3%	0.33	0.61 0.38	1.43	1.58 1.16	x	<u> </u>	
	Dawn Dark	5	6	9	20	18%	6.67	10.22	18.94	20.61	^	<u> </u>	
	Unknown	0	0	0	0	0%	0.07	0.41	1.15	1.30		1	
URFACE CONDITIONS		26	35	41	102	89%	34.00	26.41	45.71	49.41	х	1	
-	Wet	2	4	2	8	7%	2.67	4.41	8.78	9.62			
	Others	4	0	0	4	4%	1.33	0.69	1.88	2.11	X		
MONTH OF A YEAR	January	3	3	4	10	9%	3.33	2.57	5.04	5.52	X		
	February	2	6	6	14	12%	4.67	2.37	4.59	5.02	X	X	
	March April	03	5	1 4	2 12	2% 11%	0.67 4.00	3.09 2.57	5.92 5.30	6.46 5.82	x		
	May	4	2	5	11	10%	3.67	2.51.	4.81	5.25	^		
	June	2	4	7	13	11%	4.33	2.81	5.74	6.30	х		
	July	2	2	2	6	5%	2.00	2.60	4.96	5.42			
	August	3	4	5	12	11%	4.00	3.00	5.66	6.17	X		
	September	3	3	0	6	5%	2.00	2.48	4.92	5.39			
	October	5	4	3	12	11%	4.00	2.89	5.40	5.88	X		
	November	5	3	3	11	10%	3.67	2.41	4.85	5.32	X		
DAY OF THE WEEK	December Sunday	0	2	3 5	5	4% 6%	1.67 2.33	2.22 4.00	4.55 6.58	5.00 7.08			
	Monday	1	6	6	13	11%	4.33	4.62	9.23	10.11			
	Tuesday	6	8	5	19	17%	6.33	4.46	7.81	8.46	х		
	Wednesday	10	5	5	20	18%	6.67	4.56	8.62	9.40	Х		
	Thursday	6	6	7	19	17%	6.33	5.04	9.04	9.80	X		
	Friday	7	7	9	23	20%	7.67	4.86	9.39	10.26	Х		
	Saturday	1	6	6	13	11%	4.33	3.98	8.10	8.89	Х		
	00:00-06:00 06:00-09:00	0	1	1	2 15	2% 13%	0.67 5.00	3.79 3.44	8.65 6.94	9.58	x		
	09:00-11:00	5	6 5	5	13	11%	4.33	2.58	5.30	7.61 5.82	X		
	11:00-13:00	6	7	8	21	18%	7.00	3.12	5.78	6.29	x	x	x
	13:00-15:00	5	4	8	17	15%	5.67	3.57	6.32	6.85	X	~	~
	15:00-18:00	6	8	7	21	18%	7.00	6.38	11.52	12.50	X		
	18:00-24:00	6	8	11	25	22%	8.33	8.60	15.51	16.83			
						YEAR		3-Year	1				
						2	3						
					1	-		Average	-				
Average Daily Traffic A	DT (Vehicles per D	lay)			55,981	57,123	58,289	57,131	1				
-lorida Average Crash	rate (Crashes per	Million En	tering Ve	hicles)	0.579	0.568	0.566	0.571	1				
Fraffic Base					20.433	20.850	21.275	20.853	1				
									4				
Actual Crash Rate (Cra		-	,		1.566	1.871	2.021	1.819	4				
Critical Crash Rate (Cr	rashes per Million E	Entering V	ehicles)		1.157	1.135	1.126	1.139	1				
Safety Ratio					1.353	1.648	1.795	1.599	1				
High Crash Location	22				YES	YES	YES	YES	1				
Actual Crash F		0 ,000				f crashes	or number o		type occurrin	ng in a 1 year	period.		
	$ute = AVR + \frac{0.5}{TB} + \frac{0.5}{TB}$	112	2	<i>TB</i> = Tr <i>TF</i> = Te	affic Base st Factor (z	z-value)		a particular el for RURAL		Confidence 1 68.3 86.6	Level (%)	nt. Constant Z 1.00 1.50]
	$\frac{Years \times ADT \times 3}{1,000,000}$ $= \frac{Actual Crash}{Critical Crash}$		_	= 3.	29 (assume	99.95% (Confidence I	Level for URE	BAN areas)	90.0 95.0 95.5 98.8 99.0	0 0 0 0 0	1.64 1.96 2.00 2.50 2.58	
зајегу Кино -	Critical Cras	h Rate								99.7 99.9	0	3.00 3.29	

Table 36 – Crash Analysis – SW 137 Avenue and SW 136 Street



Table 37 – Abnormal Crash Details & Countermeasures SW 137 Avenue and SW 136 Street

						treet				
	(6 Lane x 4 L	ane, Signalized, W	ith Turn La	anes, 4 Le	eg Interse	ction -Table	e 35) - URI	BAN Spot		
			NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN		
				YEAR		TOTAL	of	Accidents	Possible	Counter-
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Rear Er	nd Crashes	18	2007	2000	58	100%	19.33	(1)	2
	Total Hoar El	Day Light	16	16	15	47	81%	15.67	(2)	5
	Lighting Conditions	Dawn	0	0	2	2	3%	0.67	(4)	6
	Lighting Conditions	Dark	2	4	3	9	16%	3.00	(4)	0
		00:00 - 06:00	0	0	0	0	0%	0.00	(0)	
		06:00 - 09:00	1	6	1	8	14%	2.67		
		09:00 - 11:00	4	0	2	6	10%	2.07		
	Hours of Day	11:00 - 13:00	3	2	4	9	16%	3.00		
Rear End	Tiours of Day	13:00 - 15:00	3	3	6	9 12	21%	4.00		
					3	12				
		15:00 - 18:00	4	5			21%	4.00		
		18:00 - 24:00	3	4	4	11	19%	3.67		
		North	9	6	5	20	34%	6.67		
	Discotion	South	5	8	8	21	36%	7.00		
	Direction	East	3	3	3	9	16%	3.00		
		West	1	3	4	8	14%	2.67		
		Unknown	0	0	0	0	0%	0.00		
			NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN	Possible	Counter-
				YEAR		TOTAL	of	Accidents		
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Left tur	n Crashes	6	7	8	21	100%	7.00	(4)	6
		Day Light	4	7	5	16	76%	5.33	(9)	13
	Lighting Conditions	Dawn	0	0	2	2	10%	0.67	(13)	-
		Dark	2	0	1	3	14%	1.00	(,	
	 	00:00 - 06:00	0	0	0	0	0%	0.00		
		06:00 - 09:00	1	0	2	3	14%	1.00		
		09:00 - 11:00	0	3	1	4	19%	1.33		
	Hours of Day	11:00 - 13:00	1	3	0	4	19%	1.33		
Left Turn		13:00 - 15:00	2	0	0	2	10%	0.67		
		15:00 - 18:00	0	1	1	2	10%	0.67		
		18:00 - 24:00	2	0	4	6	29%	2.00		
		$NB \rightarrow WB$	3	0	5	8	38%	2.67		
			0	0	0	0	0%	0.00		
	Direction	$WB \to SB$ $SB \to EB$	3	5	2	10	48%	3.33		
	Direction	-								
		$EB \rightarrow NB$	0	2	1	3	14%	1.00		
		Unknown	0	0	0	0	0%	0.00		
			NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN	Possible	Counter-
				YEAR		TOTAL	of	Accidents	Cause(s)	
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	T-t-LO'-L	na Craabaa	2	8	8	18	100%	6.00	(8)	19
	Total Sideswi		4		0	10				21
			2	7	5	14	78%	4.67	(18)	
		Day Light Dawn		7	F	4.4	78%	4.67 0.00	(18) (19)	22
		Day Light Dawn	2	7	5 0	14	78% 0%	0.00	(19)	
		Day Light Dawn Dark	2 0 0	7 0 1	5 0 3	14 0 4	78% 0% 22%	0.00 1.33		
		Day Light Dawn Dark 00:00 - 06:00	2 0 0 0	7 0 1 0	5 0 3 1	14 0 4 1	78% 0% 22% 6%	0.00 1.33 0.33	(19)	
		Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00	2 0 0 0 1	7 0 1 0 0	5 0 3 1 0	14 0 4 1 1	78% 0% 22% 6% 6%	0.00 1.33 0.33 0.33	(19)	
Sideswipe	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00	2 0 0 0 1 0	7 0 1 0 0 1	5 0 3 1 0 1	14 0 4 1 1 2	78% 0% 22% 6% 6% 11%	0.00 1.33 0.33 0.33 0.67	(19)	
Sideswipe (Overtake)		Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00	2 0 0 1 1 0 1	7 0 1 0 0 1 1	5 0 3 1 0 1 0	14 0 4 1 2 2	78% 0% 22% 6% 6% 11% 11%	0.00 1.33 0.33 0.33 0.67 0.67	(19)	
Sideswipe (Overtake)	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00	2 0 0 1 0 1 0 1 0	7 0 1 0 0 1 1 1 1	5 0 3 1 0 1 0 2	14 0 4 1 2 2 3	78% 0% 22% 6% 6% 11% 11% 11%	0.00 1.33 0.33 0.67 0.67 1.00	(19)	
	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 09:00 11:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00	2 0 0 1 0 1 0 0 0 0	7 0 1 0 0 1 1 1 2	5 0 3 1 0 1 0 2 2 2	14 0 4 1 2 2 3 4	78% 0% 22% 6% 6% 11% 11% 11% 22%	0.00 1.33 0.33 0.67 0.67 1.00 1.33	(19)	
	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 09:00 11:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00	2 0 0 1 0 1 0 0 0 0 0	7 0 1 0 1 1 1 2 3	5 0 3 1 0 1 0 2 2 2 2	14 0 4 1 2 2 3 4 5	78% 0% 22% 6% 6% 11% 11% 17% 22% 28%	0.00 1.33 0.33 0.67 0.67 1.00 1.33 1.67	(19)	
	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 09:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North	2 0 0 1 0 1 0 0 0 0 0	7 0 1 0 1 1 1 2 3 3	5 0 3 1 0 1 2 2 2 2 3	14 0 4 1 2 2 3 4 5 6	78% 0% 22% 6% 11% 11% 22% 28% 33%	0.00 1.33 0.33 0.67 0.67 1.00 1.33 1.67 2.00	(19)	
	Lighting Conditions Hours of Day	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South	2 0 0 1 0 1 0 0 0 0 0 0 0	7 0 1 0 1 1 1 2 3 3 3 3	5 0 3 1 0 2 2 2 3 1	14 0 4 1 2 3 4 5 6 4	78% 0% 22% 6% 11% 11% 22% 28% 33% 22%	0.00 1.33 0.33 0.67 0.67 1.00 1.33 1.67 2.00 1.33	(19)	
	Lighting Conditions	Day Light Dawn Dark 00:00 - 06:00 06:00 - 09:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 24:00 North South East	2 0 0 1 0 1 0 0 0 0 0 0 2	7 0 1 0 1 1 1 2 3 3 3 2	5 0 3 1 0 1 2 2 2 2 3 1 3	14 0 4 1 2 2 3 4 5 6 4 7	78% 0% 22% 6% 6% 11% 11% 17% 22% 28% 33% 22% 39%	0.00 1.33 0.33 0.67 0.67 1.00 1.33 1.67 2.00 1.33 2.33	(19)	
	Lighting Conditions Hours of Day	Day Light Dawn Dark 00:00 - 06:00 09:00 - 11:00 11:00 - 13:00 13:00 - 15:00 15:00 - 18:00 18:00 - 24:00 North South	2 0 0 1 0 1 0 0 0 0 0 0 0	7 0 1 0 1 1 1 2 3 3 3 3	5 0 3 1 0 2 2 2 3 1	14 0 4 1 2 3 4 5 6 4	78% 0% 22% 6% 11% 11% 22% 28% 33% 22%	0.00 1.33 0.33 0.67 0.67 1.00 1.33 1.67 2.00 1.33	(19)	



3.16.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 137 Avenue and SW 136 Street were performed on a typical weekday on November 18, 2010. A summary of the traffic data is presented in *Figure 63*, and the field review is presented in *Figure 64*.

This intersection has single left-turn bays for northbound/southbound approaches, and the eastbound/westbound approaches have double left-turn lanes. The signal operation is split phases for eastbound and westbound traffic, and protected/permissive for northbound and southbound left-turn traffic.

Heavy traffic and long queues were observed for northbound and southbound approaches and eastbound/westbound left-turn traffic. Also, vehicles were observed changing lanes and weaving at these approaches.

This intersection presents a large offset alignment between northbound and southbound leftturn lanes. The northbound/southbound left-turn movement struggles to cross the opposing through movement.

Long queues were observed for westbound left-turn with vehicles spilling back and blocking the through lane. Speeding was observed for northbound and southbound approaches, and red light running was observed at the intersection.

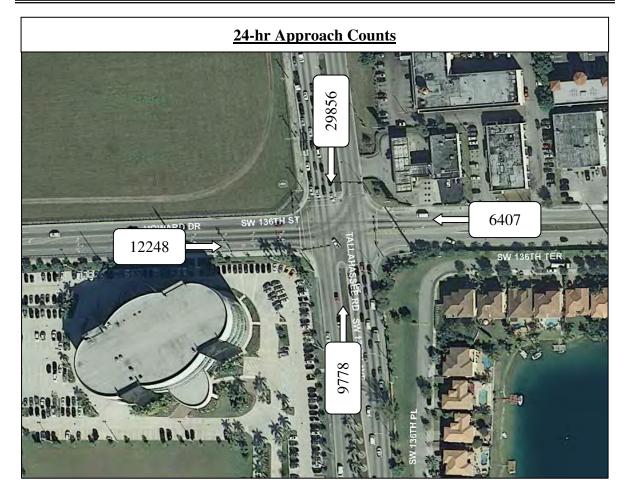
3.16.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 137 Avenue and SW 136 Street, the following is recommended:

- Lengthen the westbound left-turn lane to 300 ft. and provide raised median.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Reduce the offset between northbound and southbound left turn lanes by reducing the median width and creating striped gores.
- Add pedestrian crosswalks, ADA approved pedestrian ramps and signal heads at east and south legs.
- Resurfacing the intersection.
- Refurbishing of pavement markings using thermoplastic painting.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 65.





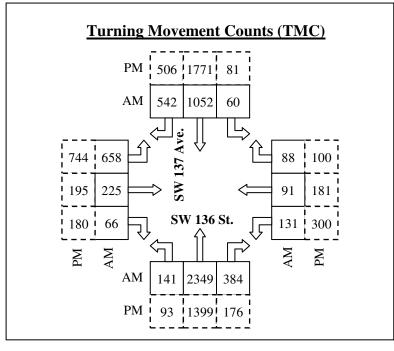


Figure 63: Traffic Data – SW 137 Avenue and SW 136 Street





Figure 64: Field Review – SW 137 Avenue and SW 136 Street



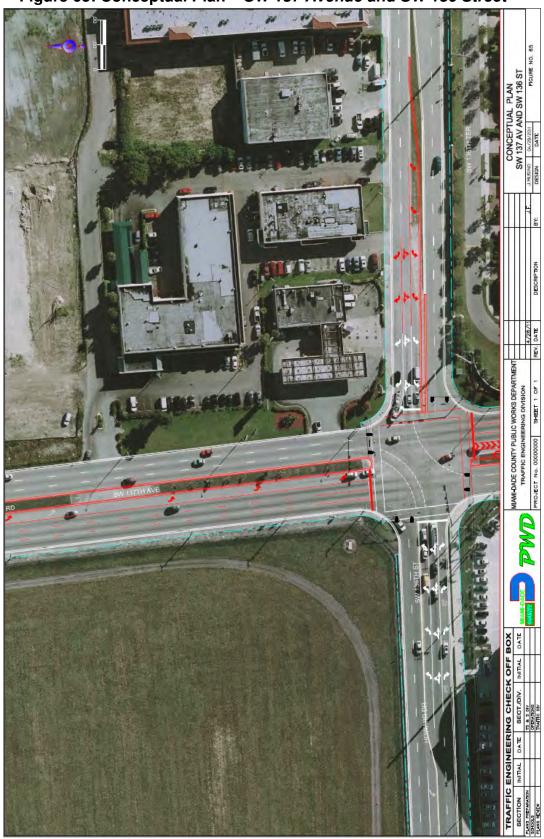


Figure 65: Conceptual Plan – SW 137 Avenue and SW 136 Street



3.17. SW 97 Avenue and SW 24 Street

3.17.1. Site Description

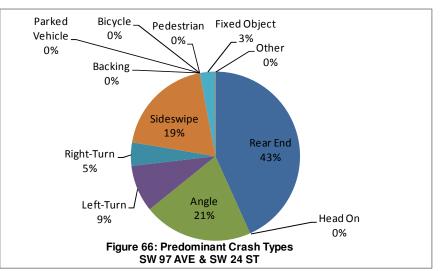
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 97 Avenue is a four lane urban arterial divided by a paved median that runs north-south, and SW 24 Street is a four lane urban arterial divided by a raised median that runs east-west.

3.17.2. Safety Conditions and Analysis

The intersection of SW 97 Avenue and SW 24 Street is ranked number 17 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 67 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 22. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 66*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 38* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 0.896, 1.135, and 1.500, respectively. The safety ratio for the three years averaged 1.177. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that fixed object collisions presented abnormal crash pattern that exceeds the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 39*.



		(4) or :-	v 4 lors				SW 24 S		28) - URBAN	Spot			
	TYPE OF CRASH	NUMBE	R OF CF	ASHES	3 YEAR TOTAL	% of	MEAN Accidents		ANNUAL CF	ASH VALUE 95th	ABNORM Mean	ALLY HIGH 90th	CRASHES 95th
		2006	2007	2008	CRASHE	Total	per Year			Percentile		Percentil	Percenti
OLLISION TYPE	Rear End Head On	7	12	10 0	29 0	22% 0%	9.67 0.00	5.70 0.33	16.96 1.02	19.12 1.15	Х		
	Angle	2	0	5	14	9%	4.67	3.05	7.08	7.85	х		
	Left Turn	1	1	4	6	4%	2.00	1.67	4.02	4.47	X		
	Right Turn	0	1	2	3	2%	1.00	0.33	1.25	1.42	X	1	
	Sideswipe	6	1	6	13	7%	4.33	1.60	4.64	5.22	Х		
	Backed Into	0	0	0	0	0%	0.00	0.17	0.56	0.63			
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.10	0.51	0.59			
	Coll. w/ Pedestrian Coll. w/ Bicycle	0	0	0	0	0% 0%	0.00	0.28	1.04 0.33	1.19			
	Fixed Object	1	0	1	2	1%	0.00	0.09	0.33	0.38	x	x	x
	Ran Off Road	0	0	0	0	0%	0.00	0.00	0.00	0.00	~	^	~
	Overtuned	0	0	0	0	0%	0.00	0.03	0.21	0.24			
	Other	0	0	0	0	0%	0.00	3.70	8.83	9.82			
	Total Crashes	17	22	28	67	24%	22.33	17.77	40.96	45.39	X		
EVERITY	PDO crashes	16	17	24	57	85%	19.00	9.93	22.30	24.67	X		
	Fatal crashes	0	0	0	0	0% 15%	0.00	0.05	0.26 33.08	0.29			
IGHT CONDITIONS	Injury crashes	13	5 13	4 22	10 48	72%	3.33 16.00	13.14 12.40	29.18	36.90 32.39	х	-	
	Day Light Dusk	0	0	0	40	0%	0.00	0.28	0.87	0.98	^	+	
	Dawn	0	0	0	0	0%	0.00	0.17	0.56	0.63		1	
	Dark	4	9	6	19	28%	6.33	4.56	10.53	11.68	Х		
	Unknown	0	0	0	0	0%	0.00	0.35	1.05	1.18			
URFACE CONDITIONS		12	16	18	46	69%	15.33	15.30	34.45	38.12	Х		
	Wet	0	2	1	3	4%	1.00	2.10	6.02	6.76		<u> </u>	
	Others	5	4	9	18	27%	6.00	0.37	1.10	1.24	Х	X	х
IONTH OF A YEAR	January February	0	2	2	4	6% 0%	1.33 0.00	1.42 1.42	3.33 3.53	3.69 3.93		+	
	March	0	3	1	4	0% 6%	1.33	1.42	4.12	4.59		+	
	April	2	0	4	6	9%	2.00	1.30	3.21	3.57	х	1	
	May	1	1	1	3	4%	1.00	1.74	4.46	4.99			
	June	0	2	3	5	7%	1.67	1.38	3.49	3.90	X		
	July	2	4	2	8	12%	2.67	1.35	3.22	3.58	Х		
	August	1	6	2	9	13%	3.00	1.56	3.99	4.46	X		
	September	4	1	7	12	18%	4.00	1.46	3.73	4.16	Х	X	
	October November	0	1	1 4	2	3% 16%	0.67 3.67	1.47 1.39	3.59 3.53	4.00 3.94	x	x	
	December	2	0	4	3	4%	1.00	1.61	4.43	4.97	^	<u> </u>	
AY OF THE WEEK	Sunday	1	3	5	9	13%	3.00	1.46	3.47	3.85	х		
	Monday	1	5	2	8	12%	2.67	2.70	6.42	7.13			
	Tuesday	7	2	5	14	21%	4.67	2.49	6.18	6.88	Х		
	Wednesday	1	5	2	8	12%	2.67	2.56	5.84	6.47	Х		
	Thursday	2	5	5	12	18%	4.00	2.88	7.20	8.03	X		
	Friday	3	2	6	11	16%	3.67	3.07	7.50	8.35	X		
OUR OF THE DAY	Saturday 00:00-06:00	2	0	3	5	7% 10%	1.67 2.33	2.61 1.70	6.40 3.39	7.13 3.71	х		
	06:00-09:00	1	2	6	9	13%	3.00	1.98	5.12	5.72	x		
	09:00-11:00	1	2	1	4	6%	1.33	1.72	4.23	4.71	~		
	11:00-13:00	5	1	6	12	18%	4.00	2.40	6.30	7.05	Х		
	13:00-15:00	2	2	4	8	12%	2.67	1.95	5.32	5.96	X		
	15:00-18:00	3	4	5	12	18%	4.00	3.58	7.81	8.62	Х		
	18:00-24:00	4	8	3	15	22%	5.00	4.42	10.63	11.82	Х		
									-				
						YEAR		3-Year					
					1	2	3	Average					
verage Daily Traffic A	DT (Vehicles ner F)av)			57,074	58,238	59,427	58,246	1				
		••	torizz 1/	hial					1				
lorida Average Crash	rate (Urashes per l	villion En	tering Ve	nicies)	0.420	0.424	0.394	0.413	4				
raffic Base					20.832	21.257	21.691	21.260	1				
ctual Crash Rate (Cr	rashes per Million E	nterina V	ehicles)		0.816	1.035	1.291	1.047	1				
Critical Crash Rate (C		-							1				
	asnes per minion E	ening V	enicies)		0.911	0.912	0.860	0.895	4				
Safety Ratio					0.896	1.135	1.500	1.177					
ligh Crash Location	??				NO	YES	YES	YES					
•	$Rate = \frac{A \times 1,00}{V}$	0 ,000				f crashes	or number of		type occurrin	ng in a 1 year	period.		
	$ate = AVR + \frac{0.5}{TB} + 2$		2	TB = Tr	Average Sta affic Base st Factor (z		ash Rate for	a particular	type of interse	ection or road	Level (%)	Constant Z]
	$\frac{Years \times ADT \times 30}{1,000,000}$			= 1.	96 (assume	ə 95% [′] Cor	nfidence Leve Confidence L			68.30 86.60 90.00 95.00 95.50 98.80	0 0 0 0	1.00 1.50 1.64 1.96 2.00 2.50	
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	n Rate h Rate	-							98.80 99.00 99.70 99.95	D D	2.50 2.58 3.00 3.29	

Table 38 – Crash Analysis – SW 97 Avenue and SW 24 Street



Table 39 – Abnormal Crash Details & CountermeasuresSW 97 Avenue and SW 24 Street

		SW	97 Aveni	Je & SV	V 24 St	reet				
	(4 Lane x 4 l	ane, Signalized,	With Turn L	anes, 4 L	eg Inters	ection-table	28) - URB	AN Spot		
				R OF CR YEAR		3 YEAR TOTAL	% of	MEAN Accidents	Possible Cause(s)	Counter- measure(s)
	Total Fixed Ob	ioot Crachoo	2006	2007 0	2008	CRASHE	Total	per Year		12
	TOLAL FIXED OD	Day Light	0	0	0	2 0	<u>100%</u> 0%	0.67 0.00	(6) (17)	12
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(25)	28
		Dark	1	0	1	2	100%	0.67	(-)	-
		00:00 - 06:00	0	0	0	0	0%	0.00		
		06:00 - 09:00	0	0	0	0	0%	0.00		
		09:00 - 11:00	0	0	0	0	0%	0.00		
Fixed Object	Hours of Day	11:00 - 13:00	0	0	0	0	0%	0.00		
Fixed Object		13:00 - 15:00	0	0	0	0	0%	0.00		
		15:00 - 18:00	0	0	0	0	0%	0.00		
		18:00 - 24:00	1	0	1	2	100%	0.67		
		North	0	0	1	1	50%	0.33		
		South	0	0	0	0	0%	0.00		
	Direction	East	0	0	0	0	0%	0.00		
		West	1	0	0	1	50%	0.33		
		Unknown	0	0	0	0	0%	0.00		

3.17.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 97 Avenue and SW 24 Street were performed on a typical weekday on November 2, 2010. A summary of the traffic data is presented in *Figure 67*, and the field review is presented in *Figure 68*.

This intersection has single left-turn bays for all approaches, and the northbound receiving lanes merge from two lanes to one lane. The signal operation is protected/permissive for all left-turn movements.

It was observed that the westbound left-turn lane is inadequate to handle the left-turn movement.

It was observed that the driveways in the southeast corner are located very close to the intersection. Also, extensive number of trees located in the southwest corner presents a hazard and visual obstruction.

The merging condition in the north leg needs warning signs. Additionally, lack of lighting was observed at the intersection.

Pedestrians (a high percentage is elderly) find it difficult to cross SW 24 Street due to short walk time. Also, red light running was observed at the intersection.

The southbound approach two-way middle lane needs to be modified to handle the southbound left-turn demand.



3.17.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 97 Avenue and SW 24 Street, the following is recommended:

- Lengthen the westbound left-turn lane to approximately 500 ft.
- Lengthen the southbound left-turn lane to approximately 350 ft.
- Increase the walk time for pedestrians crossing SW 24 Street.
- Install lane end and merge signs (W9-2L & W4-2) on north leg northbound.
- Install a 40 mph speed limit sign on east leg eastbound.
- Modify the landscape in the southwest corner to reduce the clutter of trees.
- Provide ADA approved pedestrian ramps at all corners.
- Refurbishing of pavement markings using thermoplastic painting.
- Improving lighting system at the intersection.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 69.





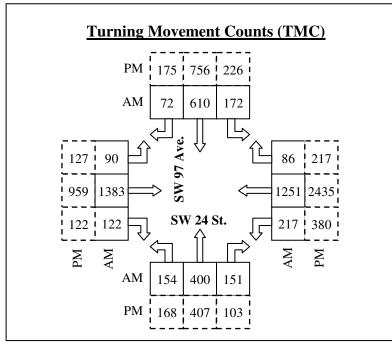


Figure 67: Traffic Data – SW 97 Avenue and SW 24 Street





Figure 68: Field Review – SW 97 Avenue and SW 24 Street





Figure 69: Conceptual Plan – SW 97 Avenue and SW 24 Street

Safety Studies at High Crash Locations Countywide



3.18. SW 122 Avenue and SW 26 Street (Coral Way)

3.18.1. Site Description

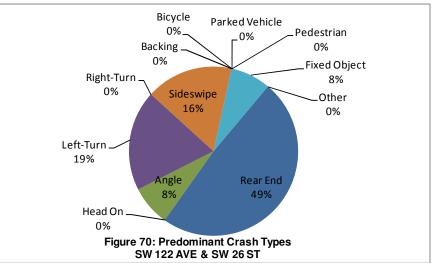
This intersection is a signalized four legged intersection located in the unincorporated area of southwest Miami Dade County. SW 122 Avenue is a four lane major collector divided by a paved median that runs north-south, and SW 26 Street (Coral Way) is a four lane urban arterial divided by a raised median that runs east-west.

3.18.2. Safety Conditions and Analysis

The intersection of SW 122 Avenue and SW 26 Street is ranked number 18 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 78 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 26. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 70*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 40* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.236, 1.631, and 1.312, respectively. The safety ratio for the three years averaged 1.393. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that left-turn and fixed object collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 41*.



	(4	Lane x 4	Lane, Si				SW 26 S		able28) - URE	AN Spot			
		NUMBE	R OF CR	ASHES	3 YEAR	%	MEAN	EXPECTED	-	ASH VALUE	ABNORM	-	
	TYPE OF CRASH	2006	YEAR 2007	2008	CRASHE	of Total	Accidents per Year	MEAN	90th Percentile	95th Percentile	Mean	90th Percentil	95th Percenti
COLLISION TYPE	Rear End	9	15	14	38	24%	12.67	5.70	16.96	19.12	Х		
	Head On Angle	0	0	0	0	0% 3%	0.00 2.00	0.33 3.05	1.02 7.08	1.15 7.85			
	Left Turn	6	3	6	15	8%	5.00	1.67	4.02	4.47	х	x	x
	Right Turn	0	0	0	0	0%	0.00	0.33	1.25	1.42			
	Sideswipe Backed Into	5	5	3	13 0	6% 0%	4.33 0.00	1.60 0.17	4.64 0.56	5.22 0.63	X		
	Coll. w/ Parked Car		0	0	0	0%	0.00	0.10	0.51	0.59			
	Coll. w/ Pedestrian	0	0	0	0	0%	0.00	0.28	1.04	1.19			
	Coll. w/ Bicycle Fixed Object	0	0	0	0	0% 2%	0.00 2.00	0.09	0.33	0.38	x	x	x
	Ran Off Road	0	0	0	0	0%	0.00	0.03	0.21	0.24	^	<u>^</u>	<u> </u>
	Overtuned	0	0	0	0	0%	0.00	0.03	0.21	0.24			
	Other Total Creabas	0	0	0	0 78	0%	0.00	3.70	8.83	9.82	v		
SEVERITY	Total Crashes PDO crashes	23 22	31 27	24 21	70	23% 90%	26.00 23.33	17.77 9.93	40.96 22.30	45.39 24.67	X	x	
	Fatal crashes	0	0	0	0	0%	0.00	0.05	0.26	0.29			
	Injury crashes	1	4	3	8	10%	2.67	13.14	33.08	36.90	~	+	
LIGHT CONDITIONS	Day Light Dusk	18 0	21 1	16 0	55	71% 1%	18.33 0.33	12.40 0.28	29.18 0.87	32.39 0.98	X		
	Dawn	0	0	0	0	0%	0.00	0.17	0.56	0.63			
	Dark	4	9	8	21	27%	7.00	4.56	10.53	11.68	Х		
SURFACE CONDITIONS	Unknown Dry	1 10	0 28	0 19	1 57	1% 73%	0.33	0.35	1.05 34.45	1.18 38.12	x		
	Wet	6	3	4	13	17%	4.33	2.10	6.02	6.76	Х	1	
	Others	7	0	1	8	10%	2.67	0.37	1.10	1.24	X	X	Х
MONTH OF A YEAR	January February	1 2	3	3	7	9% 6%	2.33 1.67	1.42 1.42	3.33 3.53	3.69 3.93	X X	+	
	March	2	5	2	9	12%	3.00	1.67	4.12	4.59	X		
	April	0	5	2	7	9%	2.33	1.30	3.21	3.57	Х		
	May June	0	4	3	7	9% 10%	2.33 2.67	1.74	4.46 3.49	4.99 3.90	X		
	July	3	1	1	5	6%	1.67	1.35	3.49	3.58	x		
	August	1	2	5	8	10%	2.67	1.56	3.99	4.46	Х		
	September	4	4	4	12	15% 4%	4.00	1.46 1.47	3.73 3.59	4.16 4.00	Х	X	
	October November	3	0	1	3	4%	1.00	1.47	3.59	3.94			
	December	3	0	1	4	5%	1.33	1.61	4.43	4.97			
DAY OF THE WEEK	Sunday	4	2	2	8	10%	2.67	1.46	3.47	3.85	X		
	Monday Tuesday	3	3	4	10 15	13% 19%	3.33 5.00	2.70 2.49	6.42 6.18	7.13 6.88	X		
	Wednesday	2	5	5	12	15%	4.00	2.56	5.84	6.47	Х		
	Thursday	1	7	6	14	18%	4.67	2.88	7.20	8.03	Х		
	Friday Saturday	6 4	1 5	2	9 10	12% 13%	3.00 3.33	3.07 2.61	7.50 6.40	8.35 7.13	x		
HOUR OF THE DAY	00:00-06:00	0	4	0	4	5%	1.33	1.70	3.39	3.71	~		
	06:00-09:00	3	4	1	8	10%	2.67	1.98	5.12	5.72	Х		
	09:00-11:00 11:00-13:00	1 7	4	3	8	10% 15%	2.67 4.00	1.72 2.40	4.23 6.30	4.71 7.05	X		
	13:00-15:00	1	3	1	5	6%	1.67	1.95	5.32	5.96	^		
	15:00-18:00	7	8	8	23	29%	7.67	3.58	7.81	8.62	X		
	18:00-24:00	4	5	9	18	23%	6.00	4.42	10.63	11.82	X		
						YEAR		3-Year	1				
					1	2	3	Average					
Average Daily Traffic A	ADT (Vehicles ner F	Dav)			55,501	56,633	57,789	56,641	1				
Florida Average Crash			tering Vo	hicles)	0.420	0.424	0.394	0.413	1				
8	ale (Clashes per		Sing ve	10103/					-				
Traffic Base	,				20.258	20.671	21.093	20.674	4				
Actual Crash Rate (Cr		-	,		1.135	1.500	1.138	1.258	4				
Critical Crash Rate (C	rashes per Million E	Entering V	'ehicles)		0.918	0.919	0.867	0.902	1				
Safety Ratio					1.236	1.631	1.312	1.393					
High Crash Location	??				YES	YES	YES	YES					
Actual Crash i	$Rate = \frac{A \times 1,00}{V}$	0 ,000			al number o rage Annua			f crashes by	type occurrin	ng in a 1 year	period.		
CriticalCrashRo	$ate = AVR + \frac{0.5}{TB} + \frac{1}{TB}$	$TF\sqrt{\frac{AVH}{TB}}$	2	TB = Trans	Average Sta affic Base est Factor (z		ash Rate for	a particular	type of interse	ection or road	Level (%)	Constant Z]
	$\frac{Years \times ADT \times 3}{1,000,000}$			= 1.	96 (assume	e 95% Cor		el for RURAL Level for URE		68.30 86.60 90.00 95.00 95.50 98.80)))	1.00 1.50 1.64 1.96 2.00 2.50	
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	h Rate	-							99.00 99.70 99.95)	2.58 3.00 3.29	

Table 40 – Crash Analysis – SW 122 Avenue and SW 26 Street



Table 41 – Abnormal Crash Details & CountermeasuresSW 122 Avenue and SW 26 Street

		SW 1	22 Aven	ue & S	W 26 St	reet				
	(4 Lane x 4 Lane	e, Signalized, With					able28) - I	JRBAN Spot	t	
				R OF CF		3 YEAR	%	MEAN		
			NOMBL	YEAR	ASTILS	TOTAL	of	Accidents	Possible	Counter-
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Left Tu	rnCrashes	6	3	6	15	100%	5.00	(4)	6
		Day Light	3	2	4	9	60%	3.00	(6)	12
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(9)	13
		Dark	3	1	2	6	40%	2.00	(13)	
		00:00 - 06:00	0	1	0	1	7%	0.33	. ,	
		06:00 - 09:00	0	0	0	0	0%	0.00		
		09:00 - 11:00	0	0	0	0	0%	0.00		
1 . <i>(</i>) T	Hours of Day	11:00 - 13:00	2	0	1	3	20%	1.00		
Left Turn	· ·	13:00 - 15:00	0	1	0	1	7%	0.33		
		15:00 - 18:00	1	1	2	4	27%	1.33		
		18:00 - 24:00	3	0	3	6	40%	2.00		
		$NB \rightarrow WB$	1	0	0	1	7%	0.33		
		$WB \rightarrow SB$	2	1	3	6	40%	2.00		
	Direction	$SB \rightarrow EB$	0	0	0	0	0%	0.00		
		$EB \rightarrow NB$	1	2	3	6	40%	2.00		
		Unknown	2	0	0	2	13%	0.67		
		·						-		
			NUMBE	R OF CF	ACHES	3 YEAR	%	MEAN		
			NOWIDE	YEAR		TOTAL	of	Accidents	Possible	Counter-
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Fixed Ob	iect Crashes	1	4	1		100%	2.00	(6)	12
		Day Light	1	1	0	2	33%	0.67	(11)	17
	Lighting Conditions	Dawn	0	1	0	1	17%	0.33	(16)	20
	3 • 3 • • • • •	Dark	0	2	1	3	50%	1.00	(17)	
		00:00 - 06:00	0	2	0	2	33%	0.67	()	
		06:00 - 09:00	0	0	0	0	0%	0.00		
		09:00 - 11:00	0	0	0	0	0%	0.00		
	Hours of Day	11:00 - 13:00	0	0	0	0	0%	0.00		
Fixed Object	,	13:00 - 15:00	0	0	0	0	0%	0.00		
					-	-				1
			1	1	0	2	33%	0.67		
		15:00 - 18:00 18:00 - 24:00	1	1	0	2	33% 33%	0.67		
		15:00 - 18:00			-			0.67		
		15:00 - 18:00 18:00 - 24:00	0	1	1	2	33%			
	Direction	15:00 - 18:00 18:00 - 24:00 North	0	1 0	1 0	2 1	33% 17%	0.67 0.33		
	Direction	15:00 - 18:00 18:00 - 24:00 North South	0 1 0	1 0 1	1 0 0	2 1 1	33% 17% 17%	0.67 0.33 0.33		

3.18.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at SW 122 Avenue and SW 26 Street were performed on a typical weekday on November 2, 2010. A summary of the traffic data is presented in *Figure 71*, and the field review is presented in *Figure 72*.

This intersection has single left-turn bays for all approaches, and the westbound approach has an exclusive right-turn bay. The signal operation is protected/permissive for all left-turn movements.

Long queues were observed for southbound and westbound left-turns with vehicles spilling back and blocking the through lanes. Also the westbound left-turn movement struggles to cross the opposing eastbound through movement.

The merging condition in the south leg needs warning signs. Also, there are no warning signs for eastbound/westbound traffic to alert motorists of the curved east leg and the signal.

Red light running was observed at the intersection. Additionally, lack of lighting was observed at the intersection.

Lack of pedestrian features on the north and west legs was observed, and pedestrian ramps need to be ADA approved.

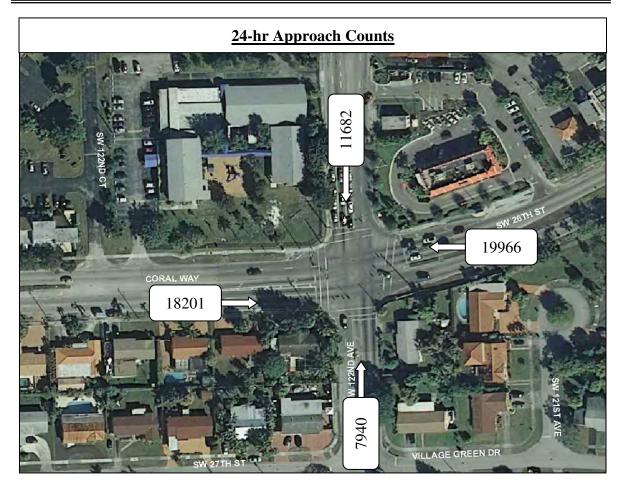
3.18.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of SW 122 Avenue and SW 26 Street, the following is recommended:

- Lengthen the westbound left-turn lane to approximately 350 ft.
- Lengthen the southbound left-turn lane to approximately 500 ft.
- Retiming/optimizing of the existing signal while maintaining cycle length for both the AM and PM peak hours.
- Reduce the offset between eastbound and westbound left turn lanes by reducing the swale area in the southeast corner and shifting the median to the south.
- Installing curve warning signs (W1-2) for both eastbound and westbound approaches and "Signal Ahead" signs (W3-3) for westbound approach.
- Install lane end and merge signs (W9-2L & W4-2) on south leg southbound.
- Provide pedestrian signal heads to cross the north and west legs.
- Refurbishing of pavement markings using thermoplastic painting.
- Improving lighting system at the intersection.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 73.





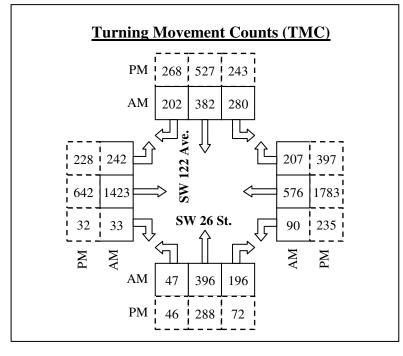


Figure 71: Traffic Data – SW 122 Avenue and SW 26 Street



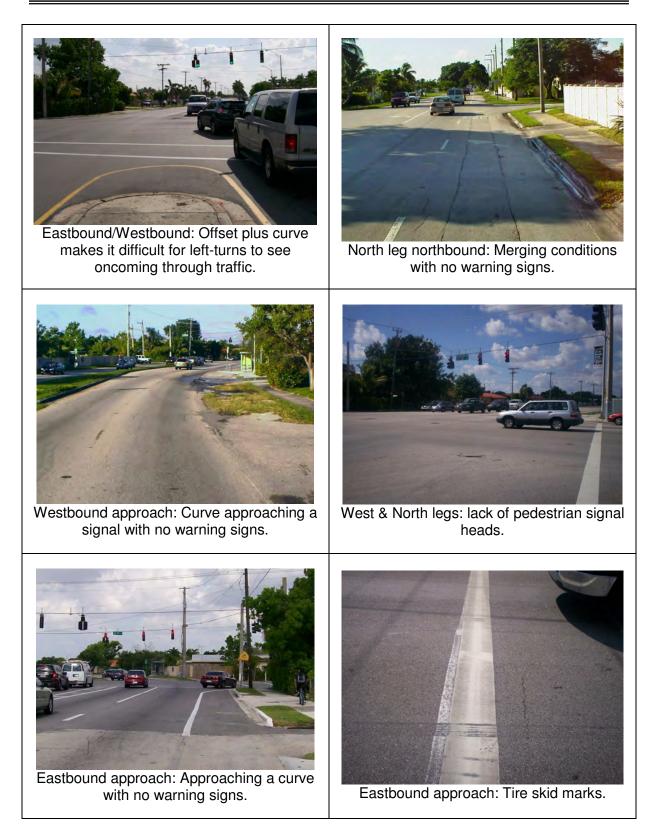


Figure 72: Field Review – SW 122 Avenue and SW 26 Street



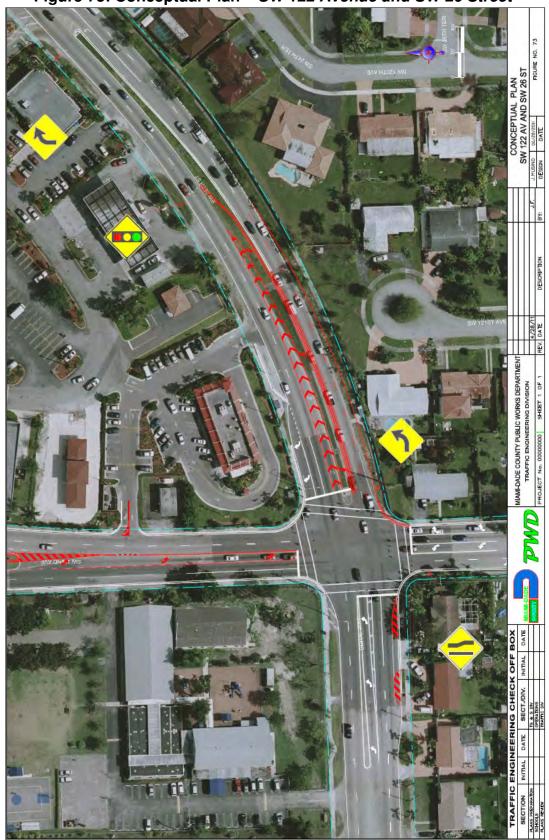


Figure 73: Conceptual Plan – SW 122 Avenue and SW 26 Street

Safety Studies at High Crash Locations Countywide



3.19. NW 79 Avenue and NW 58 Street

3.19.1. Site Description

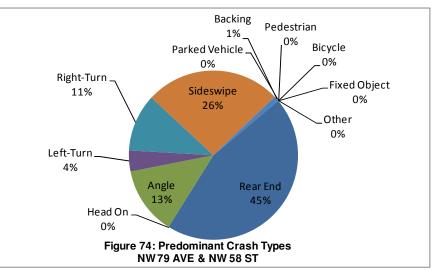
This intersection is a signalized four legged intersection located in the northwest part of Miami Dade County at the limit between unincorporated area and the City of Doral. NW 79 Avenue is a four lane major collector divided by a paved median that runs north-south, and NW 58 Street is a six lane arterial divided by a raised median that runs east-west.

3.19.2. Safety Conditions and Analysis

The intersection of NW 79 Avenue and NW 58 Street is ranked number 19 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 100 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 33. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 74*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 42* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 0.852, 1.419, and 1.148, respectively. The safety ratio for the three years averaged 1.140. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that right-turn and sideswipe collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 43*.



		(4 ane	x 4 ane				4 Leg Inters		28) - URBAN	Spot			
			R OF CF		3 YEAR	%	MEAN			RASH VALUE			CBASUE
	TYPE OF CRASH	2006	YEAR 2007	2008	TOTAL	% of Total	Accidents	MEAN	90th Percentile	95th	Mean	90th Percentil	95th
COLLISION TYPE	Rear End	10	19	16	45	23%	15.00	5.70	16.96	19.12	x	Percentin	Percenti
	Head On	0	0	0	0	0%	0.00	0.33	1.02	1.15			
	Angle	4	6	3	13	5%	4.33	3.05	7.08	7.85	X		
	Left Turn	0	1	3	4	2% 3%	1.33 3.67	1.67	4.02	4.47	x	x	x
	Right Turn Sideswipe	6 4	3 13	2 9	11 26	3%	8.67	0.33	1.25 4.64	1.42 5.22	x	x	- x
	Backed Into	1	0	0	1	0%	0.33	0.17	0.56	0.63	x	^	^
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.10	0.51	0.59			
	Coll. w/ Pedestrian	0	0	0	0	0%	0.00	0.28	1.04	1.19			
	Coll. w/ Bicycle	0	0	0	0	0%	0.00	0.09	0.33	0.38			
	Fixed Object	0	0	0	0	0%	0.00	0.03	0.21	0.24			
	Ran Off Road Overtuned	0	0	0	0	0% 0%	0.00	0.00	0.00	0.00 0.24			
	Other	0	0	0	0	0%	0.00	3.70	8.83	9.82			
	Total Crashes	25	42	33	100	24%	33.33	17.77	40.96	45.39	х		
SEVERITY	PDO crashes	23	42	32	97	97%	32.33	9.93	22.30	24.67	x	х	X
	Fatal crashes	1	0	0	1	1%	0.33	0.05	0.26	0.29	Х	Х	Х
	Injury crashes	1	0	1	2	2%	0.67	13.14	33.08	36.90			
LIGHT CONDITIONS	Day Light	20	38	30	88	88%	29.33	12.40	29.18	32.39	X	X	
	Dusk	0	0	0	0	0%	0.00	0.28	0.87	0.98	~		<u> </u>
	Dawn Dark	0	0	1	1	1% 11%	0.33 3.67	0.17 4.56	0.56	0.63	X		
	Unknown	0	4	2	0	0%	0.00	4.56	1.05	1.18			
SURFACE CONDITIONS		18	39	27	84	84%	28.00	15.30	34.45	38.12	x		
	Wet	2	2	3	7	7%	2.33	2.10	6.02	6.76	X		
	Others	5	1	3	9	9%	3.00	0.37	1.10	1.24	Х	Х	Х
MONTH OF A YEAR	January	1	3	1	5	5%	1.67	1.42	3.33	3.69	X		
	February	0	5	2	7	7%	2.33	1.42	3.53	3.93	Х		
	March	1	0	1	2	2% 15%	0.67 5.00	1.67 1.30	4.12 3.21	4.59 3.57	~	x	x
	April May	7	3	5 3	15	7%	2.33	1.30	4.46	4.99	X	^	^
	June	5	4	2	11	11%	3.67	1.38	3.49	3.90	X	х	
	July	2	2	2	6	6%	2.00	1.35	3.22	3.58	X	^	
	August	3	2	8	13	13%	4.33	1.56	3.99	4.46	Х	Х	
	September	2	5	5	12	12%	4.00	1.46	3.73	4.16	Х	Х	
	October	0	6	1	7	7%	2.33	1.47	3.59	4.00	Х		
	November	1	5	2	8	8%	2.67	1.39	3.53	3.94	X		
	December	2	4	1	7	7%	2.33	1.61	4.43	4.97	Х		
DAY OF THE WEEK	Sunday	2	0 7	3 5	5 15	5% 15%	1.67 5.00	2.70 2.49	6.42 6.18	7.13 6.88	x		
	Monday Tuesday	4	12	6	22	22%	7.33	2.49	5.84	6.47	X	x	x
	Wednesday	3	10	5	18	18%	6.00	2.88	7.20	8.03	X	^	^
	Thursday	3	8	6	17	17%	5.67	3.07	7.50	8.35	X		
	Friday	7	5	6	18	18%	6.00	2.61	6.40	7.13	Х		
	Saturday	3	0	2	5	5%	1.67	1.46	3.47	3.85	Х		
HOUR OF THE DAY	00:00-06:00	0	0	1	1	1%	0.33	1.70	3.39	3.71			
	06:00-09:00	2	6	7	15	15%	5.00	1.98	5.12	5.72	X		
	09:00-11:00	3	2	5	10	10%	3.33	1.72	4.23	4.71	X		
	11:00-13:00 13:00-15:00	4	6 8	5 4	15 14	15% 14%	5.00 4.67	2.40 1.95	6.30 5.32	7.05 5.96	X X		
	15:00-18:00	8	14	7	29	29%	9.67	3.58	7.81	8.62	x	х	x
	18:00-24:00	6	6	4	16	16%	5.33	4.42	10.63	11.82	X	~	^
									•				
					1	YEAR 2	3	3-Year					
Average Daily Traffic A	NDT (Vehicles nor P)av)			1 88,168	2 89,967	3 91,803	Average 89,979	-				
Florida Average Crash			tering Vo	hicles)	0.490	0.486	0.458	0.478	4				
8	nate (Crashes per l	∙mn∪n EN	uniy ve						4				
Traffic Base					32.181	32.838	33.508	32.842					
Actual Crash Rate (Cr	rashes per Million E	ntering V	ehicles)		0.777	1.279	0.985	1.014	1				
Critical Crash Rate (C	1	<u> </u>			0.912	0.901	0.858	0.890	1				
	aoneo per miniOn E		0/110/03/						4				
Safety Ratio					0.852	1.419	1.148	1.140	1				
High Crash Location	??				NO	YES	YES	YES					
Actual Crash I	$Rate = \frac{A \times 1,00}{V}$	0,000			al number o rage Annua			f crashes by	/ type occurri	ng in a 1 year	period.		
CriticalCrashRo	$ate = AVR + \frac{0.5}{TB} + 2$	$TF\sqrt{\frac{AVH}{TB}}$	2	TB = Tr	Average Sta affic Base st Factor (z		ash Rate for	a particular	type of inters	ection or road		nt. Constant Z	ר
	$\frac{Years \times ADT \times 30}{1,000,000}$			= 1.	96 (assume	95% Cor	nfidence Lev Confidence I			68.30 86.60 90.00 95.00 95.50)))	1.00 1.50 1.64 1.96 2.00	
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	n Rate h Rate	-							98.80 99.00 99.70 99.75)))	2.50 2.58 3.00 3.29	

Table 42 – Crash Analysis – NW 79 Avenue and NW 58 Street



Table 43 – Abnormal Crash Details & CountermeasuresNW 79 Avenue and NW 58 Street

		NW	79 Aven	ue & N\	N 58 St	reet				
	(4 Lane x 4 L	ane, Signalized, W	/ith Turn La	anes, 4 Le	eg Interse	ction -Table	e 28) - UR	BAN Spot		
							•			
			NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN	Possible	Counter-
			2006	2007	2008	TOTAL CRASHE	of Total	Accidents per Year	Cause(s)	measure(s)
	Total Right Tu	ım Crashes	6	3	2000	11	100%	3.67	(1)	4
	i ota rigiti re	Day Light	6	3	2	11	100%	3.67	(8)	9
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(9)	21
		Dark	0	0	0	0	0%	0.00	(-)	
		00:00 - 06:00	0	0	0	0	0%	0.00		
		06:00 - 09:00	1	0	1	2	18%	0.67		
		09:00 - 11:00	1	0	1	2	18%	0.67		
Dischet Terms	Hours of Day	11:00 - 13:00	2	0	0	2	18%	0.67		
Right Turn		13:00 - 15:00	0	2	0	2	18%	0.67		
		15:00 - 18:00	2	1	0	3	27%	1.00		
		18:00 - 24:00	0	0	0	0	0%	0.00		
		NB→EB	4	2	1	7	64%	2.33		
		EB→SB	0	0	0	0	0%	0.00		
	Direction	WB→NB	2	1	1	4	36%	1.33		
		SB→WB	0	0	0	0	0%	0.00		
		Unknown	0	0	0	0	0%	0.00		
			NUMBE	R OF CF		3 YEAR	%	MEAN		
			NOWER	YEAR		TOTAL	of	Accidents	Possible	Counter-
			2006	2007	2008	CRASHE	Total	per Year	Cause(s)	measure(s)
	Total Sideswi	oe Crashes	4	13	9	26	100%	8.67	(16)	19
		Day Light	3	11	9	23	88%	7.67	(17)	20
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(19)	21
		Dark	1	2	0	3	12%	1.00	(20)	22
		00:00 - 06:00	0	0	0	0	0%	0.00	(-)	
		06:00 - 09:00	1	1	1	3	12%	1.00		
		09:00 - 11:00	0	2	3	5	19%	1.67		
Sideswipe	Hours of Day	11:00 - 13:00	0	3	1	4	15%	1.33		
(Overtake)		13:00 - 15:00	1	4	1	6	23%	2.00		
		15:00 - 18:00	1	2	3	6	23%	2.00		
		18:00 - 24:00	1	1	0	2	8%	0.67		
		North	1	1	1	3	12%	1.00		
		South	2	2	4	8	31%	2.67		
	Direction	East	1	3	3	7	27%	2.33		
		West	0	7	1	8	31%	2.67		
		Unknown	0	0	0	0	0%	0.00		

3.19.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at NW 79 Avenue and NW 58 Street were performed on a typical weekday on November 23, 2010. A summary of the traffic data is presented in *Figure 75*, and the field review is presented in *Figure 76*.

This intersection has single left-turn bays for all approaches, except the southbound which has double left-turn lanes. The northbound, eastbound and westbound approaches have exclusive right-turn lanes. The signal operation is split phases for northbound and southbound traffic, and protected/permissive for eastbound and westbound left-turns.

This intersection handles a large number of heavy vehicles and trucks. Long queues were observed for northbound and westbound left-turns with vehicles were spilling back and blocking the through lane. Also, this east/west left-turn movement struggles to cross the opposing through movement.



There are no warning signs for southbound traffic to alert motorists of the curve and the approaching signal.

It was noticed that the wide recess at the southeast corner is confusing and motorists sometimes use it to park their vehicles. Also, due to that recess, northbound right-turns find it difficult to make a safe turn.

Red light running was observed at the intersection. Additionally, lack of lighting was observed at the intersection.

The eastbound right-turning vehicles suffer an inadequate turning radius to handle heavy vehicles and trucks.

Considerable weaving was observed in the eastbound/westbound and southbound approaches due to SR-826 ramps east of the intersection.

Capacity analysis was conducted for AM and PM traffic peak hours to evaluate existing conditions as well as improvements. *Table 44* depicts the analysis performed using Synchro 6.0. An assessment of Level of Services (LOS) analysis for peak periods indicated that this intersection is operating at LOS C during the AM peak period, and a failing LOS F during the PM peak. In addition, these analyses indicated that the northbound, southbound and eastbound movements are operating under substantial delay that generates failing conditions (LOS E & F) during the PM peak hours.

The results of the improvement and signal retiming/optimization yielded benefits mostly for the PM period. This was achieved by increasing the northbound/southbound split and modifying the left/through overlaps. As such, the overall LOS improved to D during the PM period with minor degradation to the southbound and westbound approaches.

			EB				WB					١	NB		SB			Overall
			L	Т	R	Арр	L	Т	R	Арр	L	Т	R	Арр	L	TR	Арр	
	Exist.	LOS	В	D	А	D	D	В	А	С	F	Е	Α	D	Е	Е	Е	С
AM		Delay	19	40	10	37	45	11	0	21	98	77	9	41	60	55	57	32
	Modif.	LOS	В	D)	D	D	В	А	С	D	D	Α	С	Е	Е	Е	С
		Delay	18	45		44	36	15	0	21	50	44	6	27	66	57	59	32
	Exist.	LOS	В	F	В	F	Е	В	А	С	Е	F	F	F	Е	Е	Е	F
РМ		Delay	13	89	13	83	58	17	0	27	66	192	150	151	60	57	58	83
	Modif.	LOS	В	E		D	Е	С	А	С	D	D	С	D	F	Е	Е	D
		Delay	18	50	6	55	64	24	0	34	45	51	25	38	94	66	76	46



3.19.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of NW 79 Avenue and NW 58 Street, the following is recommended:

- Converting the eastbound right turn lane to be a shared through and right-turn.
- Adding a third receiving lane to the eastbound movement.
- Retiming and optimizing the signal while maintaining cycle length for both the AM and PM peak hours.
- Removing the "Right Turn Lane Must Turn Right" sign (R3-7R) on eastbound approach.
- Installing new advance intersection lane use signs (R3-8) for both eastbound and westbound directions.
- Installing turn warning and "Signal Ahead" signs (W1-1 & W3-3) at southbound approach.
- Improving turning radius for both eastbound and westbound right turns.
- Improving roadway lighting.
- Pavement milling and resurfacing.
- Refurbishing of pavement markings and channelization guidelines.
- Trimming the trees at the southwest corner on NW 58 Street.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 77.





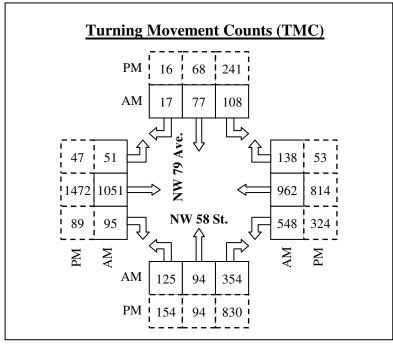


Figure 75: Traffic Data – NW 79 Avenue and NW 58 Street





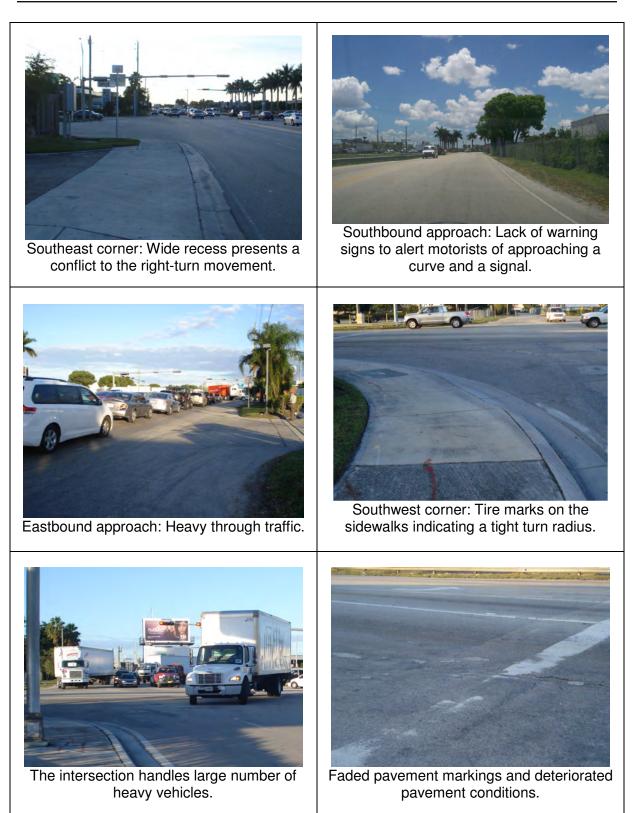


Figure 76: Field Review – NW 79 Avenue and NW 58 Street



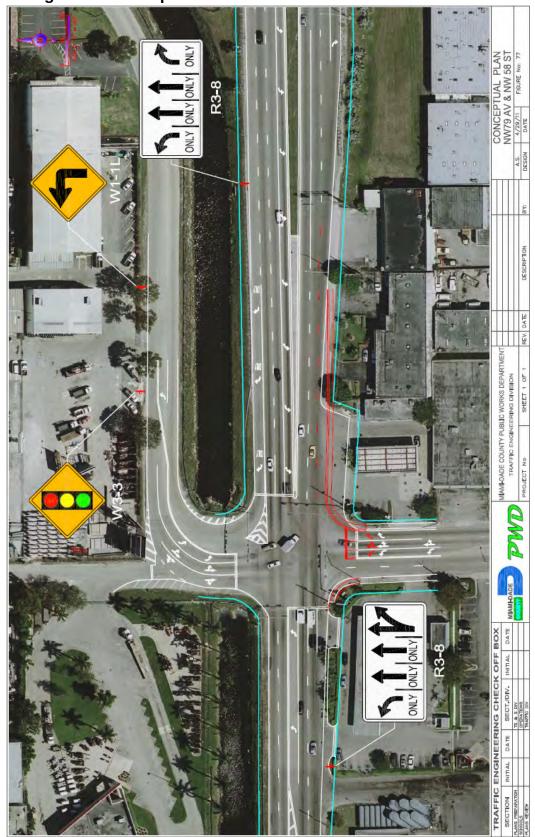


Figure 77: Conceptual Plan – NW 79 Avenue and NW 58 Street



3.20. NW 107 Avenue and NW 41 Street

3.20.1. Site Description

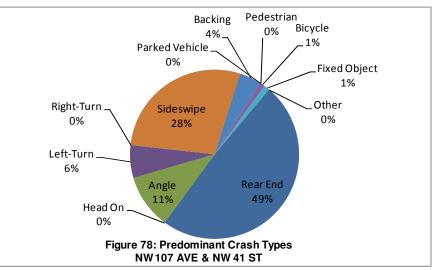
This intersection is a signalized four legged intersection located in the southwest part of Miami Dade County in the City of Doral. NW 107 Avenue is a four lane urban arterial divided by a raised median that runs north-south, and NW 41 Street is a six lane urban arterial divided by a raised median that runs east-west.

3.20.2. Safety Conditions and Analysis

The intersection of NW 107 Avenue and NW 41 Street is ranked number 20 in our high crash locations list. A review of the hard copy police reports for the years 2006 through 2008 was performed. During the three-year analysis period, 96 relevant crashes occurred at the intersection. The analysis indicated that the average number of crashes per year is 32. The crash summaries, crash statistics and collision diagrams for the intersection are documented in *Appendix A*.

Based on the analysis of crash records for this intersection, the predominant types of crashes are shown in *Figure 78*.

Calculated intersection mean crash per year were compared to the average Miami-Dade Crash Rate for County corridors to assess the safety conditions at the



study intersection in relation to other roadways with similar traffic and geometric characteristics. This study is based on the 2007 FDOT's "Expected Value Analysis." *Table 45* illustrates the expected accident volume analysis of this intersection as well as the safety ratios and the confidence levels during the analysis period.

Based on a regression growth of 2% from the 2006 entering volume, the calculated safety ratios for the years 2006, 2007, and 2008 were 1.090, 1.165, and 1.336, respectively. The safety ratio for the three years averaged 1.197. Also, results of confidence level indicated that this intersection has been a high crash location during the three years with a confidence level higher than 99.95%.

From this analysis, it was determined that sideswipe and backing collisions presented abnormal crash patterns that exceed the threshold limits for the 95th percentile and 90th percentile confidence level. Those results indicate that these types of collisions were abnormally high during the period of 2006 through 2008. A detailed review of the abnormal crashes as well as probable countermeasures is presented in *Table 46*.



	(6	Lane x 4	Lane. Si				eg Intersecti		able35) - URI	BAN Spot			
	(-		R OF CF		3 YEAR	%	MEAN			RASH VALUE	ABNORM		CRASHES
	TYPE OF CRASH		YEAR		TOTAL	of	Accidents	MEAN	90th	95th	Mean	90th	95th
COLLISION TYPE	Rear End	2006 13	2007 15	2008 19	CRASHE 47	Total 24%	per Year 15.67	8.68	Percentile 17.26	Percentile 18.90	х	Percentil	Percenti
	Head On	0	0	0	0	0%	0.00	0.60	1.64	1.84			
	Angle	2	2	6	10	4%	3.33	5.40	9.19	9.92			
	Left Turn	2	2	2	6	3%	2.00	3.00	6.13	6.73			
	Right Turn	0	0 10	0	0 27	0%	0.00 9.00	0.46	1.36	1.53	v		x
	Sideswipe Backed Into	12 0	2	5	4	9% 1%	9.00	2.58 0.28	4.92 0.84	5.37 0.94	X	X	Ŷ
	Coll. w/ Parked Car	0	0	0	0	0%	0.00	0.12	0.57	0.65	~	~	^
	Coll. w/ Pedestrian	0	0	0	0	0%	0.00	0.74	1.80	2.00			
	Coll. w/ Bicycle	0	0	1	1	0%	0.33	0.14	0.49	0.55	Х		
	Fixed Object	0	0	1	1	0%	0.33	0.79	2.01	2.24			
	Ran Off Road	0	0	0	0	0%	0.00	0.01	0.11	0.13			
	Overtuned Other	0	0	0	0	0% 0%	0.00	0.04 8.67	0.28 21.05	0.33 23.42			
	Total Crashes	29	31	36	96	23%	32.00	31.51	54.94	59.43	х		
SEVERITY	PDO crashes	28	30	35	93	97%	31.00	19.21	36.95	40.35	x		
	Fatal crashes	0	0	0	0	0%	0.00	0.16	0.56	0.63			
	Injury crashes	1	1	1	3	3%	1.00	20.77	38.34	41.71			
LIGHT CONDITIONS	Day Light	25	27	26	78	81%	26.00	19.89	35.12	38.03	Х		
	Dusk Dawn	0	0	1	1 4	1% 4%	0.33	0.61 0.38	1.43	1.58 1.16	x	x	x
	Dawn Dark	4	1	3 6	4	4% 14%	4.33	10.22	18.94	20.61	^	^	<u> </u>
	Unknown	0	0	0	0	0%	0.00	0.41	1.15	1.30			
SURFACE CONDITIONS	Dry	23	28	31	82	85%	27.33	26.41	45.71	49.41	х		
	Wet	1	3	5	9	9%	3.00	4.41	8.78	9.62		L	
	Others	5	0	0	5	5%	1.67	0.69	1.88	2.11	Х		
MONTH OF A YEAR	January	4	4	3	11	11%	3.67	2.57	5.04	5.52	Х		
	February March	2	2	3	7	7% 13%	2.33 4.00	2.37 3.09	4.59	5.02	x		
	April	4	5	3	12	13%	4.00	2.57	5.92 5.30	6.46 5.82	x		
	May	1	5	4	10	10%	3.33	2.51.	4.81	5.25	~		
	June	1	3	3	7	7%	2.33	2.81	5.74	6.30			
	July	5	2	3	10	10%	3.33	2.60	4.96	5.42	Х		
	August	1	0	3	4	4%	1.33	3.00	5.66	6.17			
	September	2	1	1	4	4%	1.33	2.48	4.92	5.39			
	October	3	2	3	8	8% 6%	2.67	2.89	5.40	5.88			
	November December	1	4	1 2	6 5	5%	2.00 1.67	2.41 2.22	4.85 4.55	5.32 5.00			
DAY OF THE WEEK	Sunday	0	3	5	8	8%	2.67	4.00	6.58	7.08			
-	Monday	2	5	6	13	14%	4.33	4.62	9.23	10.11			
	Tuesday	8	5	7	20	21%	6.67	4.46	7.81	8.46	Х		
	Wednesday	3	2	5	10	10%	3.33	4.56	8.62	9.40			
	Thursday	10	8	2	20	21%	6.67	5.04	9.04	9.80	X		
	Friday Saturday	5	6 2	9 2	20 5	21% 5%	6.67 1.67	4.86 3.98	9.39 8.10	10.26 8.89	Х		
HOUR OF THE DAY	00:00-06:00	1	0	3	4	4%	1.33	3.79	8.65	9.58			
	06:00-09:00	2	4	4	10	10%	3.33	3.44	6.94	7.61			
	09:00-11:00	3	3	1	7	7%	2.33	2.58	5.30	5.82			
	11:00-13:00	5	8	3	16	17%	5.33	3.12	5.78	6.29	Х		
	13:00-15:00	6	5	12	23	24%	7.67	3.57	6.32	6.85	X	Х	Х
	15:00-18:00	7	8	6	21	22%	7.00	6.38	11.52	12.50	X		
	18:00-24:00	5	3	7	15	16%	5.00	8.60	15.51	16.83			
						YEAR		3-Year	1				
					1	2	3	Average					
	DT (Vabi-las -) and						-	-				
Average Daily Traffic A					65,538	66,875	68,240	66,884	4				
Iorida Average Crash	rate (Crashes per	Million En	tering Ve	hicles)	0.579	0.568	0.566	0.571					
Traffic Base					23.921	24.409	24.908	24.413	1				
Actual Crash Rate (Cr	rashes ner Million F	nterina V	ehicles)		1.212	1.270	1.445	1.309	1				
		-	,						-				
Critical Crash Rate (C	rashes per Million E	ntering V	enicles)		1.112	1.090	1.082	1.095	4				
Safety Ratio					1.090	1.165	1.336	1.197					
High Crash Location	??				YES	YES	YES	YES					
•	$Rate = \frac{A \times 1,00}{V}$	0,000				f crashes	or number of		r type occurri	ng in a 1 year	period.		
CriticalCrashRa	TB = Tr TF = Te	affic Base est Factor (z	z-value)		·	Confidence Level (%) Constant Z							
	$\frac{Years \times ADT \times 3}{1,000,000}$			= 1.	96 (assume	e 95% Cor	nfidence Leve Confidence L		68.30 1.00 86.60 1.50 90.00 1.64 95.00 1.96 95.50 2.00 08.00 2.50				
Safety Ratio	$= \frac{Actual Crash}{Critical Crash}$	h Rate h Rate	-							98.80 99.00 99.70 99.9)	2.50 2.58 3.00 3.29	

Table 45 – Crash Analysis – NW 107 Avenue and NW 41 Street



Table 46 – Abnormal Crash Details & Countermeasures NW 107 Avenue and NW 41 Street

NW 107 Avenue & NW 41 street														
(6 Lane x 4 Lane, Signalized, With Turn Lanes, 4 Leg Intersection -Table 35) - URBAN Spot														
			NUMBE	R OF CF	ASHES	3 YEAR	%	MEAN	Possible	Counter-				
				YEAR		TOTAL	of	Accidents	Cause(s)	measure(s)				
	Table Office	0	2006	2007	2008	CRASHE	Total	per Year	.,					
	Total Sideswi	12	10	5	27	100%	9.00	(16)	20					
	Linkting Conditions	Day Light	11	10	4	25	93%	8.33	(17)	21				
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(19)	22				
		Dark	1	0	1	2	7% 0%	0.67	(20)					
		00:00 - 06:00		-		÷	0.70	0.00						
		06:00 - 09:00	1	2	1	4	15%	1.33						
O i de avuire e	Lieure of Devi	09:00 - 11:00	1	0	0	1	4%	0.33						
Sideswipe	Hours of Day	11:00 - 13:00	3	2	1	6	22%	2.00						
(Overtake)		13:00 - 15:00	1	2	2	5	19%	1.67						
		15:00 - 18:00	3	4	0	7	26%	2.33						
		18:00 - 24:00	3	0	1	4	15%	1.33						
		North	2	3	2	7	26%	2.33						
		South	2	2	1	5	19%	1.67						
	Direction	East	3	3	0	6	22%	2.00						
		West	5	2	2	9	33%	3.00						
		Unknown	0	0	0	0	0%	0.00						
			NUMBE	R OF CF	ACHES	3 YEAR	%	MEAN						
			NOWDE	YEAR	ASHES	TOTAL	of	Accidents	Possible	Counter-				
			2006	2007	2008	CRASHE	Total		Cause(s)	measure(s)				
	Total Backed	nto Crashes	0	2007	2000	4	100%	per Year 1.33	(4)	6				
	Total Babilou	Day Light	0	1	2	3	75%	1.00	(8)	21				
	Lighting Conditions	Dawn	0	0	0	0	0%	0.00	(19)	22				
		Dark	0	1	0	1	25%	0.33	(10)					
		00:00 - 06:00	0	1	0	1	25%	0.33						
		06:00 - 09:00	0	0	1	1	25%	0.33						
		09:00 - 11:00	0	0	0	0	0%	0.00						
	Hours of Day	11:00 - 13:00	0	0	1	1	25%	0.33						
Backed into	line of Edy	13:00 - 15:00	0	0	0	0	0%	0.00						
		15:00 - 18:00	0	1	0	1	25%	0.33						
		18:00 - 24:00	0	0	0	0	0%	0.00						
		10.00 27.00	-			-	25%	0.33						
	-	North	0	1	0	1 1								
		North South	0	1	0	1								
	Direction	South	0	1	1	2	50%	0.67						
	Direction	South East	0	1 0	1	2 1	50% 25%	0.67 0.33						
	Direction	South	0	1	1	2	50%	0.67						

3.20.3. Traffic Operation Conditions and Analysis

In order to identify the traffic operation characteristics and safety relevant conflicts, field observations at NW 107 Avenue and NW 41 Street were performed on a typical weekday on November 22, 2010. A summary of the traffic data is presented in *Figure 79*, and the field review is presented in *Figure 80*.

This intersection has double left-turn bays for all approaches, except the eastbound which has a single left-turn lane. The northbound approach has an exclusive right-turn lane. The signal operation is split phases for northbound and southbound traffic, protected for eastbound left-turns and protected/permissive for westbound left-turns.

Long queues were observed for southbound, eastbound and westbound left-turns with vehicles spilling back and blocking the through lanes. Also the eastbound left-turn movement struggles to cross the opposing westbound through movement.



Vehicles in/out of the median opening in the north leg present a conflict to the north/south through movements.

It was also observed that pedestrians find difficulty crossing NW 41 Street which has crosswalks only on the east leg of the intersection.

Northbound/southbound approaches are not properly aligned and receiving lanes are shifted to the left. Also, the northbound/southbound handles heavy traffic that affects the capacity.

Capacity analysis was conducted for AM and PM traffic peak hours to evaluate existing conditions as well as improvements. *Table 47* depicts the analysis performed using Synchro 6.0. An assessment of Level of Services (LOS) analysis for peak periods indicated that this intersection is operating at a failing LOS E during both of the AM and PM peaks. In addition, these analyses indicated that the northbound and southbound movements are operating under substantial delay that generates failing conditions (LOS E & F) during the AM and PM peak hours. Also, the analyses concluded that in addition to northbound, the eastbound is under failing condition (LOS E) during the AM peak.

The results of the improvement and signal retiming/optimization yielded benefits for both AM and PM periods. This was achieved by adding lanes and changing lane assignment of the northbound and southbound approaches. Also, changing the current half quad north/south split phase to a full quad, and optimizing the signal while maintaining cycle length for both the AM and PM peak hours. As such, the overall LOS improved to D during AM and PM, and the overall and the approaches delays were improved.

			EB			WB				N	IB		SB				Overall
		L	TR	Арр	L	TR	Арр	L	Т	R	Арр	L	Т	R	Арр		
	Eviat	LOS	В	D	D	F	С	D	Е	F	Е	F	F	F		F	E
АМ	Exist.	Delay	16	46	44	110	23	50	75	112	80	94	144	13	35	138	72
Alvi	Modif.	LOS	В	D	D	F	С	D	Е	Е	D	Е	F	Е	В	Е	D
		Delay	17	49	47	88	21	42	70	66	39	56	88	73	12	72	52
	Exist.	LOS	F	D	Е	Е	D	D	F	F	С	F	D	E	Ξ	Е	E
РМ		Delay	130	38	57	72	45	50	130	122	27	103	54	6	0	58	67
	Modif.	LOS	D	С	D	Е	D	D	Е	D	В	D	Е	Е	А	D	D
		Delay	47	35	37	64	47	50	56	47	15	43	68	59	8	52	46

Table 47 – Capacity Analysis – NW 107 Avenue and NW 41 Street



3.20.4. Recommendations

Based on the safety analysis, field observations and traffic operations for the intersection of NW 107 Avenue and NW 41 Street, the following is recommended:

- Changing the lane configuration of the southbound approach by adding two lanes to become L, L, T, T & R instead of L, LT & TR. *This improvement will require additional right-of-way*.
- Changing the lane configuration of the northbound approach to become L, L, T, T & R instead of L, LT, T & R.
- Changing the current half quad north/south split phase to a full quad, and optimizing the signal while maintaining cycle length for both the AM and PM peak hours.
- Lengthen the eastbound left-turn lane to approximately 400 ft.
- Lengthen the westbound outside left-turn lane to approximately 500 ft.
- Lengthen the proposed southbound left-turn lanes to approximately 350 ft. each.
- Closing of the median opening in front of CVS driveway on the north leg.
- Adding more green time to pedestrians crossing NW 41 Street.
- Provide crosswalks and ADA approved pedestrian ramps on the west leg to cross NW 41 Street.
- Install 40 mph speed limit signs (R2-1) in all receiving directions.
- Pavement milling and resurfacing.
- Refurbishing of pavement marking and channelization guidelines.

A conceptual vision of the proposed roadway improvements is exhibited in Figure 81.





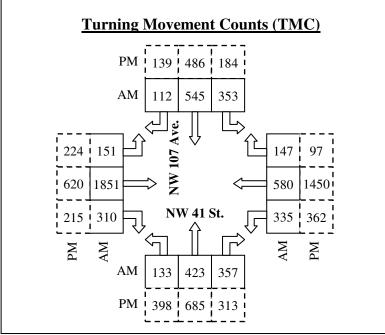


Figure 79: Traffic Data – NW 107 Avenue and NW 41 Street





Southbound approach: Heavy traffic exceeds the capacity.



North/South: Road is not properly aligned with an offset to the left.



Eastbound approach: Offset and trucks make it difficult for left-turn vehicles to cross the opposite traffic.



Eastbound approach: Red light running.



East leg: Pedestrians find it difficult to cross long crosswalk with insufficient time.

Westbound approach: Tire skid marks.

Figure 80: Field Review – NW 107 Avenue and NW 41 Street



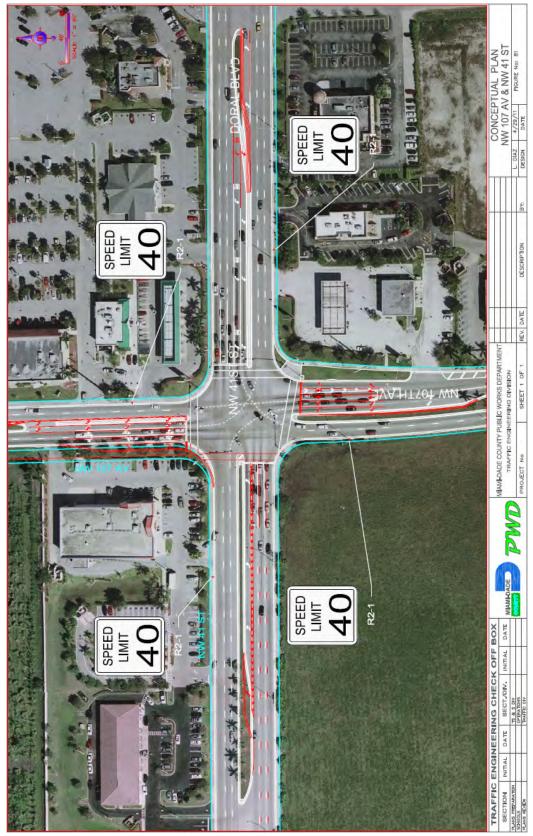


Figure 81: Conceptual Plan – NW 107 Avenue and NW 41 Street

Safety Studies at High Crash Locations Countywide