

Adding Turbo Lanes to T-intersections Study

Final Report



Adding Turbo Lanes to T-Intersections Study

Final Report

Prepared by:

David Plummer & Associates, Inc.
1750 Ponce de Leon Boulevard
Coral Gables, Florida 33134

March 2010
Revised May 2010
DPA Project #09141

This report was funded in part through grant[s] from the Federal Highway Administration [and Federal Transit Administration], U.S. Department of Transportation. The views and opinions of the authors [or agency] expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.



TABLE OF CONTENTS

1.0 BACKGROUND1

2.0 PURPOSE OF THE REPORT1

3.0 DATA GATHERING2

4.0 INTERSECTION SCREENING5

5.0 ANALYSIS/BENEFITS6

6.0 TYPICAL CONFIGURATIONS7

7.0 RECOMMENDATIONS9

8.0 IMPLEMENTATION PLAN9

8.1 Study Coordination9

8.2 Estimated Costs9

8.3 Priorities/Schedule10

LIST OF EXHIBITS

<u>Exhibit</u>	<u>Page</u>
1 Existing Turbo Lanes (2 pics) a- OCR/Deering Bay, b- NW 12 St/Dolphin Mall)	1
2 List of Turbo Lane Intersection Candidates.....	2
3 Turbo Lane Recommended in Previous Study (US1/NE 178 St).....	3
4 Full Turbo Lane Aerial Photo.....	3
5 Partial Turbo Lane Aerial Photo.....	4
6 MD PWD Turbo Lane Types.....	5
7 Recommended Turbo Lane Locations (Map).....	6
8 Location 2 Rendering	7
9 Location 4 Rendering	8
10 Location 8 Rendering	8
11 Location 18 Rendering	9
12 Preliminary Cost Estimates by Turbo Lane Type.....	10

Volume II: Appendices (Under Separate Cover)

- A. CTAC Resolution #1-08
- B. MD PWD Report 1
- C. MD PWD Report 2
- D. Concept Design Parameters
- E. Field Observations
- F. Screening Results
- G. Approach Capacity Increase
- H. Estimated Costs
- I. Priorities

1.0 BACKGROUND

The Citizens Transportation Advisory Committee (CTAC) of the Miami Urbanized Area Metropolitan Planning Organization (MPO) requested that the Miami-Dade Public Works Department (PWD) provide a list of intersections that can safely be converted into turbo lanes (Resolution #1-08 in [Appendix A](#)). As a result of this request, PWD prepared the document “Identification of Signalized 3-Leg Intersections on County Roads that can be Safely Converted to Turbo lane Operations”. This report is included as [Appendix B](#). This report listed a total of 105 locations classified as follows:

- a. 8 intersections are already converted to turbo lanes
- b. 30 intersections are suitable for the conversion to turbo lanes
- c. 21 intersections need further analysis
- d. 46 intersections are not suitable for conversion to turbo lanes

What is a turbo lane?

A turbo lane is an intersection geometric arrangement, supported by special traffic signalization that allows continuous flow on one or more of the through lanes of the main street. [Exhibit 1](#) shows photographs of two existing turbo lanes in Miami-Dade. Different types of turbo lanes are further described in subsequent sections of this report.

For the purpose of this study, the 51 locations listed in (b) and (c) above were considered for the development of this study. [Exhibit 2](#) shows the location of these intersections.

2.0 PURPOSE OF THE REPORT

The objective of this study is to evaluate a list of T-intersections turbo lane conversion candidates identified by the PWD and to prepare schematic concept diagrams for 25 intersections that can potentially be converted from conventional signalized T-intersections to turbo lane configuration. The evaluation took into consideration factors such as:

- available right-of-way
- minimum or no environmental impact
- low costs
- construction should not take more than three years including design

In addition, the study also evaluates the benefits, presents preliminary costs estimates and suggests priorities for implementation.

Exhibit 1
Existing Turbo Lanes



Location a: Old Cutler Road / Deering Bay



Location b: NW 12 St / Dolphin Mall

Exhibit 2
List of Turbo Lane Intersection Candidates

**COUNTY T-INTERSECTIONS WITH SUITABLE GEOMETRY FOR
TURBOLANE OPERATION**

ID	Location	Turbolane Direction
4847	1 Ludlam Rd at NW 188 Ter	SB
4624	2 NW 22 Ave at NW 139 St	SB
5989	3 NW 22 Ave at NW 127 St	SB
4917	4 Douglas-LeJeune at NW 159 St	NB
4625	5 Ludlam Rd at Windmill Gate	SB
4149	6 Ludlam Rd at W 74 St	SB
4387	7 Ludlam Rd at W 26 St	SB
3963	8 SW 72 Ave at SW 85 St	EB
5033	9 SW 117 Ave at SW 112 St	SB
4390	10 Miami Lakes Dr at NW 60 Ave	NWB
5692	11 NW 25 St at 84 Ave	WB
5584	12 NW 84 Ave at NW 12 St	EB
4659	13 NW 78 Ave at NW 12 St	EB
5031	14 NW 7 St at NW 53 Ave	WB
4648	15 Aventura Blvd at Country Club Dr	N
5258	16 Fontainebleau Blvd at Park Blvd	SEB
6057	17 Ludlam Rd at NW 34 St	SB
5034	18 SW 117 Ave at SW 128 St	SB
5697	19 SW 117 Ave at SW 134 St	SB
6027	20 SW 137 Ave at SW 180 St	NB
4607	21 Ives Dairy Rd at NE 800 Blk	SWB
4635	22 Ives Dairy Rd at NE 195 St Dr	SWB
5892	23 NW 107 Ave at NW 19 St	SB
6737	24 SW 117 Ave at SW 136 St	SB
5730	25 NW 22 Ave at NW 111 St	SB
5675	26 SW 112 Ave at SW 104 St	WB
5222	27 SW 117 Ave at SW 47 Ter	SB
5217	28 SW 137 Ave at SW 160 St	NB
2774	29 Pine Tree Dr at 47 St	NB
4832	30 Coral Way at SW 11900 Blk	EB

**COUNTY INTERSECTIONS WITH MINOR ISSUES TO OPERATE
AS TURBOLANE INTERSECTIONS**

ID	Location	Turbolane Direction
4779	31 NW 12 Ave at NW 47 Ter	SB
4000	32 NW 17 Ave at NW 60 St	NB
3561	33 NW 22 Ave at NW 56 St	SB
5768	34 Palm Ave at 29 St	NB
4406	35 NW 7 St at NW 29 & 39 Ave	EB
5870	36 Hammocks Blvd at SW 147 Ave	NB
5001	37 Miller Dr at SW 118 Ave	WB
4484	38 Perimeter Rd at NW 15 St	SB
3938	39 Perimeter Rd at NW 22 St	SB
5438	40 Rickenbacker at Virginia Beach Rd	SEB
5694	41 SW 72 Ave at SW 48 St	NB
5703	42 SW 127 Ave at SW 43 Dr	NB
5416	43 SW 127 Ave at SW 62 St	NB
5512	44 SW 147 Ave at SW 120 St	EB
6500	45 W 18 Ave at W 37 St	SB
5254	46 NW 32 Ave at NW 151 St	EB
5665	47 NW 87 Ave at NW 146 St	NB
6023	48 Drexel Ave at 17 St	WB
5755	49 Cottonwood Cir at SW 152 Ave	SB
5677	50 Palm Ave at 39 St	SB
4660	51 NW 82 Ave at NW 12 Ct	EB

Source: Identification of Signalized Three-leg Intersections on County Roads that can be safely Converted to Turbo Lane Operations:
Miami-Dade Public Works Department

3.0 DATA GATHERING

A research for national planning/design policies for turbo lanes was conducted. Based on this experience, it could be said that turbo lanes are not that well known outside of South Florida or the United States. It also is not a universal operational treatment known within the traffic engineering community. Yet, in general, turbo lanes provide a significant improvement in the capacity of T-intersections by allowing the minor street left turns to safely turn onto the main street without stopping all the traffic approaching the intersection from the main street.

The first challenge in doing the research was verifying the name (or names) of this fairly unique operational improvement. Turbo lane, although a relatively popular term in South Florida, is not that widely used at the national level. Upon consulting with the PWD staff, there was a confirmation that there may be turbo lane installations at least in Salt Lake City and Michigan. Some of the alternate names we found for this type of improvement include: turbo lanes; green lanes; Florida T; Flying T; continuous green T-intersections; and T-intersection go-at-all times.

Investigation of widely accepted sources for highway and signal design/operations, and general traffic engineering references including the American Association of State Highway and Transportation Officials (AASHTO) and the Institute of Transportation Engineers (ITE) confirmed the lack of national guidelines on the subject. Fortunately, FDOT District 6 sponsored a study of six potential turbo lane locations in 1997. The project, which extended to include guidelines, produced a report entitled Design Guidelines for the Development of Continuous Green Intersections. At this time, that document represents the only set of comprehensive criteria we found on the subject. Following that study several of the subject locations were converted to turbo lanes. Today, there are more than forty intersections using this treatment throughout Miami-Dade County. Many of the new turbo lanes are located at the end of freeway exit ramps, where strict access management rules and Limited Access Right-Of-Way simplify implementation.

Additionally, the Congested Intersection Improvements Study II (March 2008) conducted by the MPO identified a few intersections along Biscayne Boulevard in Aventura south of Miami Gardens Dr. where this concept has been recommended and are pending for implementation (**Exhibit 3**). A few other locations have been considered for such treatment but rejected due operational concerns (e.g. Biscayne Boulevard north of Miami Gardens Dr, in 2005).

Exhibit 3
Turbo Lane Recommended in Previous Study (US1/NE 178 St)

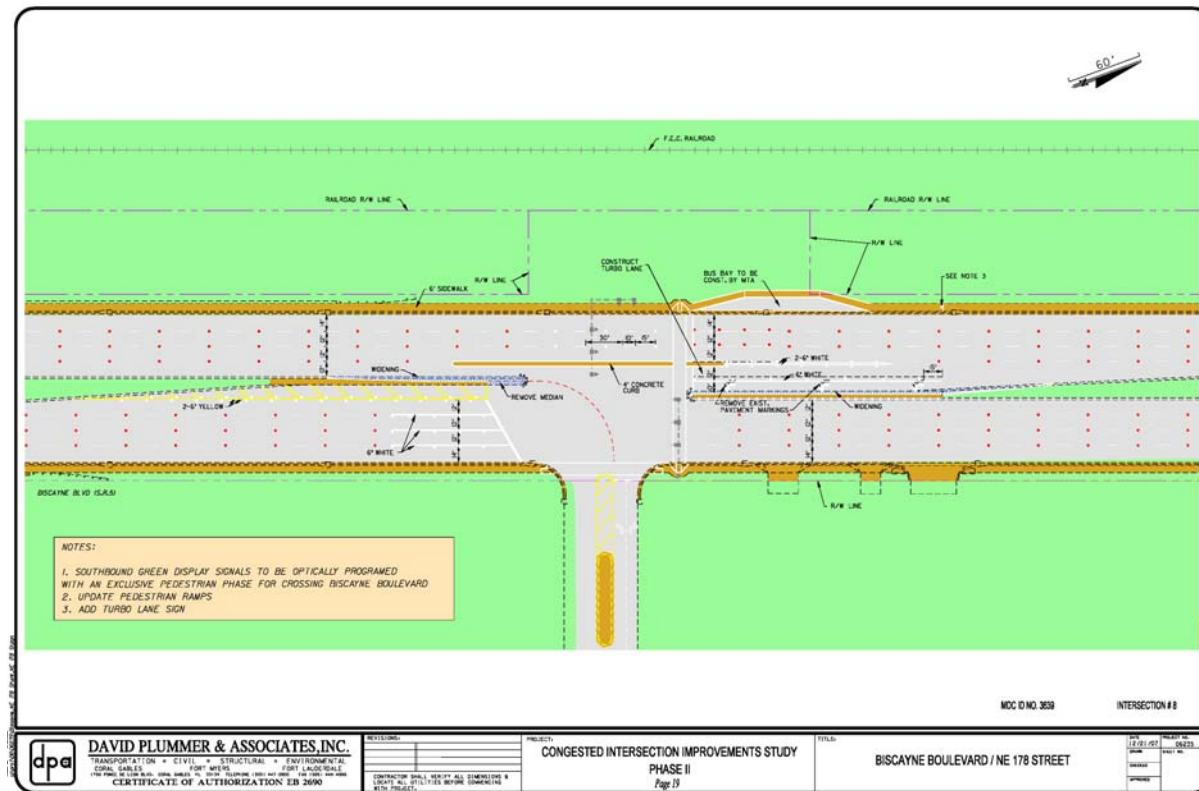


Exhibit 4
Full Turbo Lane Aerial Photo



Turbo lanes are found in two primary configurations as described in the examples below.

Full Turbo Lane

An example of this turbo lane design is the signalization/conversion in 1989 of a stop controlled T-intersection turbo lane on Old Cutler Road at the entrance to Deering Bay Estates/Chapman Field Park in Pinecrest. See aerial photo [Exhibit 4](#). The northeastbound traffic on the main street is stopped by the signal, the minor street left turning (westbound to southwestbound) traffic gets a green arrow and turns onto a lane created within the median of the main street (southwestbound), then merges onto the inside lane of the main street. The southwestbound traffic does not stop at all, however, the southwestbound left turns are separated from the through traffic lanes and subject to signal control.

Partial Turbo Lane:

One of the oldest examples of this design in Miami-Dade was built in the 1970s but was recently replaced by major improvements to LeJeune Road after many years of providing high traffic capacity and flow just south of the Miami International Airport entrance. The turbo lane intersection was located northbound on LeJeune Road at the formerly NW 18 Street. A more recent example of a partial turbo lane is found on NW 12 St at the entrance to Dolphin Mall, just east of the Turnpike ([Exhibit 5](#)). The westbound traffic on the main street is stopped by the signal, a special signal display stops the inside through lane and the left turn lanes of the major street eastbound traffic, the minor street left turning (southbound) traffic gets a green arrow and turns onto the inside lane of the main street (eastbound). The remaining eastbound lanes do not stop.

Exhibit 5
Partial Turbo Lane Aerial Photo



- Left-turn Path/Accepting Lane
- Signing
- Signal Displays

The FDOT report also presents suggested geometric design concepts for both turbo lane types. These guidelines, recognizing they were developed for state roads (and they are not design criteria), were the starting point in this study. In fact, while engaging PWD in this study, they provided two undated (circa 2009) reports prepared in response to the original request from CTAC. The reports are as follow:

- Identification of Signalized Three-leg Intersections on County Roads That Can Be Safely Converted to Turbo Lane Operations **(included as Appendix B)**
- Cost Estimates for Conversion of Three-leg Intersections to Turbo Lane Operations **(see Appendix C)**

The first report included a list of 30 T-intersections (three-leg) on county roads suitable for conversion. The subject report also presented a second list with 21 intersections on county roads with minor issues that may be suitable for conversion. The second report further classified the locations based on their recommended configuration. Four typical turbo lane design types were defined in the reports as follows **(see Exhibit 6):**

- Type A: Ideal (i.e. full turbo lane with no lanes stopping in the turbo direction and minor street left turn merge downstream of turbo lane intersection, raised median)
- Type B: With Ped (pedestrian)s &/or Minor 4th Leg and Downstream Merge (full turbo lane)
- Type C: With One Through Stopped Lane (partial turbo lane)
- Type D: With Curb &/or Pylons Instead of Median (partial turbo lane)

Obviously, certain unique design elements (e.g. separator, signal displays, etc) are required to ensure a safe operation, especially because of unfamiliar drivers. The capacity improvement is derived from the additional green signal time provided to the turbo lane(s) traffic, which (for the most part) does not have to stop.

The design elements discussed in the aforementioned guidelines include:

- Acceleration/Merge Distance
- Island/Separator
- Upstream and Downstream Dividers

4.0 INTERSECTION SCREENING

The initial screening of the PW list of 51 candidates was based on fatal flaws identified from aerial photography and other readily available information (Google Earth, MD GIS data, etc.). Fatal flaw criteria included: right of way (ROW), environmental issues, excessive cost and permitting/construction time due to potentially complex design. The objective was to select the 25 locations most suitable for conversion to turbo lane operation.

Further screening was conducted through the gathering of additional data. The primary data source was field observations including:

- Aerial photography
- Street views
- Right-of-way lines

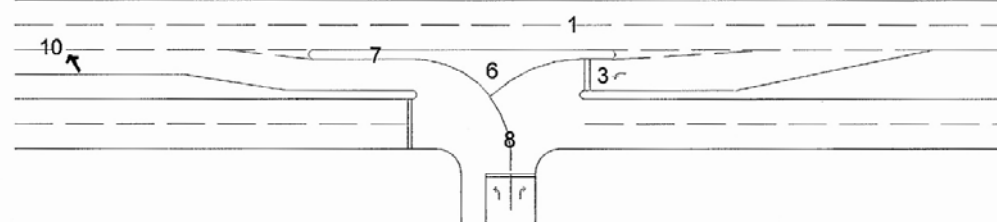
The reports prepared by FDOT and other roadway design criteria sources were used to develop a set of preliminary concept design parameter for the various elements of typical turbo lanes by type ([see Appendix D](#)). The initial 25 recommended locations were presented to the MPO and PWD for concurrence in the form of a report with preliminary recommendations. Field review and the application of these parameters resulted in the replacement of a few candidate locations that did not meet basic criteria for turbo lanes. Also, some of the initial turbo lane types recommended by PWD were changed in order to comply with the aforementioned criteria.

Each or the suggested locations was field inspected and additional information was gathered to facilitate the subject screening. Field information includes items such as:

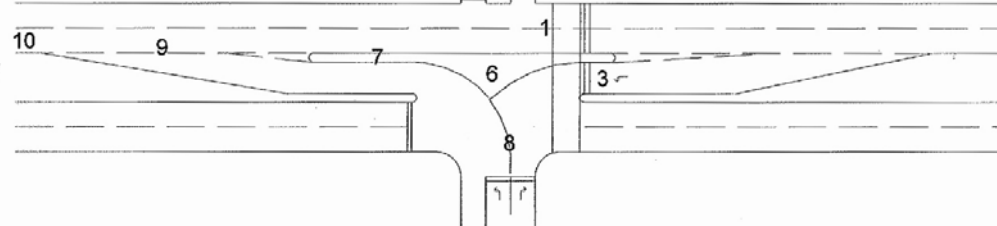
- Proximity of median openings
- Presence of major driveways
- Proximity of signals
- Presence of dual left turn lanes
- Posted speed limit
- Number of lanes

EXHIBIT 6
TURBO LANE INTERSECTION DESIGNS

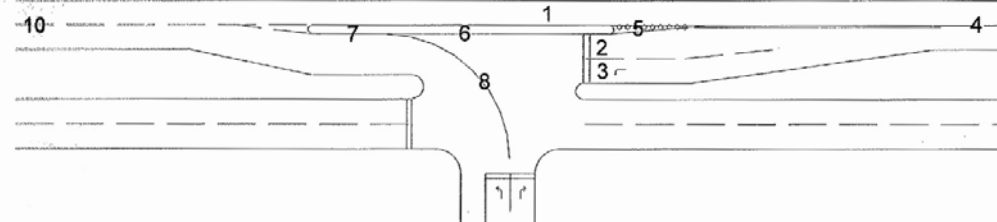
EXAMPLE A
IDEAL



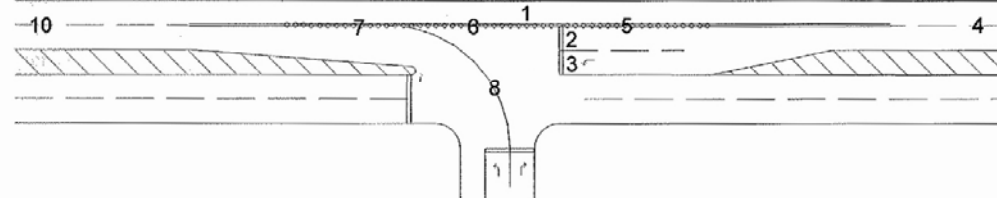
EXAMPLE B
WITH PEDS &/OR MINOR 4TH LEG
AND DOWNSTREAM MERGE



EXAMPLE C
WITH 1 THROUGH STOPPED LANE



EXAMPLE D
WITH CURB &/OR PILONS INSTEAD OF MEDIAN



- | | |
|-------------------------------|-----------------------------|
| 1 Turbo Lanes | 6 Center divider |
| 2 Stoppable through lanes | 7 Downstream divider |
| 3 Main street left turn lanes | 8 Side street turn guidance |
| 4 Upstream weaving area | 9 Merge area |
| 5 Upstream divider | 10 Downstream weaving area |

Source: Miami-Dade Public Works Department

The field observations and screening information are presented in **Appendices E and F** respectively.

5.0 ANALYSIS/BENEFITS

The screening process described above and the field visits resulted in a list of the 25 most suitable locations for conversion to turbo lanes including the recommended turbo lane type listed on and shown in **Exhibit 7**.

During the preparation of concept schematics, additional analysis was undertaken to further define the configuration of the selected locations which include details such as:

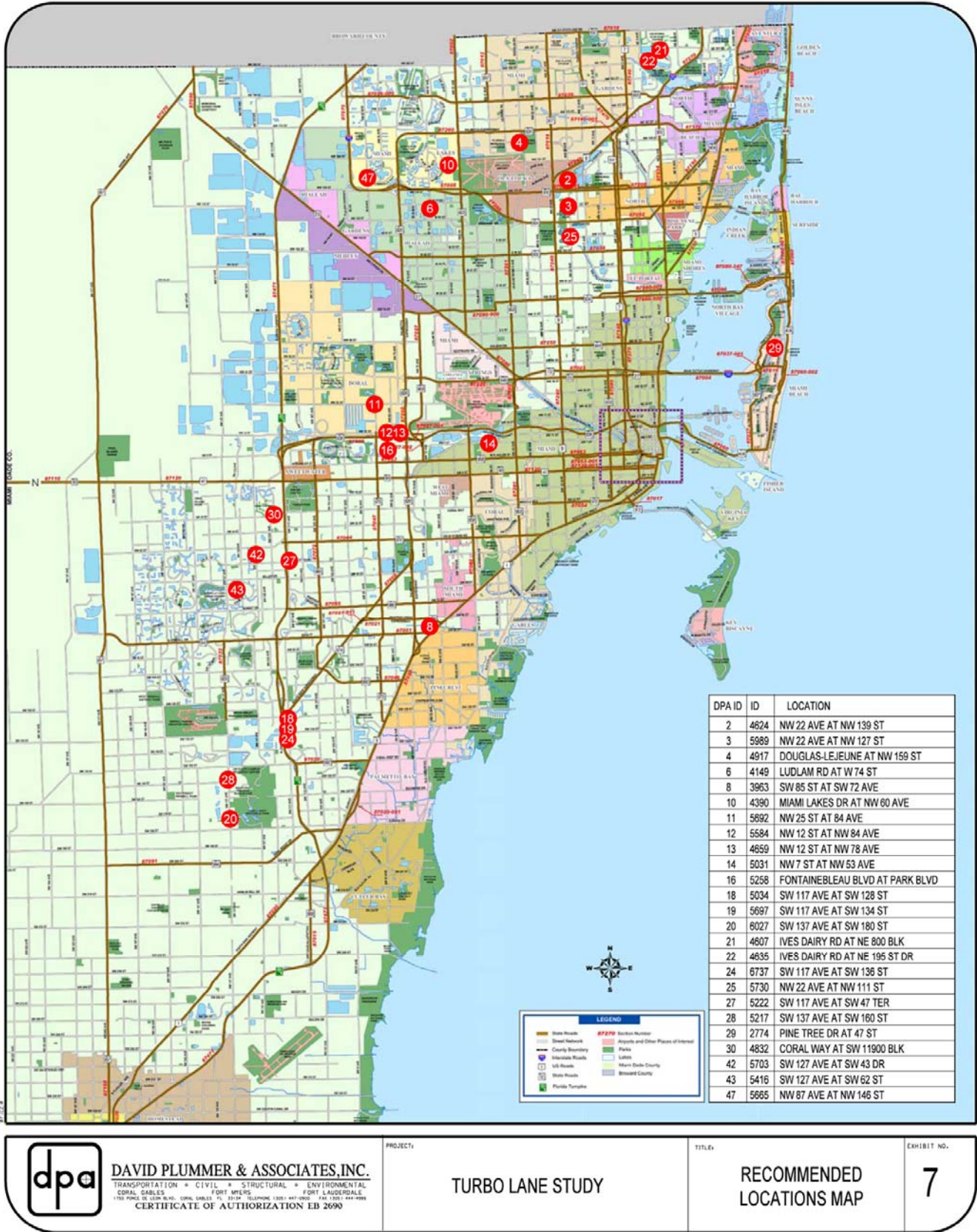
- Need for an actuated pedestrian phase to stop the proposed turbo lanes upon the presence and actuation of a pedestrian signal push button.
- Need for special advance signage to advise motorist as to best lane usage for downstream locations.
- Need to modify minor street lanes and signal timing.
-

Capacity increase was used as the primary measurement of benefit in as much as more capacity results in less delay, shorter queues and better level of service. While it is understood that turbo lanes increase the capacity of the respective approach to the intersection, the degree of improvement can vary widely.

Calculation of the percent increase in approach capacity for each of the recommended turbo lane conversion locations is included in **Appendix G**. The factors that enter into this calculation include:

- Number of approach lanes
- Number of turbo lanes
- Existing green signal time allocation for the through movement on the turbo lane approach.

The calculations were performed for the peak hour of the day as determined by the maximum green time allocation for the subject approach. This means that the approach capacity improvement during off-peak periods can be even greater. It also means that the greater the existing green time percent allocated to the main street, the lower the benefit of the turbo lane. Nevertheless, the range in the percent improvement in approach capacity for the recommended locations was estimated to be between 7% and 173%, as shown in **Appendix G**.



It should be noted that most of the recommended locations include pedestrian crossing treatments. All existing pedestrian crossings across the main street are being replaced with a special pedestrian phase. This requires:

- Signalization of all through lanes on the main street
- Special pedestrian actuated signal phase and signal
- Optically programmed signal heads to provide separate indications to the through turbo and non-turbo lanes

Pedestrian phases are recommended in a few additional cases where the need was apparent. While pedestrian phases reduce the potential capacity of the turbo lane configuration, the capacity reduction occurs only upon actuation and pedestrian activity is expected to be light at most intersections.

6.0 TYPICAL CONFIGURATIONS

Given the conceptual parameters developed for this study as well as an analysis of the candidate locations, slight adjustments were made to the PWD lane types described in section 3 above. These adjusted include:

- Minimum dimension used for the divider was 2 ft
- Pylons (plastic pole vertical delineators) were recommended within all the dividers
- Actuated pedestrian phases coupled with pedestrian crossings and signals were recommended when an existing crossing was present or deemed necessary
- Advance signage was recommended where needed to facilitate access to certain driveways/minor streets downstream from the proposed turbo lanes
- Type A turbo lanes included locations with and without pedestrian crossings
- Type C turbo lanes were used primarily at locations with an existing raised median
- Type D turbo lanes were used primarily at locations with an existing painted median

Renderings of several types of turbo lanes recommended at selected locations (Exhibits 8 - 11) have been included here to provide an easy to understand illustration of the concept and differences among the various turbo lane types.

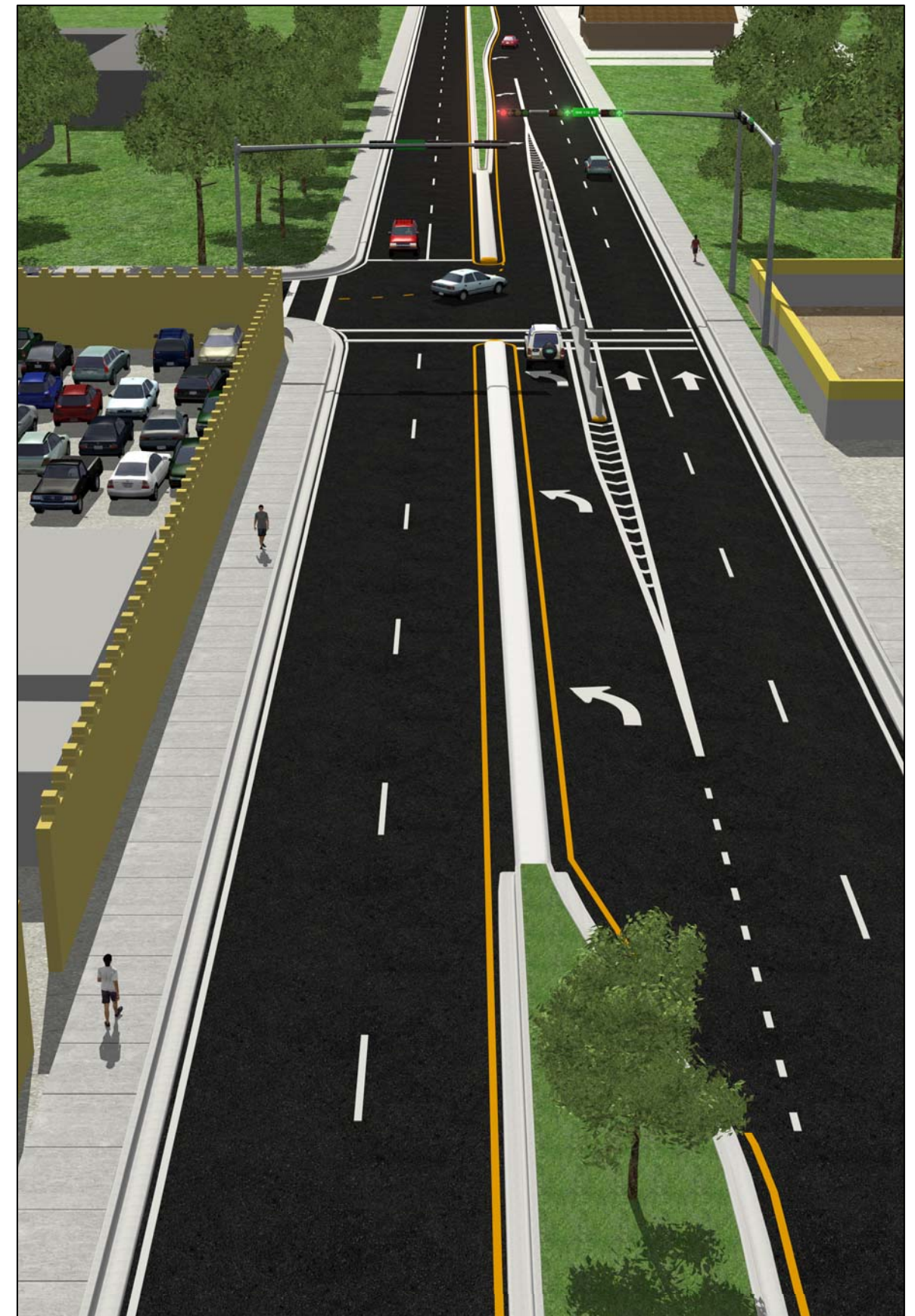


Exhibit 8: Location 2 (Type A with pedestrian crossing): NW 22 Ave @ NW 139 St

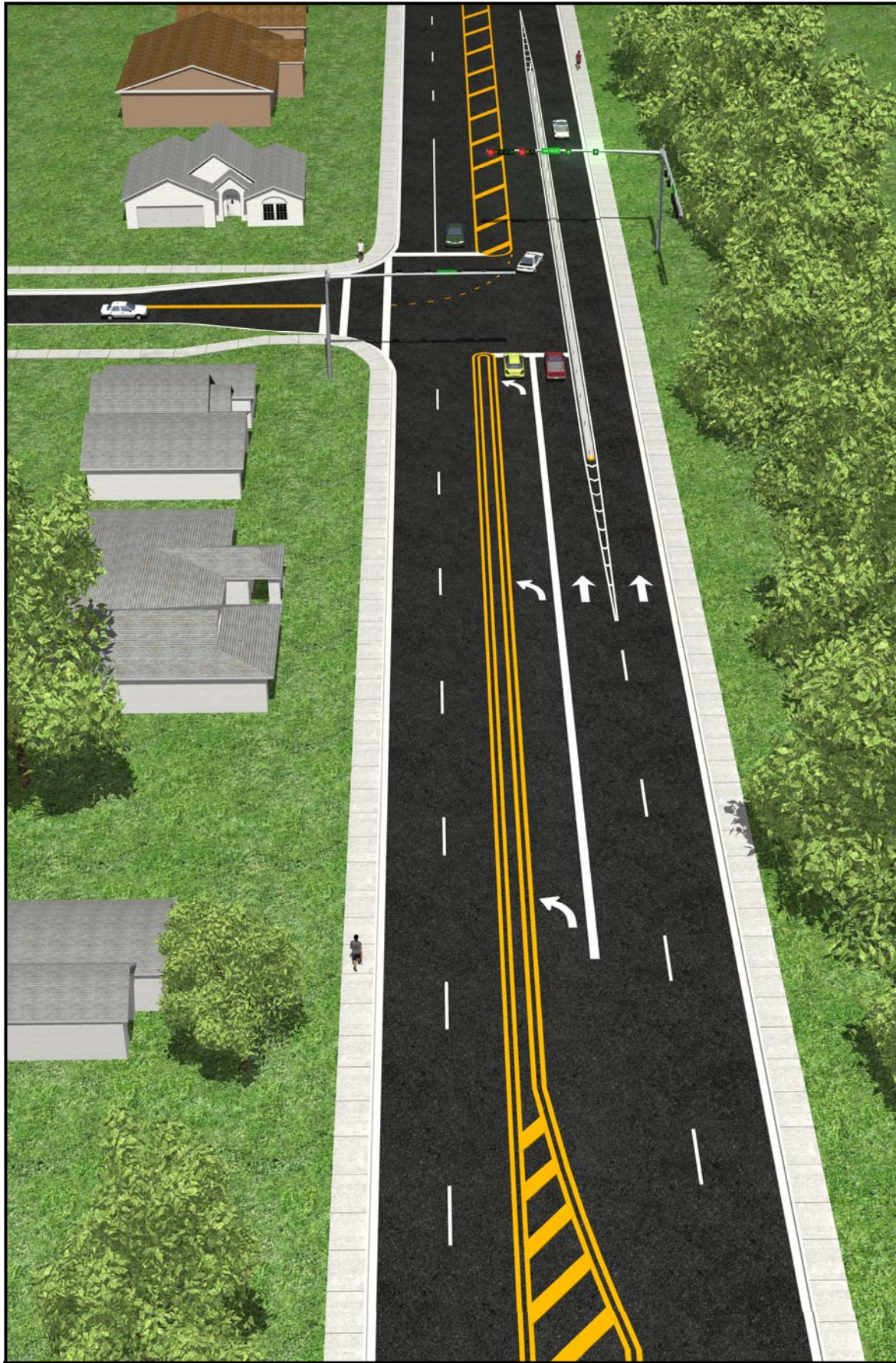


Exhibit 9: Location 4 (Type D without pedestrian crossing): Douglas-LeJeune @ NW 159 St

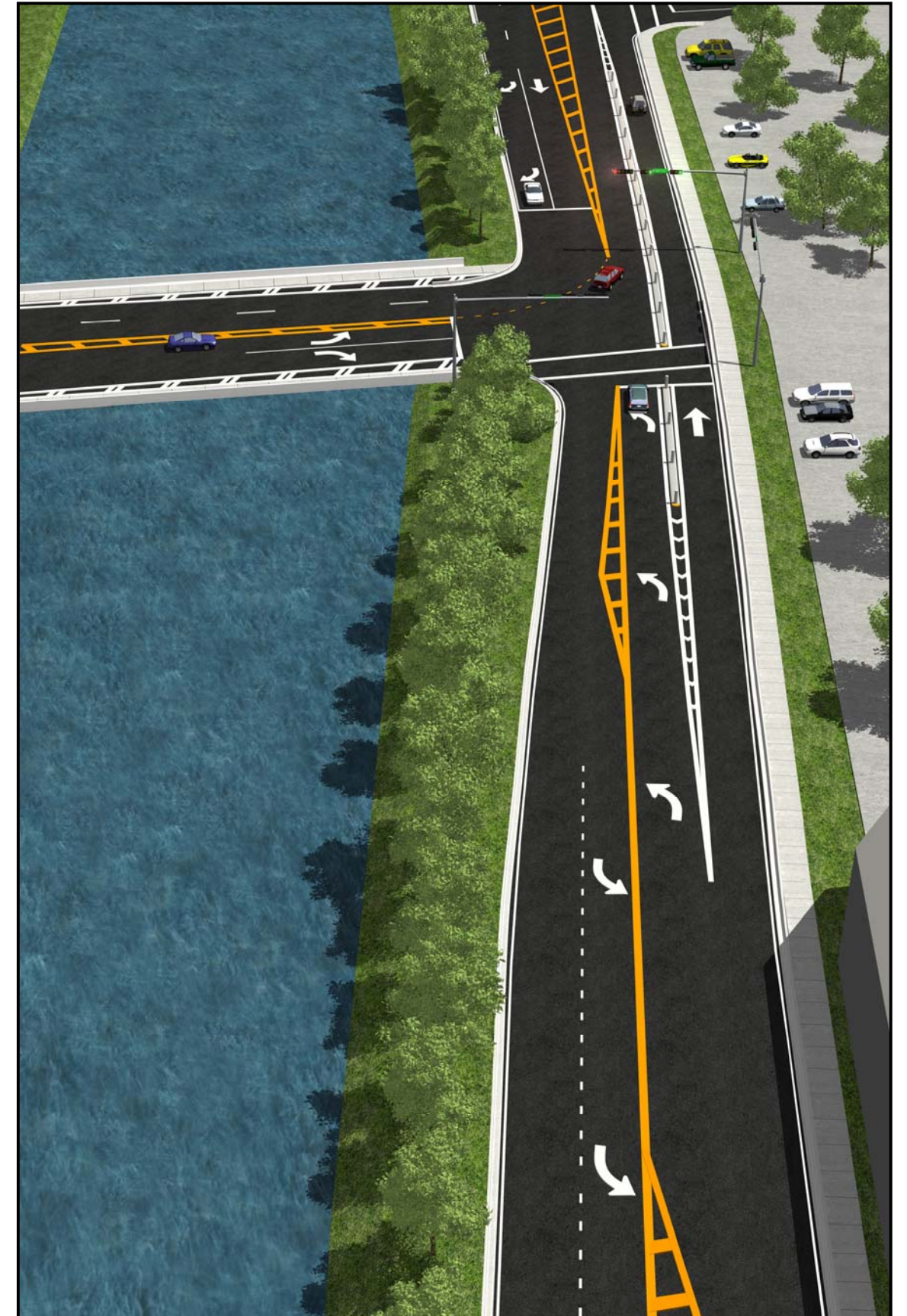


Exhibit 10: Location 8 (Type B/D hybrid with pedestrian crossing): SW 85 St @ SW 72 Ave
(The approach is type B because none of the through lanes stop, the departure side is type D because vehicles turning left from the side street do not merge onto the trough lanes)

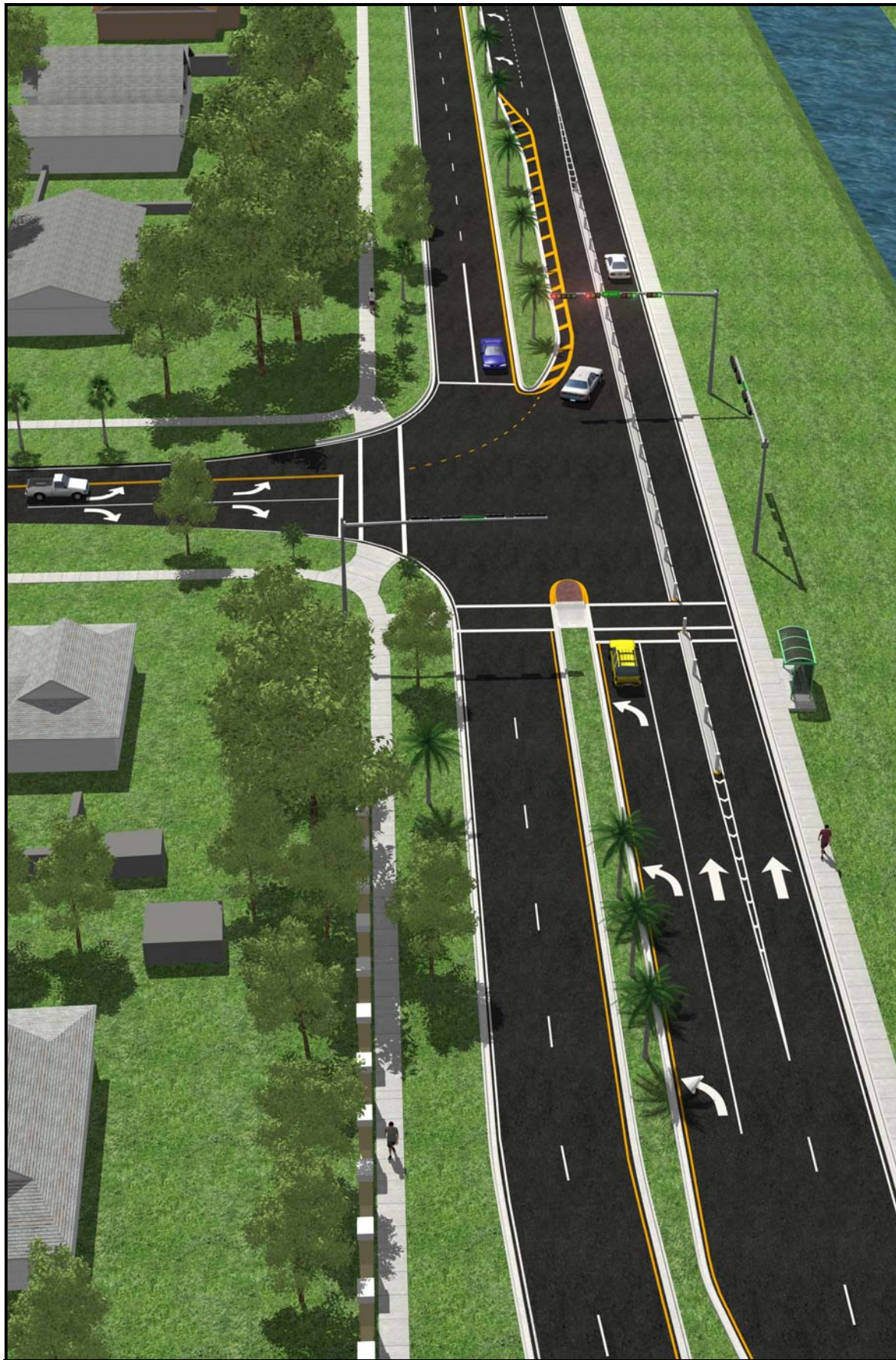


Exhibit 11: Location 18 (Type C with pedestrian crossing): SW 117 Ave @ SW 128 St

7.0 RECOMMENDATIONS

The conceptual recommendations for each of the 25 location listed above are shown following the Priorities/Schedule section below. These recommendations are organized by location and include for each location:

- Location map
- Narrative of the location existing features and implementation issues
- General specifications table including recommended turbo lane type, benefits, estimated cost estimate, priority and schedule.
- Ground level picture
- Schematic plan overlayed on a current aerial photo

8.0 IMPLEMENTATION PLAN

This section describes: the study coordination effort (expected to simplify implementation); the development of cost estimates; and the recommended priorities and schedule.

8.1 Study Coordination

The study recommendations were developed in close coordination with representatives of the Miami-Dade PWD. The coordination took place both in the form of meetings and distribution of recommendation materials for review and comments. Implementation should proceed based on available PWD funding for these types of projects. All the intersections are located on Miami-Dade County roads.

8.2 Estimated Costs

Conceptual cost estimates, based on typical configurations were developed. For each turbo lane type (see [Appendix H](#)), a cost range was established. This was further stratified into a low, mid and high cost range. Each recommended location was then identified as a low, mid or high cost range location as shown in the general specifications. [Exhibit 12](#) provides the cost ranges.

8.3 Priorities/Schedule

Priority recommendations are presented in this section. These priorities are based on 3 major factors, namely:

- Percent capacity improvement
- Cost
- Implementation issues

A 3 point system was used for each factor resulting a possible score range between 3 and 9 (the higher the score the higher the recommended priority). The scoring system and the resulting implementation scores and priorities are shown in Appendix I.

The suggested implementation schedule, provided funding becomes available, is as follows:

- Short Term: 6 – 12 months (High Priority)
- Mid Term: 1 – 2 years (Medium Priority)
- Long Term: 3 years + (Low Priority)

Exhibit 12
Preliminary Cost Estimates by Turbo Lane Type

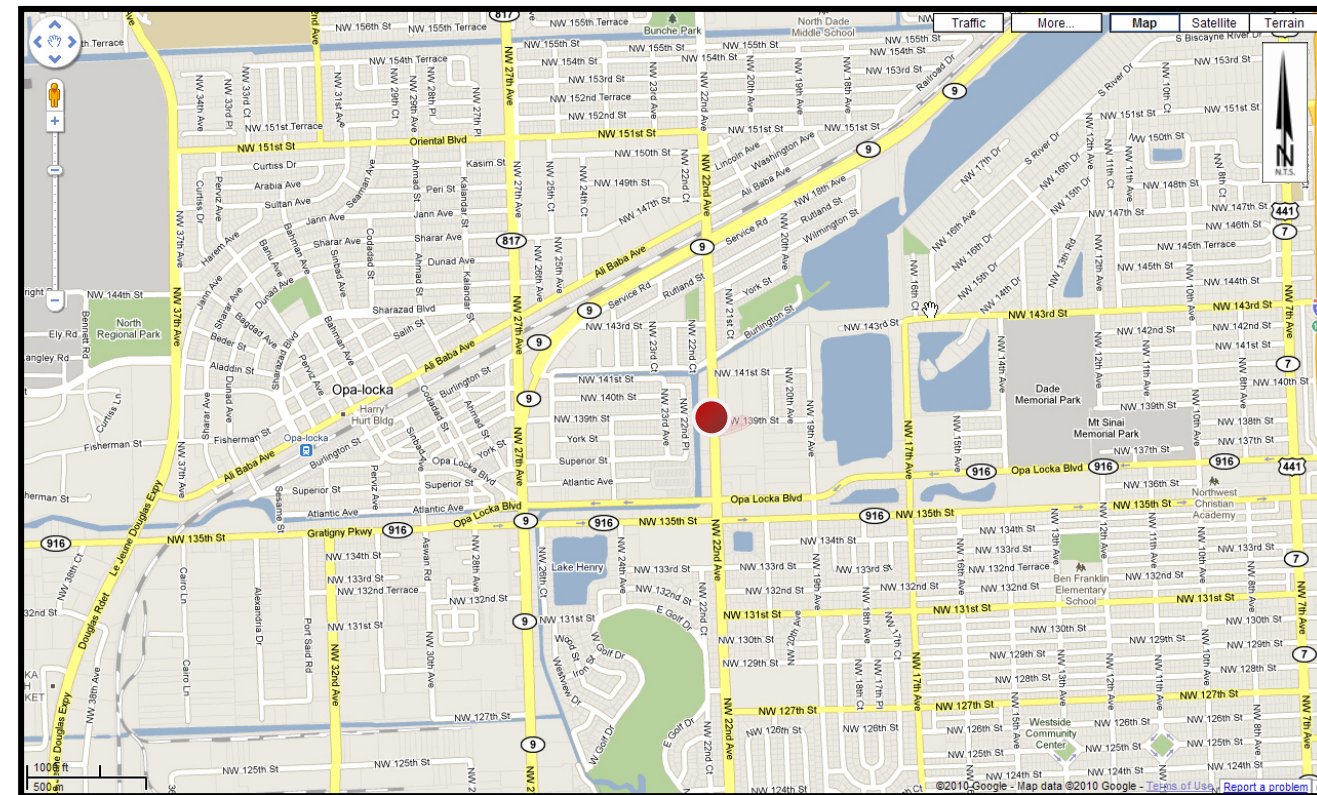
Turbo Lane Type	Low	Mid	High
Type A or B	\$215,000	\$270,000	\$325,000
Type C	\$135,000	\$170,000	\$205,000
Type D	\$95,000	\$120,000	\$145,000

Source: David Plummer and Associates

Intersections

Location No. 2
NW 22 Ave @ NW 139 St

The main street at this location, NW 22 Ave, is a four lane road with a raised median that runs in the north-south direction. NW 139 St is a minor street intersecting the main street from the east. The area has both commercial/industrial and residential developments. A canal, vacant property and a few low scale businesses are located along the west side of NW 22 Ave. Little friction and weaving is expected from the nearby driveways. The outside southbound lane is extra wide and allows for on-street parking. Parking activity, however, was not observed. Therefore, the extra wide lane is available to reconfigure the southbound approach and introduce the required geometry for the proposed turbo lane. Final design should consider plans for bicycle lanes if configuration is known at that time. A rendering of the recommended improvements at this intersection is included in section 6 of the report.



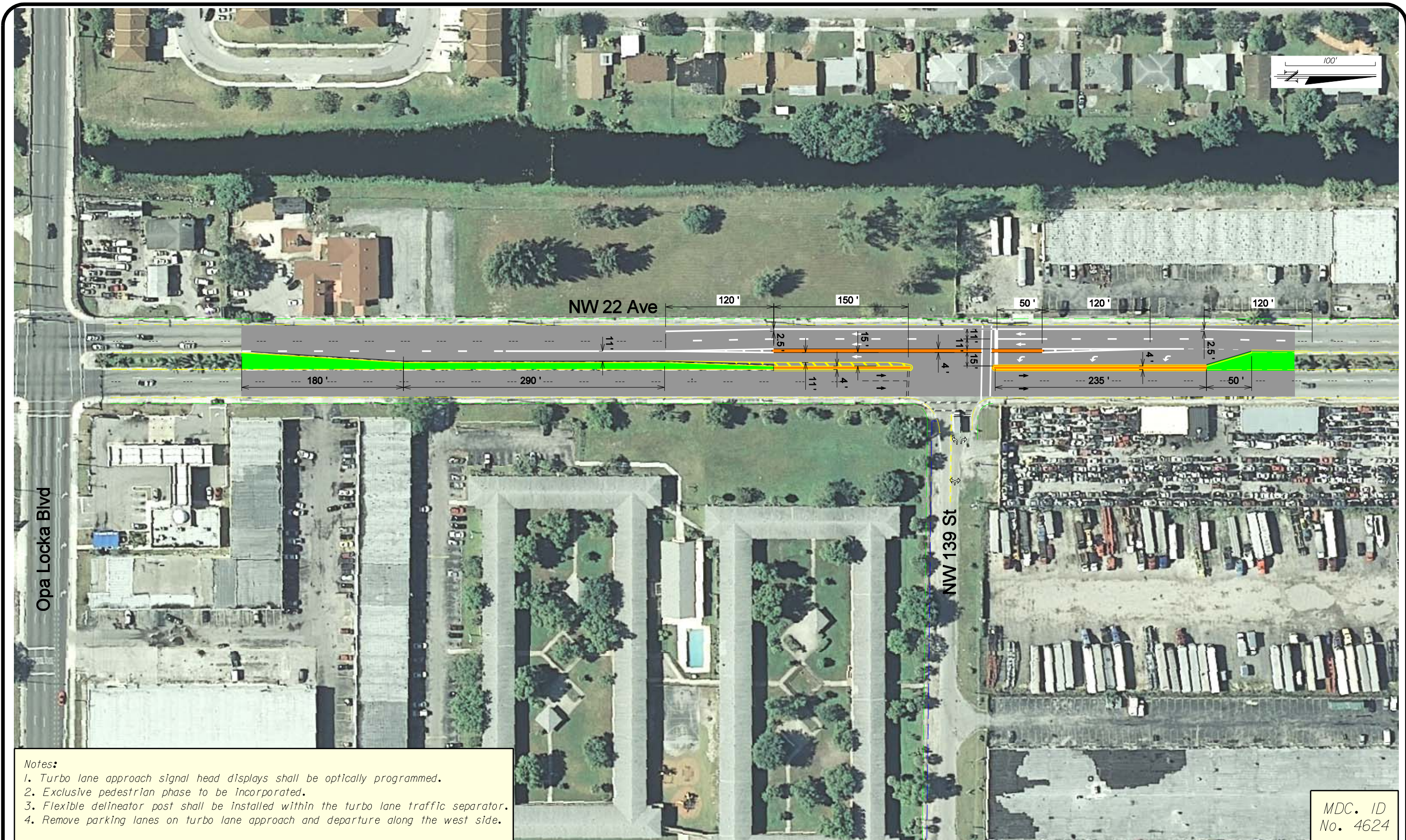
LOCATION MAP



EXISTING CONDITIONS

Location ID:	2
MD Signal ID:	4624
Location:	NW 22 Ave @ NW 139 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Southbound
MD Turbo Lane Type:	A
Number of Turbo Lanes:	2
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	26%
Advance Signs:	No
Driveway Control:	No
Other Issues:	Remove parking lanes
Estimated Cost	\$240,000 - \$300,000
Implementation Priority:	Low
Schedule:	Long Range

GENERAL SPECIFICATIONS



Notes:

1. Turbo lane approach signal head displays shall be optically programmed.
2. Exclusive pedestrian phase to be incorporated.
3. Flexible delineator post shall be installed within the turbo lane traffic separator.
4. Remove parking lanes on turbo lane approach and departure along the west side.

MDC. ID
No. 4624



DAVID PLUMMER & ASSOCIATES, INC.

TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS
1750 PONCE DE LEON BLVD., CORAL GABLES, FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plan

TITLE:

Location No. 2
NW 22 Avenue and NW 139 Street

DATE

DRAWN

CHECKED

APPROVED

PROJECT NO.

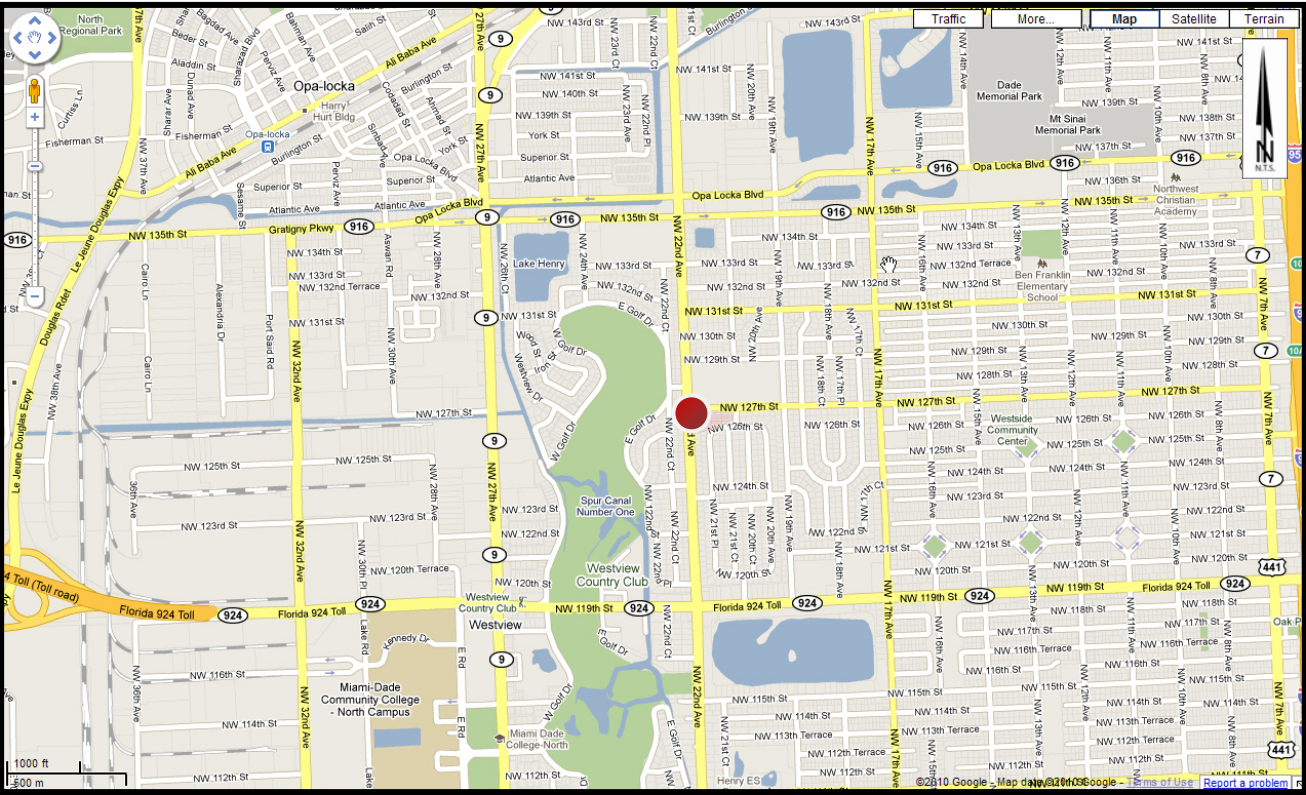
SHEET NO.

Location No. 3
NW 22 Ave @ NW 127 St

The main street at this location, NW 22 Ave, is a four lane road with a raised median that runs in the north-south direction. NW 127 St is a minor street intersecting the main street from the east. The area is primarily residential. There is an elementary school (Carrie P. Meek/Westview) on the northeast corner. Little friction and weaving is expected from the nearby single family homes driveways. The outside southbound lane is extra wide and allows for on-street parking. Parking activity, however, was not observed. At the same time, the median is also wide and is available to reconfigure the southbound approach and introduce the required geometry for the proposed turbo lane. Also, development of a southbound left turn lane with adequate deceleration and storage distance requires the removal of the northbound left turn lane and median opening at NW 128 St. Final design should consider plans for bicycle lanes if configuration is known at that time.



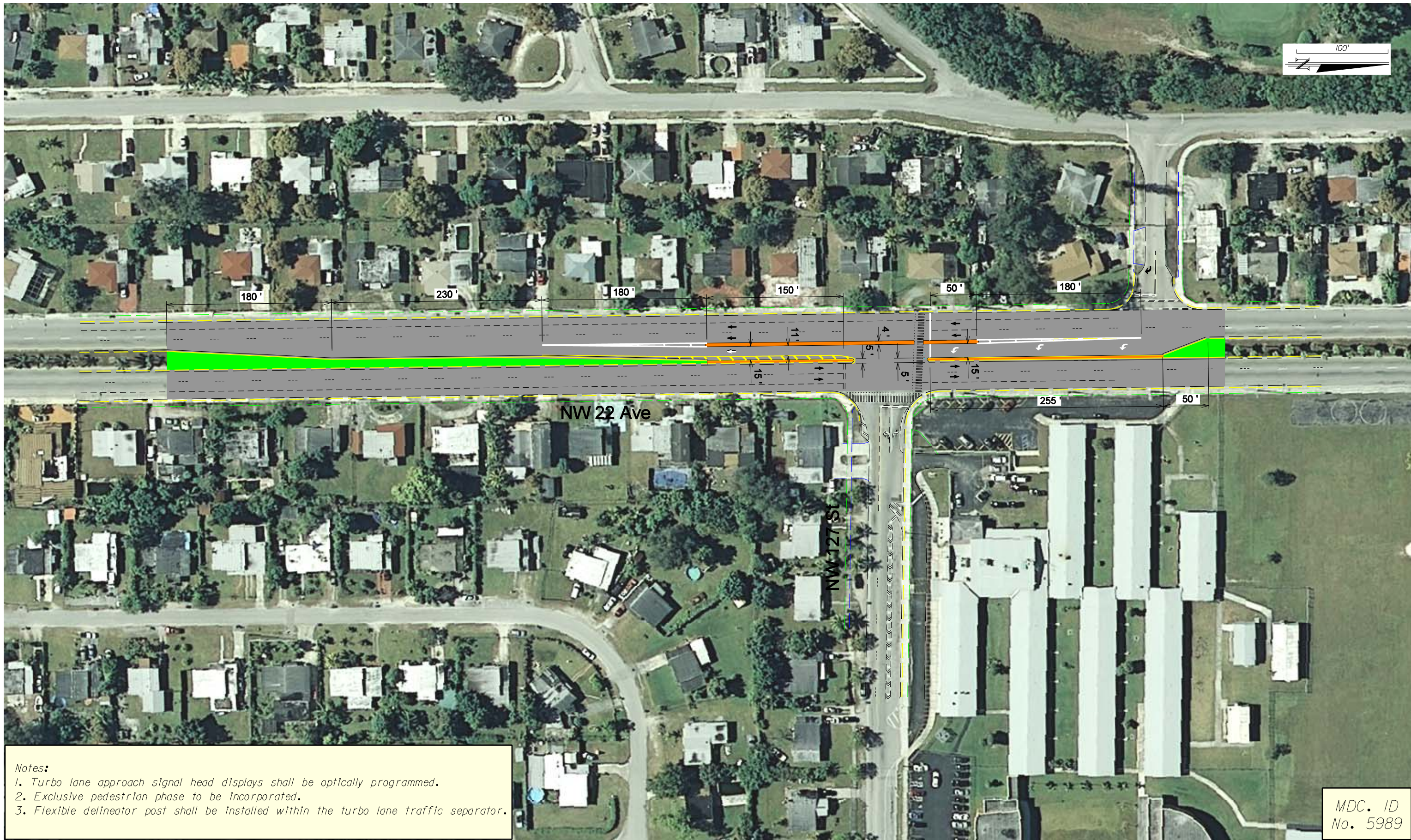
EXISTING CONDITIONS



LOCATION MAP

Location ID:	3
MD Signal ID:	5989
Location:	NW 22 Ave @ NW 127 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Southbound
MD Turbo Lane Type:	A
Number of Turbo Lanes:	2
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	28%
Advance Signs:	No
Driveway Control:	No
Other Issues:	Removal of NB left turn lane and median opening @ NW 128 St
Estimated Cost	\$215,000 - \$240,000
Implementation Priority:	High
Schedule:	Short Range

GENERAL SPECIFICATIONS



- Notes:
- 1. Turbo lane approach signal head displays shall be optically programmed.
 - 2. Exclusive pedestrian phase to be incorporated.
 - 3. Flexible delineator post shall be installed within the turbo lane traffic separator.

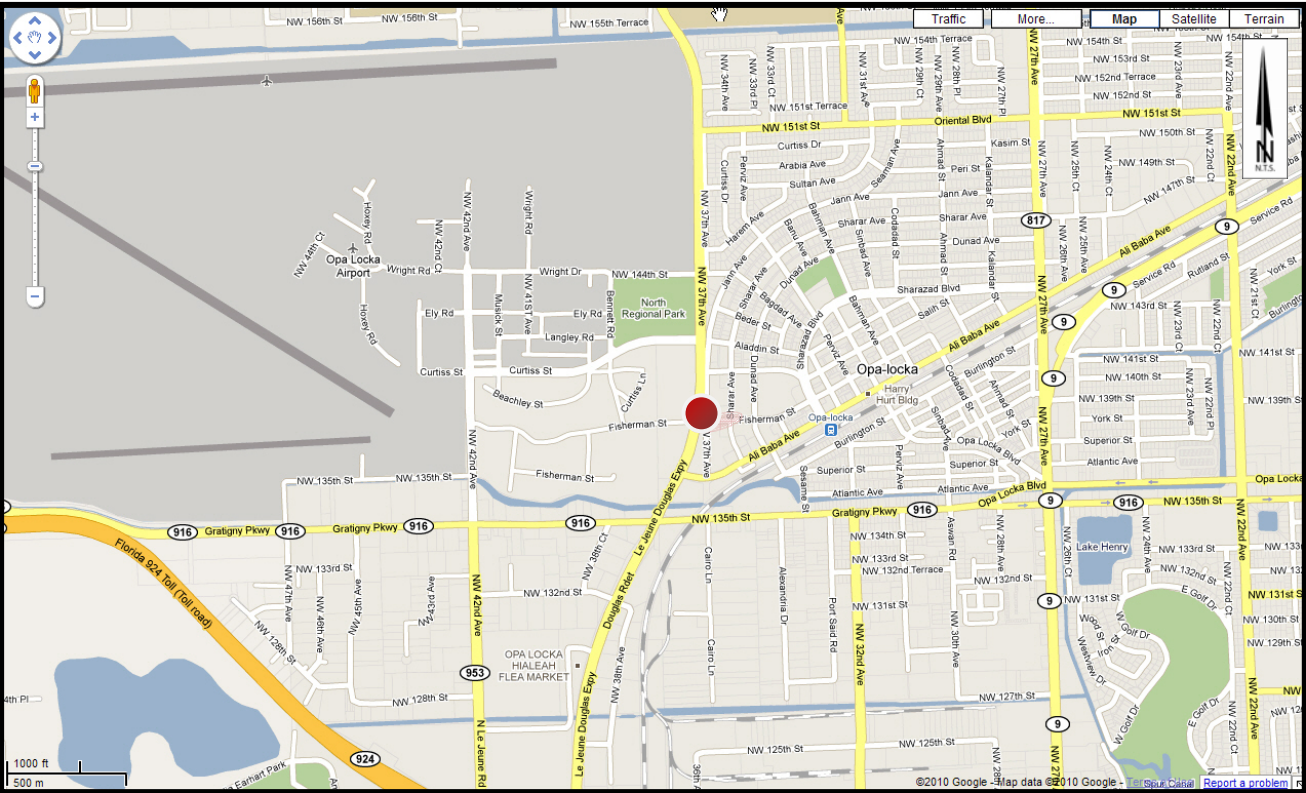
MDC. ID
No. 5989

Location No. 4
Douglas Rd @ NW 159 St

The main street at this location, NW 37 Ave, is a four lane road with a painted median that runs in the north-south direction. NW 159 St is a minor street intersecting the main street from the west. The area has both residential and institutional uses. Vacant property and the grounds of St. Thomas University are located along the east side of NW 37 Ave. Therefore, there are no driveways on that side of the road adjacent to the proposed turbo lane. Restricted right-of-way will require narrowing the existing sidewalk in order to reconfigure the northbound approach and introduce the required geometry for the turbo lane. A rendering of the recommended improvements at this intersection is included in section 6 of the report.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	4
MD Signal ID:	4917
Location:	Douglas Rd @ NW 159 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Northbound
MD Turbo Lane Type:	D
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	No
Approach Capacity Improvement:	26%
Advance Signs:	No
Driveway Control:	No
Other Issues:	Narrow sidewalk
Estimated Cost	\$130,000 - \$145,000
Implementation Priority:	High
Schedule:	Short Range

GENERAL SPECIFICATIONS



Notes:

1. Turbo lane approach signal head displays shall be optically programmed.
2. Exclusive pedestrian phase to be incorporated.
3. Flexible delineator post shall be installed within the turbo lane traffic separator.
4. Shift northbound lanes 1'(ft) towards the east by narrowing sidewalk.

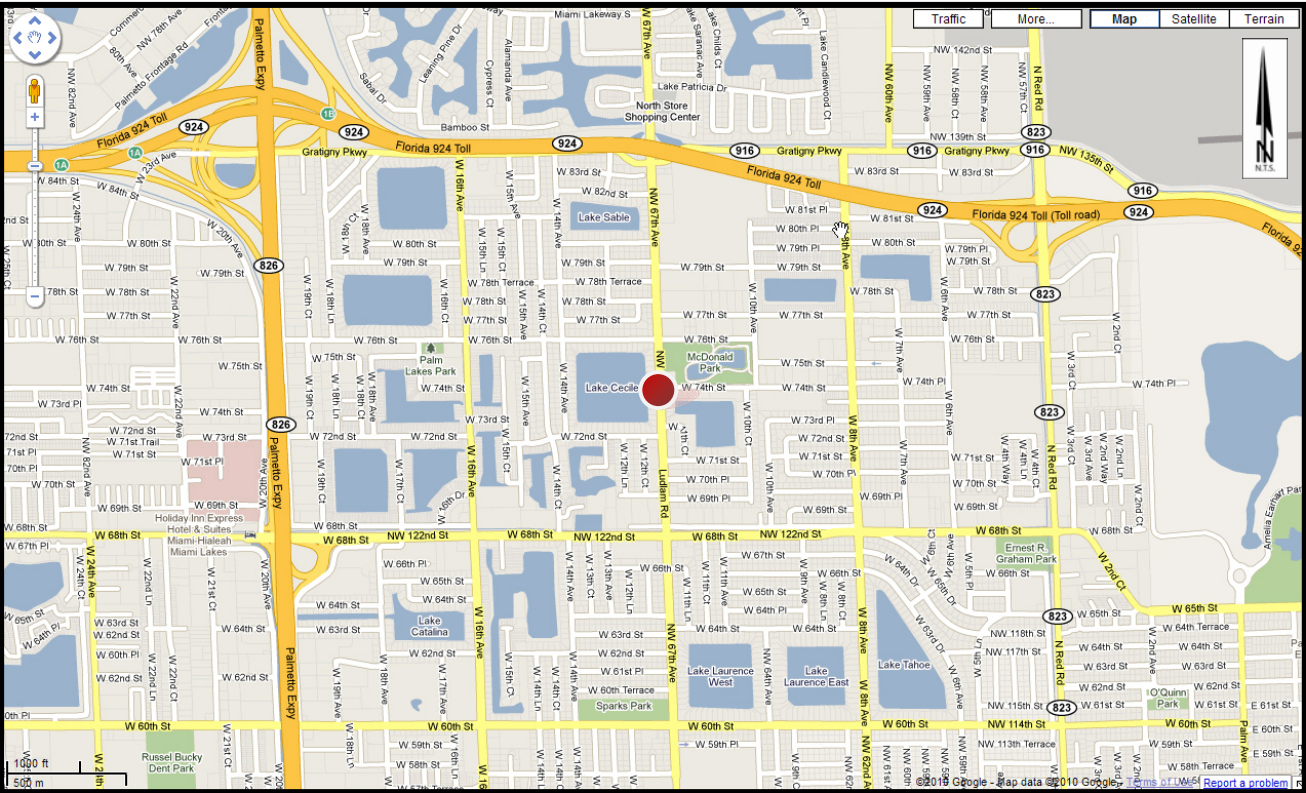
MDC. ID
No. 4917

Location No. 6
Ludlam Rd @ W 74 St

The main street at this location, NW 67 Ave, is a four lane road with a painted median that runs in the north-south direction. W 74 St (Hialeah) is a minor street intersecting the main street from the east. The area has residential and commercial uses as well as a city park on the northeast corner. Little friction and weaving is expected from the nearby single family homes driveways on the west side of the road. There is a lake behind these houses. Narrowing the west sidewalk will be needed in order to reconfigure the southbound approach and introduce the required geometry for the proposed turbo lane.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	6
MD Signal ID:	4149
Location:	Ludlam Rd @ W 74 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Southbound
MD Turbo Lane Type:	D
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	15%
Advance Signs:	No
Driveway Control:	No
Other Issues:	Narrow sidewalk
Estimated Cost	\$130,000 - \$145,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS

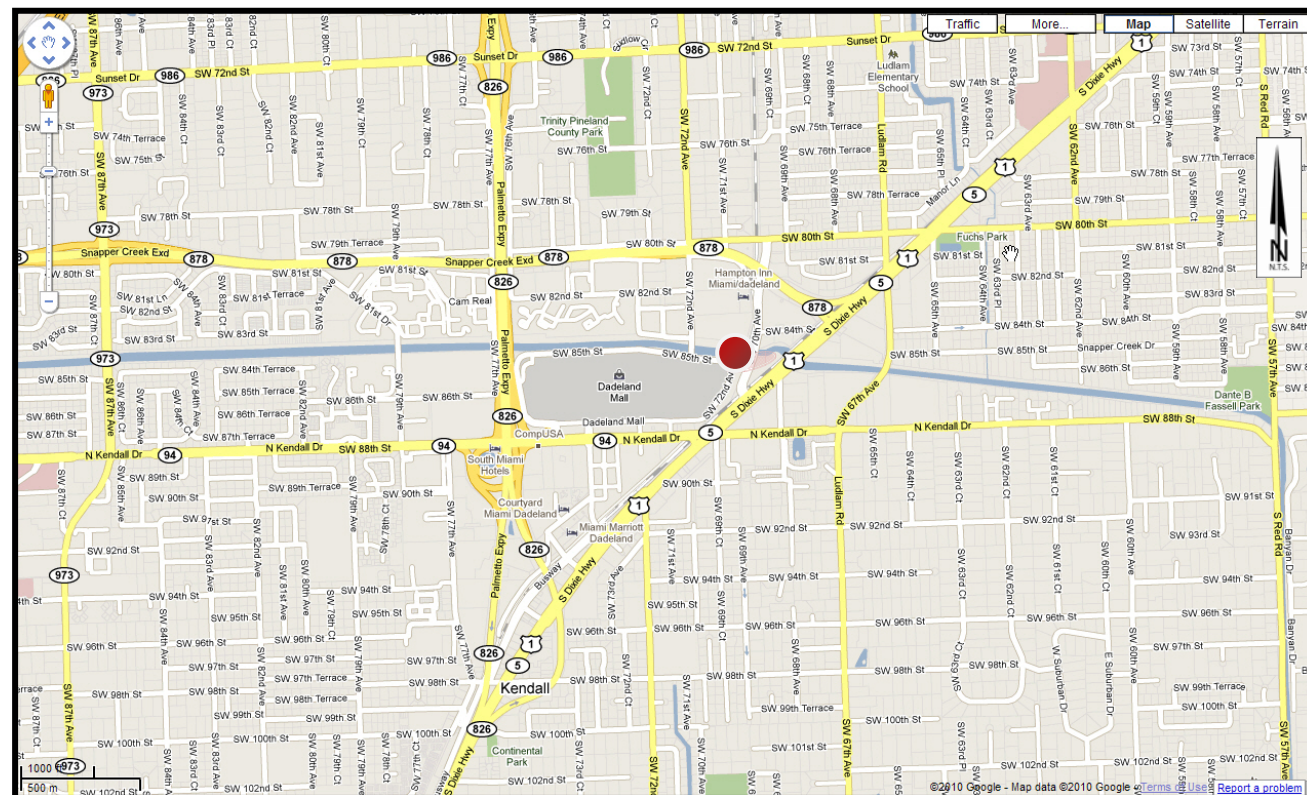


Location No. 8
SW 85 St @ SW 72 Ave

The main street at this location, SW 85 St, is part of the northern ring road around Dadeland Mall and runs in the east-west direction. Its cross section changes from two lanes with a painted median west of the intersection to four lanes with painted median to the east. The “minor” street, SW 72 Ave, is a four lane half-section line road intersecting and terminating (due to realignment) at the main street from the north. The area is dominated by commercial development. A Dadeland Mall parking lot abuts the south side of SW 85 St and the Snapper Creek Canal borders on the north side. Little friction and weaving is expected from the nearby driveways, however, closing of the left turn lane and median opening to parking lot east of the intersection will be needed. Alternate access is readily available via the southern segment of SW 72 Ave immediate east of the subject opening. The proposed turbo lane has an atypical configuration, a hybrid of types B and D that takes advantage of the change in the cross section of SW 85 St. Specifically, the eastbound turbo lane will be created by introducing a divider separating the single eastbound through lane from the left turn lane. This is a type B configuration because no through lane stops. On the eastbound departure side of the intersection, the additional existing inside through lane is used to bring in the southbound left turns from SW 72 Ave onto its own lane. This side is a type D turbo lane because the side street left turns need not merge onto the main street traffic. A rendering of the recommended improvements at this intersection is included in section 6 of the report.



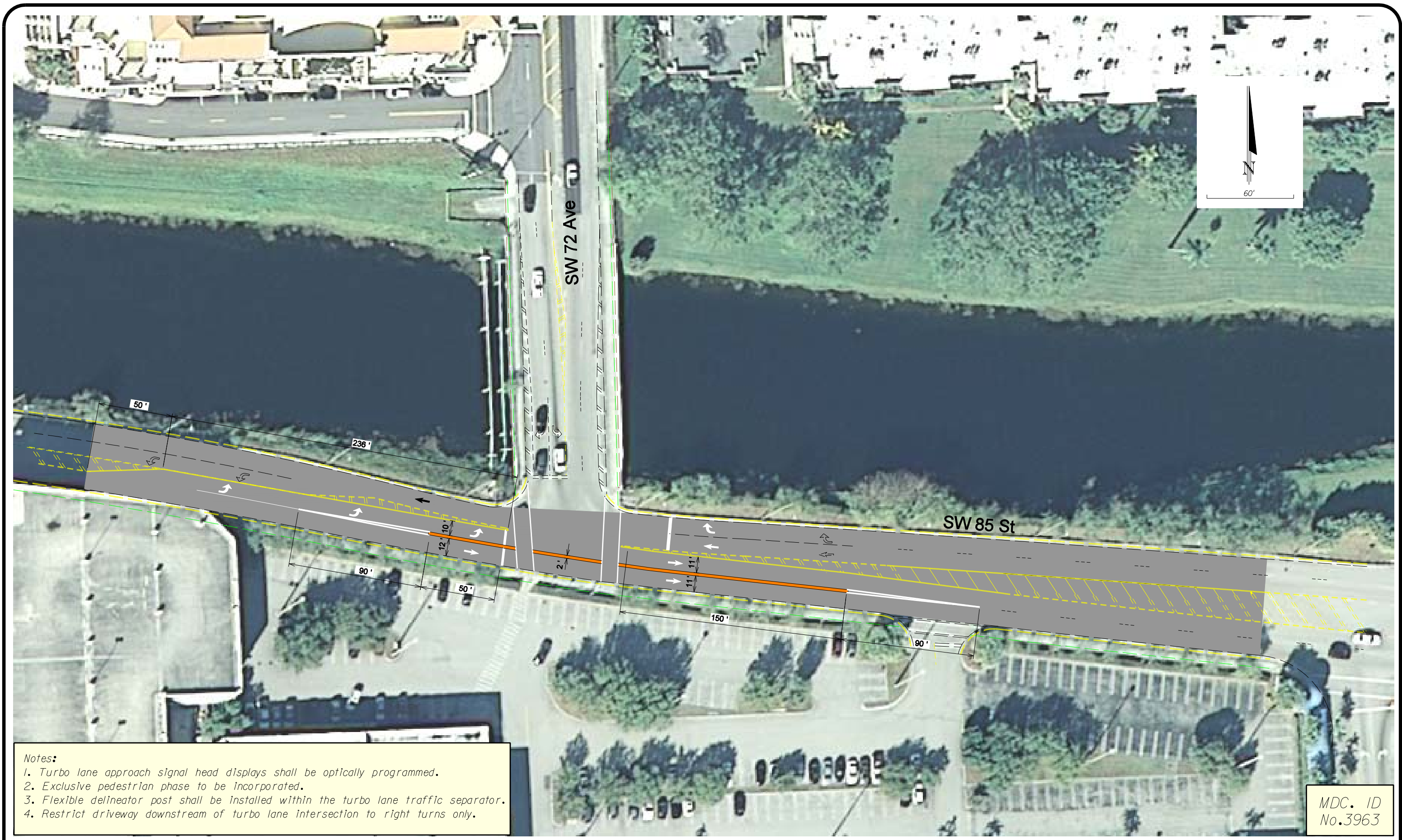
EXISTING CONDITIONS



LOCATION MAP

Location ID:	8
MD Signal ID:	3963
Location:	SW 85 St @ SW 72 Ave
Posted Speed:	40 MPH
Turbo Lane Direction:	Eastbound
MD Turbo Lane Type:	B/D
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	173%
Advance Signs:	No
Driveway Control:	Yes
Other Issues:	Closing off left turn lane and median opening
Estimated Cost	\$150,000 - \$190,000
Implementation Priority:	High
Schedule:	Short Range

GENERAL SPECIFICATIONS



- Notes:
- 1. Turbo lane approach signal head displays shall be optically programmed.
 - 2. Exclusive pedestrian phase to be incorporated.
 - 3. Flexible delineator post shall be installed within the turbo lane traffic separator.
 - 4. Restrict driveway downstream of turbo lane intersection to right turns only.

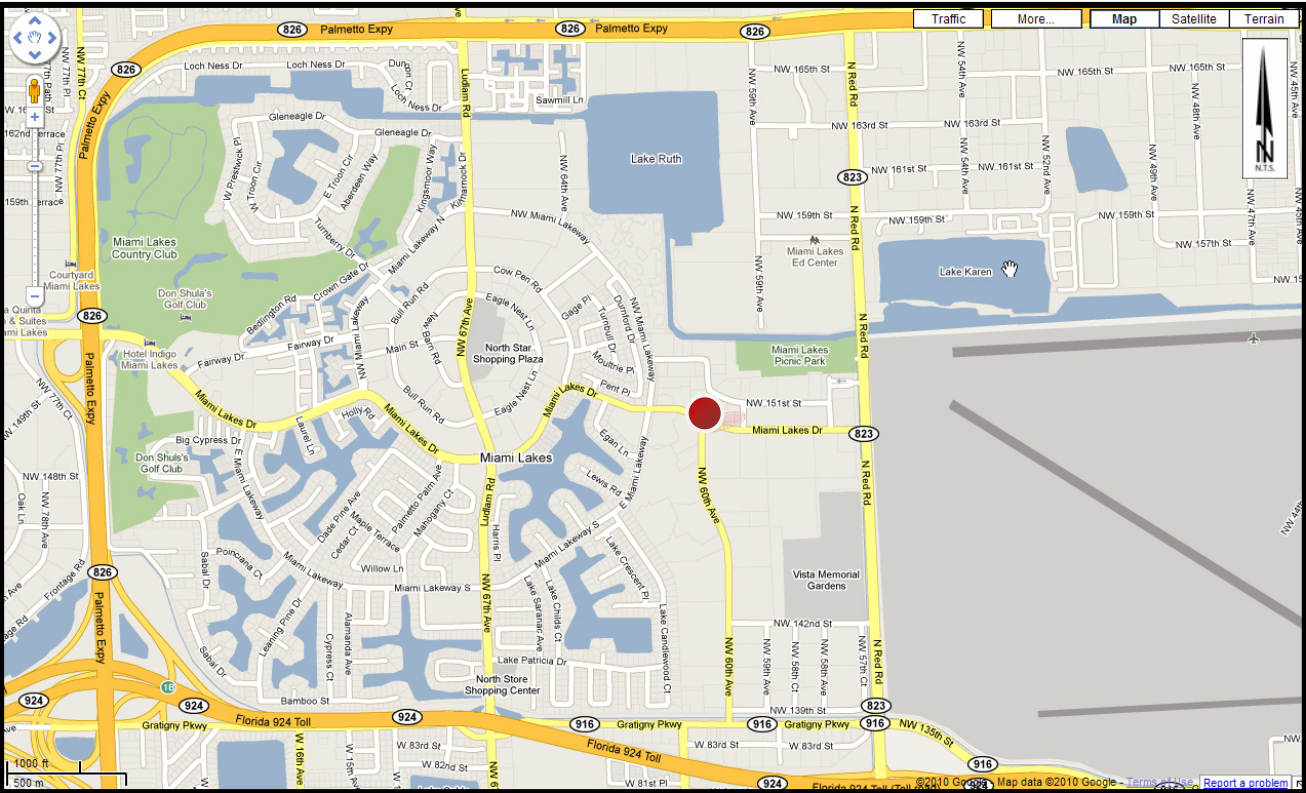
MDC. ID
No.3963

Location No. 10
Miami Lakes Dr @ NW 60 Ave

The main street at this location, Miami Lakes Dr, is a four lane road with a painted median and runs in the east-west direction. NW 60 Ave is a minor street intersecting the main street from the south. The area is dominated by office and institutional uses. There is a police station and a small park along the north side of the main street. Little friction and weaving is expected from the nearby driveways, however, closing of the left turn lane and median opening to the small parking lot west of the intersection will be needed.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	10
MD Signal ID:	4390
Location:	Miami Lakes Dr @ NW 60 Ave
Posted Speed:	35 MPH
Turbo Lane Direction:	Northwestbound
MD Turbo Lane Type:	D
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	10%
Advance Signs:	No
Driveway Control:	Yes
Other Issues:	Closing off left turn lane and median opening
Estimated Cost	\$130,000 - \$145,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS



- Notes:
- 1. Turbo lane approach signal head displays shall be optically programmed.
 - 2. Exclusive pedestrian phase to be incorporated.
 - 3. Flexible delineator post shall be installed within the turbo lane traffic separator.
 - 4. Restrict driveway downstream of turbo lane intersection to right turns only.
 - 5. Shift westbound lanes 1'(ft) towards the north by narrowing utility strip.
 - 6. MDT should consider relocating bus stop

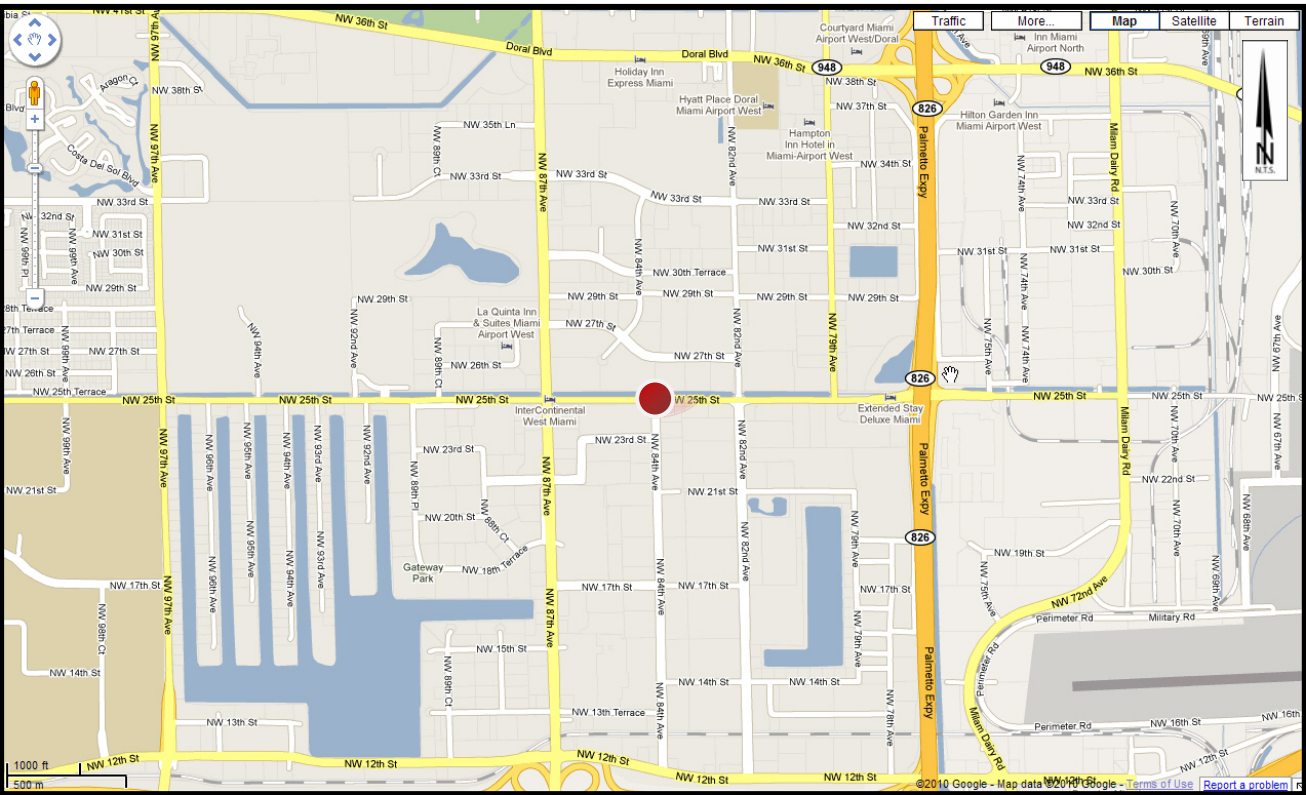
MDC. ID
No.4390

Location No. 11
NW 25 St @ NW 84 Ave

The main street at this location, NW 25 St, is a four/five lane road with a painted median and runs in the east-west direction. NW 84 Ave is a minor street intersecting the main street from the south. The area is dominated by office and commercial uses. There is a canal and no driveways along the north side of the main street. There is, however, a bus stop which may be too close to the edge of the road upon completion of the turbo lane. Additionally, access to this bus stop may require a crosswalk across the turbo lane and the necessary pedestrian signals and signal phase stopping the turbo lane traffic upon actuation by a bus rider pedestrians. Relocation of the bus stop should be considered by MDT due to these potential geometric turbo lane operational conflicts. Plans to widen NW 25 St should also consider incorporating a turbo lane at this intersection.



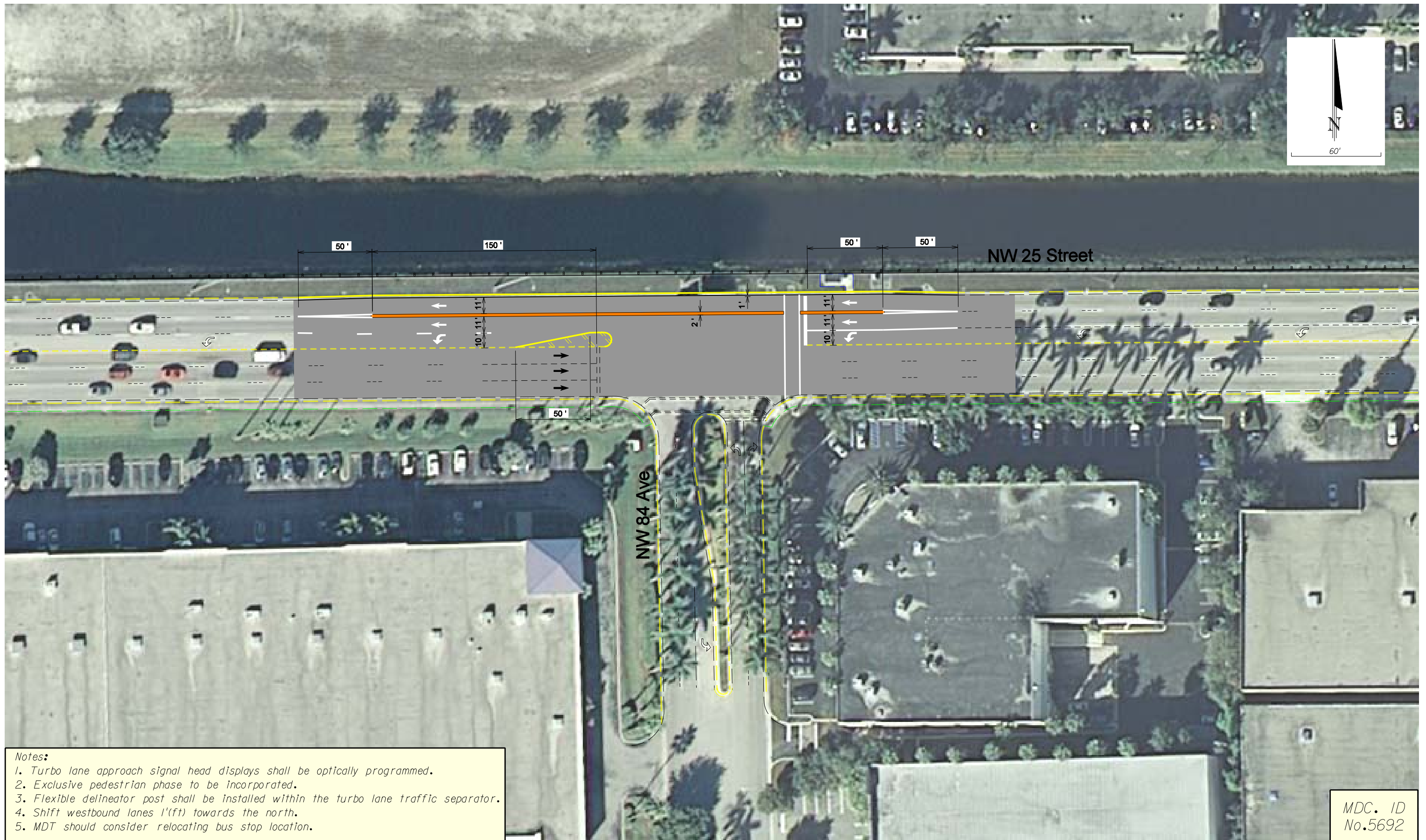
EXISTING CONDITIONS



LOCATION MAP

Location ID:	11
MD Signal ID:	5692
Location:	NW 25 St @ NW 84 Ave
Posted Speed:	40 MPH
Turbo Lane Direction:	Westbound
MD Turbo Lane Type:	D
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	7%
Advance Signs:	No
Driveway Control:	No
Other Issues:	Relocate bus stop
Estimated Cost	\$130,000 - \$145,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS

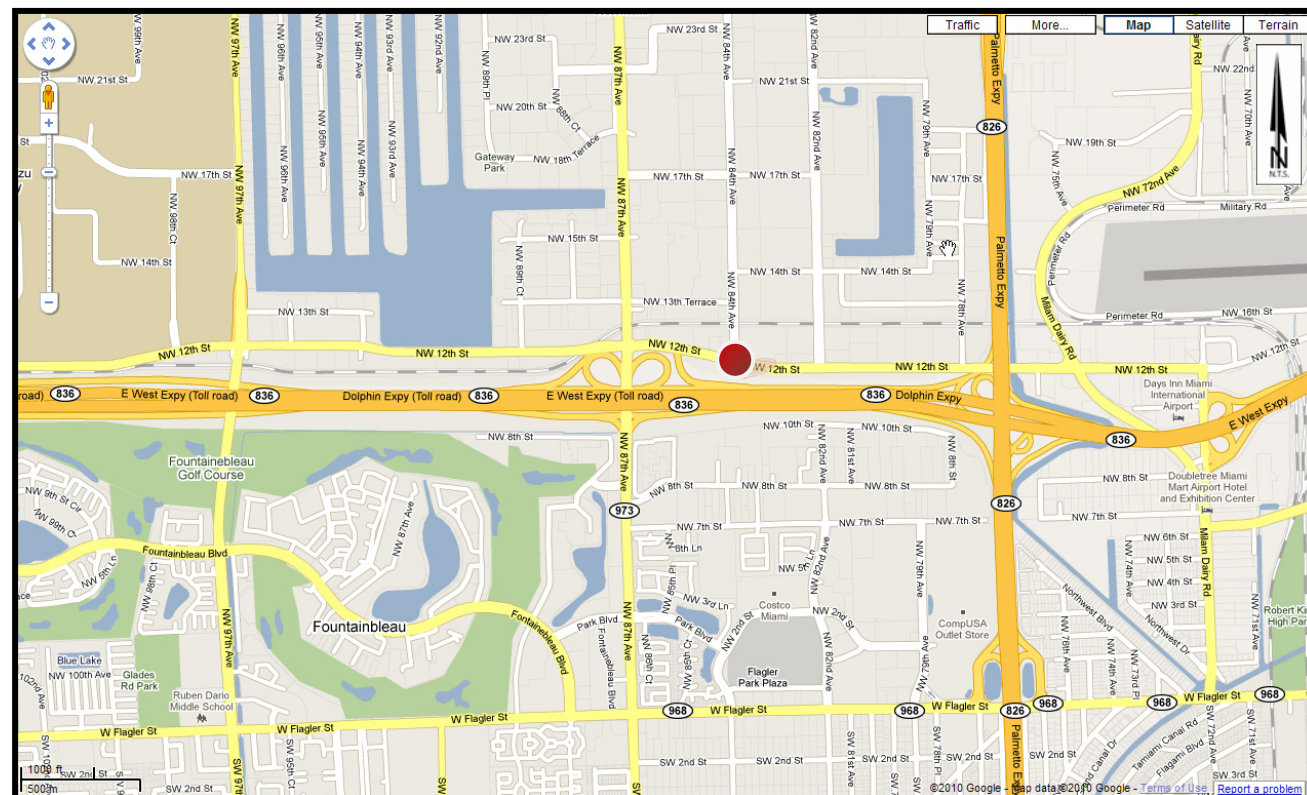


Location No. 12
NW 12 St @ NW 84 Ave

The main street at this location, NW 12 St, is a four lane road with a raised median and runs in the east-west direction. NW 84 Ave is a minor street intersecting the main street from the north. The area is dominated by office and commercial uses. The Dolphin Expressway (SR 836) abuts the main street on the south side. No driveways are present on that side. There is, however, a left turn lane and a significant driveway for the commercial development downstream from the proposed turbo lane. Therefore, eastbound traffic should be advised in advance of the intersection that the subject driveway is best accessed by moving to the left lane in advance of the turbo lane. Planned improvements to SR836 however, may conflict with the proposed turbo lane if implemented in the near future.



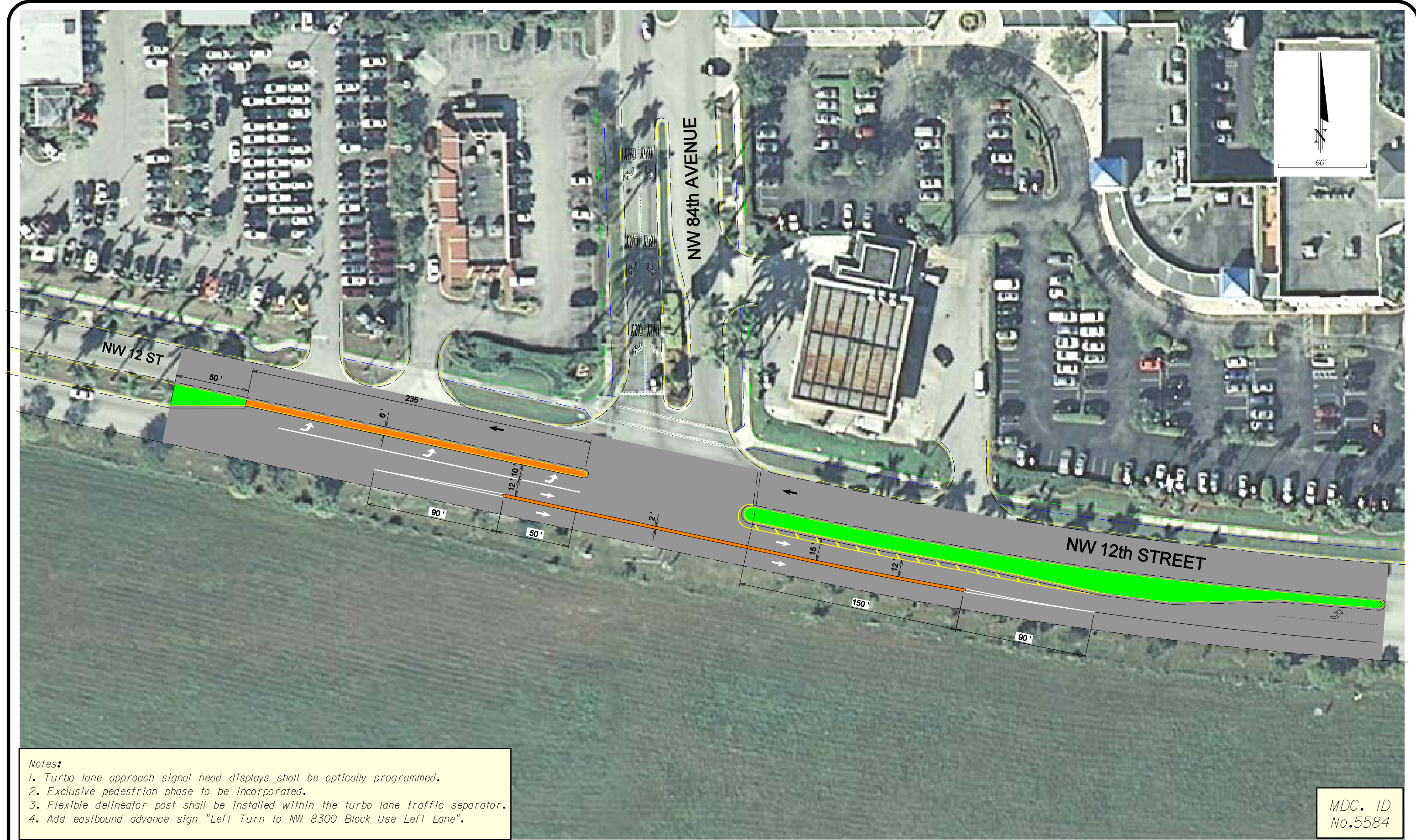
EXISTING CONDITIONS



LOCATION MAP

Location ID:	12
MD Signal ID:	5584
Location:	NW 12 St @ NW 84 Ave
Posted Speed:	40 MPH
Turbo Lane Direction:	Eastbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	No
Approach Capacity Improvement:	15%
Advance Signs:	Yes
Driveway Control:	No
Other Issues:	No
Estimated Cost	\$150,000 - \$190,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS



DAVID PLUMMER & ASSOCIATES, INC.
 TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
 CORAL GABLES FORT MYERS
 1750 PONCE DE LEON BLVD. CORAL GABLES FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plans

TITLE:

**Location No. 12
 NW 12 Street and NW 84 Avenue**

DATE PROJECT NO.

DRAWN SHEET NO.

CHECKED

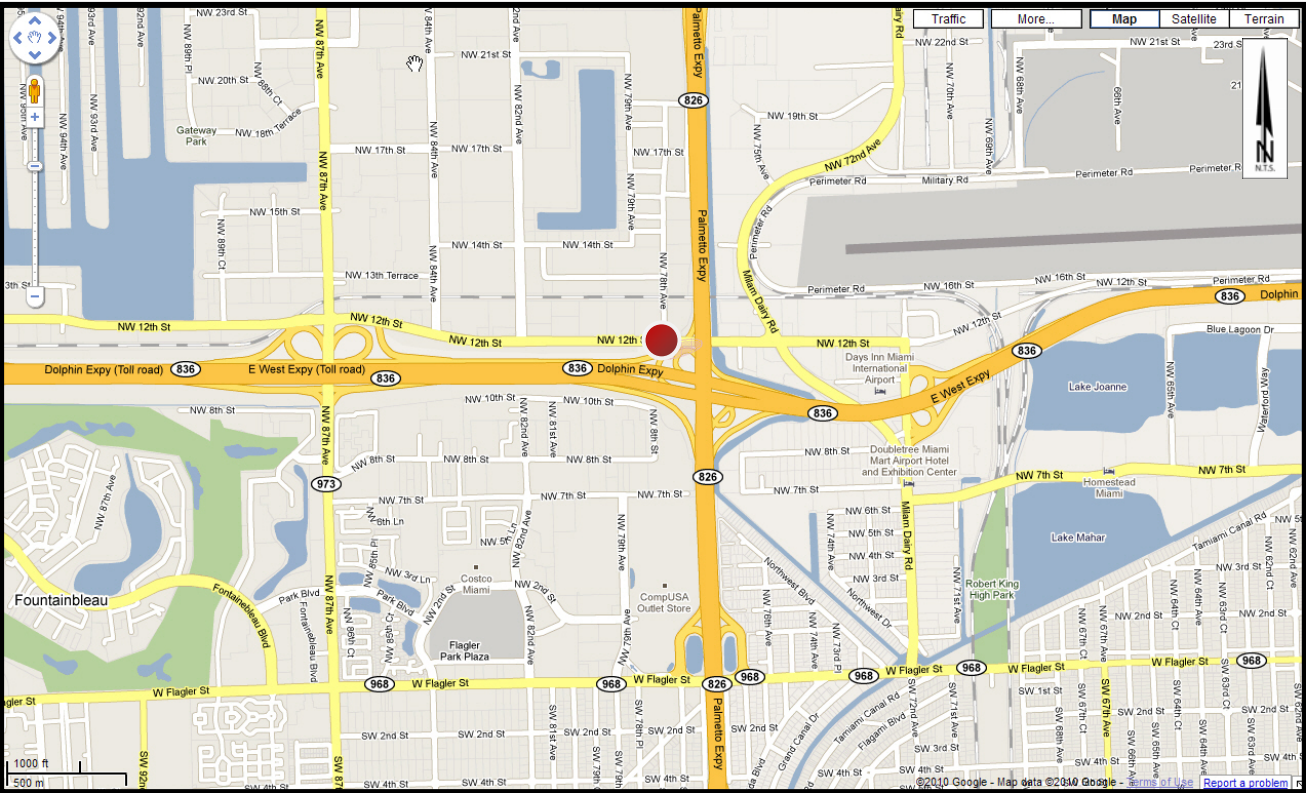
APPROVED

Location No. 13
NW 12 St @ NW 78 Ave

The main street at this location, NW 12 St, is a four lane road with a raised median and runs in the east-west direction. NW 78 Ave is a minor street intersecting the main street from the north. The area is dominated by office uses. The Dolphin Expressway (SR 836) abuts the main street on the south side. No driveways are present on that side. There is, however, a downstream median opening serving a vacant lot owned by FDOT on the northeast corner of the intersection. The subject opening should be closed to prevent potential conflicts with the proposed turbo lane. Additionally, minor narrowing of the median is also needed downstream from the turbo lane. Construction of a concrete barrier, therefore, is recommended to provide adequate protection of an existing expressway ramp pier.



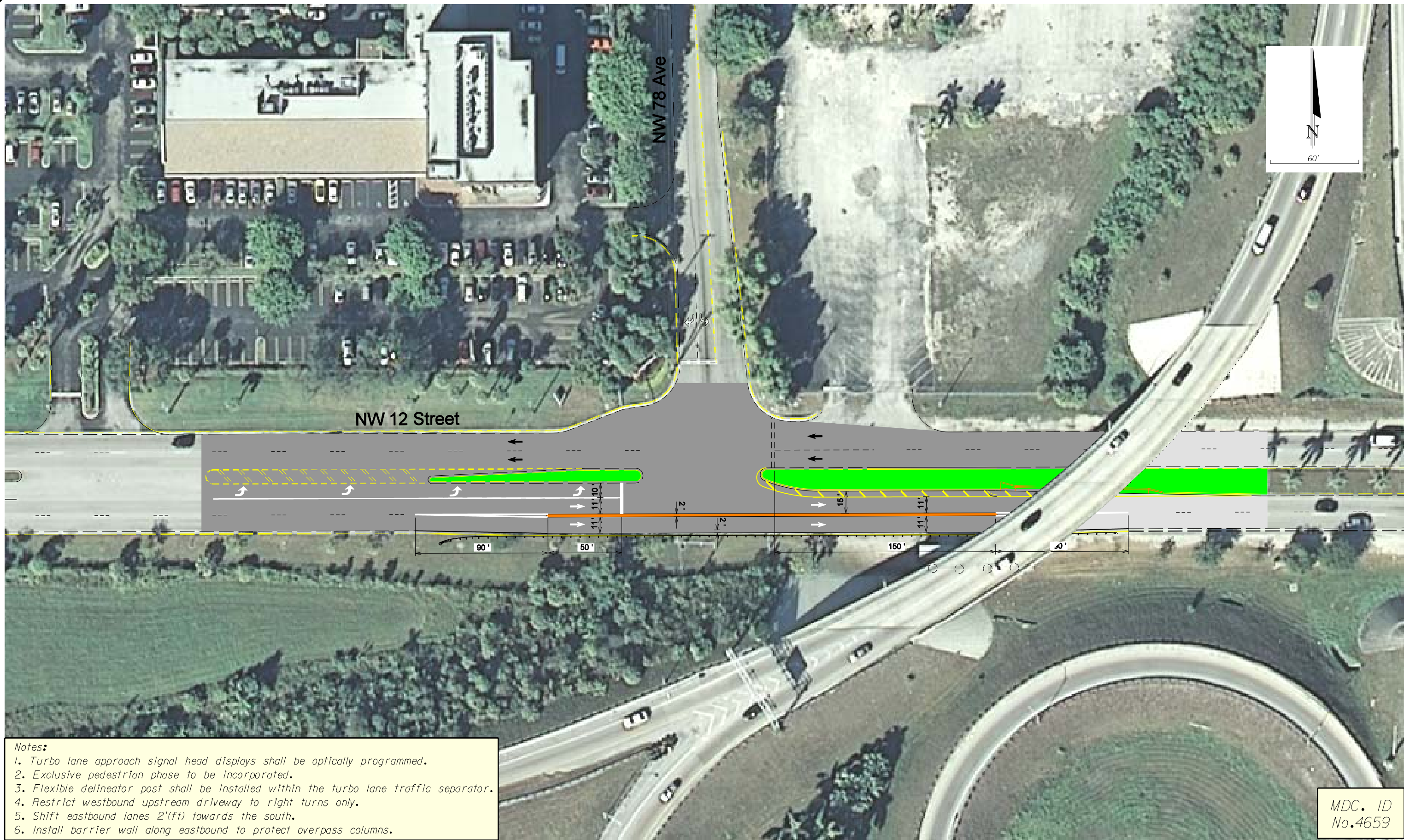
EXISTING CONDITIONS



LOCATION MAP

Location ID:	13
MD Signal ID:	4659
Location:	NW 12 St @ NW 78 Ave
Posted Speed:	40 MPH
Turbo Lane Direction:	Eastbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	No
Approach Capacity Improvement:	21%
Advance Signs:	No
Driveway Control:	Yes
Other Issues:	Install concrete barrier
Estimated Cost	\$190,000 - \$205,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS

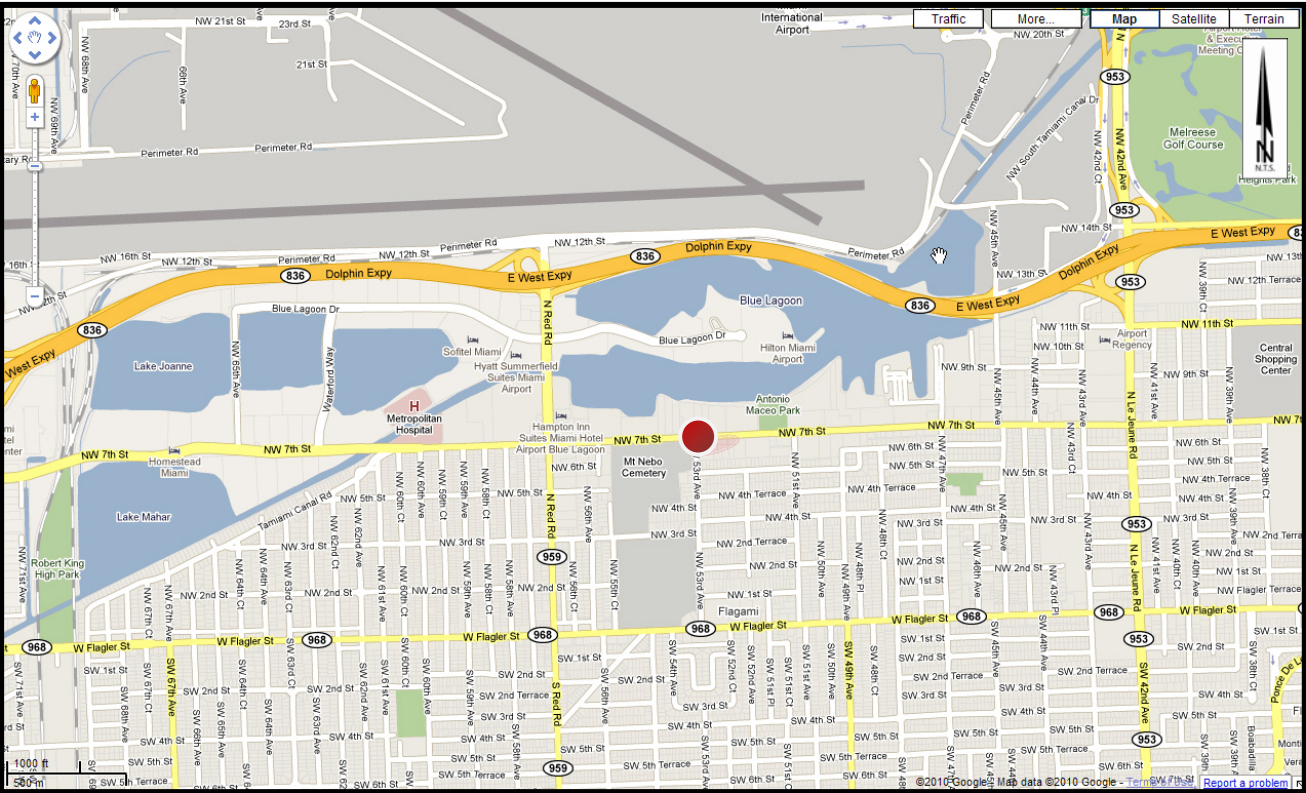


Location No. 14
NW 7 St @ NW 53 Ave

The main street at this location, NW 7 St, is a four lane road with a painted median and runs in the east-west direction. NW 53 Ave is a minor street intersecting the main street from the south. The area is dominated by commercial and multifamily residential uses. There is also a cemetery on the southwest corner of the intersection. Little friction and weaving is expected from the nearby driveways, however, several commercial driveways will need to be restricted to right turns only in the vicinity of the turbo lane divider.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	14
MD Signal ID:	5031
Location:	NW 7 St @ NW 53 Ave
Posted Speed:	40 MPH
Turbo Lane Direction:	Westbound
MD Turbo Lane Type:	D
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	8%
Advance Signs:	No
Driveway Control:	Yes
Other Issues:	No
Estimated Cost	\$150,000 - \$190,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS



- Notes:
1. Turbo lane approach signal head displays shall be optically programmed.
 2. Exclusive pedestrian phase to be incorporated.
 3. Flexible delineator post shall be installed within the turbo lane traffic separator.
 4. Restrict westbound upstream & downstream driveways to right turns only.

MDC. ID
No.5031



DAVID PLUMMER & ASSOCIATES, INC.

TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS
1750 PONCE DE LEON BLVD., CORAL GABLES, FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plans

TITLE:

Location No. 14
NW 7 Street and NW 53 Avenue

DATE PROJECT NO.

DRAWN SHEET NO.

CHECKED

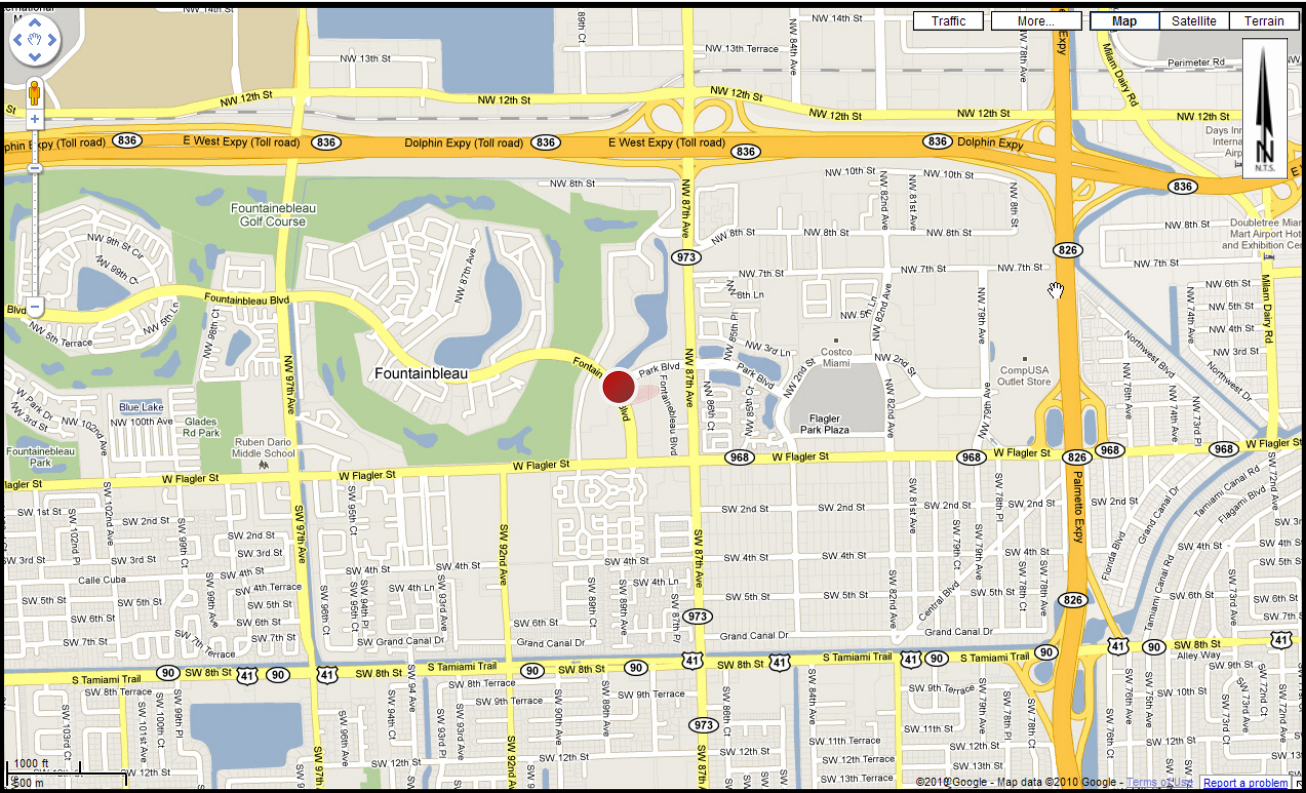
APPROVED

Location No. 16
Fontainebleau Blvd @ Park Blvd

The main street at this location, Fontainebleau Blvd, is a four lane road with a raised median and runs approximately in the north-south direction. Park Blvd is a minor street intersecting the main street from the east. The area is dominated by multifamily development. Little friction and weaving is expected from the nearby driveways, however, there is a u-turn lane downstream from the proposed turbo lane. Therefore, southbound traffic should be advised in advance of the intersection that the subject u-turn location is best accessed by moving to the left lane in advance of the turbo lane.



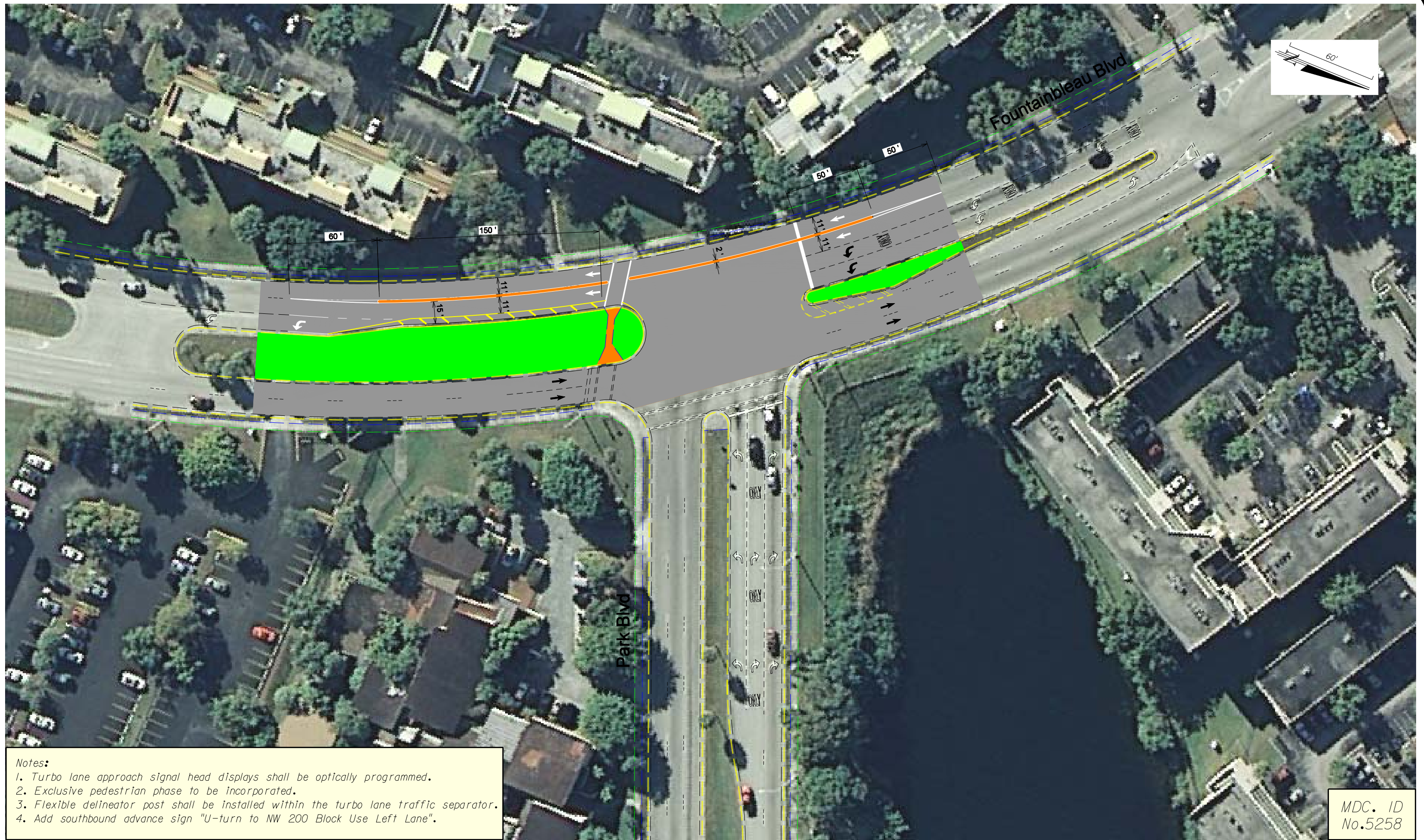
EXISTING CONDITIONS



LOCATION MAP

Location ID:	16
MD Signal ID:	5258
Location:	Fontainebleau Blvd @ Park Blvd
Posted Speed:	35 MPH
Turbo Lane Direction:	Southeastbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	21%
Advance Signs:	Yes
Driveway Control:	No
Other Issues:	No
Estimated Cost	\$190,000 - \$205,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS



Notes:

1. Turbo lane approach signal head displays shall be optically programmed.
2. Exclusive pedestrian phase to be incorporated.
3. Flexible delineator post shall be installed within the turbo lane traffic separator.
4. Add southbound advance sign "U-turn to NW 200 Block Use Left Lane".

MDC. ID
No.5258



DAVID PLUMMER & ASSOCIATES, INC.

TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS
1750 PONCE DE LEON BLVD., CORAL GABLES, FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plans

TITLE:

Location No. 16
Fontainebleau Blvd and Park Blvd

DATE PROJECT NO.

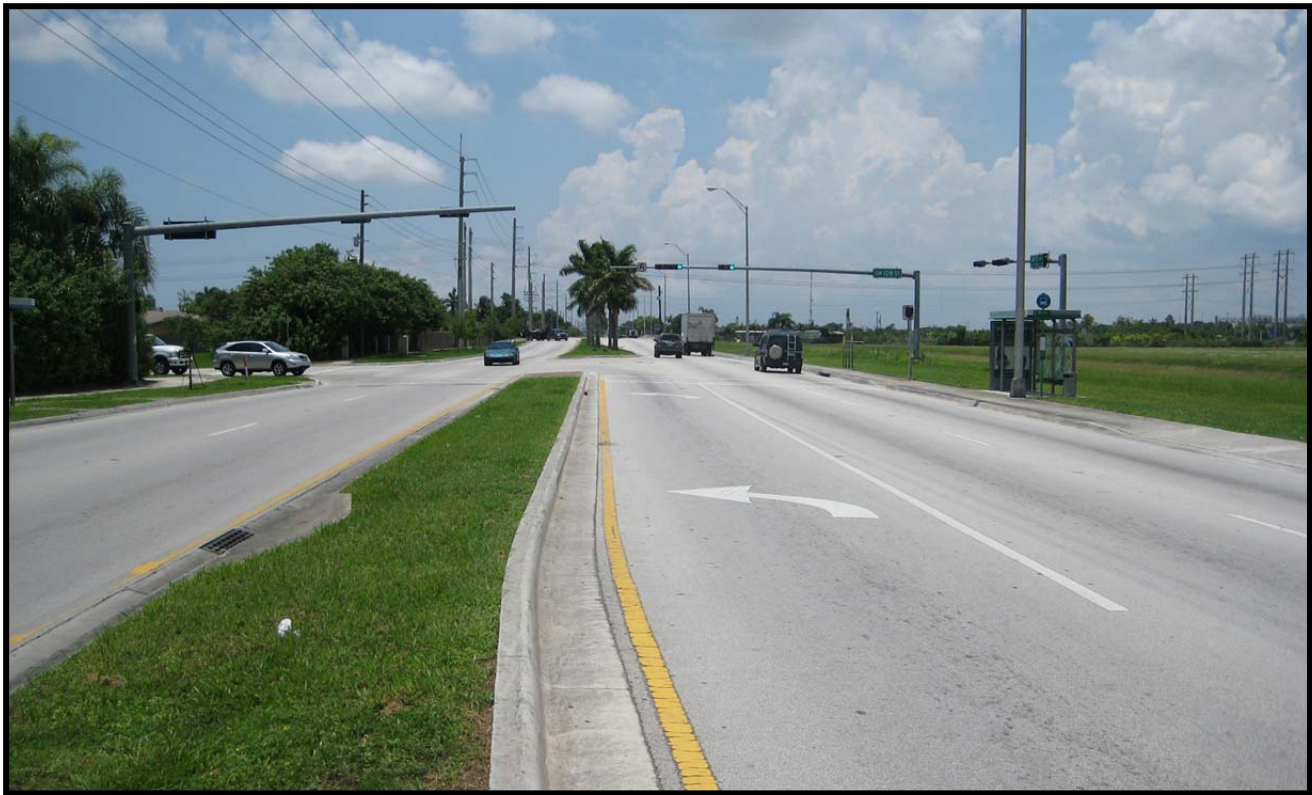
DRAWN SHEET NO.

CHECKED

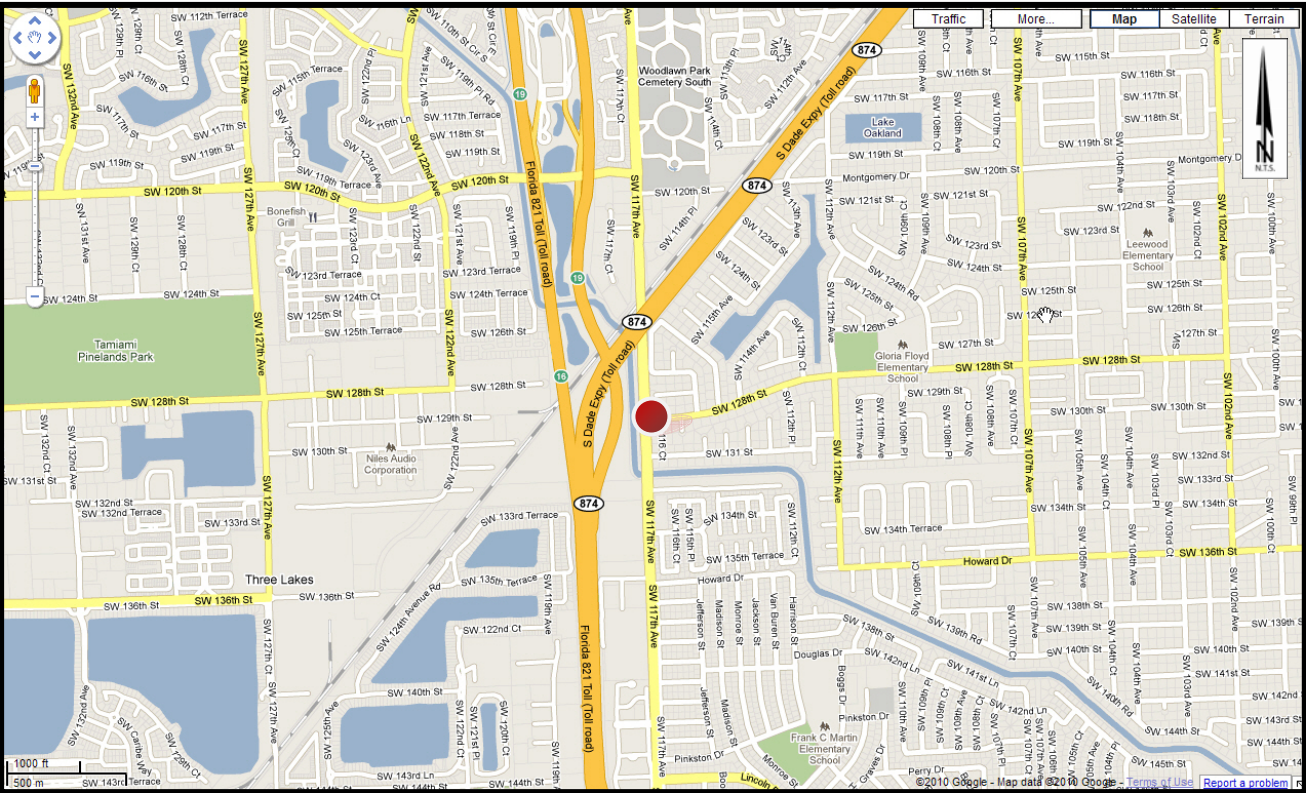
APPROVED

Location No. 18
SW 117 Ave @ SW 128 St

The main street at this location, SW 117 Ave, is a four lane road with a raised median that runs in the north-south direction. SW 128 St is a minor street intersecting the main street from the east. The area is dominated by residential development. A canal is located along the west side of the main street. No driveways are present on that side. There is, however, a left turn lane to a neighborhood street downstream from the proposed turbo lane. Therefore, southbound traffic should be advised in advance of the intersection that the subject street is best accessed by moving to the left lane in advance of the turbo lane. A rendering of the recommended improvements at this intersection is included in section 6 of the report.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	18
MD Signal ID:	5034
Location:	SW 117 Ave @ SW 128 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Southbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	15%
Advance Signs:	Yes
Driveway Control:	No
Other Issues:	Relocating Bus Stop
Estimated Cost	\$135,000 - \$150,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS



- Notes:
- 1. Turbo lane approach signal head displays shall be optically programmed.
 - 2. Exclusive pedestrian phase to be incorporated.
 - 3. Flexible delineator post shall be installed within the turbo lane traffic separator.
 - 4. Add southbound advance sign "Left Turn to SW 131 Street Use Left Lane".
 - 5. MDT should consider relocating bus stops.

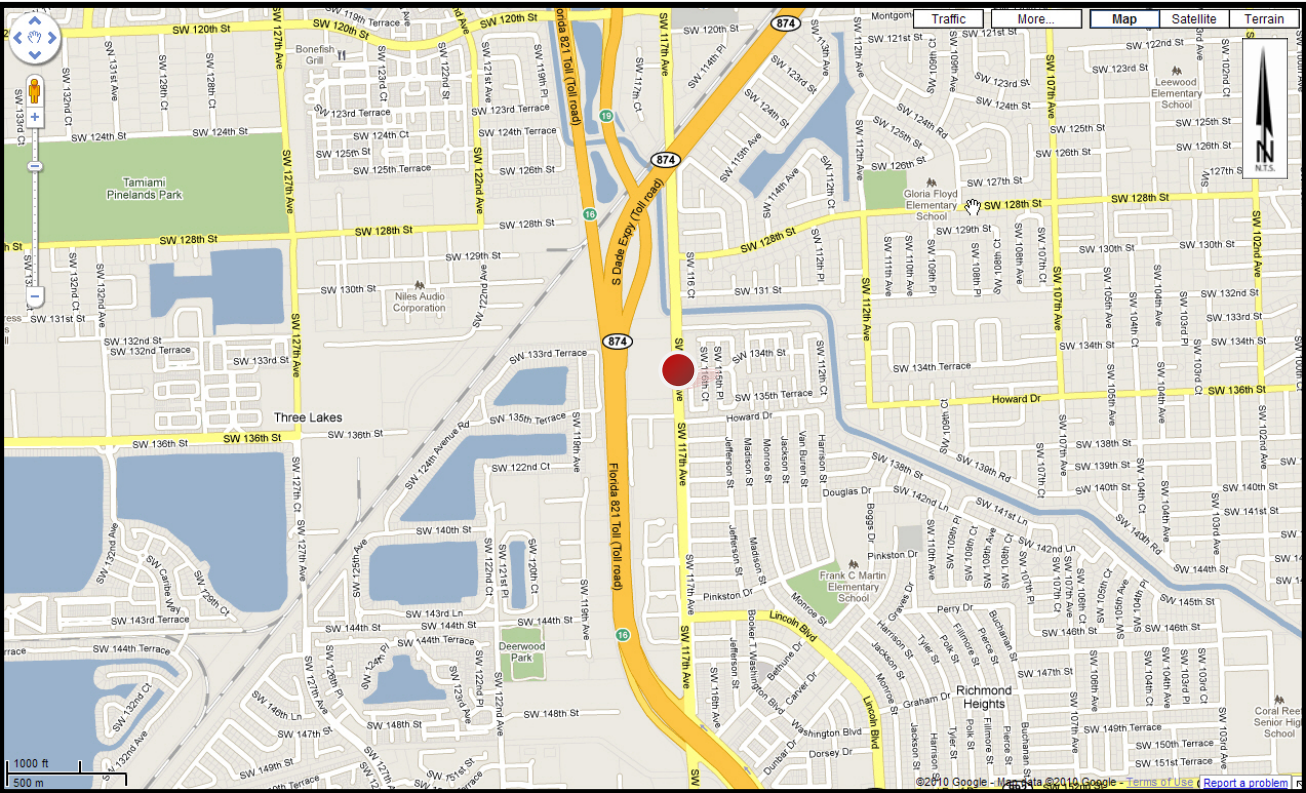
MDC. ID
No.5034

Location No. 19
SW 117 Ave @ SW 134 St

The main street at this location, SW 117 Ave, is a four lane road with a raised median that runs in the north-south direction. SW 134 St is a minor street intersecting the main street from the east. Also known as Edgewater Park Blvd, SW 134 St is the entrance to a gated residential development. The area is dominated by residential development but there is a private school on the northeast corner of the intersection. Vacant land abuts the west side of the main street, therefore, there are no driveways on that side. There is, however, a left turn lane to a neighborhood street downstream from the proposed turbo lane. Therefore, southbound traffic should be advised in advance of the intersection that the subject street is best accessed by moving to the left lane in advance of the turbo lane.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	19
MD Signal ID:	5697
Location:	SW 117 Ave @ SW 134 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Southbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	13%
Advance Signs:	Yes
Driveway Control:	No
Other Issues:	Relocating Bus Stop
Estimated Cost	\$135,000 - \$150,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS



- Notes:
- 1. Turbo lane approach signal head displays shall be optically programmed.
 - 2. Exclusive pedestrian phase to be incorporated.
 - 3. Flexible delineator post shall be installed within the turbo lane traffic separator.
 - 4. Add southbound advance sign "Left Turn to SW 136 Street Use Left Lane".
 - 5. MDT should consider relocating bus stop.

MDC. ID
No.5697



DAVID PLUMMER & ASSOCIATES, INC.
TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS
1750 PONCE DE LEON BLVD., CORAL GABLES, FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plans

TITLE:

Location No. 19
SW 117 Ave and SW 134 Street

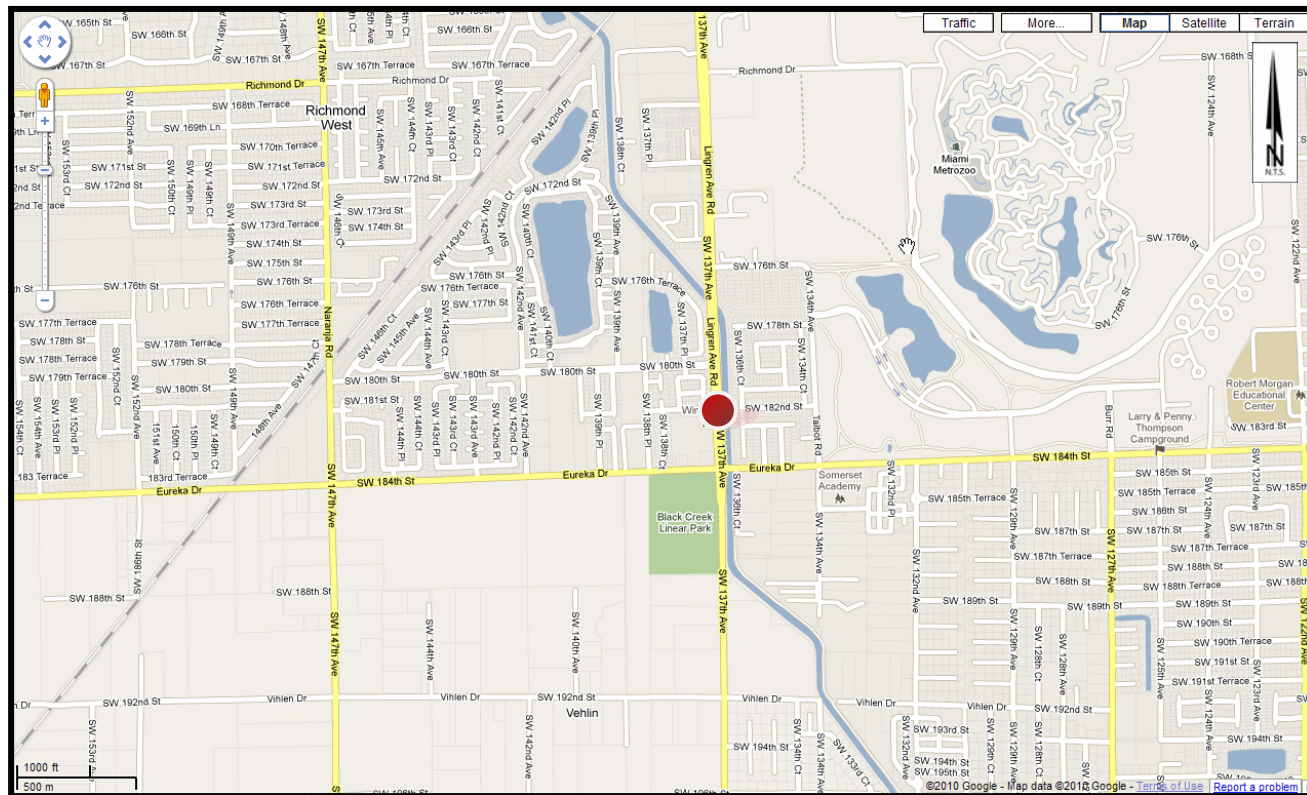
DATE	PROJECT NO.
DRAWN	SHEET NO.
CHECKED	
APPROVED	

Location No. 20
SW 137 Ave @ SW 180 St

The main street at this location, SW 137 Ave, is a six lane road with a raised median that runs in the north-south direction. SW 180 St is a minor street, with a double left turn lane, intersecting the main street from the west. The area is dominated by residential development. A canal is located along the east side of the main street, therefore, there are no driveways on that side except for a service entrance to the canal. The recommended turbo lane configuration will require closing of the southbound left turn lane serving the canal service driveway. Also, the eastbound double left turn lane should be reconfigured as a single left turn lane. This change may necessitate signal timing adjustments to prevent excessive peak hour queuing on the side street.



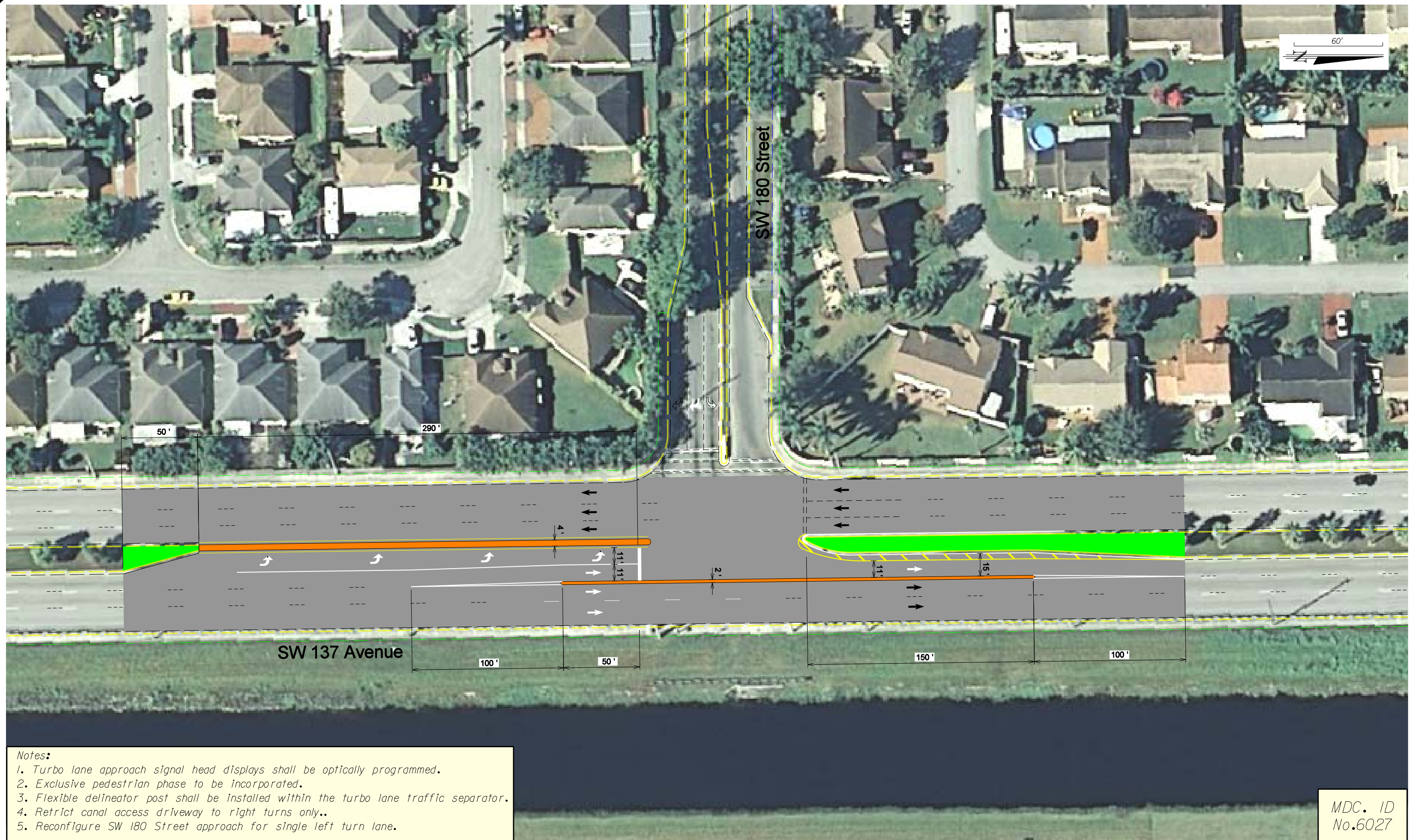
EXISTING CONDITIONS



LOCATION MAP

Location ID:	20
MD Signal ID:	6027
Location:	SW 137 Ave @ SW 180 St
Posted Speed:	45 MPH
Turbo Lane Direction:	Northbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	2
Actuated Pedestrian Phase:	No
Approach Capacity Improvement:	29%
Advance Signs:	No
Driveway Control:	Yes
Other Issues:	Signal timing adjustments
Estimated Cost	\$150,000 - \$190,000
Implementation Priority:	High
Schedule:	Short Range

GENERAL SPECIFICATIONS



DAVID PLUMMER & ASSOCIATES, INC.
TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS
1750 PONCE DE LEON BLVD. CORAL GABLES FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plans

TITLE:

Location No. 20
SW 137 Avenue and SW 180 Street

DATE

DRAWN

CHECKED

APPROVED

PROJECT NO.

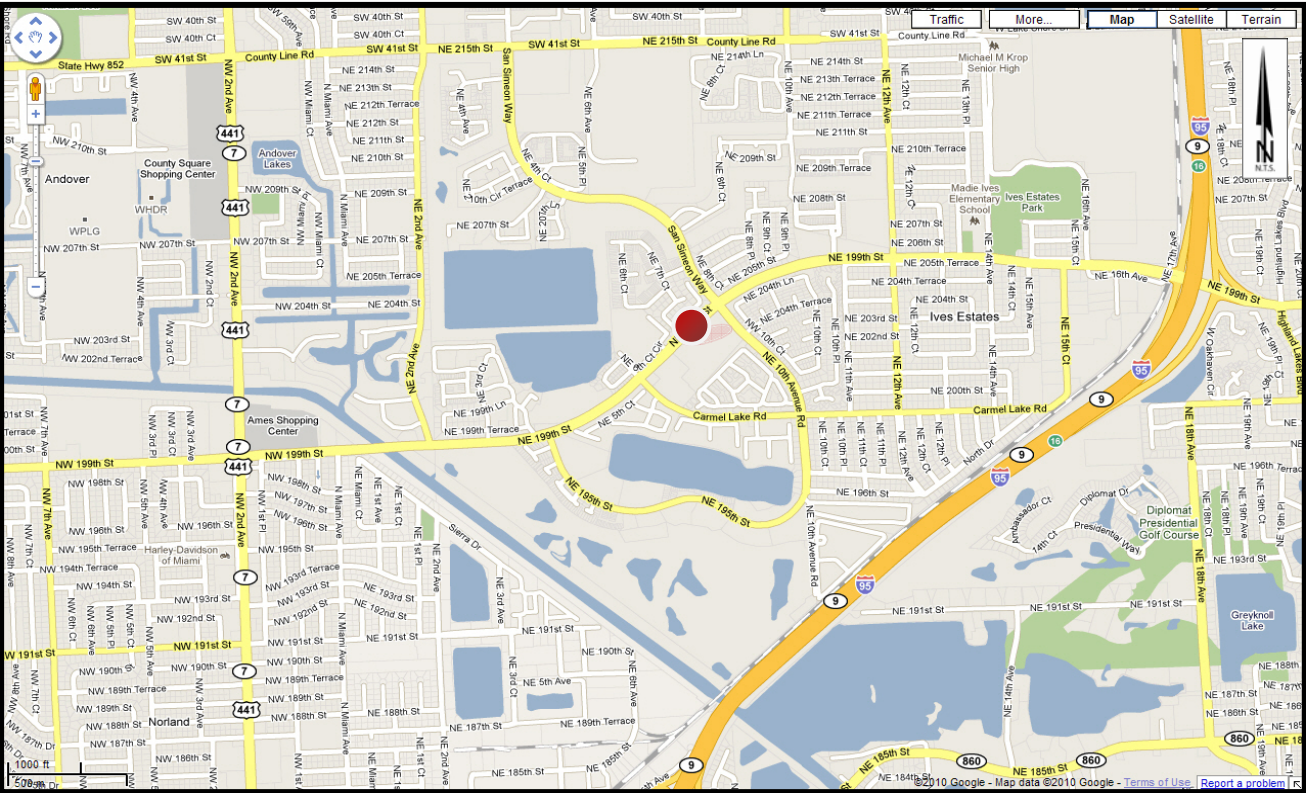
SHEET NO.

Location No. 21
Ives Dairy Rd @ NE 800 Blk

The main street at this location, Ives Dairy Rd, is a four lane road with a raised median and runs approximately in the east-west direction. The NE 800 Block Driveway is the entrance to a shopping center intersecting the main street from the south. Otherwise the area is dominated by residential uses. There are no driveways on the north side of the street.



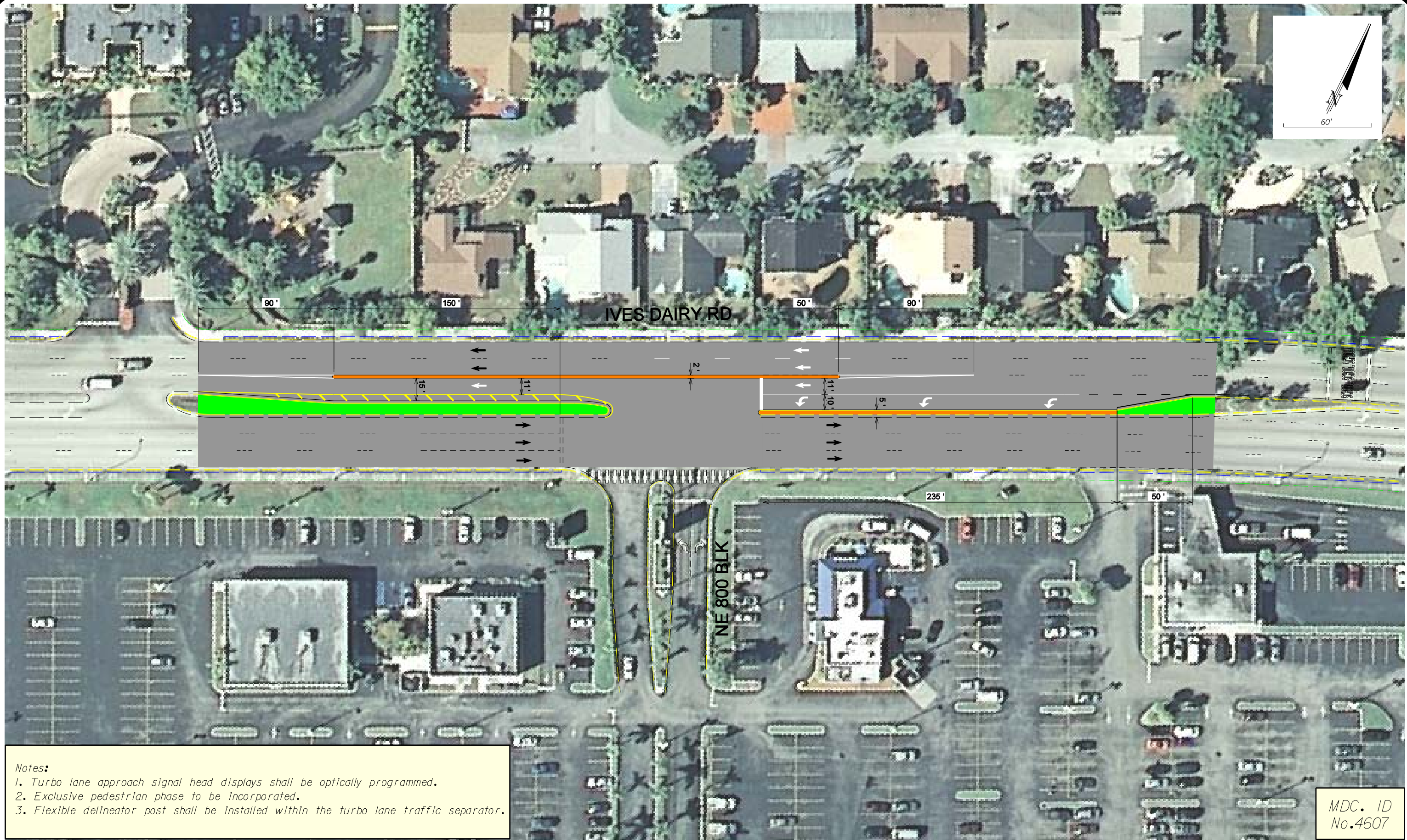
EXISTING CONDITIONS



LOCATION MAP

Location ID:	21
MD Signal ID:	4607
Location:	Ives Dairy Rd @ NE 800 Blk
Posted Speed:	40 MPH
Turbo Lane Direction:	Southwestbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	2
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	14%
Advance Signs:	No
Driveway Control:	No
Other Issues:	No
Estimated Cost	\$190,000 - \$205,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS

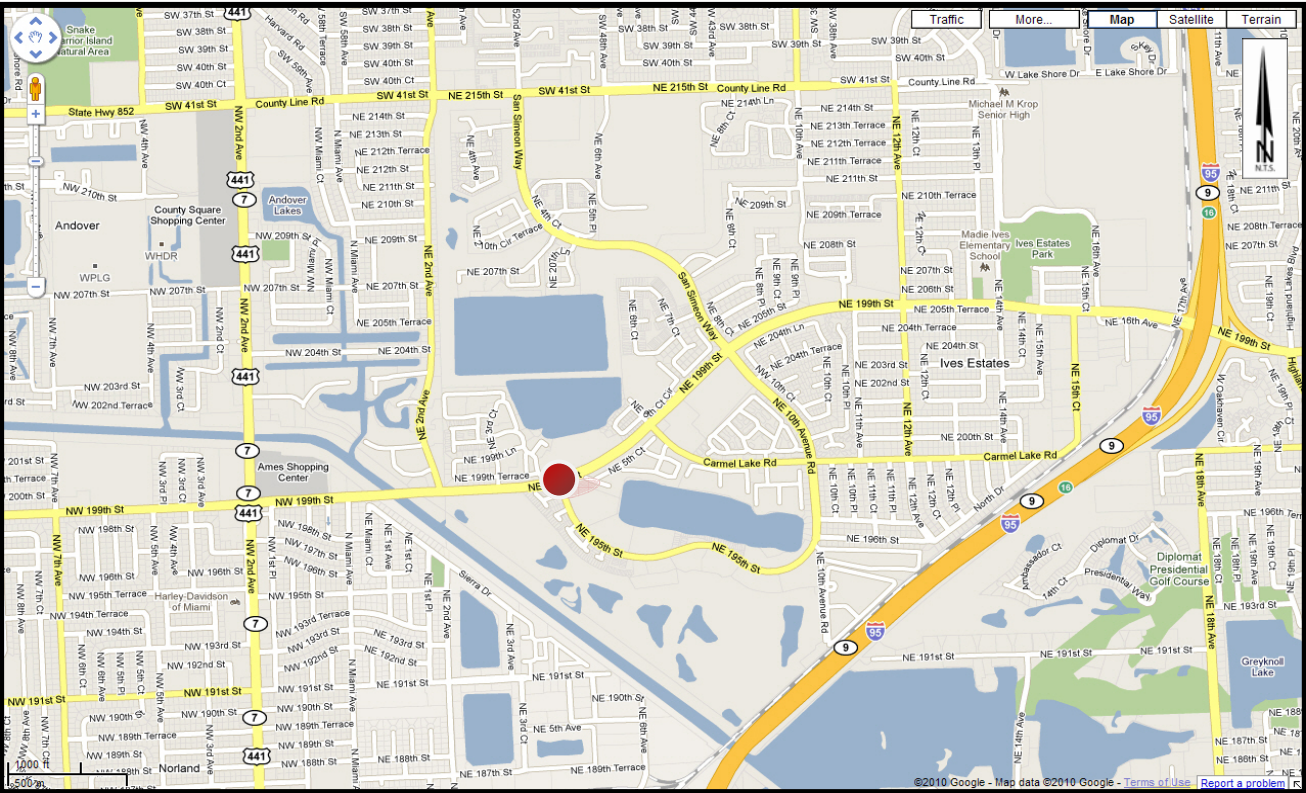


Location No. 22
Ives Dairy Rd @ NE 195 St

The main street at this location, Ives Dairy Rd, is a four lane road with a raised median and runs approximately in the east-west direction. NE 195 St is a minor street intersecting the main street from the south. NE 195 St is also known as California Club Dr. This intersection is somewhat unconventional because it has a signalized north leg that is a secondary exit driveway from a gated multifamily complex (Summertree). The area is dominated by residential uses. There are few driveways on the north side of the street, therefore, significant friction and/or weaving are not anticipated. The existing signalization of the gated exit driveway which presently allows for southbound left turns, however, is in conflict with the required divider for the turbo lane. Therefore, this proposal is based on restricting the southbound exit to right turns only and removing the corresponding signal display. The existing outbound left turns can turn right and then make a u-turn further west or use Summertree’s main driveway to the east. That driveway has an unsignalized full median opening.



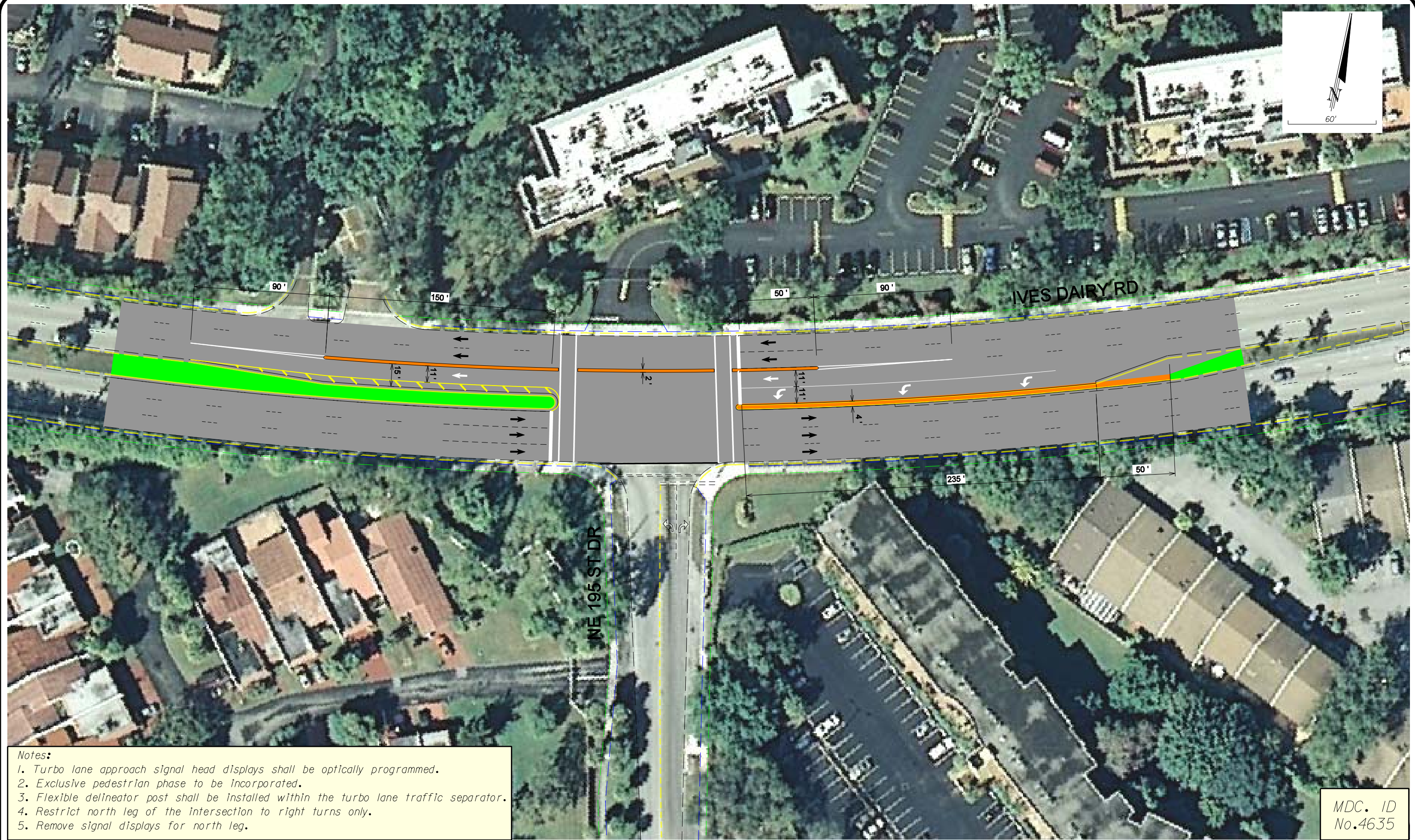
EXISTING CONDITIONS



LOCATION MAP

Location ID:	22
MD Signal ID:	4635
Location:	Ives Dairy Rd @ NE 195 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Southwestbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	2
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	28%
Advance Signs:	No
Driveway Control:	Yes
Other Issues:	Remove signal displays for north leg
Estimated Cost	\$190,000 - \$205,000
Implementation Priority:	High
Schedule:	Short Range

GENERAL SPECIFICATIONS



- Notes:
- 1. Turbo lane approach signal head displays shall be optically programmed.
 - 2. Exclusive pedestrian phase to be incorporated.
 - 3. Flexible delineator post shall be installed within the turbo lane traffic separator.
 - 4. Restrict north leg of the intersection to right turns only.
 - 5. Remove signal displays for north leg.

MDC. ID
No.4635



DAVID PLUMMER & ASSOCIATES, INC.
TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS
1750 PONCE DE LEON BLVD. CORAL GABLES FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plans

TITLE:

Location No. 22
Ives Dairy Road and NE 195 Street Drive

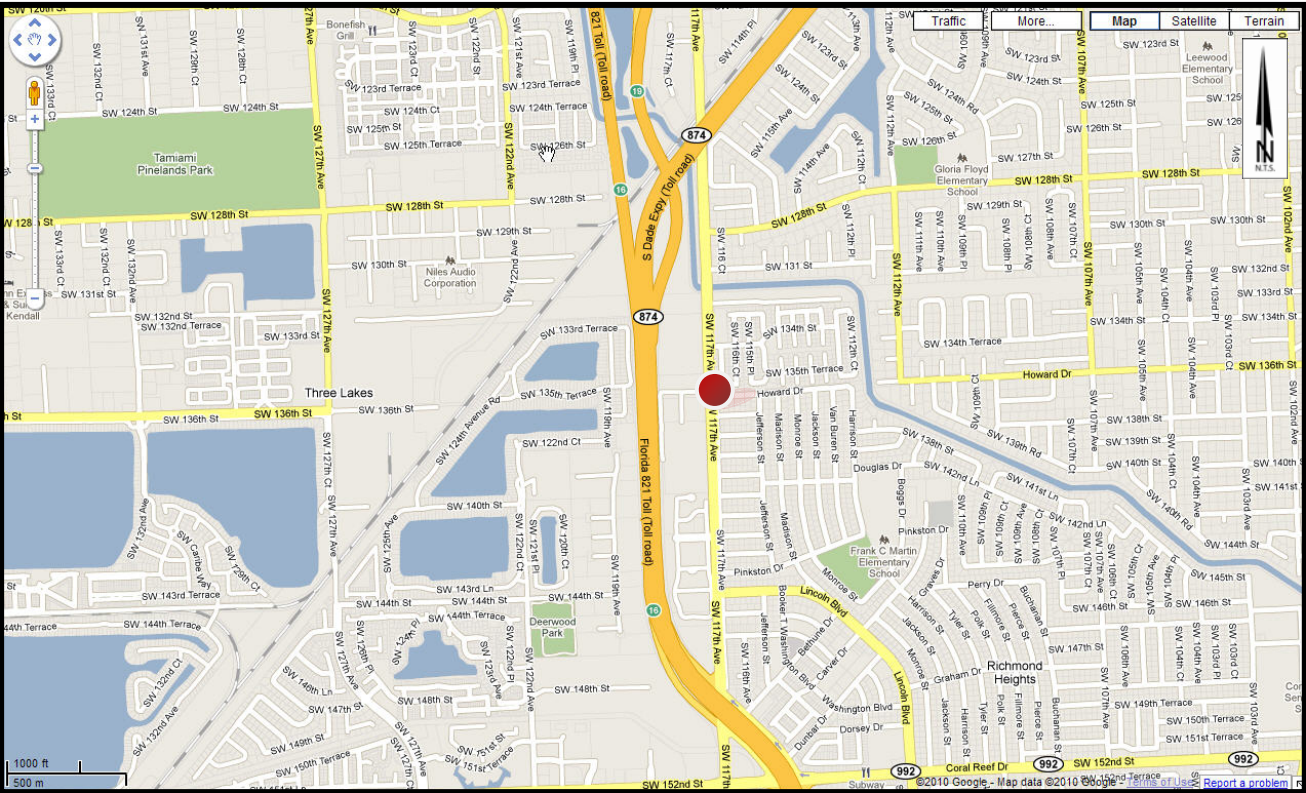
DATE	PROJECT NO.
DRAWN	SHEET NO.
CHECKED	
APPROVED	

Location No. 24
SW 117 Ave @ SW 136 St

The main street at this location, SW 117 Ave, is a four lane road with a raised median that runs in the north-south direction. SW 136 St is a minor street intersecting the main street from the east. The area is dominated by residential development. A cemetery abuts the west side of the main street. There are few driveways on the north side of the street, therefore, significant friction and/or weaving are not anticipated.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	24
MD Signal ID:	6737
Location:	SW 117 Ave @ SW 136 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Southbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	20%
Advance Signs:	No
Driveway Control:	No
Other Issues:	No
Estimated Cost	\$150,000 - \$190,000
Implementation Priority:	High
Schedule:	Short Range

GENERAL SPECIFICATIONS



Notes:

- 1. Turbo lane approach signal head displays shall be optically programmed.
- 2. Exclusive pedestrian phase to be incorporated.
- 3. Flexible delineator post shall be installed within the turbo lane traffic separator.

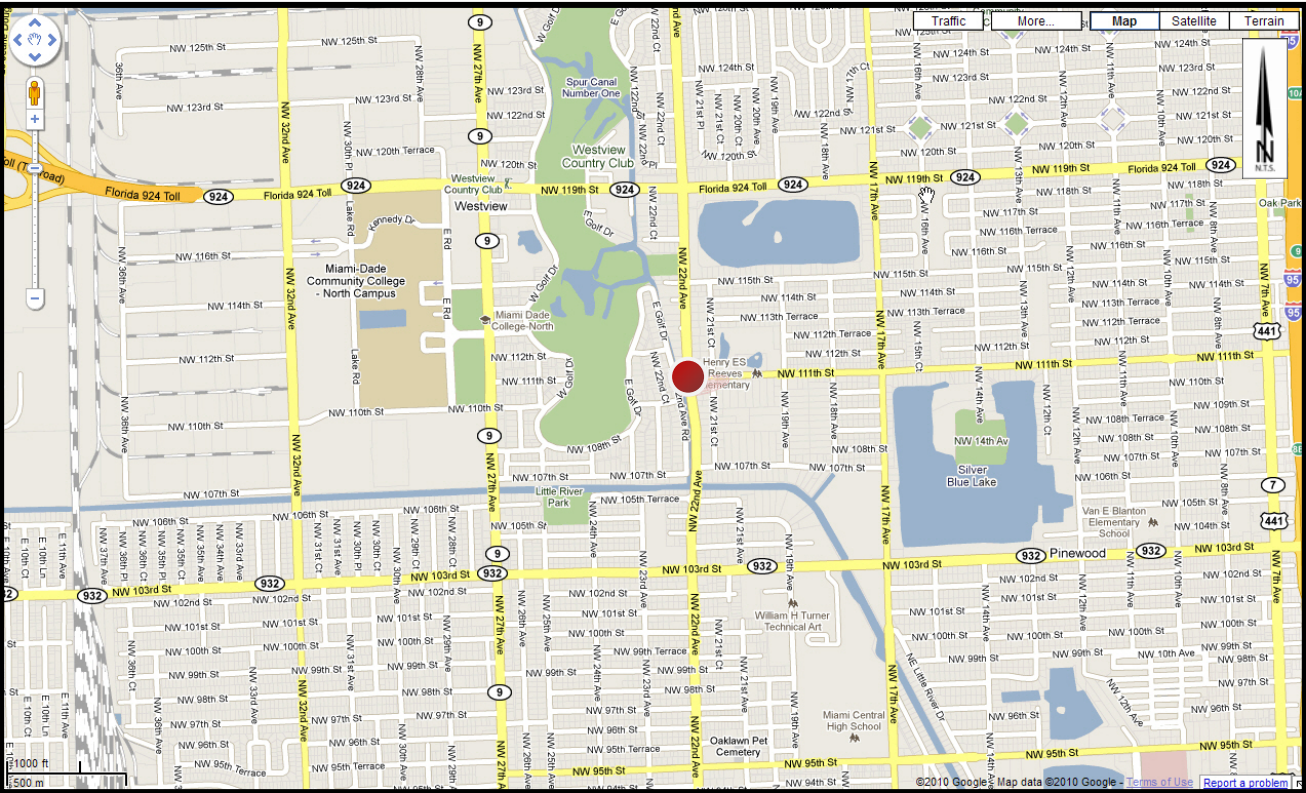
MDC. ID
No. 6737

Location No. 25
NW 22 Ave @ NW 111 St

The main street at this location, NW 22 Ave, is a four lane road with a raised median that runs in the north-south direction. NW 111 St is a minor street intersecting the main street from the east. The area is dominated by residential development. A canal abuts the west side of the main street. Little friction and weaving is expected from the nearby driveways. The outside southbound lane is extra wide and allows for on-street parking north of the intersection. Parking activity, however, was not observed. Therefore, the extra wide lane is available to reconfigure the southbound approach and introduce the required geometry for the proposed turbo lane.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	25
MD Signal ID:	5730
Location:	NW 22 Ave @ NW 111 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Southbound
MD Turbo Lane Type:	A
Number of Turbo Lanes:	2
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	30%
Advance Signs:	No
Driveway Control:	No
Other Issues:	Shift SB lanes 2' towards the west
Estimated Cost	\$300,000 - \$325,000
Implementation Priority:	Medium
Schedule:	Medium Range

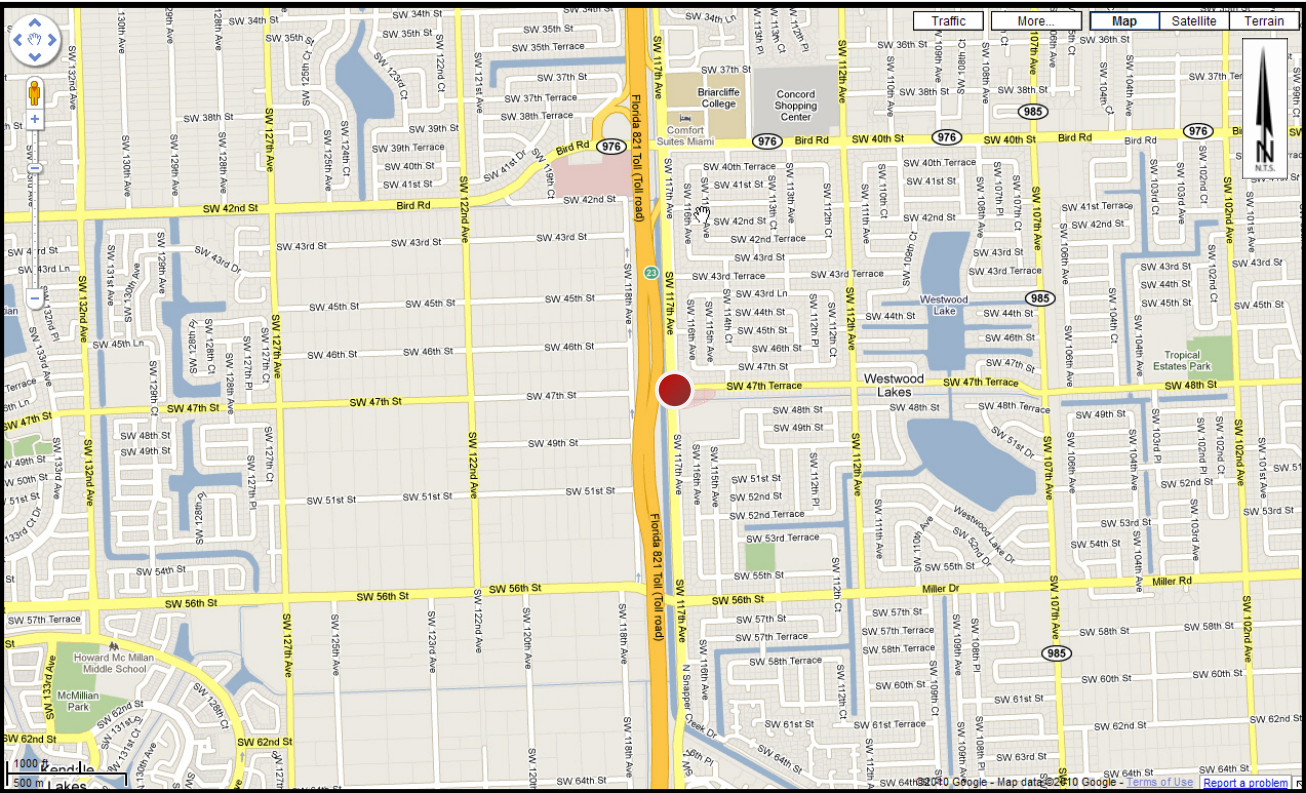
GENERAL SPECIFICATIONS

Location No. 27
SW 117 Ave @ SW 47 Terr

The main street at this location, SW 117 Ave, is a four lane road with a raised median that runs in the north-south direction. SW 47 Terr is a minor street intersecting the main street from the east. The area is dominated by residential development. A canal abuts the west side of the main street. There is, however, a left turn lane to a neighborhood street downstream from the proposed turbo lane. Therefore, southbound traffic should be advised in advance of the intersection that the subject street is best accessed by moving to the left lane in advance of the turbo lane.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	27
MD Signal ID:	5222
Location:	SW 117 Ave @ SW 47 Terr
Posted Speed:	40 MPH
Turbo Lane Direction:	Southbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	21%
Advance Signs:	Yes
Driveway Control:	No
Other Issues:	No
Estimated Cost	\$135,000 - \$150,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS



- Notes:
1. Turbo lane approach signal head displays shall be optically programmed.
 2. Exclusive pedestrian phase to be incorporated.
 3. Flexible delineator post shall be installed within the turbo lane traffic separator.
 4. Add southbound advance sign "Left Turn to SW 4900 Block Use Left Lane".

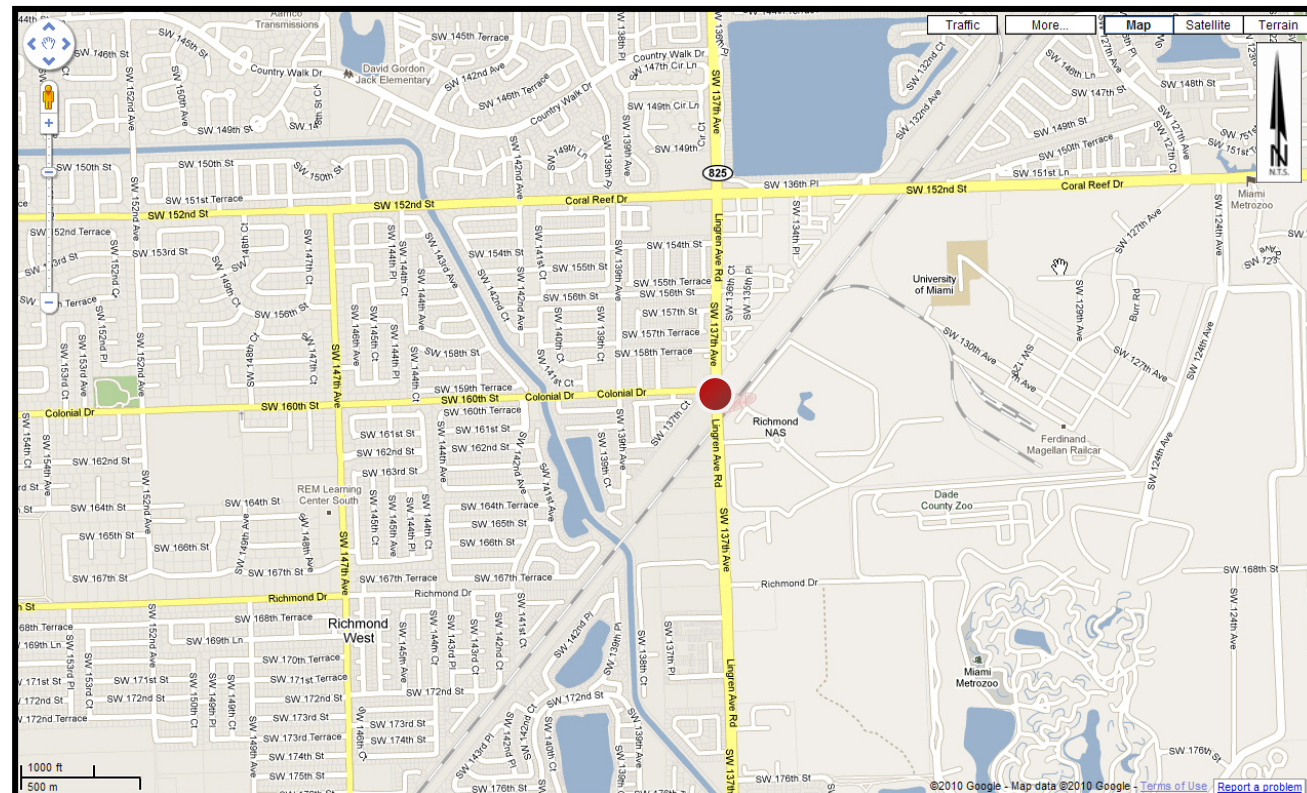
MDC. ID
No.5222

Location No. 28
SW 137 Ave @ SW 160 St

The main street at this location, SW 137 Ave, is a six lane road with a raised median that runs in the north-south direction. SW 160 St is a minor street, with a double left turn lane, intersecting the main street from the west. A canal abuts the east side of the main street, therefore, there are no driveways on that side. The area is primarily residential but a shopping center (northwest corner), FPL right-of-way and a railroad are found near the intersection. These uses do not affect the implementation of the turbo lane except for the presence of a downstream left turn lane at one of the entrances to the shopping center. Therefore, northbound traffic should be advised in advance of the intersection that the subject driveway is best accessed by moving to the left lane in advance of the turbo lane. Also, the eastbound double left turn lane should be reconfigured as a single left turn lane. This change may necessitate signal timing adjustments to prevent excessive peak hour queuing on the side street.



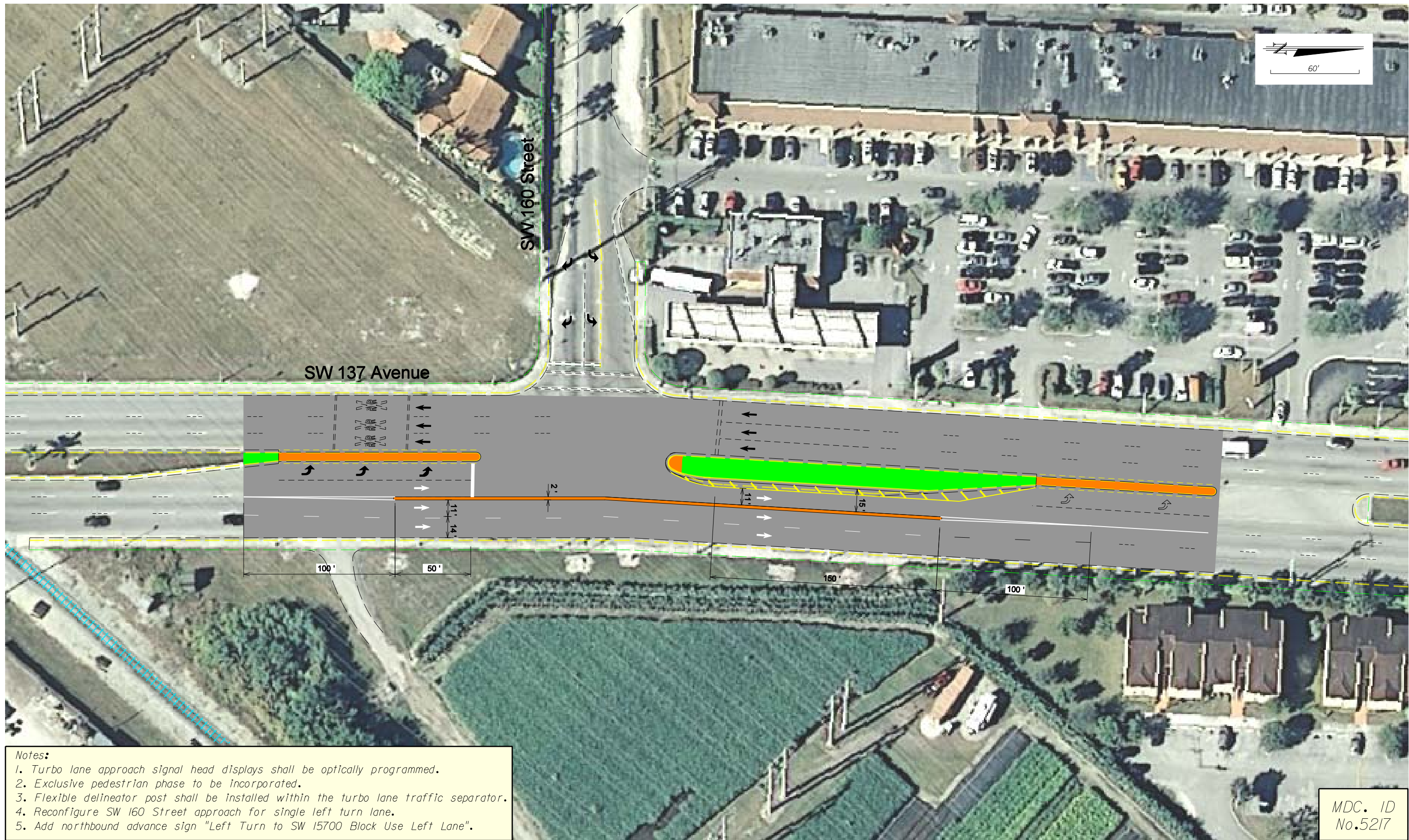
EXISTING CONDITIONS



LOCATION MAP

Location ID:	28
MD Signal ID:	5217
Location:	SW 137 Ave @ SW 160 St
Posted Speed:	45 MPH
Turbo Lane Direction:	Northbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	2
Actuated Pedestrian Phase:	No
Approach Capacity Improvement:	29%
Advance Signs:	Yes
Driveway Control:	No
Other Issues:	Reconfigure EB approach for single left turn lane
Estimated Cost	\$135,000 - \$150,000
Implementation Priority:	High
Schedule:	Short Range

GENERAL SPECIFICATIONS



- Notes:
1. Turbo lane approach signal head displays shall be optically programmed.
 2. Exclusive pedestrian phase to be incorporated.
 3. Flexible delineator post shall be installed within the turbo lane traffic separator.
 4. Reconfigure SW 160 Street approach for single left turn lane.
 5. Add northbound advance sign "Left Turn to SW 15700 Block Use Left Lane".

MDC. ID
No.5217



DAVID PLUMMER & ASSOCIATES, INC.
TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS
1750 PONCE DE LEON BLVD., CORAL GABLES, FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plans

TITLE:

Location No. 28
SW 137 Ave and SW 160 Street

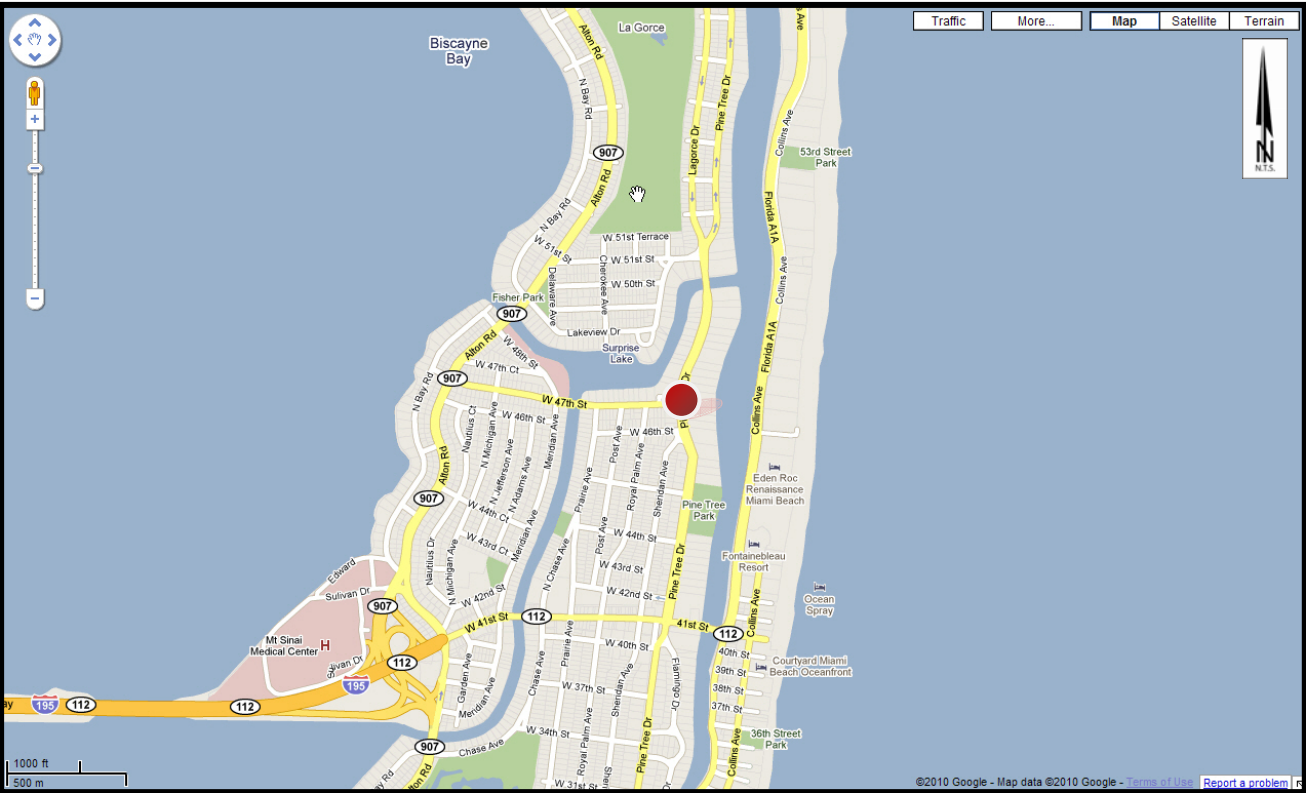
DATE	PROJECT NO.
DRAWN	SHEET NO.
CHECKED	
APPROVED	

Location No. 29
Pine Tree Dr @ 47 St

The main street at this location, Pine Tree Dr, is a four lane road with a raised median that runs in the north-south direction. 47 St is a minor street intersecting the main street from the west. The area has both commercial and residential development. Little friction and weaving is expected from the nearby driveways. The outside northbound lane is extra wide and allows for on-street parking. Parking activity, however, was light. Therefore, the extra wide lane is available to reconfigure the northbound approach and introduce the required geometry for the proposed turbo lane.



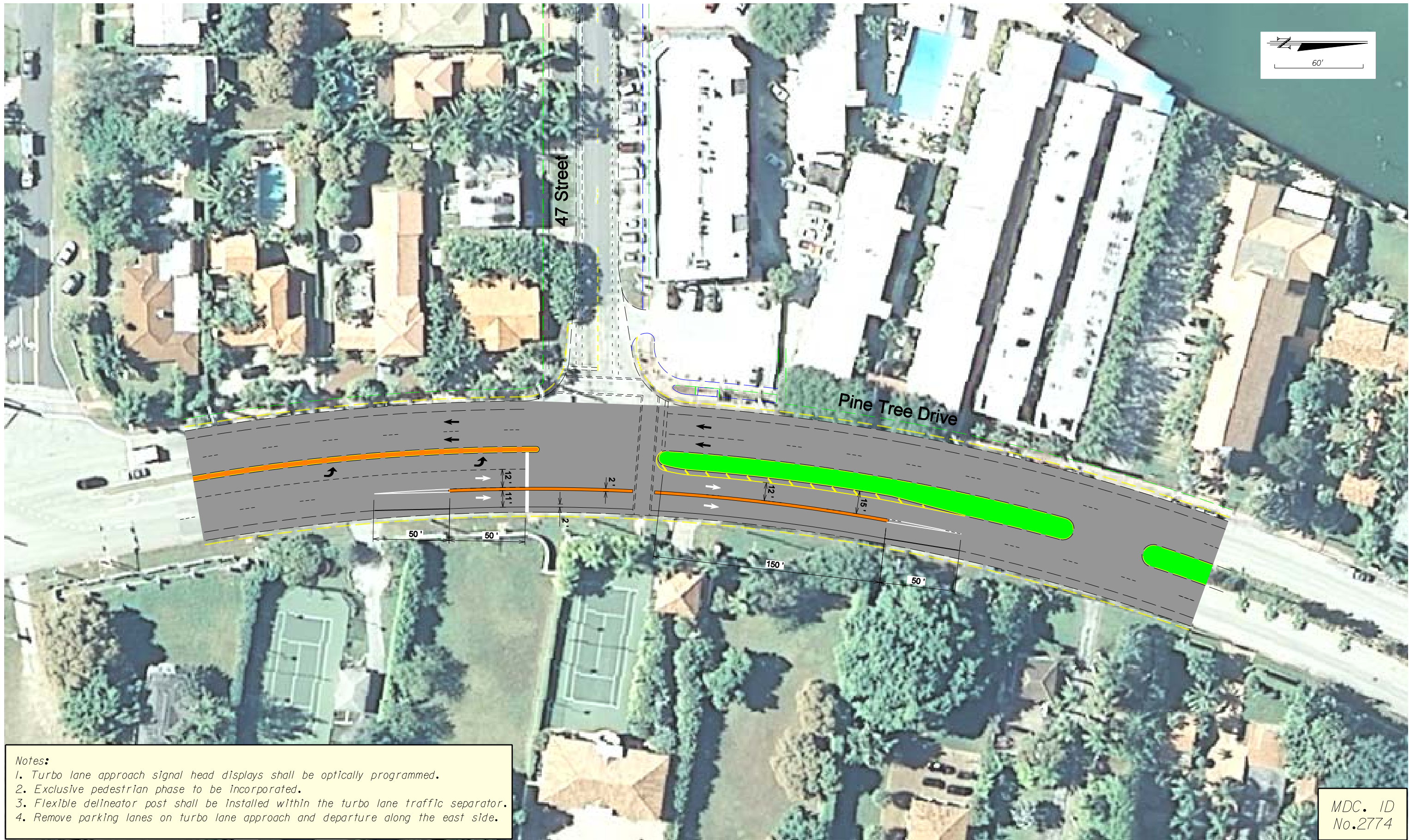
EXISTING CONDITIONS



LOCATION MAP

Location ID:	29
MD Signal ID:	2774
Location:	Pine Tree Dr @ 47 St
Posted Speed:	30 MPH
Turbo Lane Direction:	Northbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	18%
Advance Signs:	No
Driveway Control:	No
Other Issues:	Remove parking lanes
Estimated Cost	\$135,000 - \$150,000
Implementation Priority:	High
Schedule:	Short Range

GENERAL SPECIFICATIONS



- Notes:
- 1. Turbo lane approach signal head displays shall be optically programmed.
 - 2. Exclusive pedestrian phase to be incorporated.
 - 3. Flexible delineator post shall be installed within the turbo lane traffic separator.
 - 4. Remove parking lanes on turbo lane approach and departure along the east side.

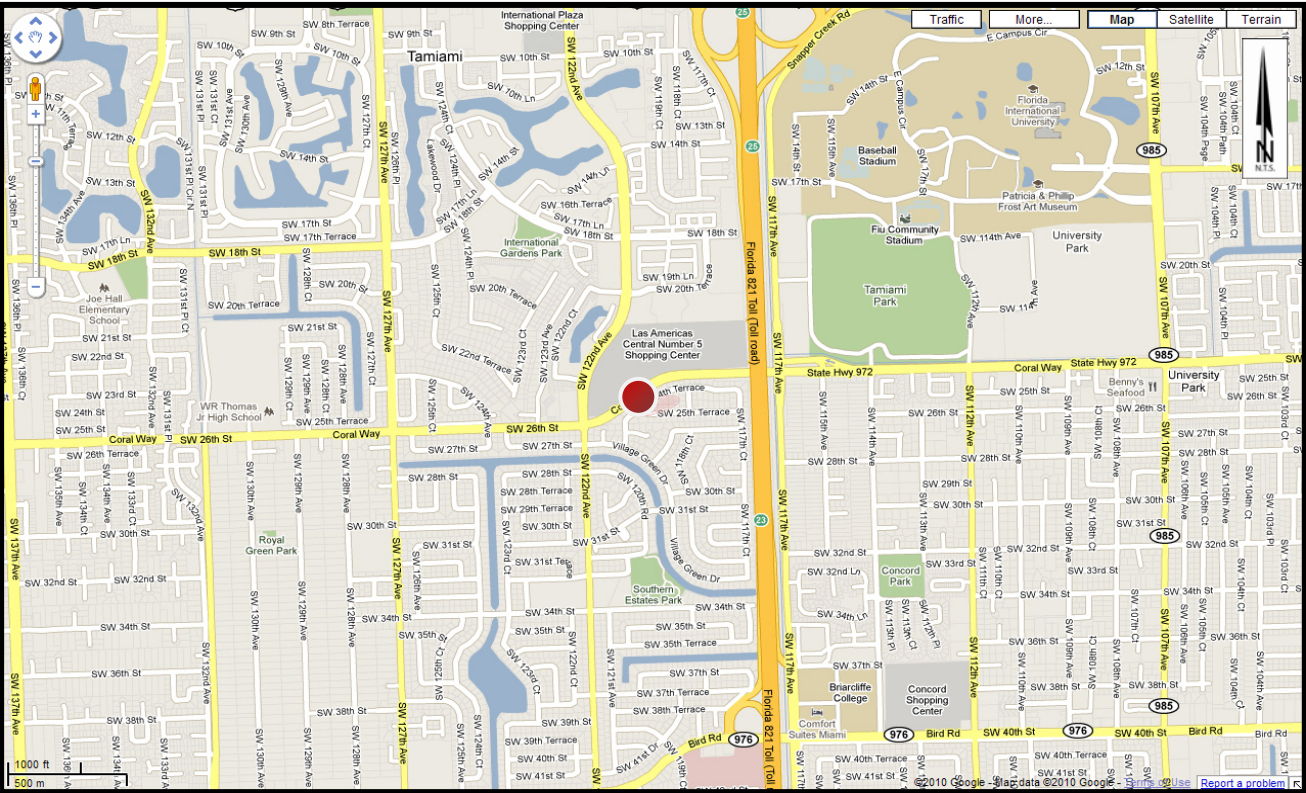
MDC. ID
No.2774

Location No. 30
Coral Way @ SW 11900 Blk

The main street at this location, Coral Way, is a four lane road with a raised median and runs in the east-west direction. SW 119 Block Driveway is the main entrance to a large shopping center and intersects the main street from the north. Otherwise the area is dominated by residential uses. There are no driveways on the south side of the main street, therefore, friction and/or weaving are not the south side of the main street, therefore, friction and/or weaving are not anticipated.



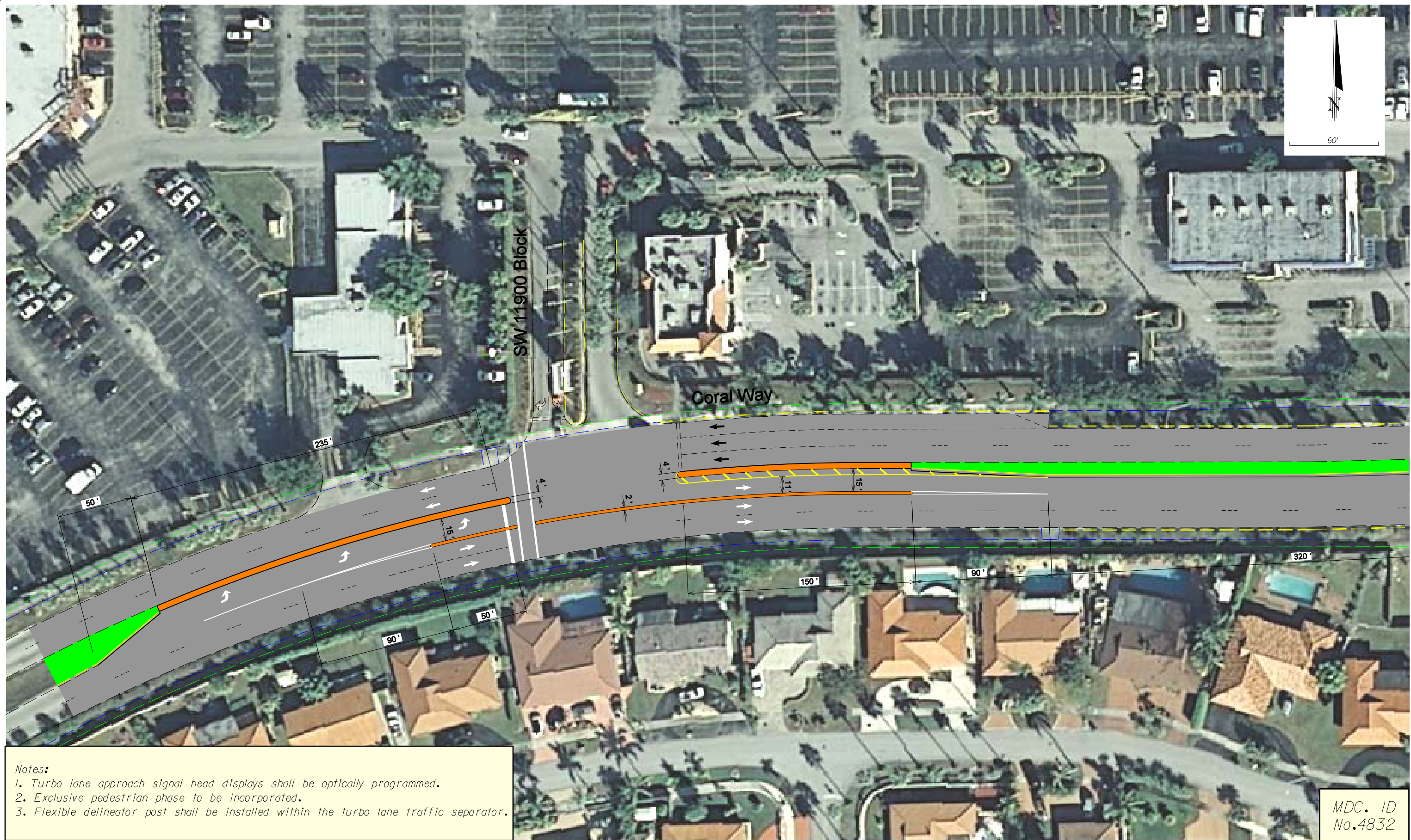
EXISTING CONDITIONS



LOCATION MAP

Location ID:	30
MD Signal ID:	4832
Location:	Coral Way @ SW 11900 Blk
Posted Speed:	40 MPH
Turbo Lane Direction:	Eastbound
MD Turbo Lane Type:	A
Number of Turbo Lanes:	2
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	15%
Advance Signs:	No
Driveway Control:	No
Other Issues:	No
Estimated Cost	\$240,000 - \$300,000
Implementation Priority:	Low
Schedule:	Long Range

GENERAL SPECIFICATIONS



DAVID PLUMMER & ASSOCIATES, INC.

TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS
1750 PONCE DE LEON BLVD., CORAL GABLES, FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plans

TITLE:

Location No. 30
Coral Way and SW 11900 Block

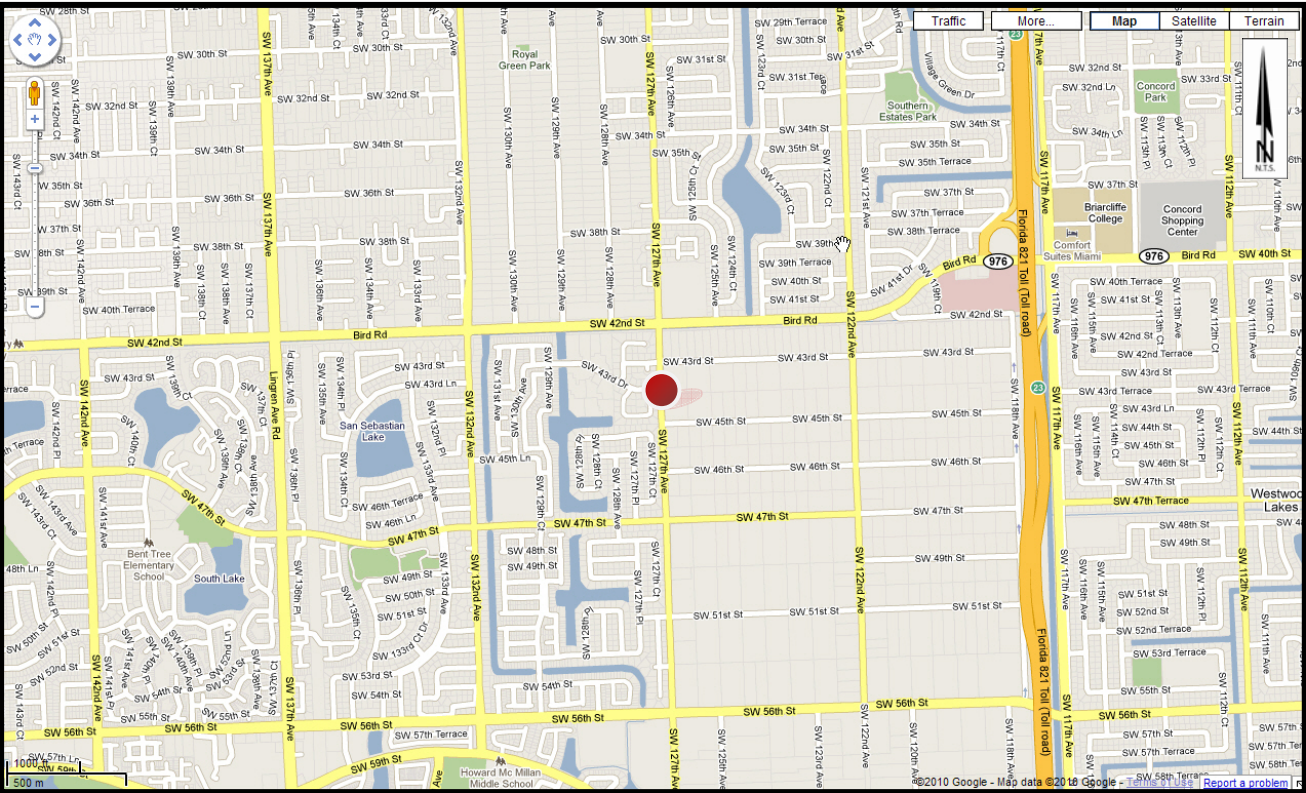
DATE	PROJECT NO.
DRAWN	SHEET NO.
CHECKED	
APPROVED	

Location No. 42
SW 127 Ave @ SW 43 Dr

The main street at this location, SW 127 Ave, is a four lane road with a painted median that runs in the north-south direction. SW 43 Dr is a minor street intersecting the main street from the west. The area is dominated by residential development on the west side and plant nurseries on the east side. There are few driveways on the east side of the street, therefore, significant friction and/or weaving are not anticipated. There is, however, a left turn lane to a neighborhood street downstream from the proposed turbo lane. Therefore, northbound traffic should be advised in advance of the intersection that the subject street is best accessed by moving to the left lane in advance of the turbo lane. Final design should consider plans for bicycle lanes if configuration is known at that time.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	42
MD Signal ID:	5703
Location:	SW 127 Ave @ SW 43 Dr
Posted Speed:	40 MPH
Turbo Lane Direction:	Northbound
MD Turbo Lane Type:	D
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	No
Approach Capacity Improvement:	17%
Advance Signs:	Yes
Driveway Control:	No
Other Issues:	No
Estimated Cost	\$95,000 - \$110,000
Implementation Priority:	Medium
Schedule:	Medium Range

GENERAL SPECIFICATIONS



- Notes:
1. Turbo lane approach signal head displays shall be optically programmed.
 2. Exclusive pedestrian phase to be incorporated.
 3. Flexible delineator post shall be installed within the turbo lane traffic separator.
 4. Restrict northbound upstream driveway to right turns only.
 5. Add northbound advance sign "Left Turns to SW 43 Street use Left Lane".

MDC. ID
No.5703



DAVID PLUMMER & ASSOCIATES, INC.

TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS
1750 PONCE DE LEON BLVD. CORAL GABLES FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plans

TITLE:

Location No. 42
SW 127 Avenue and SW 43 Drive

DATE

PROJECT NO.

DRAWN

SHEET NO.

CHECKED

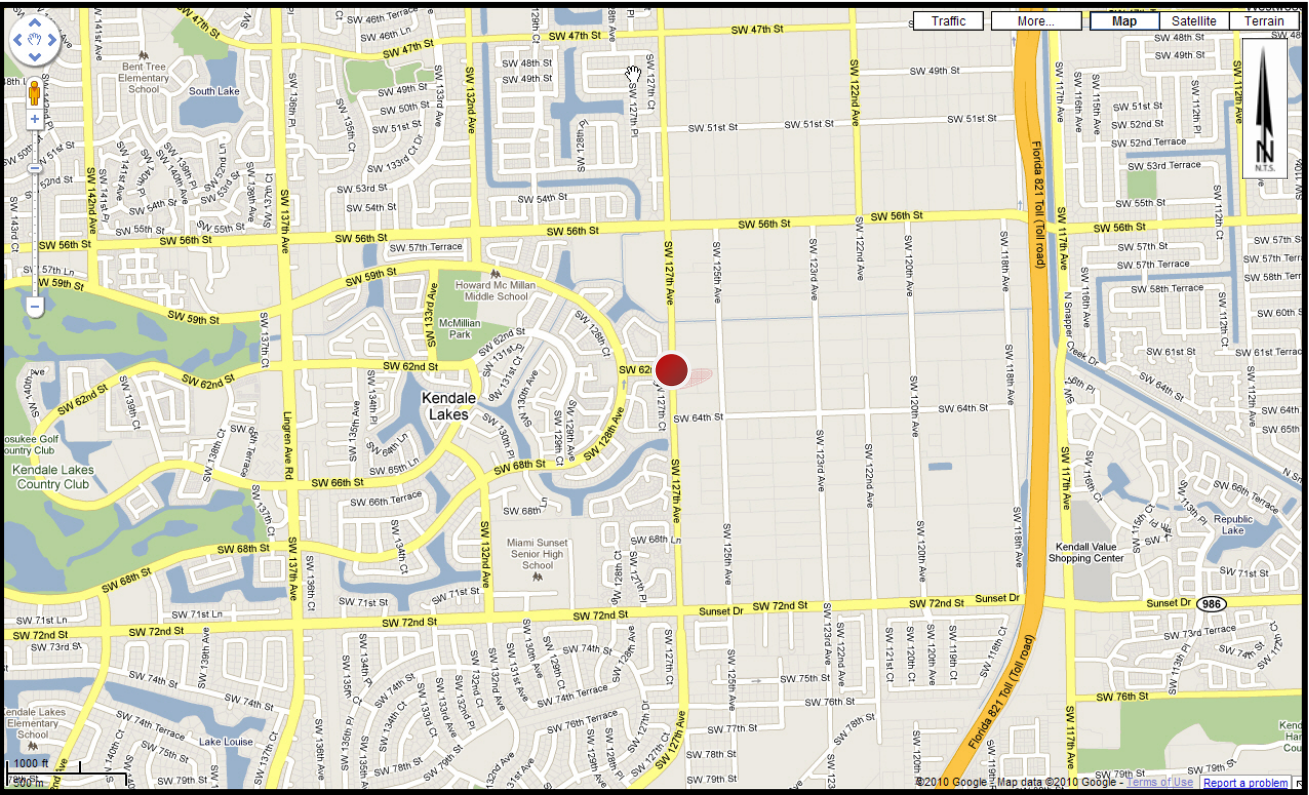
APPROVED

Location No. 43
SW 127 Ave @ SW 62 St

The main street at this location, SW 127 Ave, is a four lane road with a painted median that runs in the north-south direction. SW 62 St is a minor street intersecting the main street from the west. The area is dominated by residential development on the west side and plant nurseries on the east side. There are few driveways on the east side of the street, therefore, significant friction and/or weaving are not anticipated. There is, however, an upstream driveway on the east side that should be restricted to right turns only in order to prevent conflicts with the turbo lane divider. Final design should consider plans for bicycle lanes if configuration is known at that time.



EXISTING CONDITIONS



LOCATION MAP

Location ID:	43
MD Signal ID:	5416
Location:	SW 127 Ave @ SW 62 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Northbound
MD Turbo Lane Type:	D
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	26%
Advance Signs:	No
Driveway Control:	Yes
Other Issues:	No
Estimated Cost	\$95,000 - \$110,000
Implementation Priority:	High
Schedule:	Short Range

GENERAL SPECIFICATIONS



DAVID PLUMMER & ASSOCIATES, INC.
TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS
1750 PONCE DE LEON BLVD. CORAL GABLES FL 33134 TELEPHONE (305) 447-0900 FAX (305) 444-4986

PROJECT:

Turbo Lane Schematic Plans

TITLE:

Location No. 43
SW 127 Avenue and SW 62 Street

DATE PROJECT NO.

DRAWN SHEET NO.

CHECKED

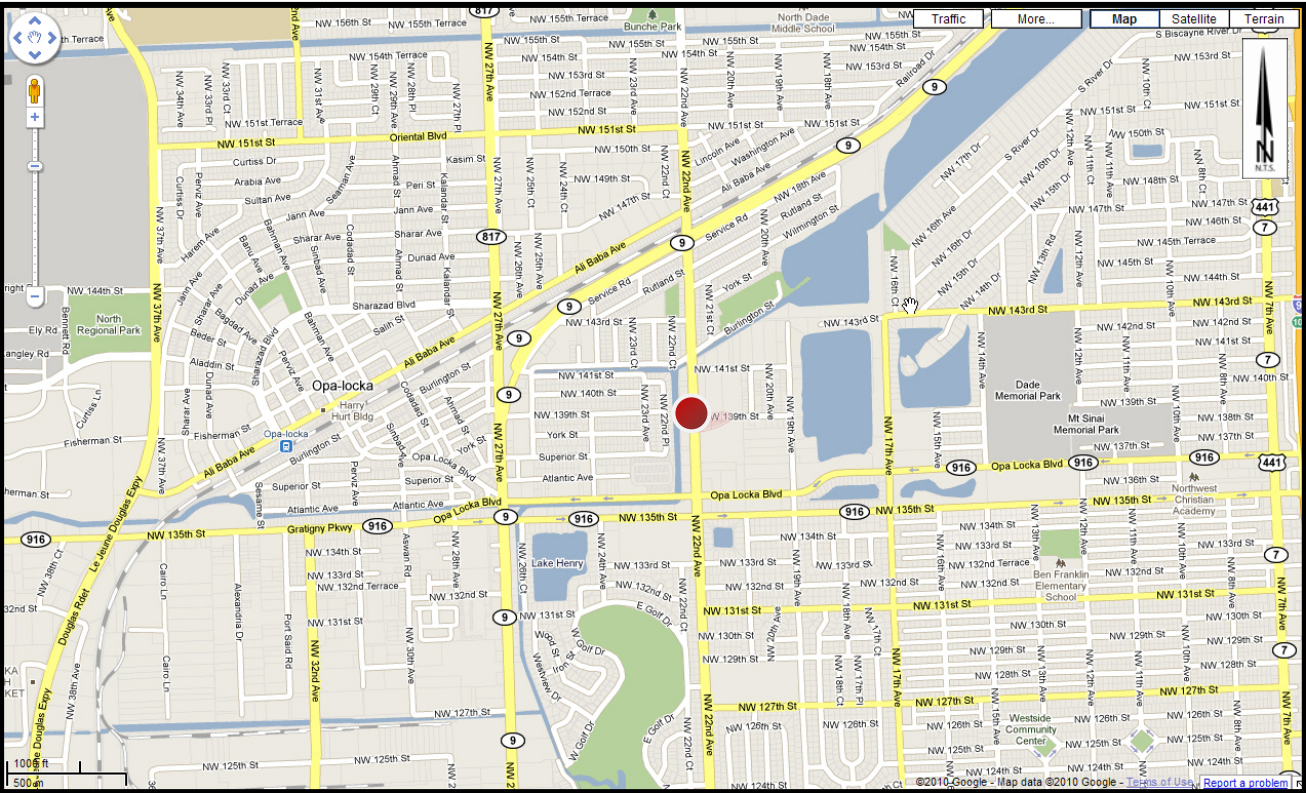
APPROVED

Location No. 47
NW 87 Ave @ NW 146 St

The main street at this location, NW 87 Ave, is a four lane road with a raised median that runs in the north-south direction. NW 146 St is a minor street intersecting the main street from the west. The area is dominated by residential development. There are few driveways on the east side of the street, therefore, significant friction and/or weaving are not anticipated. There is, however, a left turn lane to a neighborhood street downstream from the proposed turbo lane. Therefore, northbound traffic should be advised in advance of the intersection that the subject street is best accessed by moving to the left lane in advance of the turbo lane.



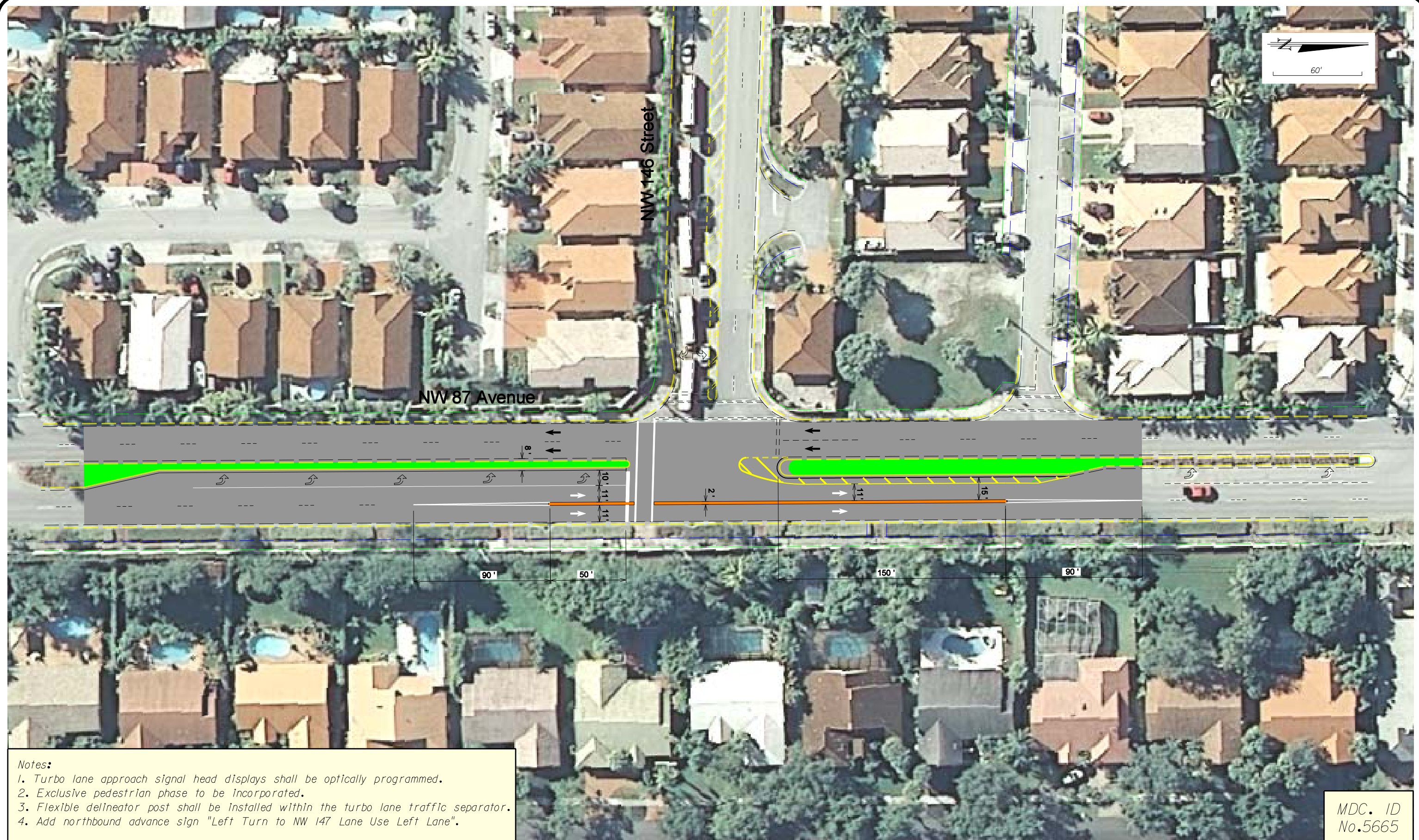
EXISTING CONDITIONS



LOCATION MAP

Location ID:	47
MD Signal ID:	5665
Location:	NW 87 Ave @ NW 146 St
Posted Speed:	40 MPH
Turbo Lane Direction:	Northbound
MD Turbo Lane Type:	C
Number of Turbo Lanes:	1
Actuated Pedestrian Phase:	Yes
Approach Capacity Improvement:	14%
Advance Signs:	Yes
Driveway Control:	No
Other Issues:	No
Estimated Cost	\$150,000 - \$190,000
Implementation Priority:	Low
Schedule:	Long Range

GENERAL SPECIFICATIONS



David Plummer & Associates

1750 Ponce de Leon Blvd

Coral Gables, FL 33134

Phone: (305) 447-0900

Fax: (305) 444-4986

Email: dpa@dplummer.com

www.dplummer.com

