Palmetto Bay Traffic Calming Report

THE CORRADINO GROUP

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148TH STREET / MANGOWOOD / SOUTHWOOD NEIGHBORHOODS TRAFFIC CALMING

EXECUTIVE SUMMARY

Traffic calming entails implementing methods which mitigate high vehicular speeds, high traffic volumes, and poor driving behavior in order to promote safety, livability and an increased quality of life. The most successful traffic calming programs are multi-faceted, beginning with the least intrusive measures and moving forward to increasingly aggressive measures until the problem is mitigated.

Prior to the recommendation of a traffic calming program, or the selection of physical devices, it is important to understand the nature of the traffic problem. This is done through the collection and analysis of a variety of data as well as through meetings with those directly affected by the traffic. This project attempts to determine whether traffic calming strategies should be recommended for implementation along 148th Street, in the Mangowood neighborhood, and in the Southwood neighborhood of The Village of Palmetto Bay. And if so, which are the most appropriate. Corradino's approach is one of communication and coordination with the Village, the individual neighborhoods and Miami Dade County Public Works Department (MDCPW), combined with technical analysis to determine the most appropriate solution.

It was determined that traffic calming is warranted because neighborhood livability is threatened by both volumes and speed. The type of traffic calming that would best fit the situation would mitigate speeds and enhance safety. Replacement of high volumes of traffic off of these roads to better suited roads is not a necessity. This conclusion was arrived at because while daily volumes generally fall within livability thresholds, peak hour volumes do not. Peak hour volumes exceeded thresholds on nearly 50% of the roads counted which points to traffic accessing the schools.

A combination of several types of traffic calming treatments are recommended. The approach focuses on Enforcement / Awareness, and Physical Devices. It is suggested that an enforcement program initiate at the beginning of the school year 2005/06. Speed and volume data should be recollected after 30 days. If the problem is mitigated, enforcement should continue. Concurrent to the enforcement program, the speed limit should be lowered to 25 miles per hour, and speed limit signs should be posted at the entries to the neighborhoods and at the main Village gateways. If speeding persists, the enforcement should continue, and the selected alternative traffic calming devices should be designed and permitted, a process which takes up to 90 days. After permitting they should be constructed, a process which could take up to a year depending on the number of devices installed and the number of contractors hired to install them. Two options have been included for the type of devices. Corradino recommends Option 1 because data shows it would be more impactfull.

Devices selected are a combination of:

1. **Chicanes** with Islands, Circles and Raised Intersections
2. **Raised Intersections**, Circles and Chicanes with Islands

Locations and Preliminary Opinion of Probable Construction costs are presented within the main body of the report.

A more detailed explanation of the project, its development, and implementation is presented in the main body of this report.

INTRODUCTION

Traffic calming entails implementing methods which mitigate high vehicular speeds, high traffic volumes, and poor driving behavior in order to promote safety, livability and an increased quality of life. The most successful traffic calming programs are multi-faceted, beginning with the least intrusive measures and moving forward with increasingly aggressive measures until the problem is solved. Such programs begin with operational tactics such as enhanced police enforcement, speed limit displays, or other ways of calming. If problems persist, physical devices that move up the continuum are implemented. This continuum ranges from passive to aggressive devices, such as landscaping, chokers, chicanes, traffic circles, speed tables, and raised crosswalks to eventually street closures. The effectiveness of these measures lies in changes in street alignment, installation of barriers, and other physical measures to reduce traffic speeds and/or cut-through volumes.

Prior to the recommendation of a traffic calming program, or the selection of physical devices, it is important to understand the nature of the current traffic problem. This is done through the collection and analysis of a variety of data as well as through meetings with those directly affected by the traffic. This project attempts to determine whether traffic calming strategies should be implemented along 148th Street, in the Mangowood neighborhood and in the Southwood neighborhood of The Village of Palmetto Bay. And if so, which are the most appropriate. Corradino's approach is one of communication and coordination with the Village, the individual neighborhoods and Miami Dade County Public Works Department, Traffic Engineering Division (MDCPW), combined with technical analysis to determine the most appropriate solution.

There are several traffic calming solutions that can be implemented in a variety of situations to solve problems. MDCPW has developed a pallet of devices after several years of experience in implementing and monitoring traffic calming. The input from MDCPW is important, as they are the official approval body for all traffic control devices on all streets except state roads in our county. This power was granted to the county as part of the Home Rule Charter, developed in the 1950's.

As such, special attention has been paid to recommending appropriate solutions that serve both the needs of the neighborhood and the governing bodies. The solutions have been planned to mitigate speeding, maintain a consistent flow of traffic, as well as provide access for municipal service, emergency and transit vehicles.

APPROACH

The first steps in calming traffic are to gain an understanding of the traffic issues both from the perspective of the neighbors and through analysis. Data, in the form of volume and speed counts, has been collected in order to realize the existing conditions in each neighborhood. An analysis was conducted to determine what, if any, traffic calming measures would be appropriate to mitigate the current issues affecting the area, particularly related to speeding or abundant traffic intrusion. Initial stakeholder meetings were held with individuals and groups to discuss the perceived problems and various ways of mitigating them. The resulting recommendations have been suggested as they pertain to maintaining the roads primary function as neighborhood streets as well as their ability to mitigate the traffic issues in the most efficient and effective manner possible. Preliminary Engineer's Opinion of Probable Construction Cost have been provided for each recommended alternative.

Once a clear understanding of the issues was developed, Corradino received additional input from the Village and the neighbors. With this input, a final list of recommendations for traffic calming in the neighborhoods was developed. The Implementation Plan outlines the suggested measures, their potential cost, an estimated time frame and the process required for their further development and implementation.

STUDY AREAS

Because traffic calming is most effective in an area-wide approach two general study areas were examined.

A) 148TH STREET / MANGOWOOD NEIGHBORHOODS

This study area is defined by:

- 146th Street (north side)
- 152nd Street (south Side)
- 80th Avenue (east side)
- US-1 (Dixie Highway) (west side)

B) SOUTHWOOD NEIGHBORHOOD

This study area is defined by:

- 152nd Street (north side)
- 168th Street (south Side)
- 77th Avenue (east side)
- 82nd Avenue (west side)

TRAFFIC CALMING

Public involvement relative to traffic calming begins with gaining an understanding of the practice of traffic calming and the tools used to develop a successful program. The following discussion is an introduction to the traffic calming devices used sucessfully nationally. This was presented to the various stakeholders as the process unfolded.

Volumes vs. Speed

The art of traffic calming generally involves changes in street alignment, installation of barriers, and other physical measures to reduce traffic speeds and/or cut-through volumes. These measures can be separated into two groups based on the main intended consequence. Speed Control Measures are primarily used to address safety or speeding problems by changing vertical alignment, changing horizontal alignment, or narrowing the roadway. Volume Control Measures are primarily used to address cut-through traffic problems by blocking certain movements, thereby diverting traffic to streets better able to handle it. The distinction between the two types of measures is not as clear as their names suggest, since each may have unintended consequences that can effect not only the street that they are placed, but surrounding roadway network. That's why it is important to develop the least costly and intrusive measures first.

Speed Control Measures:

Speed Humps

Speed humps are rounded raised areas placed across the roadway. They are generally 10 to 14 feet long (in the direction of travel), making them distinct from the shorter "speed bumps" found in many parking lots, and are 3 to 4 inches high. The profile of a speed hump can be circular, or parabolic. They are often tapered as they reach the curb on each end to allow unimpeded drainage. Speed Humps are good for locations where very low speeds are desired and reasonable, and noise and fumes are not a major concern. These are generally placed in private developments such as shopping centers, and are no longer permitted in public right of ways within Miami Dade County, yet they are very effective.

Effectiveness:

- For a 12-foot hump:
  - Average of 22% decrease in the 85th percentile travel speeds, or from an average of 35.0 to 27.4 miles per hour;
  - Average of 11% decrease in accidents or from an average of 2.7 to 2.4 accidents per year
- For a 14-foot hump:
  - Average of 23% decrease in the 85th percentile travel speeds, or from an average of 33.3 to 25.6 miles per hour
  - Average of 41% decrease in accidents or from an average of 4.4 to 2.6 accidents per year

Speed Tables

Speed tables are flat-topped speed humps often constructed with brick or other textured materials on the flat section. Speed tables are typically long enough for the entire wheelbase of a passenger car to rest on the flat section. Their long flat fields give speed tables higher design speeds than speed humps. The brick pavers or other textured materials improve the appearance of speed tables, draw attention to them, and may enhance safety and speed-reduction. Speed tables are good for locations where low speeds are desired but a somewhat smooth ride is needed for larger vehicles. Because of safety concerns these are no longer permitted on public right of ways in Miami Dade County.

Effectiveness:

- For a 22-foot speed table:
  - Average of 18% decrease in the 85th percentile travel speeds, or from an average of 36.7 to 30.1 miles per hour;
  - Average of 45% decrease in accidents or from an average of 6.7 to 3.7 accidents per year

Raised Crosswalks

Raised crosswalks are similar to Speed Tables outfitted with crosswalk markings and signage to channelize pedestrian crossings, providing pedestrians with a level street crossing. Also, by raising the level of the crossing, pedestrians are more visible to approaching motorists. Raised crosswalks are good for locations where pedestrian crossings occur at hazard locations and vehicle speeds are excessive.

Effectiveness:

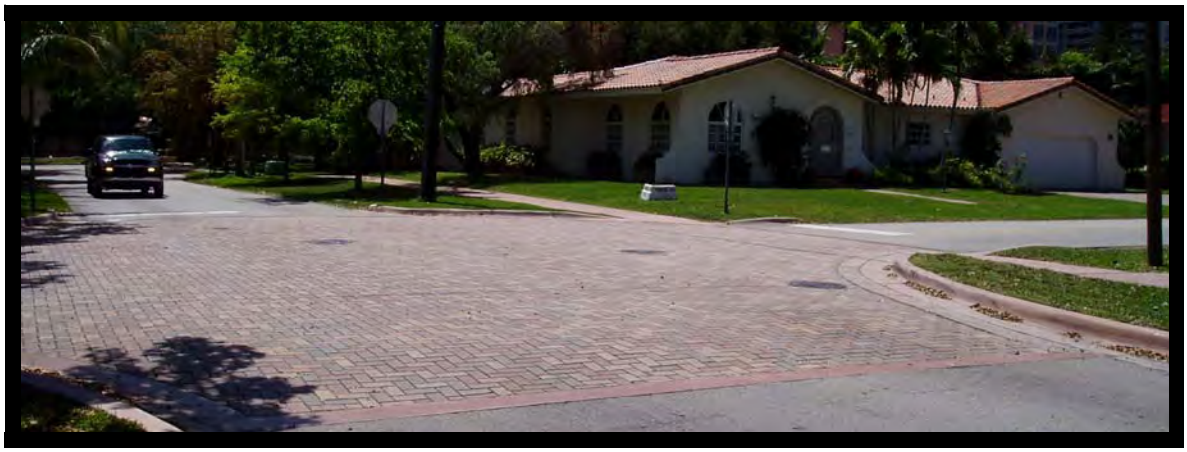
- Similar to a speed table.

Raised Intersections

Raised intersections are flat raised areas covering an entire intersection, with ramps on all approaches and often with brick or other textured materials on the flat section. They usually rise to the level of the sidewalk, or slightly below to provide a "lip" that is detectable by the visually impaired. By modifying the level of the intersection, the crosswalks are more readily perceived by motorists to be "pedestrian territory". Raised intersections are good for intersections with substantial pedestrian activity, and areas where other traffic calming measures would be unacceptable because they take away scarce parking spaces, or interfere with drawings.

Effectiveness:

- *Average of 1% decrease in the 85th percentile travel speeds, or from an average of 34.6 to 34.3 miles per hour*



Textured Pavements

Textured and colored pavement includes the use of stamped pavement or alternate paving materials to create an uneven surface for vehicles to traverse. They may be used to emphasize either an entire intersection or a pedestrian crossing, and are sometimes used along entire street blocks. Textured pavements are good for "main street" areas where there is substantial pedestrian activity and noise is not a major concern.

Effectiveness:

- Has not been proven to reduce traffic speeds

Traffic Circles

Traffic circles are raised islands, placed in intersections, around which traffic circulates. They are good for calming intersections, especially within neighborhoods, where large vehicle traffic is not a major concern but speeds, volumes, and safety are problems.

Effectiveness:

- Average of 11% decrease in the 85th percentile travel speeds, or from an average of 34.1 to 30.2 miles per hour
- Including a large sample from Seattle, an average of 73% decrease in accidents, or from an average of 2.2 to 0.6 accidents per year
- Excluding the large sample from Seattle, an average of 29% decrease in accidents, or from an average of 5.9 to 4.2 accidents per year

Roundabouts

Roundabouts require traffic to circulate counterclockwise around a center island. Unlike traffic circles, roundabouts are used on higher volume streets to allocate right-of-way between competing movements.

Effectiveness:

- *Average 29% reduction in accidents, with a reduction from 9.3 to 5.9 accidents per year*

Chicanes

Chicanes are curb extensions that alternate from one side of the street to the other, forming S-shaped curves. Good for locations where speeds are a problem but noise associated with Speed Tables and other textured devices and related measures would be unacceptable.

Effectiveness:

- *No data has been compiled on the effects of chicanes*

Realigned Intersections

Realigned intersections are changes in alignment that convert T-intersections with straight approaches into curving streets that meet at right-angles. A former "straight-through" movement along the top of the T becomes a turning movement. While not commonly used, they are one of the few traffic calming measures for T-intersections, because the straight top of the T makes deflection difficult to achieve, as needed for traffic circles. They are good for T-intersections.

Effectiveness:

- *No data has been compiled on the effects of realigned intersections*

Neckdowns

Neckdowns are curb extensions at intersections that reduce the roadway width from curb to curb. They "pedestrianize" intersections by shortening crossing distances for pedestrians and drawing attention to pedestrians via raised peninsulas. They also tighten the curb radii at the corners, reducing the speeds of turning vehicles. They are good for intersections with substantial pedestrian activity and areas where vertical traffic calming measures would be unacceptable because of noise considerations.

Effectiveness:

- *Average of 4% decrease in the 85th percentile travel speeds, or from an average of 34.9 to 32.3 miles per hour*

Center Island

A center island is a raised island located along the centerline of a street that narrows the travel lanes at that location. Center islands are often landscaped to provide a visual amenity. Placed at the entrance to a neighborhood, and often combined with textured pavement, they are often called "gateway islands." Fitted with a gap to allow pedestrians to walk through at a crosswalk, they are often called "pedestrian refuges." Center Islands are good for entrances to residential areas and wide streets where pedestrians need to cross.

Effectiveness:

- Average of 4% decrease in the 85th percentile travel speeds, or from an average of 34.9 to 32.3 miles per hour

Chokers

Chokers are curb extensions at midblock locations that narrow a street by widening the sidewalk or planting strip. If marked as crosswalks, they are also known as safe crosses. Two-lane chokers leave the street cross section with two lanes that are narrower than the normal cross section. One-lane chokers narrow the width to allow travel in only one direction at a time, operating similarly to one-lane bridges. They are good for areas with substantial speed problems and no on-street parking shortage.

Effectiveness:

- Average of 4% decrease in the 85th percentile travel speeds, or from an average of 34.9 to 32.3 miles per hour

Volume Control Measures

Full Closures

Full street closures are barriers placed across a street to completely close the street to through-traffic, usually leaving only sidewalks open. They are good for locations with extreme traffic volume problems and where other less aggressive measures have been unsuccessful.

Effectiveness:

- Average of 44% decrease in traffic volume

Half Closures

Half closures are barriers that block travel in one direction for a short distance on otherwise two-way streets. They are good for locations with extreme traffic volume problems and non-restrictive measures have been unsuccessful.

Effectiveness:

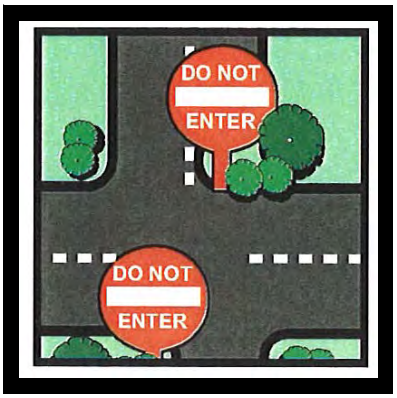
- Average of 42% decrease in traffic volume.

Diagonal Diverters

Diagonal diverters are barriers placed diagonally across an intersection, blocking through movements and creating two separate, L-shaped streets. Like half closures, diagonal diverters are often staggered to create circuitous routes through the neighborhood as a whole, discouraging non-local traffic while maintaining access for local residents. They are good for inner-neighborhood locations with non-local traffic volume problems.

Effectiveness:

- *Average of 35% decrease in traffic volume, or a decrease of 501 vehicles per day*

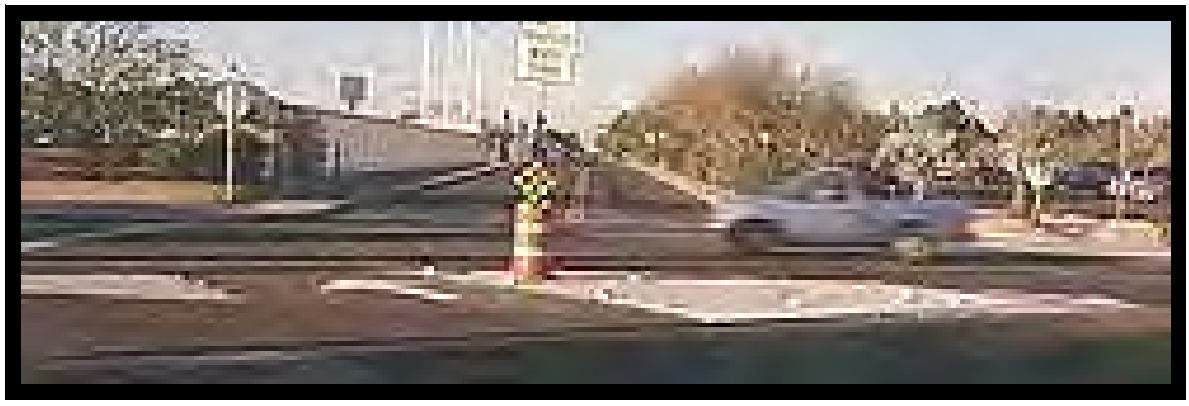


Median Barriers

Median barriers are islands located along the centerline of a street and continuing through an intersection so as to block through movement at a cross street.

Effectiveness:

- *Average of 31% decrease in traffic volume.*



PUBLIC INVOLVEMENT

The purpose of this task was to introduce the project to the neighbors and stakeholders, provide a consistent level of understanding regarding traffic calming measures, and the data that was collected, from which the analysis and recommendations were based. Meetings were held on several occasions with individuals, groups, as well as Village and County officials.

Upon receiving a notice to proceed, The Corradino Group was provided an initial list of stakeholders in the various neighborhoods. On several occasions tours of the subject areas were taken with individuals. The Village decision makers were kept involved in the process. The most organized group was the Mangowood Homeowners Association. An initial meeting and tour with their Chairman was followed up by a presentation to their Board of Directors on May 18, 2005. At this meeting a full presentation of the process, and the traffic calming devices used nationally, was given. After the issues were discussed, the Board suggested that their preferred devices were the Speed Table and the Raised Textured Intersection. Emphasis was placed on having the devices interfere as little as possible with the existing drainage swales and driveways within the neighborhood.

Subsequent to the meeting with the Mangowood Board of Directors, data was collected and analyzed. The results, presented in the Data Analysis section of this report, confirmed that a traffic problem did exist, and that the nature of the problem was one that could be mitigated through devices that focused on safety or speeding, as opposed to the elimination of cut through traffic.

The initial program was taken to the Miami Dade Public Works Department for their review and recommendations. At this meeting it was made known that the MDCPW no longer supported the implementation of Speed Tables, due to several problems encountered after their implementation. These devices, in their current design had become a safety hazard. The program was then modified, and the speed tables were conceptually redesigned, (from a length of 20' to a length of 50') this was given a verbal concurrence by the County, pending further review.

On May 31, 2005, a meeting was held at Coral Reef Elementary School, with the general membership of the Mangowood Homeowners Association. At this meeting a presentation of the process to that point was provided and the draft program presented. Consensus was gained on the idea that the problem inferred from the data was accurate, and that a traffic calming program beginning with enforcement, signage, and then traffic calming devices at several locations throughout the neighborhood would be best to mitigate the problem.

The elongated Speed Tables were taken back to MDCPW for review. Since the previous meeting the MDCPW staff had met to discuss the design and had decided that it was not appropriate. This meant that they would no longer be approving Speed Tables for use. It was discovered that approvable designs were Traffic Circles, Traffic Islands, Raised Intersections, and Chicanes.

For the Southwood neighborhood some individuals were met one on one, in small groups, and over the telephone to discuss their issues. The basis for improvement was taken from the input provided from the Mangowood neighborhood.

DATA COLLECTION

Data for this project was collected by taking twenty two (22), 72-hour bidirectional traffic counts, using Automatic Traffic Recorders. In addition five counts were taken for vehicle classification, gap and speed, again in the 72-hour time period. These were taken Tuesday, Wednesday, and Thursday, April 12, 13 and 14, Accident Locations, furnished by the Palmetto Bay Police Department, were examined.

Count Locations:

	LINK	FROM	TO
1	89th Avenue	149th Street	152nd Street
2	88th Avenue	149th Street	152nd Street
3	148th Drive	152nd Street	83rd Court
4	148th Drive	83rd Court	82nd Avenue
5	148th Drive	82nd Avenue	80th Avenue
6	151st Street	148th Drive	82nd Avenue
7	151st Street	82nd Avenue	80th Avenue
8	80th Avenue	152nd Street	148th Drive
9	80th Avenue	148th Drive	144th Street
10	80th Avenue	168th Street	162nd Street
11	160th Street	80th Avenue	79th Avenue
12	160th Street	79th Avenue	77th Court
13	79th Avenue	160th Street	152nd Street
14	77th Court	160th Street	152nd Street
15	162nd Street	77th Court	80th Avenue
16	164th Street	77th Court	80th Avenue
17	165th Street	77th Court	80th Avenue
18	166th Street	77th Court	80th Avenue
19	77th Court	168th Street	162nd Street
20	162nd Street	82nd Avenue	80th Avenue
21	160th Street	82nd Avenue	80th Avenue
22	148th Street	US-1	87th Avenue

Speed Count Locations:

	LINK	FROM	TO
1	148th Drive	152nd Street	83rd Court
2	80th Avenue	152nd Street	148th Drive
3	80th Avenue	148th Drive	144th Street
4	148th Street	US-1	87th Avenue
5	77th Court	152nd Street	160th Street

The tables show each count station by:

- location
- date of the count
- time period, (am or pm)
- travel direction (northbound, southbound, eastbound, westbound)
- directional flow percentage
- directional peak hour
- total daily bidirectional volume
- daily peak hour
- total daily peak hour volume,
- 85th percentile speed, (if counted)

The counts are color coded. The blue row indicates the total average am and pm count totals. The Total Daily Average row at the bottom is colored:

- Green (below traffic calming thresholds, [no problem])
- Yellow (approaching traffic calming thresholds [potential problem])
- Red (over traffic calming thresholds [problem exists])

The analysis section of this report goes into greater detail of the issues discovered from this data. Data collection sheets are found in Appendix A.

ANALYZED TRAFFIC COUNT DATA

1	89 Ave bw 149/152	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005	252		50.5	7:30	64	247		49.5	8:30	49	499	7:30	103	
	AM	4/13/2005	283		54.3	8:00	72	238		45.7	8:30	54	521	8:00	125	
	AM	4/14/2005	249		50.4	8:00	64	245		49.6	8:00	59	494	8:00	123	
	AM TOTAL AVG		261		52		67	243		48		54	505		117	
	PM	4/12/2005	413		48.5	4:45	70	439		51.5	6:00	64	852	4:45	124	
	PM	4/13/2005	466		52.5	4:30	54	422		47.5	2:30	56	888	4:30	128	
	PM	4/14/2005	436		51.2	4:30	66	415		48.8	4:45	66	851	4:45	131	
	PM TOTAL AVG		438		51		63	425		49		62	864		128	
	TOTAL DAILY AVERAGE		700		51		130	669		49		116	1368		245	

2	88 Ave bw 149/152	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005	122		50.2	8:00	27	121		49.8	11:00	26	243	8:00	51	
	AM	4/13/2005	120		56.3	7:15	38	93		43.7	7:00	19	213	7:15	54	
	AM	4/14/2005	124		51.5	7:00	31	117		48.5	9:45	29	241	7:00	57	
	AM TOTAL AVG		122		53		32	110		47		25	232		54	
	PM	4/12/2005	159		48.6	4:15	29	168		51.4	3:00	26	327	3:30	52	
	PM	4/13/2005	172		49.7	4:00	30	174		50.3	1:30	32	346	1:45	58	
	PM	4/14/2005	174		52.7	3:45	34	156		47.3	2:45	28	330	3:45	51	
	PM TOTAL AVG		168		50		31	166		50		29	334		54	
	TOTAL DAILY AVERAGE		290		52		63	276		49		53	567		108	

4	148 Dr bw 152 / 83	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005		181	60.9	6:45	69		116	39.1	7:00	53	297	7:00	120	
	AM	4/13/2005		150	56.3	7:15	38		107	41.6	6:45	104	257	6:45	104	
	AM	4/14/2005		155	53.4	7:00	48		135	46.6	7:00	51	290	7:00	99	33
	AM TOTAL AVG			162	57		52		119	42		69	281		108	
	PM	4/12/2005		193	47.4	5:15	37		214	52.6	1:45	37	407	1:45	67	
	PM	4/13/2005		181	47.4	1:00	32		201	52.6	1:00	35	382	1:00	67	
	PM	4/14/2005		195	48	1:30	30		211	52	1:15	41	406	1:15	69	43
	PM TOTAL AVG			190	48		33		209	52		38	398		68	
	TOTAL DAILY AVERAGE			352	52		85		328	47		107	680		175	

5	148 Dr bw 82 / 80	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005		112	38.1	7:45	58		182	61.9	8:00	136	294	7:45	192	
	AM	4/13/2005		86	31.4	7:30	56		188	68.6	8:00	127	274	7:45	178	
	AM	4/14/2005		99	33.6	7:45	61		196	66.4	7:45	134	295	7:45	195	
	AM TOTAL AVG			99	34		58		189	66		132	288		188	
	PM	4/12/2005		91	34.3	2:30	22		174	65.7	2:45	66	265	2:45	88	
	PM	4/13/2005		90	31.8	1:15	23		193	82	1:30	82	283	1:30	105	
	PM	4/14/2005		88	28.9	2:45	19		217	71.1	2:30	74	305	2:30	90	
	PM TOTAL AVG			90	32		21		195	73		74	284		94	
	TOTAL DAILY AVERAGE			189	33		80		383	69		206	572		283	

6	151St bw 148 / 82	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005	55		35.3	7:15	21	101		64.7	6:45	45	156	6:45	65	
	AM	4/13/2005	56		38.6	7:00	20	89		61.4	6:45	45	145	7:00	65	
	AM	4/14/2005	47		34.6	6:45	22	89		65.4	7:00	51	136	7:00	73	
	AM TOTAL AVG		53		36		21	93		64		47	146		68	
	PM	4/12/2005	83		44.6	2:15	19	103		55.4	4:45	18	186	4:45	33	
	PM	4/13/2005	82		47.7	12:15	17	90		52.3	2:45	15	172	12:30	31	
	PM	4/14/2005	86		42.4	2:00	18	117		57.6	1:15	23	203	1:15	35	
	PM TOTAL AVG		84		45		18	103		55		19	187		33	
	TOTAL DAILY AVERAGE		136		41		39	196		59		66	333		101	

7	151St bw 82 / 80	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005	6		2.9	7:45	4	199		97.1	7:45	147	205	7:45	151	
	AM	4/13/2005	6		3.9	7:45	4	148		96.1	7:30	117	154	7:30	120	
	AM	4/14/2005	5		3.1	8:15	3	154		96.9	7:30	117	159	7:30	119	
	AM TOTAL AVG		6		3		4	167		97		127	173		130	
	PM	4/12/2005	2		1.7	3:45	1	119		98.3	2:30	46	121	2:30	46	
	PM	4/13/2005	3		2.2	5:45	2	136		97.8	1:15	58	139	1:15	59	
	PM	4/14/2005	3		2.3	2:15	3	125		97.7	2:15	49	128	2:15	52	
	PM TOTAL AVG		3		2		2	127		98		51	129		52	
	TOTAL DAILY AVERAGE		8		3		6	294		97		178	302		182	

8	80 Ave bw 152 / 148	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005														
	AM	4/13/2005														
	AM	4/14/2005														31
	AM TOTAL AVG		0		0		0	0		0		0	0		0	
	PM	4/12/2005														
	PM	4/13/2005														
	PM	4/14/2005														28
	PM TOTAL AVG		0		0		0	0		0		0	0		0	
	TOTAL DAILY AVERAGE		0		0		0	0		0		0	0		0	

9	80 Ave bw 148 / 144	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005														
	AM	4/13/2005														
	AM	4/14/2005														37
	AM TOTAL AVG		0		0		0	0		0		0	0		0	
	PM	4/12/2005														
	PM	4/13/2005														
	PM	4/14/2005														33
	PM TOTAL AVG		0		0		0	0		0		0	0		0	
	TOTAL DAILY AVERAGE		0		0		0	0		0		0	0		0	

10	80 Ave bw 168 / 162	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005	745		74.7	7:00	381	252		25.3	7:00	95	997	7:00	476	
	AM	4/13/2005	802		81.3	7:00	404	185		18.7	7:00	74	987	7:00	478	
	AM	4/14/2005	790		78.6	7:00	401	215		21.4	7:00	73	1005	7:00	476	
	AM TOTAL AVG		779		78		395	217		22		81	996		477	
	PM	4/12/2005	458		54.5	2:15	184	382		45.4	2:30	93	840	2:30	274	
	PM	4/13/2005	481		53.6	2:30	177	417		46.4	2:30	109	898	2:30	286	
	PM	4/14/2005	368		48.4	12:15	177	393		51.6	12:00	111	761	12:00	284	
	PM TOTAL AVG		436		52		179	397		48		104	833		281	
	TOTAL DAILY AVERAGE		1215		65		575	615		35		186	1829		758	

11	160 St bw 80 / 79	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005		865	73.7	6:45	335		309	26.3	7:00	140	1174	6:45	455	
	AM	4/13/2005		1040	77.4	6:30	415		304	22.6	7:00	133	1344	7:00	539	
	AM	4/14/2005		919	74.9	6:00	379		308	25.1	7:00	132	1227	6:45	467	
	AM TOTAL AVG			941	75		376		307	25		135	1248		487	
	PM	4/12/2005		479	41.7	2:30	123		670	58.3	2:00	151	1149	2:00	257	
	PM	4/13/2005		519	44.3	2:30	136		652	55.7	2:15	127	1171	2:30	255	
	PM	4/14/2005		495	45.5	12:30	122		594	54.5	4:30	116	1089	12:30	212	
	PM TOTAL AVG			498	44		127		639	56		131	1136		241	
	TOTAL DAILY AVERAGE			1439	60		503		946	40		266	2385		728	

12	160 St bw 79 / 77ct	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005		369	73.8	6:45	161		131	26.2	7:00	64	500	7:00	221	
	AM	4/13/2005		360	74.5	6:30	146		123	25.5	7:00	55	483	6:45	197	
	AM	4/14/2005		365	72.7	6:45	164		137	27.3	7:00	54	502	6:45	208	
	AM TOTAL AVG			365	74		157		130	26		58	495		209	
	PM	4/12/2005		150	49.2	2:00	42		233	60.8	1:45	49	383	2:00	90	
	PM	4/13/2005		178	43.1	2:00	44		235	56.9	4:15	59	413	4:15	90	
	PM	4/14/2005		171	42	12:15	41		236	58	4:30	45	407	12:15	75	
	PM TOTAL AVG			166	45		42		235	59		51	401		85	
	TOTAL DAILY AVERAGE			531	59		199		365	42		109	896		294	

13	79 Ave bw 160 / 152	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005	353		65.4	6:30	134	187		34.6	7:00	82	540	6:45	213	
	AM	4/13/2005	370		65.1	7:00	151	198		34.9	7:00	76	568	7:00	227	
	AM	4/14/2005	351		67.9	6:30	152	166		32.1	7:00	72	517	6:45	201	
	AM TOTAL AVG		358		66		146	184		34		77	542		214	32
	PM	4/13/2005	214		35	2:45	46	398		65	2:00	93	612	2:00	130	
	PM	4/12/2005	248		37.8	2:45	63	408		62.2	2:00	76	656	2:45	127	
	PM	4/14/2005	240		35.5	12:15	53	437		64.5	4:30	78	677	3:45	120	
	PM TOTAL AVG		234		36		54	414		64		82	648		126	33
	TOTAL DAILY AVERAGE		592		51		200	598		49		159	1190		339	

14	77 Ct bw 160 / 152	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005	376		68.7	6:45	156	171		31.3	7:00	77	547	6:45	227	
	AM	4/13/2005	375		74.7	6:30	158	127		25.3	6:45	54	502	6:45	201	
	AM	4/14/2005	402		75.1	6:30	171	133		24.9	6:45	51	535	6:45	217	
	AM TOTAL AVG		384		73		162	144		27		61	528		215	34
	PM	4/12/2005	161		35.2	2:00	48	297		64.8	2:00	63	458	2:00	111	
	PM	4/13/2005	217		41.3	2:00	55	309		58.7	4:15	75	526	4:15	113	
	PM	4/14/2005	195		38.5	12:15	46	311		61.5	4:30	56	506	12:15	84	
	PM TOTAL AVG		191		38		50	306		62		65	497		103	32
	TOTAL DAILY AVERAGE		575		56		211	449		44		125	1025		318	

15	162 St bw 77 Ct / 80	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005		239	69.1	7:15	187		107	30.9	7:00	58	346	7:00	242	
	AM	4/13/2005		228	70.2	7:15	176		97	29.8	7:00	42	325	7:00	215	
	AM	4/14/2005		289	69.5	7:15	185		127	30.5	7:00	46	416	7:00	229	
	AM TOTAL AVG			252	70		183		110	30		49	362		229	
	PM	4/12/2005		279	69.9	2:15	129		120	30.1	2:15	49	399	2:15	178	
	PM	4/13/2005		301	70.5	2:15	144		126	29.5	2:15	57	427	2:15	201	
	PM	4/14/2005		296	71.3	12:15	156		119	28.7	12:00	50	415	12:00	205	
	PM TOTAL AVG			292	71		143		122	29		52	414		195	
	TOTAL DAILY AVERAGE			544	70		326		232	30		101	776		423	

16	164 St bw 77 Ct / 80	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005	138		95.2	7:00	112	7		4.8	7:00	4	145	7:00	116	
	AM	4/13/2005	0		0	-	0	47		100	7:00	32	47	7:00	32	
	AM	4/14/2005	0		0	-	0	55		100	7:00	34	55	7:00	24	
	AM TOTAL AVG		46		32		37	36		68		23	82		57	
	PM	4/12/2005	74		64.3	2:15	57	41		35.7	6:45	10	115	2:15	60	
	PM	4/13/2005	0		0	-	0	54		100	2:00	15	54	2:00	14	
	PM	4/14/2005	0		0	-	0	71		100	4:00	15	71	4:00	15	
	PM TOTAL AVG		25		21		19	55		79		13	80		30	
	TOTAL DAILY AVERAGE		71		27		56	92		73		37	162		87	

17	165 St bw 77 Ct / 80	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005		17	45.9	7:00	7		20	54.1	7:30	8	37	7:00	14	
	AM	4/13/2005		19	47.5	7:00	7		21	52.5	7:30	10	40	7:30	16	
	AM	4/14/2005		18	46.2	7:15	6		21	53.8	7:00	10	39	7:00	15	
	AM TOTAL AVG			18	47		7		21	53		9	39		15	
	PM	4/12/2005		26	41.9	2:00	15		36	58.1	2:00	20	62	2:00	35	
	PM	4/13/2005		31	38.3	2:15	15		50	61.7	2:15	23	81	2:15	38	
	PM	4/14/2005		41	49.4	12:15	24		42	50.6	12:00	25	83	12:15	48	
	PM TOTAL AVG			33	43		18		43	57		23	75		40	
	TOTAL DAILY AVERAGE			51	45		25		63	55		32	114		55	

18	166St bw 77 Ct / 80	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005		17	41.5	6:30	9		24	58.5	6:30	13	41	6:30	22	
	AM	4/13/2005		22	40.7	6:30	7		32	59.3	6:45	9	54	6:45	16	
	AM	4/14/2005		22	47.8	6:30	7		24	52.2	7:00	11	46	7:00	16	
	AM TOTAL AVG			20	43		8		27	57		11	47		18	
	PM	4/12/2005		32	44.4	2:15	7		40	55.6	2:00	9	72	2:15	15	
	PM	4/13/2005		36	40	2:15	12		54	60	2:15	12	90	2:15	24	
	PM	4/14/2005		28	35.9	12:00	9		50	64.1	12:15	16	78	12:00	24	
	PM TOTAL AVG			32	40		9		48	60		12	80		21	
	TOTAL DAILY AVERAGE			52	42		17		75	58		23	127		39	

19	77 Ct bw 168 / 162	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005	16		26.7	5:45	5	44		73.3	6:30	12	60	6:30	16	
	AM	4/13/2005	13		23.2	6:00	3	43		76.8	6:00	12	56	6:00	15	
	AM	4/14/2005	46		43	6:15	12	61		57	6:30	15	107	6:30	27	
	AM TOTAL AVG		25		31		7	49		69		13	74		19	
	PM	4/12/2005	24		26.7	4:00	6	66		72.3	4:45	14	90	4:00	18	
	PM	4/12/2005	48		40.7	5:00	14	60		59.3	2:00	19	118	2:00	27	
	PM	4/14/2005	77		40.7	12:15	18	112		59.3	4:15	21	189	3:45	31	
	PM TOTAL AVG		50		36		13	79		64		18	132		25	
	TOTAL DAILY AVERAGE		75		34		19	129		66		31	207		45	

20	162St bw 82 / 80	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005		270	61.9	6:00	157		166	38.1	6:00	85	436	6:00	242	
	AM	4/13/2005		224	54.8	6:00	133		185	45.2	6:15	99	409	6:00	229	
	AM	4/14/2005		304	49.3	6:00	157		313	50.7	11:00	138	617	6:00	256	
	AM TOTAL AVG			266	55		149		221	45		107	487		242	
	PM	4/13/2005		172	43	1:15	83		228	57	1:15	114	400	1:15	197	
	PM	4/13/2005		196	45	1:15	85		240	55	1:30	119	436	1:15	202	
	PM	4/14/2005		91	39.9	3:00	20		137	60.1	12:00	30	228	12:00	40	
	PM TOTAL AVG			153	43		63		202	57		88	355		146	
	TOTAL DAILY AVERAGE			419	49		212		423	51		195	842		389	

21	160St bw 82 / 80	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed NB/SB
	AM	4/12/2005		389	41.2	7:00	196		555	58.8	7:00	283	944	7:00	479	
	AM	4/13/2005		397	41.2	7:00	179		566	58.8	7:00	286	963	7:00	465	
	AM	4/14/2005		408	40.8	7:00	187		593	59.2	7:00	278	1001	7:00	465	
	AM TOTAL AVG			398	41		187		571	59		282	969		470	
	PM	4/12/2005		548	43	2:00	131		727	57	2:30	214	1275	2:00	333	
	PM	4/13/2005		582	46	2:15	134		683	54	2:15	194	1265	2:15	328	
	PM	4/14/2005		588	46	12:00	137		690	54	12:30	199	1287	12:15	324	
	PM TOTAL AVG			573	45		134		700	55		202	1276		328	
	TOTAL DAILY AVERAGE			971	43		321		1271	57		485	2245		798	

22	148 St bw US-1 / 87	Date	NB	EB	%	Peak Hr	Vol	SB	WB	%	Peak Hr	Vol	TOTAL	PEAK HR	PH VOL	85 %-tile Speed EB/WB
	AM	4/12/2005		532	22%	8:00	118		697	0.23	8:00	158	1229		276	
	AM	4/13/2005		719	22%	8:00	159		735	0.20	8:00	148	1454		307	
	AM	4/14/2005		775	22%	8:00	171		768	0.21	8:00	158	1543		329	38
	AM TOTAL AVG			675	22%		149		733	0.21		155	1409		304	
	PM	4/12/2005		921	14%	5:00	129		809	0.16	3:00	132	1730		261	
	PM	4/13/2005		984	14%	5:00	136		871	0.15	3:00	130	1855		266	
	PM	4/14/2005		1075	14%	4:00	150		826	0.17	4:00	142	1901		292	45
	PM TOTAL AVG			993	14%		138		835	0.16		135	1829		273	
	TOTAL DAILY AVERAGE			1669	18		288		1569	18		289	3237		577	

DATA ANALYSIS

The purpose of this task is to provide analysis of the data collected that will determine if there is a need for traffic calming measures, and if so, what type.

The three most common reasons for the need of traffic calming are: high vehicular volumes, cut through traffic, and speeding. Residential streets lose livability with a combination of high volumes and high speeds. The former is the result of arterial traffic diverting to local streets, either to shorten the travel distance and time, or to avoid traffic congestion. For example, drivers on either 82nd Avenue or 152nd Street trying to avoid the signal at the intersection of these roads may cut through on 148th Street in Mangowood. The latter is generally caused by long stretches of roadways without obstructions or conflicts. For example, 148th Street, west of US-1 provides ample opportunity of speeding as vehicles enter the long uninterrupted street. Each of the study area exhibit these characteristics.

Essentially, 148th Street is an access point from US-1 into a residential neighborhood. 85th percentile speeds are at or above 40mph. Mangowood is a potential short cut between 152nd Street and 82nd Ave, and is significantly influenced by Coral Reef Elementary School. Traffic in this area exceeds peak hour thresholds on most streets counted. Southwood is also influenced by both Coral Reef Elementary and Southwood Middle School, twice daily, and also exceeds peak hour thresholds on many of its streets.

Miami-Dade County requires all traffic calming projects to follow the guidelines contained in the ***Street Closure/Traffic Flow Modification Study*** report conducted in 1996.

Machine counts are conducted to determine the traffic volumes (See Appedix "A" for details). A residential street begins to lose its livability if the following thresholds are surpassed:

Roadway Classification	Daily Threshold*	Peak-Hour Threshold**
Residential local street	1,500 vpd	150 vph
Residential collector	3,000 vpd	300 vph

*vpd = vehicles/day
**vph = vehicles/hour

Volumes:

The streets in the study areas are considered residential local streets. If the level of through traffic volume is determined to be incompatible with the function of a residential street, the street begins to lose its livability. If the thresholds are surpassed, traffic calming devices should be considered.

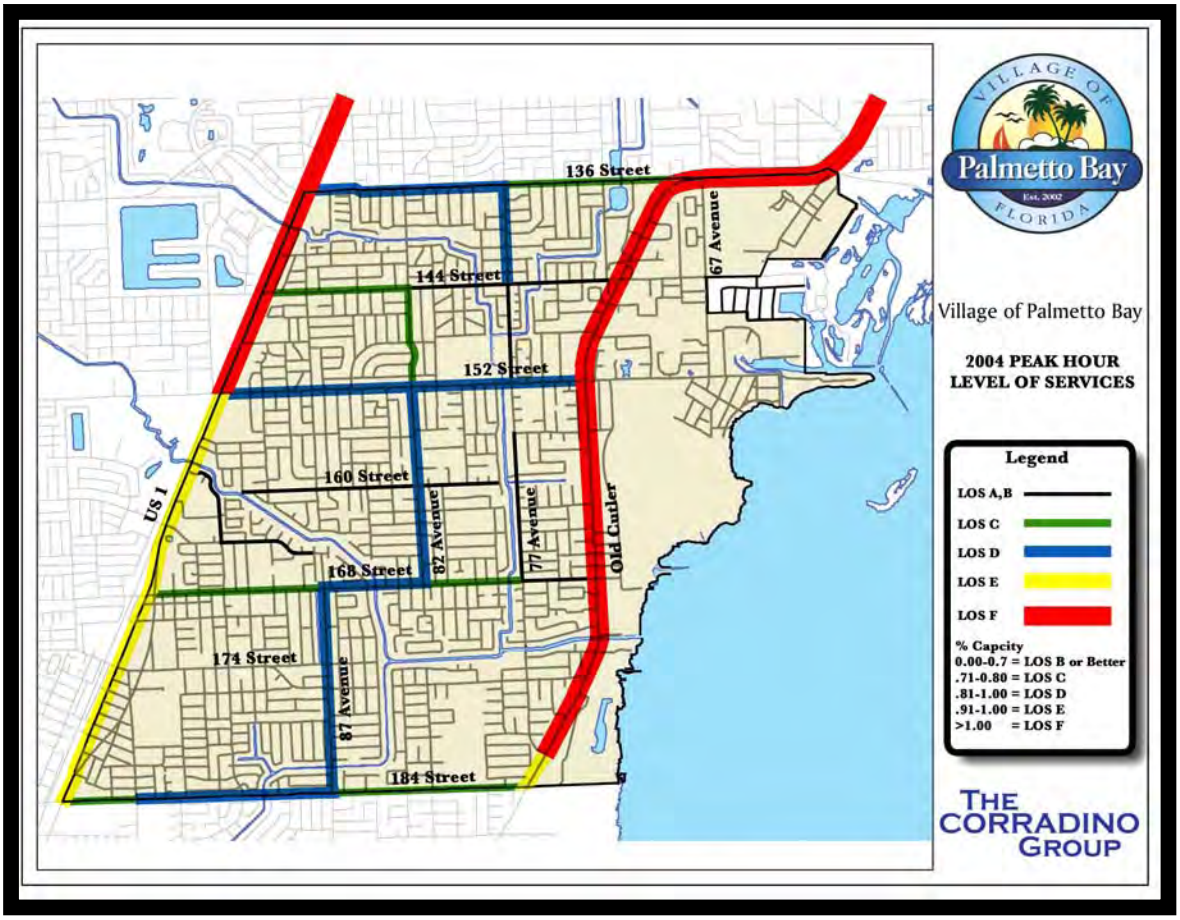
Travel Speeds:

The determination of the average speeds can be made using several methods. These include radar guns and pressure-tube machines. The Florida Department of Transportation recommends a methodology to determine spot speeds in its ***Manual of Uniform Traffic Studies.*** Usually the 85-percentile speed (85% of the vehicles operate at that speed or lower) is used to determine the prevailing speeds.

The maximum tolerable speeds are determined as a consensus within the neighborhood. Once the surveyed speeds are determined to be significantly higher (10 mph) than the acceptable thresholds, traffic calming devices should be considered. The streets being studied are residential local streets and have a posted speed limit of 30 miles per hour.

In order to better understand what is occurring in these particular neighborhoods it is important to understand the larger picture of what is occurring in the southern half of Miami Dade County. It was discovered during The Village of Palmetto Bay Transportation Master Plan that traffic in South Miami Dade County, particularly as it passes through The Village of Palmetto Bay is primarily carried by US-1 and Old Cutler Road and secondarily on the County's section-line and ½ section-line grid system. US-1 and Old Cutler Road are faced with carrying tremendous amounts of traffic. They are essentially over capacity, causing a spillover effect on to the County grid. This grid system in Palmetto Bay is interrupted, forcing traffic on to a few of these thoroughfares as it makes its way to its destination. When the grid is further blocked by an over capacity intersection or school zone, traffic again attempts to find a faster route, cutting through the local residential streets. To exacerbate the situation, there are two major destinations within the subject neighborhoods. Southwood Middle School and Coral Reef Elementary are both traffic generators that force traffic off of the main roadway network and through the neighborhoods. This is particularly evident at the intersection of 152nd Street and 82nd Avenue. The curved streets of Mangowood are conducive for cut through traffic as drivers attempt to bypass the congested intersection, and continue on their route north or south or access Coral Reef Elementary.

If the grid were complete, traffic would be able to flow north and south on 77th Ave, 82nd Ave, 87th Ave, 92nd Ave and 97th Ave. This cannot occur because 87th Ave is disrupted by a canal north of 164th Street, 77th Avenue is disrupted twice by canals, and 97th Avenue is interrupted by US-1. The result is that traffic flows on just a few of these streets as it attempts to find its destination. It generally flows along 87th Avenue, 168th Street, 82nd Avenue, 152nd Street, 77th Avenue north of 152nd Street. The pattern shows the heaviest flows northbound in the morning and southbound in the afternoon.



The flow of traffic is highly directional because, thousands of drivers are attempting to access the major employment centers north of 88th Street. There are generally no major employment centers in South Dade, but, there is tremendous population and population growth.

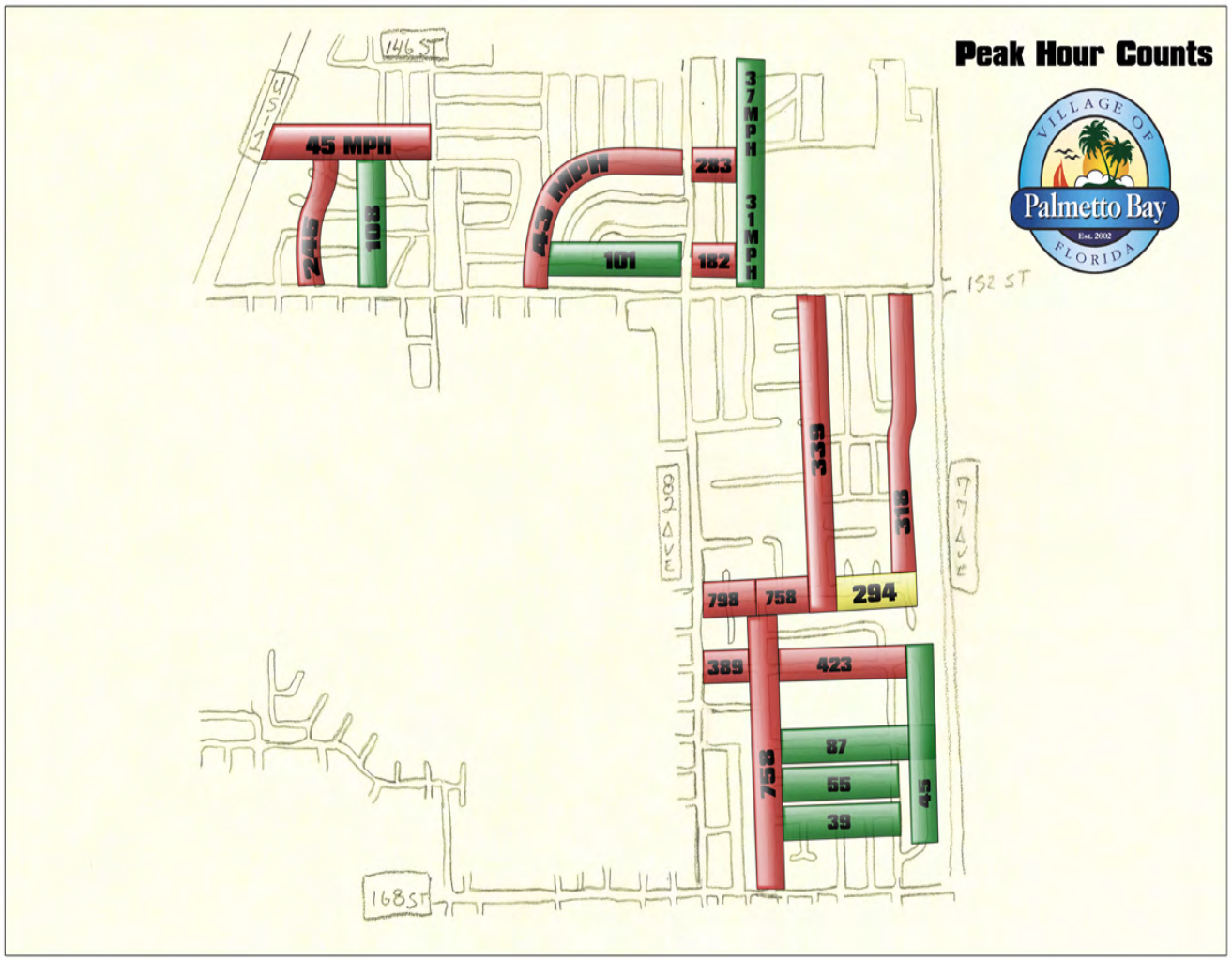
Data collected through this study, has determined that there is a need for traffic calming in these neighborhoods. This is due to heavy volumes and high speeds. The volumes however, have shown that they surpass traffic calming thresholds mainly in the peak hours, and that the afternoon peaks are much earlier than the traditional roadway peak hours of between 4pm and 6pm. This leads to the conclusion that the traffic issues are due to the school traffic, primarily because there is not a consistent all day traffic flowing through the neighborhoods. The following table shows each road counted whether it requires traffic calming and the reason for it. The color red signifies that the individual road surpasses a threshold for traffic calming, yellow signifies that it is nearing a traffic calming threshold, and green signifies that it does not near a threshold for traffic calming. Thirteen of 21 roadways counted, approach or surpass traffic calming thresholds.

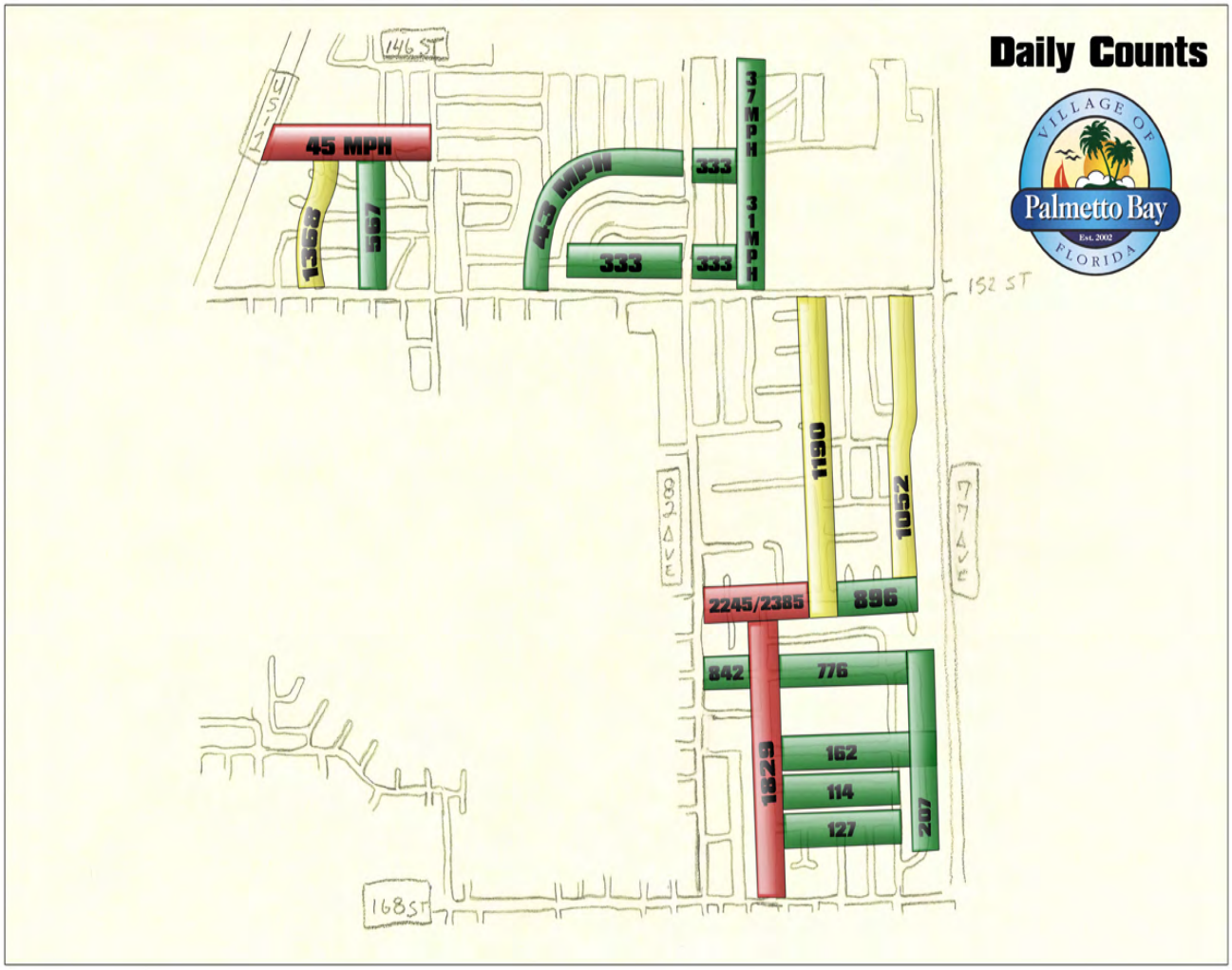
Location	Requires Traffic Calming	Reason
89 Ave bw 149/152	Marginal	Daily Volumes
88 Ave bw 149/152	No	
148 Dr bw 152 / 83	No	
148 Dr bw 82 / 80	Yes	AM Peak Hour Volumes
151St bw 148 / 82	No	
151St bw 82 / 80	Marginal	AM Peak Hour Volumes
80 Ave bw 152 / 148	No	
80 Ave bw 148 / 144	Marginal	85 %tile Speeds @ 37mph
80 Ave bw 168 / 162	Yes	AM and PM Peak Hr Volumes
160 St bw 80 / 79	Yes	AM and PM Peak Hr Volumes
160 St bw 79 / 77ct	Yes	AM Peak Hour Volumes
79 Ave bw 160 / 152	Yes	AM Peak Hour Volumes
77 Ct bw 160 / 152	Yes	AM Peak Hour Volumes
162 St bw 77 Ct / 88	Yes	AM and PM Peak Hr Volumes
164 St bw 77 Ct / 80	No	
165 St bw 77 Ct / 80	No	
166St bw 77 Ct / 80	No	
77 Ct bw 168 / 162	No	
162St bw 82 / 80	Yes	AM and PM Peak Hr Volumes
160St bw 82 / 80	Yes	AM and PM Peak Hr Volumes
148 St bw US-1 / 87	Yes	Daily Volumes, AM and PM Pk Hr Vol, Speeds

While neighbors acknowledge the problem, matters relative to safety are made worse due to the fact that there are few sidewalks in the neighborhood to segregate pedestrian and vehicular traffic. Sidewalks are not desired by the neighbors.

In conclusion it was determined that traffic calming is warranted because neighborhood livability is threatened by both volumes and speed. The type of traffic calming that would best fit the situation would mitigate speeds and enhance safety. Movement of high volumes this traffic off of these roads to better suited roads is not a necessity. This conclusion was arrived at because while daily volumes generally fall within livability thresholds, peak hour volumes do not. In fact peak hour volumes exceeded thresholds, while daily volumes did not on 9 of the 10 failing links, which points to traffic accessing the school. To try and place that traffic on other roads would only worsen overall traffic in the Village by placing greater burden on the section line roads. Nearly 21,000 vehicles either use 152nd Street or 82nd Avenue during the course of a day. In short, until a more efficient way of accessing the schools is developed, this type of traffic should be expected.

In addition, several links exhibit speeds that are in excess of 10 miles per hour over the 30 mile per hour speed limit. It is believed that a speed limit of 25 miles per hour is more appropriate for these residential neighborhoods.




Daily Counts
Village of Palmetto Bay
Est. 2002
Florida
146 ST
152 ST
168 ST
87 AVE
77 AVE
45 MPH
45 MPH
1366
567
333
333
333
37 MPH
31 MPH
1190
1052
2245/2385
896
842
776
1829
162
114
127
207

RECOMMENDED TRAFFIC CALMING PROGRAM

A combination of several types of traffic calming treatments are recommended to improve the quality of life in The Village of Palmetto Bay neighborhoods. The approach focuses on two phases Phase I Enforcement/ Awareness, and Phase II Physical Devices.

PHASE I - ENFORCEMENT/AWARENESS: It is suggested that an enforcement program initiate at the beginning of the school year 2005/06. Speed and volume data should be recollected after 30 days. If the problem is mitigated, enforcement should continue. Concurrent to the enforcement program, the speed limit should be lowered to 25 miles per hour, and speed limit signs should be posted at the entries to the neighborhoods and at main Village gateways. If speeding persists, the enforcement should continue, and the selected alternative traffic calming devices should be designed and permitted, a process which takes up to 90 days. After permitting they should be constructed, a process which could take up to a year depending on the number of devices installed and the number of contractors hired to install them.

From a more regional standpoint the fact that many schools in the county provide access directly from section line roads and half section line roads is probably a major cause of overall traffic congestion. Evidence of this is can be seen in the relative freedom of movement when school is out of session. The Village, as well as every other municipality should work with the school board to develop internal pickup and drop-off roads at the schools and attempt to have primary access moved off of major traffic carrying roadways to secondary streets. A good example of the latter is the Southwood Elementary School, where traffic accesses the school off of 80th Avenue, not 82nd Avenue.

PHASE II - PHYSICAL DEVICES: Two programs have been developed. The first is seen as the most effective, consisting of chicanes and center islands. It must be noted that neighbors were concerned about devices that affected driveways and that required use of swale areas. A second option using raised intersections has been suggested to avoid impinging on swales and placing islands in the center of the roads. A general description of each type of traffic calming device proposed in the plan is summarized below. Two options have been provided to try to reach consensus on the program.

The following describes the tools used in each phase and then advantages, effectiveness and cost.

PHASE I ENFORCEMENT/AWARENESS:

A traffic calming enforcement program is seen as an essential step in the process of solving the identified problems. The attractiveness of residential communities such as The Village of Palmetto Bay, are its high quality of life. This quality of life is easily affected by traffic. A strict enforcement program, which targets speeding is recommended in chronic locations. These "hot spots" can be developed through citizen complaints or areas noticed by police officers during their daily patrols. Use of several methods is important. The physical presence of uniformed police officers and patrol cars, who issue warnings and citations, will provide an incentive for adherence to the speed limit. Monitoring speeds by radar guns or radar speed monitoring vehicles will make people aware of their speed and the need to control it. Use of monitoring data will keep track of issues, and help plan the deployment of enforcement in the future. At the same time an awareness campaign should be developed. This would focus on the Village approving and posting a 25 mile per hour speed limit at the entrances of the problem roadways. Signage stating that the speed limits are strictly enforced should be located at Village gateways. After about 30 to 60 days have passed an assessment of traffic conditions in the neighborhoods should be made through additional speed and volume counts. These assessments should be made on a consistent basis. If the problems have not been adequately addressed, the traffic calming devices should be designed, temporarily installed, evaluated and then permanently installed if they prove effective.

Advantages:

- Develops awareness of the traffic issue
- Mitigates speeding
- Enhances safety
- Generates revenue

Effectiveness

- Known to work best when consistently applied

Cost: Included in regular Assignments

LOCATION OF ENFORCEMENT AND SIGNAGE

- Enforcement should be applied throughout the neighborhoods in the AM and PM peak hours, generally around the arrival and dismissal periods at the schools. This should occur mainly during the school year. Other locations should be determined from observation and citizen recommendations.
- Signage should be at the main entry to each neighborhood.
  - US-1
    - @ 144th St
    - @ 148th St
    - @ 152nd St
    - @ 168th St
    - @ 184th St
  - Old Cutler Road
    - @ 144th St
    - @ 152nd St
    - @ 168th St
    - @ 184th St
  - 146th St
    - @ 87th Ave
    - @ 82nd Ave
  - 148th Dr
    - @ 152nd St
    - @ 82nd Ave
  - 152nd St
    - @148th Dr
    - @ 82nd Ave
    - East of 77th Ave
  - 77th Ct
    - @ 152nd St
    - @160th St
  - 79th Ave
    - @152nd St
    - @160th St
  - 160th St
    - @82nd Ave
  - 80th Ave
    - @168th St

- 78th Ave
  - @ 168th St
- 162nd St
  - @ 80th Ave
  - @ 78th Ave

Recommended Traffic Calming Devices

After many meetings with neighborhood stakeholders, and representatives from MDCPW, (the permitting body for such issues), the following plan has been developed. This represents devices that will mitigate speeds and enhance safety. Since the traffic issues are mainly peak hour and school related, large scale movement of traffic off the streets is not seen as appropriate. Placement of these has been developed in an area wide program, to provide even coverage and eliminate moving the problem to other roads, and other neighborhoods.

Chicanes with Center Islands

Chicanes with center islands are horizontal shifts in roadway alignment, which will cause the driver to slow and be cautious. Traditional chicanes incorporate lateral shifts, but generally leave a clear path in which a driver could choose not to shift with the lane. The center island requires the shift with the lane, and are essentially the effective part of this device. Center islands alone do not fit within the 20'+/- driving surface offered on many neighborhood streets, therefore must be accommodated with the chicane. The preliminary cost estimate for these devices is approximately $20,000. This can be found in Appendix "C".

Chicanes

Chicanes are curb extensions that alternate from one side of the street to the other, forming S-shaped curves. Good for locations where speeds are a problem but noise associated with Speed Humps and related measures would be unacceptable.

Advantages:

- Chicanes discourage high speeds by forcing horizontal deflection
- They are easily negotiable by large vehicles (such as fire trucks) except under heavy traffic conditions

Effectiveness:

- No data has been compiled on the effects of chicanes

Center Island

A center island is a raised island located along the centerline of a street that narrow the travel lanes at that location. Center islands are often landscaped to provide a visual amenity.

Advantages:

- Center Island increase pedestrian safety
- If designed well, they can have positive aesthetic value
- They reduce traffic volumes

Effectiveness:

- Average of 4% decrease in the 85th percentile travel speeds, or from an average of 34.9 to 32.3 miles per hour

Cost: Chicane/Island $20,000 +/-.

Location of Chicanes with Center Islands:

- 146 St
  - bw 85th Ave and 84th Ct
  - bw 83rd Pl and 83rd Ct
  - bw 83rd Ave and 82nd Ct
- 148 Dr
  - at 84th Ct
  - bw 83rd Pl and 83rd Ct
  - bw 83rd Ave and 82n Ct
- 148th St
  - E of 89th Ave
  - W of 89th Ave
- 151st St
  - bw 149th Dr and 150 Dr
  - bw 150 Dr and 82nd Ave
- 77th Ct
  - bw 152 Ave and 156th St
  - bw 157 Terr and 160th St
  - bw 165th Street and 166th Street
- 79th Ave
  - bw 157th St and 157th Terr
  - bw 158th Terr and 160th St
- 160th St
  - bw 78th Pl and 78th Ave
- 80th Ave
  - bw 166th St and 165th St
- 78th Ave
  - bw 166th St and 165th Ave

Raised / Textured or Colored Intersections

This option can be used instead of the chicane and island devices. Their effectiveness in reducing speeds is negligible, mainly due to the fact that they are placed at stop controlled intersections. They may be effective in having the drivers stop at those intersections and practice a higher level of caution. The preliminary cost estimate for these devices is $22,000. This can be found in Appendix "C".

The Raised intersections are flat raised areas covering an entire intersection, with ramps on all approaches and often with brick pavers or other textured materials on the flat section. They usually rise to the level of the sidewalk, or slightly below to provide a "lip" that is detectable by the visually impaired. By modifying the level of the intersection, the crosswalks are more readily perceived by motorists to be "pedestrian territory". Raised intersections are good for intersections with substantial pedestrian activity, and areas where other traffic calming measures would be unacceptable because they take away scarce parking spaces. Textured and colored pavement includes the use of stamped pavement or alternate paving materials to create an uneven surface for vehicles to traverse. They may be used to emphasize either an entire intersection or a pedestrian crossing, and are sometimes used along entire street blocks.

Advantages:

- Raised Intersections improve safety for both pedestrians and vehicles
- If designed well, they can have positive aesthetic value
- They can calm two streets at once
- Textured Pavements can reduce vehicle speeds over an extended length

Effectiveness:

- Average of 1% decrease in the 85th percentile travel speeds, or from an average of 34.6 to 34.3 miles per hour
- Textured Pavements have not been proven to reduce traffic speeds.

Cost: Individual $22,000 +/-

Location of Raised and Colored Intersections:

- 146 St
  - @ 84th Ct
  - @ 83rd Ct
  - @ 82nd Ct
- 148 Dr
  - @ 83rd Pl
  - @ 83rd Ave
  - @ 82nd Ave
- 148th St
  - @ 87th Pl
- 151st St
  - @ 149th Dr
- 77th Ct
  - @ 156th St
  - @ 157 Terr
- 79th Ave
  - @ 154th Terr
  - @ 156th St
  - @ 157 Terr
- 160th St
  - @ 79th Ave
- 80th Ave
  - @ 165th St
- 78th Ave
  - @ 165th Ave

Traffic Circles

Traffic circles are raised islands, placed in intersections, around which traffic circulates. They are good for calming intersections, especially within neighborhoods, where large vehicle traffic is not a major concern but speeds, volumes, and safety are problems. The location selected for the circle planned as part of this program should help alleviate congestion caused by the four-way stop at 82nd Ave and 160th St. The approximate cost for these devices is $30,000. This can be found in Appendix "C".

Advantages:

- *Traffic Circles are very effective in moderating speeds and improving safety*
- *If designed well, they can have positive aesthetic value*
- *Placed at an intersection, they can calm two streets at once*

Effectiveness:

- Average of 11% decrease in the 85th percentile travel speeds, or from an average of 34.1 to 30.2 miles per hour
- Including a large sample from Seattle, an average of 73% decrease in accidents, or from an average of 2.2 to 0.6 accidents per year
- Excluding the large sample from Seattle, an average of 29% decrease in accidents, or from an average of 5.9 to 4.2 accidents per year

Cost: +/-$30,000

Location of Traffic Circle:

- 82nd Ave
  - @160th St

Alternative Programs

PHASE II-I is the one recommended by The Corradino Group, after consultation with the City, the neighbors and MDCPW. Corradino feels that this program, consisting of mainly of chicanes with center islands, offers the best opportunity to calm traffic, by reducing speeds, and promoting safety. The citizens initially favored speed tables, but MDCPW has stated that they no longer approve such devices, because of safety issues presented by people, particularly students, attempting to "jump" them with their vehicles. As such a second alterative was developed. The cost for this program would be approximately $500,000 +/-.

PHASE II-II It must be noted that in meetings with the neighbors that the idea of traffic circles or islands, and utilizing swale areas, was not looked upon favorably. This alterative, which consists of raised and colored or textured intersections placed at stop controlled intersections, may have the affect of encouraging people to more frequently obey the stop signs, which will enhance safety. Its effects on speeding are unknown. The cost for this program would be approximately $382,000 +/-.

MIAMI DADE COUNTY TRAFFIC CALMING IMPLEMENTATION PROCESS

In 1996, under the pressure of ever increasing requests for traffic calming, which was resulting in a number of street closures that were negatively affecting traffic circulation, Miami-Dade County developed the Street Closure / Traffic Flow Modification Study. This developed standardized procedures and guidelines for use by the public, local officials, and other private sector interests requesting traffic flow modifications that may affect local neighborhoods as well as other roadway traffic patterns. The intent was to provide a uniform approach to facilitate government action in response to requests to restrict local access. The procedures were also intended to ensure that such issues are given appropriate study and timely reasons and that a full range of community impacts are considered.

Essentially the process is as follows. A more detailed explanation is held in Appendix "B".

1. The municipality receives a request for traffic calming from a neighborhood or applicant.
2. A study is undertaken to assess the nature, magnitude and confirm the existence of the traffic concerns.
3. Traffic calming alternatives are identified.
4. Pre-implementation study to determine the initial impacts of the traffic calming measures is to be undertaken.
5. Coordinate with various entities such as:
   a. MDCPW
   b. MDCFD
   c. MDT
   d. FDOT
   e. Palmetto Bay Police
   f. Palmetto Bay Public Works
   g. Palmetto Bay Planning
6. Village makes decision for approval or denial
7. Is concurrence of 2/3 of affected property owners required? (MDCPW Decision). If so petition must be signed.
8. Temporary installation
9. Post implementation study / impact analysis
10. Design of permanent devices
11. Installation of permanent devices