RESOLUTION No. 22-59

A RESOLUTION OF THE MAYOR AND THE CITY COUNCIL OF THE CITY OF DORAL, FLORIDA, AUTHORIZING THE CITY MANAGER TO AWARD INVITATION TO BID #2022-03 "INTERSECTION IMPROVEMENTS ALONG NW 58 STREET AT NW 112 AND NW 114 AVENUE" TO HR PAVING, IN AN AMOUNT NOT TO EXCEED OF $296,231.70 WHICH INCLUDES A 10% CONTINGENCY FOR ANY UNFORESEEN CONDITIONS; PROVIDING FOR IMPLEMENTATION; AND PROVIDING FOR AN EFFECTIVE DATE

WHEREAS, in 2015 Miami-Dade County (MDC) passed Resolution R-729-15 for the completion of a study regarding the conversion of certain two-way roadways to one-way roadways to alleviate traffic congestion; and

WHEREAS, in line with this MDC Resolution the City explored the feasibility of converting NW 112th Avenue and NW 114th Avenue between NW 41st Street and NW 58th Street to one-way pair roads in order to increase capacity while incorporating complete street elements such as bicycle and transit lanes and on-street parking in order to support pedestrian, bicycle, and transit use and better serve the community; and

WHEREAS, the study evaluated the one-way pair alternative and targeted localized intersection improvements in order to address the deficiencies but due to highly negative socio-economic impact and a negative impact on expected performance the one-way pair option was ranked negatively and the City is intent on moving forward with the targeted localized intersection improvements; and

WHEREAS, on December 12, 2019, the Mayor and City Councilmembers adopted Resolution No. 19-312 (approved 5-0) to issue Work Order No. 8 to EAC Consulting, Inc. to provide professional engineering design services for the provision of intersection improvements along NW 112th and NW 114th Avenue as recommended in

the One-Way Pair Study; and

WHEREAS, on February 1, 2022, the City advertised ITB No. 2022-03 - Intersection Improvements along NW 58th Street at NW 112th and NW 114th Avenue to retain the services of a qualified General Engineering Contractor to construct the intersection improvements; and

WHEREAS, in response to ITB No. 2022-03 – "Intersection Improvements along NW 58th Street at NW 112th and NW 114th Avenue", the City received seven (7) submittals by the March 1, 2022 deadline with all seven (7) firms meeting the required criteria; and

WHEREAS, H&R Paving Inc. was deemed the lowest responsive, responsible bidder; and

WHEREAS, respectfully requests that the Mayor and City Councilmembers to authorize the award of ITB No. 2022-03 – "Intersection Improvements along NW 58th Street at NW 112th and NW 114th Avenue" to H&R Paving in an amount not to exceed of $296,231.70, which includes a 10% contingency for any unforeseen conditions, a copy of which is attached as Exhibit "A"; and

WHEREAS, funding for the construction of the intersection improvements along NW 58th Street at NW 112th and NW 114th Avenue is available in the Transportation Fund Improvement Streets Account, Account No. 101.80005.500633.

NOW THEREFORE, BE IT RESOLVED BY THE MAYOR AND THE CITY COUNCIL OF THE CITY OF DORAL AS FOLLOWS:

Section 1. Recitals. The above recitals are true and correct and incorporated herein.

Section 2. Approval. The contract between the City and H&R Paving for the intersection improvements along NW 58th Street at NW 112th and NW 114th Avenue with an amount not to exceed $296,231.70, which includes a 10% contingency for any unforeseen conditions, is approved as to form and legality by the City Attorney, is hereby approved.

Section 3. Authorization. The City Manager is authorized to negotiate and execute a Contract Agreement and expend budgeted funds on behalf of the City in furtherance hereof.

Section 4. Implementation. The City Manager and the City Attorney are hereby authorized to take such further action as may be necessary to implement the purpose and the provisions of this Resolution.

Section 5. Effective Date. This Resolution shall take effect immediately upon adoption.

The foregoing Resolution was offered by Vice Mayor Cabral who moved its adoption. The motion was seconded by Councilmember Cabrera and upon being put to a vote, the vote was as follows:

Mayor Juan Carlos Bermudez	Yes
Vice Mayor Digna Cabral	Yes
Councilman Pete Cabrera	Yes
Councilwoman Claudia Mariaca	Yes
Councilman Oscar Puig-Corve	Yes

PASSED AND ADOPTED this 13 day of April, 2022.

JUAN CARLOS BERMUDEZ, MAYOR

ATTEST:

CONNIE DIAZ, MMC
CITY CLERK

APPROVED AS TO FORM AND LEGAL SUFFICIENCY
FOR THE USE AND RELIANCE OF THE CITY OF DORAL ONLY:

LUIS FIGUEREDO, ESQ.
CITY ATTORNEY

EXHIBIT “A”

Bid Tabulation Sheet

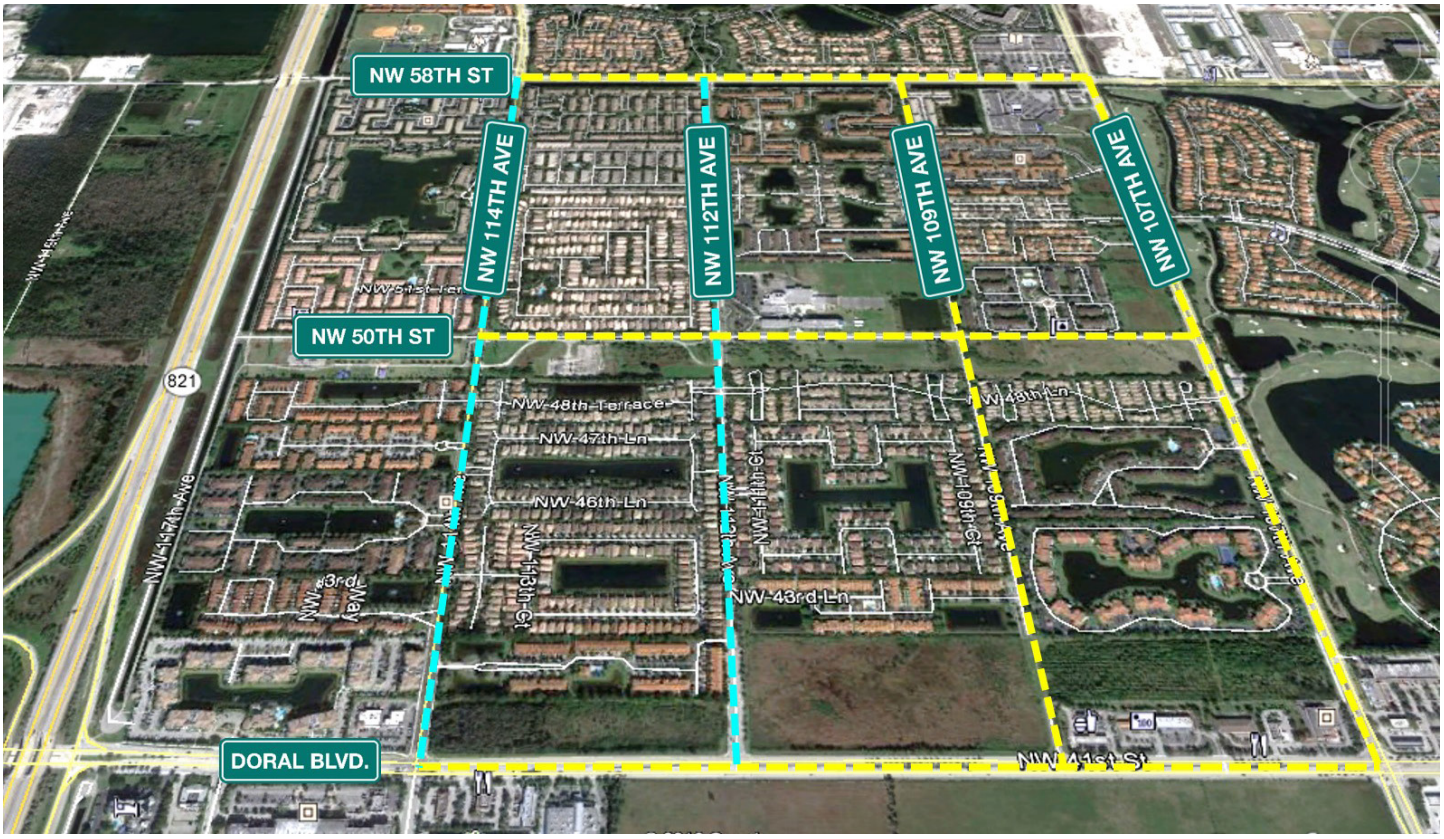
Bid Number	**ITB No. 2022-03**
Bid Name	**Intersection Improvements along NW 58th Street at NW 112th and NW 114th Avenue**
Bid Due Date	**3/1/2022 10:00**
Bid Opening	**Closed**

Company	Responded	Address	Bid Amount	Documents	Sent
A.D.A. Engineering Inc	3/1/2022 9:52:00 AM	8550 NW 33rd Street, Suite 202, Doral, FL, 33122	$365,221.06	Supplier Solication Response	**Y**
Florida Engineering & Development Corp.	3/1/2022 9:26:00 AM	12076 NW 98 Avenue, Hialeah Gardens, FL, 33018	$292,782.12	Supplier Solication Response	**Y**
General Asphalt Inc.	3/1/2022 9:53:00 AM	4850 NW 72nd Avenue, Miami, FL, 33166	$361,007.98	Supplier Solication Response	**Y**
H & R Paving Inc.	3/1/2022 8:24:00 AM	1955 NW 110 Avenue, Miami, FL, 33172	$269,301.55	Supplier Solication Response	**Y**
Hartec Group	3/1/2022 9:23:00 AM	8200 SW 187 Terr, Miami, FL, 33157	$412,517.09	Supplier Solication Response	**Y**
Metro Express	3/1/2022 9:07:00 AM	9390 NW 109th Street, Miami, FL, 33178	$302,293.00	Supplier Solication Response	**Y**
V & G Construction Solutions Corp.	3/1/2022 7:37:00 AM	9183 SW 152nd Path, Miami, FL, 33196	$316,286.57	Supplier Solication Response	**Y**

Preparer's Name:	**Tanya Donigan**
Preparer's Signature:	*TD Donigan*
Date Prepared:	**3/21/2022**

CITY OF DORAL

NW 114th Avenue & NW 112th Avenue Improvements Study



Prepared for:

CITY OF DORAL
For all the right reasons!

TPO
Miami-Dade Transportation Planning Organization

Prepared by:
bcc engineering

4901 NW 17th Way, Suite 506, Fort Lauderdale, FL 33309 | October 2017

EXECUTIVE SUMMARY

The NW 114th Avenue and NW 112th Avenue study corridors between Doral Boulevard and NW 58th Street, are two north/south parallel local roads within the City of Doral whose primary function is to provide access to several adjacent residential communities located in the western parts of the City. Given that NW 114th Avenue extends further to the north to intersect with NW 74th Street (a major east/west corridor at the northern end of the City of Doral with an interchange connection to the Homestead Extension of Florida's Turnpike – HEFT), traffic on NW 114th Avenue also likely comprises, regional trips destined for local communities within the City limits.

This Improvement Study was undertaken to quantify traffic deficiencies along the study corridors of NW 114th Avenue and NW 112th Avenue as well as to evaluate possible improvements that can be implemented by the City of Doral to address these deficiencies. With a minimum adopted level of service standard of LOS 'D' for traffic operations on City Roads (where LOS 'A' is best and 'F' is worst), the study confirms that several traffic deficiencies along the study corridors exist today including:

- *Intersection of NW 114th Avenue at Doral Boulevard*- Operating at LOS'E' conditions during the AM Peak Hour and LOS 'F' in the PM Peak hour.
- *Intersection of NW 112th Avenue at Doral Boulevard* – Operating at LOS'E' conditions during the AM and PM Peak Hours.
- *NW 114th Avenue between Doral Boulevard and NW 58th Street* – Operating at LOS'E' conditions in the southbound direction during the PM peak hour.
- *NW 112th Avenue between Doral Boulevard and NW 58th Street* – Operating at LOS'F' conditions in the northbound direction during the AM & PM peak hours.

With growth in the near term (2020 conditions) and new development, additional deficiencies are projected including:

- *Intersection of NW 114th Avenue at NW 58th Street*- Overall operations projected to degrade to LOS'E' conditions during the PM Peak hour.
- *Intersection of NW 112th Avenue at NW 50th Street*- Overall operations projected to degrade to LOS'E' conditions during the PM Peak hour.
- *Intersection of NW 112th Avenue at NW 58th Street*- Overall operations projected to degrade to LOS'F conditions during the AM & PM Peak hours.

The alternatives that were evaluated in this study to address deficiencies included:

- Targeted localized improvements at intersections along the study corridors
- One-way pair alternatives between Doral Boulevard and NW 58th Street
    - NW 114th Avenue (Northbound Only) and NW 112th Avenue (Southbound Only)
    - NW 114th Avenue (Southbound Only) and NW 112th Avenue (Northbound Only)

These alternatives were screened and ranked according to their anticipated "Socio-Economic Impact", "Expected Performance", and "Potential Challenges for Implementation" which were among the critical criteria considered. Based on these criteria, the "Targeted Intersection Improvements" collectively ranked higher than either one-way pair alternative.

The highly negative "socio-economic impact" (i.e. intense public opposition) as well as negative impact on "expected performance" (e.g. potential reduction in mobility due to the creation of circuitous routes for many residential communities as well as the adverse impact to trolley service which could reduce transit options), weighed heavily on the negative ranking that the one-way alternatives received.

The following targeted intersection improvements are recommended to the City of Doral for consideration and implementation:

NW 114th Avenue at Doral Boulevard

- Install exclusive westbound right turn lane.
- Install exclusive southbound right turn lane. This improvement will require additional right-of-way since the additional lane will encroach on the sidewalk on the west side of NW 114th Avenue as well as impact the adjacent parking lot in the northwest corner of the intersection.
- Extend exclusive eastbound left turn lane on NW 114th Avenue to approximately 270 feet.
- Optimize traffic signal operations.

NW 114th Avenue at NW 58th Street

- Change lane utilization on the westbound approach to one exclusive left turn lane, one exclusive through lane and one exclusive right turn lane.
- Extend northbound exclusive left turn lane from 100 feet to 175 feet.
- Optimize traffic signal operations.

NW 112th Avenue at Doral Boulevard

- Install exclusive westbound right turn lane on Doral Boulevard. This improvement may require modification of the existing signal mast arm in the northwest corner of the intersection.
- Optimize traffic signal operations.

NW 112th Avenue at NW 50th Street

The proposed improvements at this intersection includes two options:

- *Install roundabout* -This option considers a single lane urban roundabout with an inscribed diameter of approximately 80 feet. The current design would not require additional right-of-way

Or,

- *Install traffic signal* - This improvement will require utility call outs for further refinement.
- Optimize traffic signal operations.
- A signal warrant study should be conducted at this location to confirm that traffic conditions meet national and state thresholds for a traffic signal.

NW 112th Avenue at NW 58th Street

- Extend northbound exclusive left turn lane from 150 feet to 200 feet.
- Optimize traffic signal operations.

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1.0 INTRODUCTION

The NW 114th Avenue and NW 112th Avenue study corridors between Doral Boulevard and NW 58th Street, are two north/south parallel local roads within the City of Doral whose primary function is to provide access to several adjacent residential communities located in the western parts of the City. Given that NW 114th Avenue extends further to the north to intersect with NW 74th Street (a major east/west corridor at the northern end of the City of Doral with an interchange connection to the Homestead Extension of Florida's Turnpike – HEFT), traffic on NW 114th Avenue also likely includes regional trips destined for local communities within the City limits.

With a posted speed limit of 35 MPH, these tree lined corridors each contain sidewalks on both sides and a single travel lane in each direction separated by a painted median with exclusive turn lanes into the residential communities. According to the City of Doral 2010 Transportation Master Plan (an integrated element of the City's most recent Comprehensive Plan Update at the time of inception of this planning study), both NW 114th Avenue and NW 112th Avenue between the limits of Doral Boulevard to the south and NW 58th Street to the north, were projected to experience poor to failing traffic operations in the short term and long-term years. Based on recent traffic data and field observations, significant congestion persists at various segments and intersections within the study corridor including at the intersection of NW 114th Avenue with Doral Boulevard and the segment of NW 114th Avenue between NW 50th Street and Doral Boulevard. Additionally, the intersection of NW 112th Avenue with NW 58th Street is operating poorly with severe congestion on the NW 112th Avenue segment between NW 50th Street and NW 58th Street.

To address these deficiencies, the City of Doral in association with the Miami-Dade Transportation Planning Organization (TPO), commissioned this *NW 112th Avenue and NW 114th Avenue Improvements Study* to perform an in-depth evaluation of existing and future traffic conditions in order to identify potential improvements to traffic circulation along these corridors.

The study area is bounded by NW 114th Avenue on the westside, Doral Boulevard on the southside and NW 58th Street on the northside inclusive. The eastern side of the study area was expanded to include NW 107th Avenue to account for the potential impacts from alternatives on roadway segments and intersections this far east within the transportation network. Based on discussions with City staff, a horizon year of 2020 was used as the planning time frame in this study. **Exhibit 1-1** on the next page, shows the project location and study limits.

Options for improvements that were considered in this study include:

- Targeted localized improvements at intersections along the study corridors
- One-way pair alternatives between Doral Boulevard and NW 58th Street
    - NW 114th Avenue (Northbound Only) and NW 112th Avenue (Southbound Only)
    - NW 114th Avenue (Southbound Only) and NW 112th Avenue (Northbound Only)

Exhibit 1-1: Project Study Area

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2.0 DATA COLLECTION & INVENTORY

Various data including, traffic counts, traffic control features at study intersections, as well as other planning data were collected in order to evaluate existing conditions within the study area and provide a basis for the analysis of future conditions,

2.1 Transportation Studies and Plans

The following transportation studies/plans were provided by the City of Doral Public Works Department and reviewed for information relevant to this planning study effort:

- ***The City of Doral 2010 Transportation Master Plan*** (at the time of inception of this NW 114th Avenue & NW 112th Avenue Improvement Study) was regarded as an integral element of the City's most recent Comprehensive Plan update. The Plan provided an overview of the multimodal mobility network in Doral including its existing and future operations and a range of factors affecting those operations. The Plan identified deficiencies on NW 114th Avenue and NW 112th Avenue in the interim planning year of 2015 which were projected to get progressively worse in the 2030 long term planning year. According to the Master Plan, traffic volumes were projected in the 2030 long term that would either exceed or come very close to the standard capacity of a two-lane divided road of 14,000 vehicles per day (i.e., 42,500 vehicles per day (vpd) on NW 114th Avenue and 11,500 vpd on NW 112th Avenue).

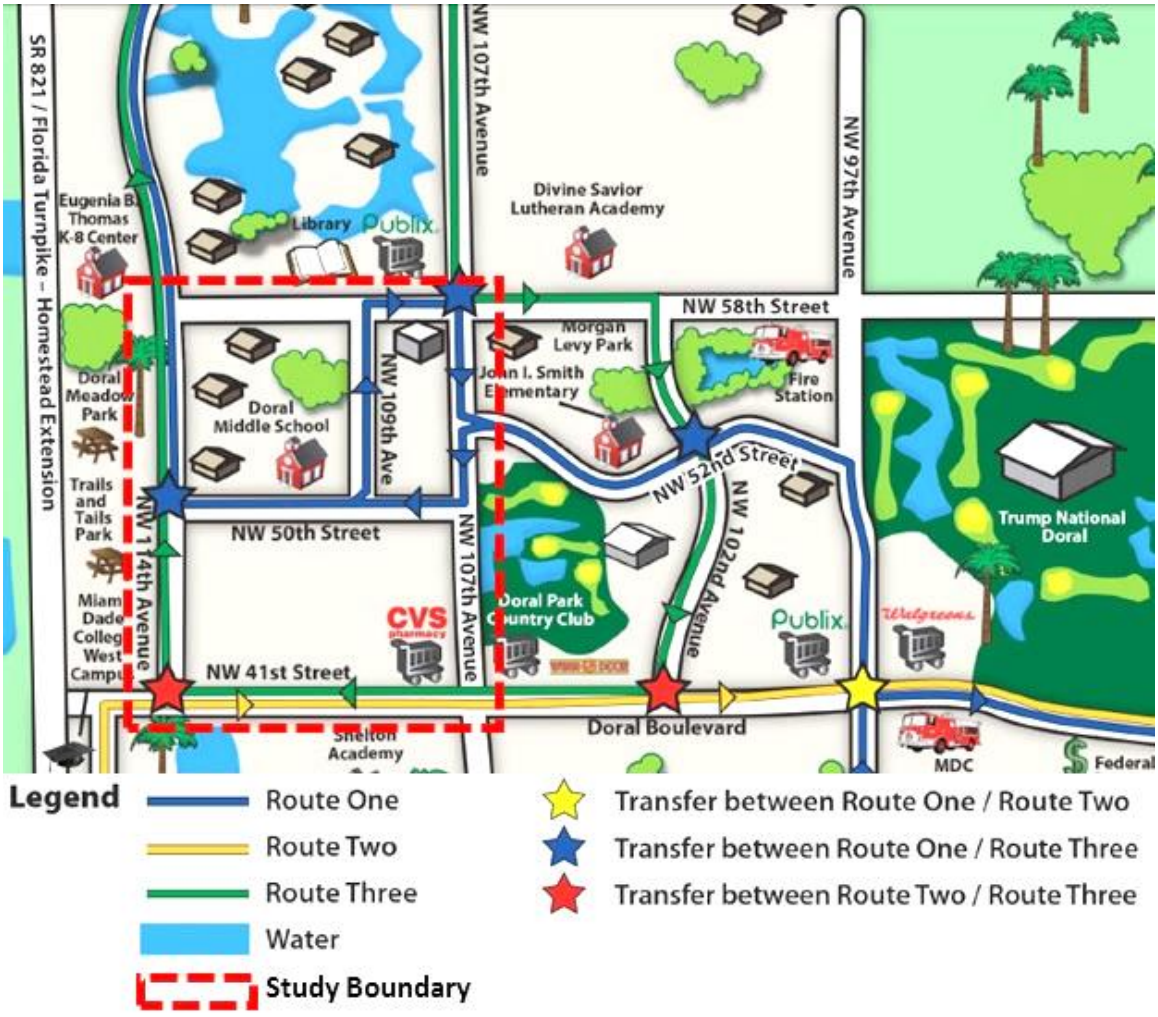
- ***The City of Doral Bikeway Network Map*** – Updated in June 2016, the City's Bikeway Map depicts the bikeway network within the City limits. Of the two study corridors, NW 114th Avenue is the only corridor that includes designated areas for bike use in the form of Sharrows (aka shared-lane markings to indicate the preferred positioning for bike traffic traversing the facility). **Appendix A** includes the Bikeway Network Map.

- ***City of Doral Trolley Route Map*** – The Doral Trolley service is a local circulator transit service managed through the City's Public Works Department. The trolley service comprises three routes including:

    - Route 1 (Cross Town Connector): provides service seven days a week including Monday through Friday between 6:00 AM and 9:45 PM), Saturdays between 7:00 AM and 7:24 PM and Sundays between 7:00 AM and 6:54 PM.
    - Route 2 (Commercial (Metrorail connector); provides service on weekdays between 6:00 AM and 7:52 PM with no service on the weekends.
    - Route 3 (Residential (Metrorail Connector): provides service on the weekdays between 6:00 AM and 9:00 PM as well as on Saturdays between 7:00 AM and 7:11 PM. There is no service on Sundays.

    While all three trolley routes impact various roadway segments within the study area, the most direct impacts are from Routes 1 and 3 which run along one of the study corridors of NW 114th Avenue between Doral Boulevard and NW 58th Street. **Exhibit 2-1** on the next page, depicts the trolley routes affecting the study area. A copy of the latest available City of Doral Trolley Route Map is included in **Appendix A**.

Exhibit 2-1: City of Doral Trolley Routes in the Study Area

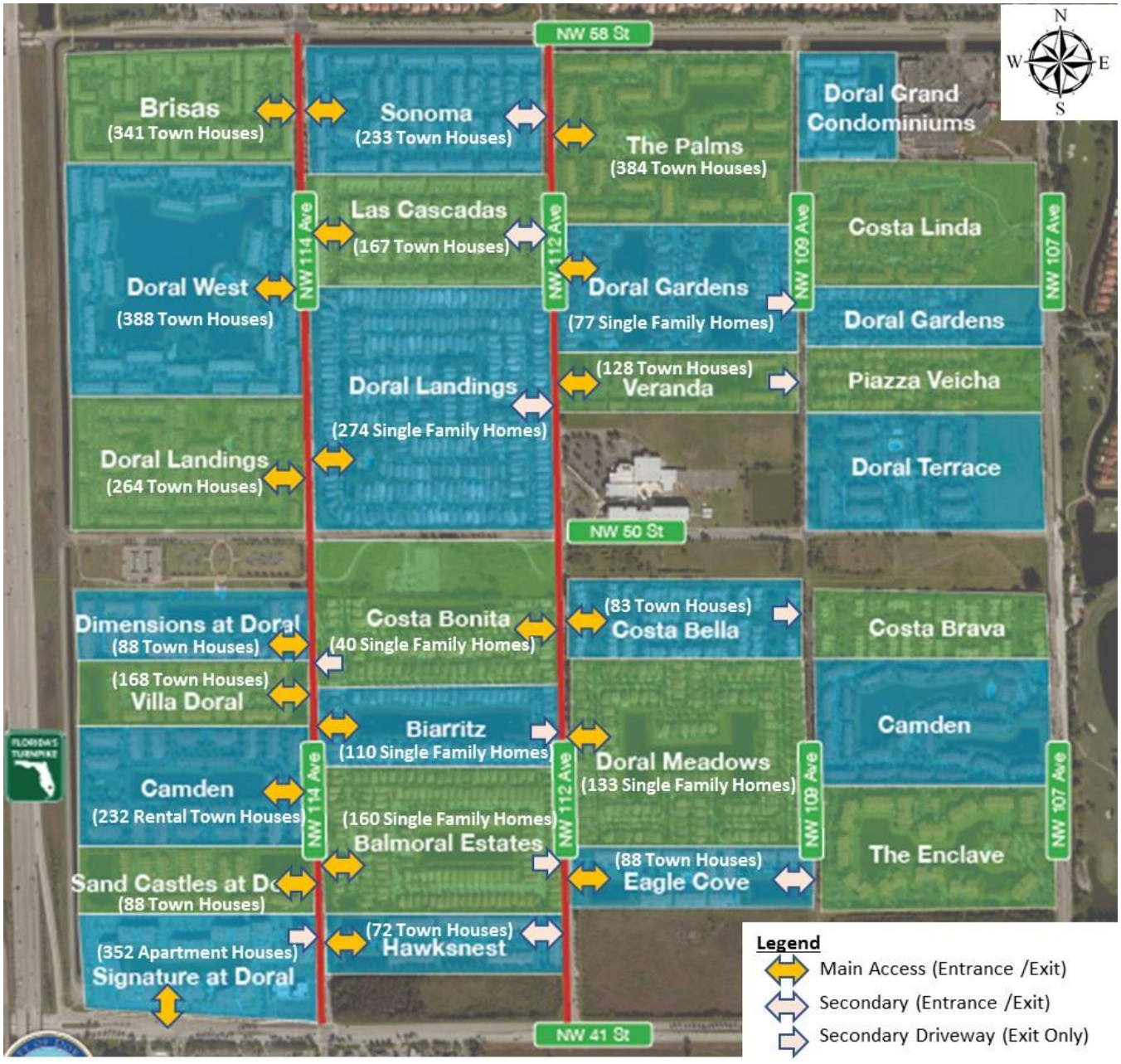


Source: 2016 Doral Trolley Route Map

2.2 Land Use and Access

Residential Uses - Several gated residential communities (ranging from 40 to 352 dwelling units) abut the study corridors of NW 114th Avenue and NW 112th Avenue. Most of the residential communities along NW 114th Avenue have their main access onto NW 114th Avenue with secondary access onto NW 112th Avenue for those communities on the east side of NW 114th Avenue. For residential communities along the east side of NW 112th Avenue, their main access is on NW 112th Avenue with secondary access on NW 109th Avenue. Given that more residential communities have their main access onto NW 114th Avenue, this contributes to higher traffic volumes on this corridor compared to the other study corridor of NW 112th Avenue. **Exhibit 2-2** on the next page, depicts the existing residential communities and the nature of their access to the study corridors (i.e., main or secondary).

Exhibit 2-2: Existing Residential Uses and Access



Schools – Three schools are located within the study area including:

- John I Smith Elementary School and Ronald Reagan High School (south campus) which are both collocated in the northeast corner of NW 112th Avenue and NW 50th Street. The elementary school operates Monday, Tuesday, Thursday, Friday (when school is in session) from 8:20 AM to 3:05 PM and from 8:35 AM to 1:50 PM on Wednesdays. The High School operates Monday through Friday from 7:30 AM to 2:04 PM.
- Eugenia B. Thomas K-8 Elementary School located in the northwest corner of the intersection of NW 58th Street with NW 114th Avenue. The school operates Monday, Tuesday, Thursday, Friday (when school is in session) from 8:20 AM to 3:05 PM and from 8:35 AM to 1:50 PM on Wednesdays.

Future Development – the City of Doral Planning and Zoning Department provided information on future developments within the study area including:

- Doral Medical Center: Proposed to be located on the north side of Doral Boulevard between NW 112th Avenue and NW 109th Avenue. The currently vacant parcel is proposed to be developed to contain a 131,700-square foot hospital and a 40,000 square-foot medical office building. The project will be constructed in two (2) phases with an anticipated build out of year 2026.
- Doral II (McGarry): is a proposed residential developing consisting of 250 dwelling units to be located on the northside of Doral Boulevard between NW 109th Avenue and NW 107th Avenue within the City limits. Project build out of after year 2020 is anticipated.

2.3 Traffic Data

Traffic volume data were collected to quantify the existing vehicle traffic circulation within the study area as well as assess the existing level of service for the transportation network. The traffic count data from other studies or ongoing efforts provided by the City Public Works Department (from 2016), were supplemented with additional data collected specifically for this improvement study (in 2017). The following data were gathered / collected for this study:

1. 4-Hour Turning Movement Counts at key study intersections during the AM & PM Peak periods;
2. 72-Hour Directional Counts

Table 2-1 provides a summary of the all intersection turning movement counts either gathered or collected and **Table 2-2** (on the following page) provides a summary of all link volume counts either gathered or collected. **Exhibit 2-3** (on the following pages) presents a graphical summary of the data collection efforts for this study.

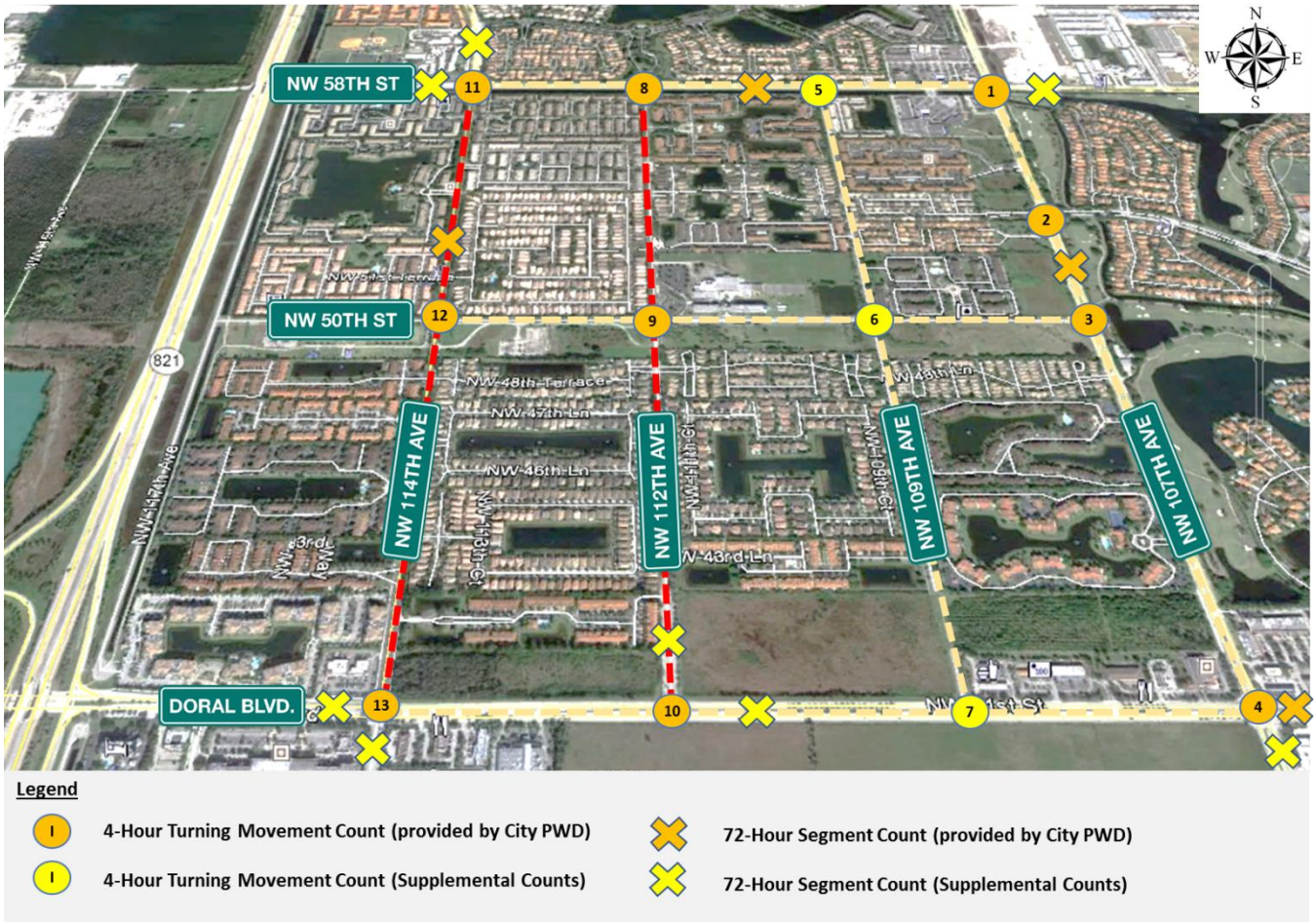
Table 2-1: Turning Movement Counts Data Collection Summary

#	Description	Date
1	NW 107 Avenue at NW 58 Street	9/13/2016
2	NW 107 Avenue at NW 52 Street	2/1/2017
3	NW 107 Avenue at NW 50 Street	2/1/2017
4	NW 107 Avenue at NW 41 Street	9/13/2016
5	NW 109 Avenue at NW 58 Street	2/1/2017
6	NW 109 Avenue at NW 50 Street	7/12/2016
7	NW 109 Avenue at NW 41 Street	7/12/2016
8	NW 112 Avenue at NW 58 Street	2/1/2017
9	NW 112 Avenue at NW 50 Street	7/12/2016
10	NW 112 Avenue at NW 41 Street	7/12/2016
11	NW 114 Avenue at NW 58 Street	9/14/2016
12	NW 114 Avenue at NW 50 Street	2/1/2017
13	NW 114 Avenue at NW 41 Street	9/7/2016

Table 2-2: Segment Volume Counts Data Collection Summary

Description	Dates
NW 41 Street West of NW 102 Avenue	5/3/2016 - 5/5/2016
NW 58 Street West of NW 109 Avenue	3/8/2016 - 3/10/2016
NW 107 Avenue North of NW 50 Street	5/3/2016 - 5/5/2016
NW 114 Avenue North of NW 51 Terrace	3/8/2016 - 3/10/2016
NW 114 Avenue North of NW 58 Street	1/31/2017 - 2/02/2017
NW 58 Street West of NW 114 Avenue	1/31/2017 - 2/02/2017
NW 41 Street West of NW 114 Avenue	1/31/2017 - 2/02/2017
NW 114 Avenue South of NW 41 Street	1/31/2017 - 2/02/2017
NW 112 Avenue North of 41 Street	1/31/2017 - 2/02/2017
NW 41 Street East of NW 112 Avenue	1/31/2017 - 2/02/2017
NW 107 Avenue South of NW 41 Street	1/31/2017 - 2/02/2017
NW 58 Street East of NW 107 Avenue	1/31/2017 - 2/02/2017

Exhibit 2-3: Data Collection Summary



Appendix A, contains all the traffic data that were collected as for this study.

2.4 Traffic Control and Signal Timing Data

Traffic signal timing information for signalized intersections within the study area was obtained from the Miami-Dade Traffic Signs & Signals Division database and is included in **Appendix A**. **Exhibit 2-4** on the next page, shows the signalized intersections within the study area.

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Exhibit 2-4: Traffic Signal Locations

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3.0 EXISTING CONDITIONS TRAFFIC ANALYSIS

An analysis of the existing conditions at roadway intersections within the study area was conducted for the critical morning and evening peak periods for a typical weekday. This section discusses the compilation / balancing of the traffic volumes collected in **Section 2.3**, field reviews performed to visually assess existing traffic operations in the field and the traffic analyses performed to quantify the existing intersection operations and level of service during the typical weekday periods.

3.1 Traffic Volumes

Since the traffic volume data (in **Section 2.3**) were collected on different days and in some cases different years, procedures were used to adjust, normalize and balance these traffic volumes prior to their use in the existing traffic operations analysis. Following is a summary of the steps used to refine the existing volumes:

A. ***Adjust for Seasonal Variation*:** Consistent with the procedures of the 2014 Florida Department of Transportation (FDOT) Project Forecasting Handbook, traffic counts were adjusted to reflect the seasonal variations in traffic volumes. **Table 3-1** presents a summary of the 2015 seasonal adjustment factors (from FDOT permanent count sites close to the study area) that were used to adjust the turning movement counts collected based on the week of data collection.

Table 3-1: 2015 Seasonal Adjustment Factors

#	Description	Date	Seasonal Factor$_{2015}$
1	NW 107 Avenue at NW 58 Street	9/13/2016	0.99
2	NW 107 Avenue at NW 52 Street	2/1/2017	1.01
3	NW 107 Avenue at NW 50 Street	2/1/2017	1.01
4	NW 107 Avenue at NW 41 Street	9/13/2016	0.99
5	NW 109 Avenue at NW 58 Street	2/1/2017	1.01
6	NW 109 Avenue at NW 50 Street	7/12/2016	1.03
7	NW 109 Avenue at NW 41 Street	7/12/2016	1.03
8	NW 112 Avenue at NW 58 Street	2/1/2017	1.01
9	NW 112 Avenue at NW 50 Street	7/12/2016	1.03
10	NW 112 Avenue at NW 41 Street	7/12/2016	1.03
11	NW 114 Avenue at NW 58 Street	9/14/2016	0.99
12	NW 114 Avenue at NW 50 Street	2/1/2017	1.01
13	NW 114 Avenue at NW 41 Street	9/7/2016	1.00

B. ***Normalize to Single Base Year:*** Traffic counts collected in 2016 were normalized to a 2017 base year by applying a 2.78% annual growth rate based on the historical traffic volume data from FDOT count sites close to the study area. The result of this adjustment produced normalized turning movement volumes (TMVs).

C. ***Balance Upstream and Downstream Normalized TMVs:*** The normalized TMVs from the preceding step were balanced such that upstream TMVs were equal to the downstream TMVs along a given corridor in the study area on roadway segments where there were no driveways in between. For segments, where there were one or more driveways in between upstream and downstream intersections to be balanced, a review of available aerial imagery was performed to assess whether the noted discrepancy between upstream and downstream TMVs was acceptable based on the type and general magnitude of the intersecting uses. An iterative process was followed to produce the balanced AM and PM Peak Hour TMVs depicted in **Exhibits 3-1** and **3-2**. A worksheet summarizing the detailed balancing process is included as **Exhibit B-1** in **Appendix B**.

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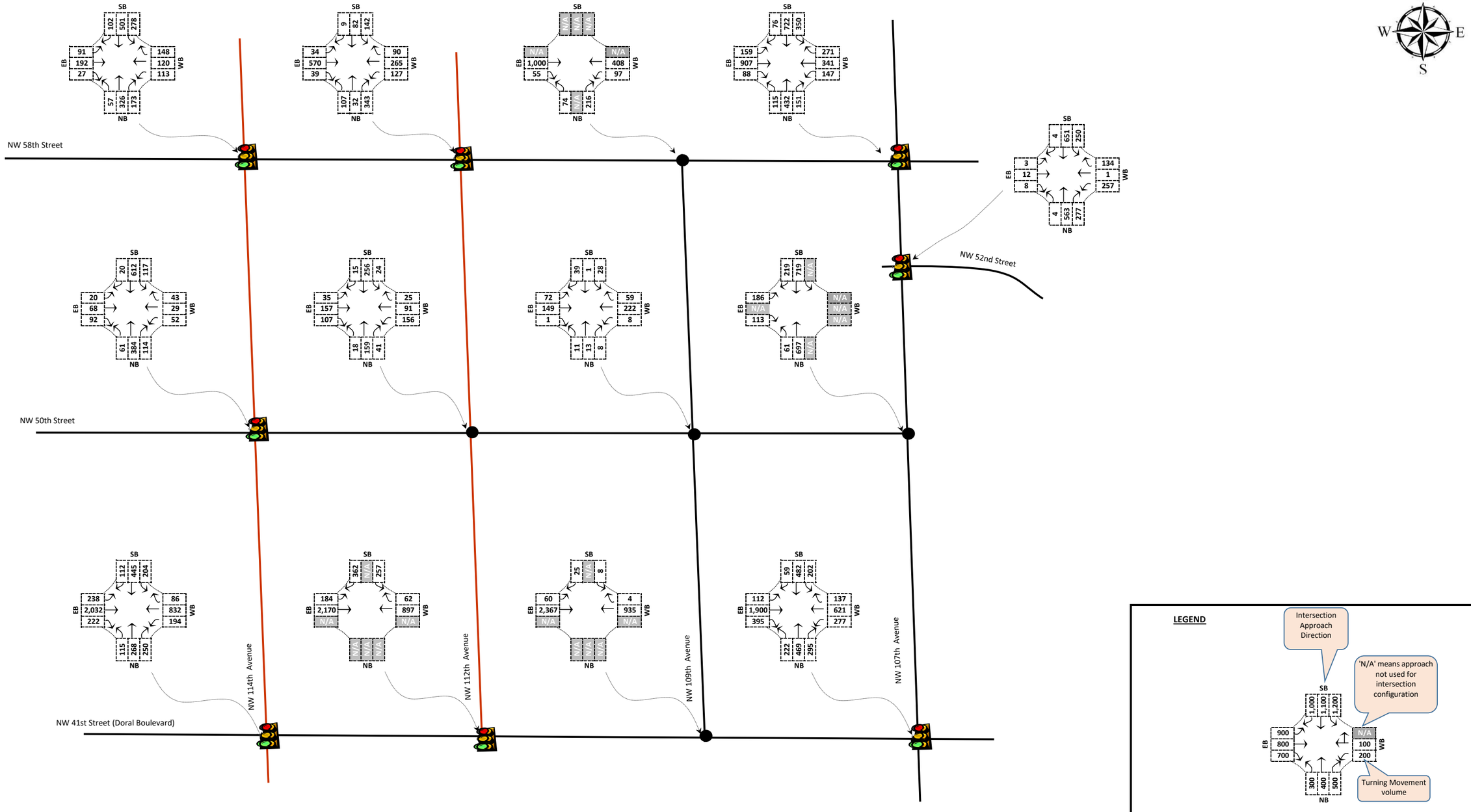


LEGEND

Project Name:

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

2017 Balanced Existing AM Peak Hour Volumes

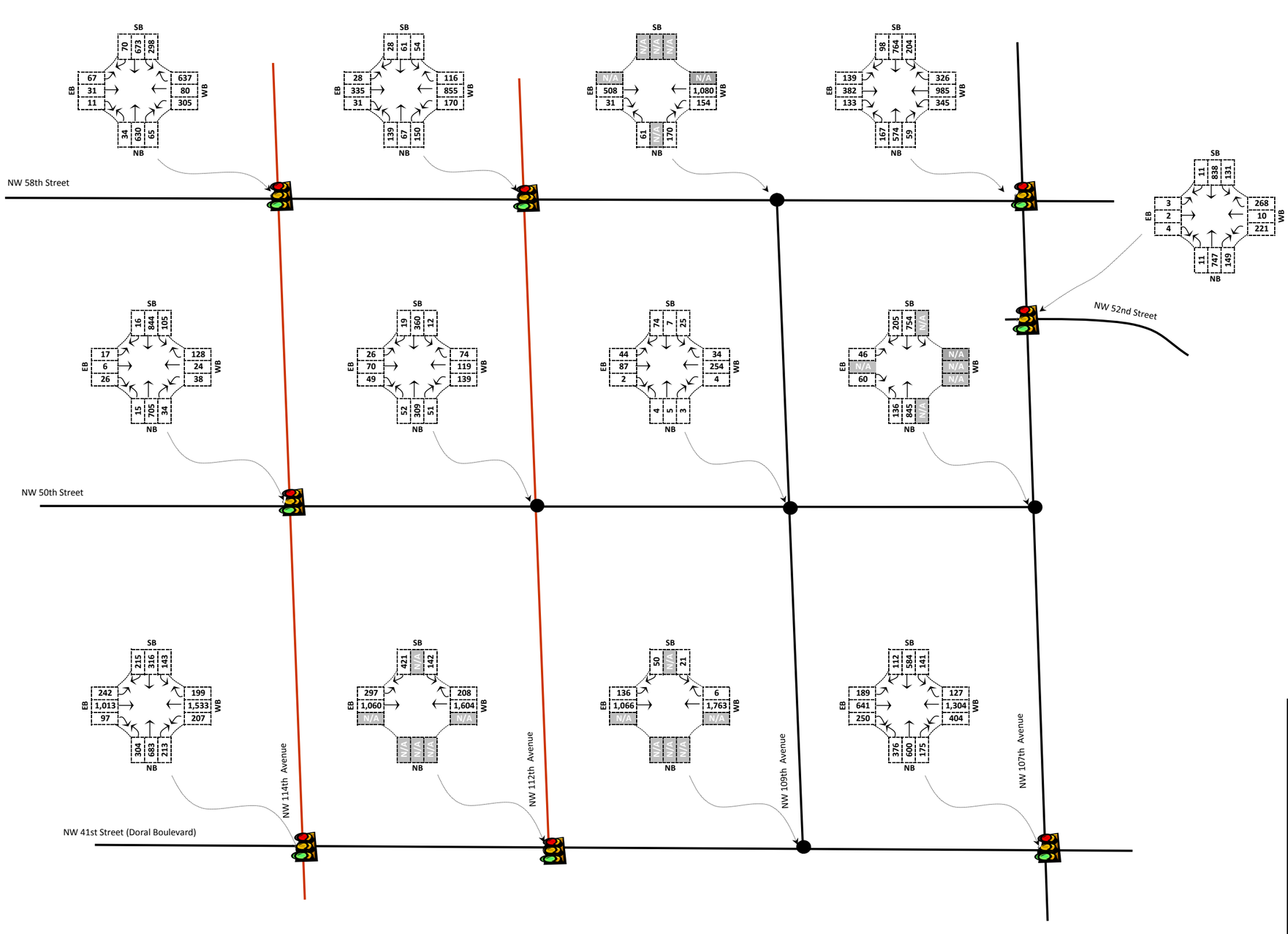
Prepared By:

BCC Engineering, Inc.
4901 NW 17th Way | Suite 506
Fort Lauderdale, FL 33309
Phone: 954-928-1828

Exhibit No. 3-1

Page No.

Date 08/09/17



Project Name:

DORAL FLORIDA

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

2017 Balanced Existing PM Peak Hour Volumes

Prepared By:

BCC Engineering, Inc.
4901 NW 17th Way | Suite 506
Fort Lauderdale, FL 33309
Phone: 954-928-1828

Exhibit No.	3-2
Page No.	
Date	10/25/17

3.2 Field Review

Field visits were conducted during the critical weekday AM and PM peak periods to qualitatively assess traffic operations at the study intersections and document existing bottlenecks or choke points throughout the study network. The AM and PM field reviews were performed on Tuesday, January 31, 2017, from 4:00 PM to 6:00 PM and on Wednesday February 1st, 2017 from 7:00 AM to 9:00 AM respectively. The findings are summarized below:

AM Peak Period (7:00 AM to 9:00 AM)

- Doral Boulevard/NW 41st Street at NW 114th Avenue:
  - Peak direction on Doral Boulevard appeared to be eastbound due to vehicles coming from Florida's Turnpike (to the west). An eastbound queue of approximately 350 ft. was observed.
  - Major movement on NW 114th Avenue is southbound traffic. No issues were observed with the northbound movement.
  - Occasional westbound left turning queues were observed.
- Doral Boulevard/NW 41st Street at NW 112th Avenue:
  - Major movement was eastbound through, but with the turbo lane operation, no issues were observed with the eastbound left turn operation. Traffic volume demand for the SB movement appeared to be less compared to PM peak period.
- NW 50th Street at NW 112th Avenue:
  - No issues or conflicts were observed at the intersection but it should be noted that due to school zone in the area (associated with the John I Smith Elementary School), speeds were reduced to 15 mph.
  - More traffic in the intersection compared to PM peak hour.
- NW 58th Street at NW 112th Avenue:
  - Peak direction on NW 112th Avenue appeared to be northbound with queues extending approximately 300 ft.to the driveway of the Palms of Doral which is to south of the intersection.
  - Left turn queues on the southbound approach leading from the Doral Isles residential community on to NW 58th Street were observed.
  - A high volume of pedestrians (comprising mostly school children) were observed using crosswalks on the west and south intersection legs. Eastbound right turning vehicles had to stop for pedestrians using the south leg of the intersection on several occasions. A couple of instances of vehicle / pedestrian conflicts were observed.
- NW 58th Street at NW 114th Avenue:
  - Heavy queues were observed on both the northbound and southbound approaches. Frequent queues of at least 500 feet to 600 feet were observed on the northbound approach and approximately 250 feet on the southbound approach.
  - Pedestrians (mostly school aged children) were observed using crosswalks on the west and south legs.
- NW 50th Street at NW 114th Avenue:
  - The major movement on NW 114th Avenue was observed to be the southbound through with queues of approximately 300 feet to 400 feet.

  - No issues were observed with the operation of the eastbound and westbound movements.
- NW 50th Street at NW 109th Avenue:
  - Heavy traffic was observed on the westbound approach towards the John I Smith Elementary School, including queues of at least 300 feet.
  - No other issues were observed.
- Doral Boulevard/NW 41st Street at NW 109th Avenue:
  - This intersection operates with stop control for southbound traffic. Southbound left turning vehicles from NW 109th Avenue to Doral Boulevard were using gaps in the eastbound though queue from the downstream intersection at NW 107th Avenue which extended past the intersection.
- Doral Boulevard/NW 41st Street at NW 107th Avenue:
  - Northbound and southbound movements were heavily congested and observed to be backing up at least 600 feet to 800 feet on each movement with frequent signal cycle failures. Northbound left turn queues were observed to extend back into the adjacent through lane.
  - Major movement on Doral Boulevard was observed to be the eastbound through movement with queuing extending as far back as NW 112th Avenue (which is over 1500 feet away)
  - Heavy westbound left turn demand was observed.
- NW 58th Street at NW 107th Avenue
  - Major movement was the eastbound through and frequent queues of at least 500 feet were observed.

<u>PM Peak Period (4:00 PM to 6:00 PM)</u>

- Doral Boulevard/NW 41st Street at NW 114th Avenue:
  - Northbound queues were observed to extend past a couple of driveways on NW 114th Avenue.
  - The peak direction on Doral Boulevard is westbound towards Florida's Turnpike. On the westbound approach, the rightmost lane as well as the adjacent lane appeared to be over utilized while the third through lane is underutilized. Westbound left turning vehicles frequently exceeded the left turn bay storage.
  - Excessive queues were observed on the northbound and southbound approaches.
  - Many trucks were observed making eastbound right turns from Doral Boulevard to NW 114th Avenue and northbound right turns from NW 114th Avenue to Doral Boulevard.
- Doral Boulevard/NW 41st Street at NW 112th Avenue:
  - The peak direction was observed to be in the westbound.
- NW 58th Street at NW 112th Avenue:
  - Queues were observed in the westbound direction (peak direction). Heavy westbound left turn demand was observed. However, with low conflicting eastbound through demand, the westbound left turn demand could clear the intersection in one signal cycle.
  - No issues with southbound and northbound vehicles were observed.
- NW 58th Street at NW 114th Avenue:

  - Major movement was observed to be in the westbound direction with left turn queues frequently extending beyond the turn bay.
  - Northbound queues were observed to extend past the driveway at Sonoma Doral.
- NW 50th Street at NW 114th Avenue:
  - Northbound through queues of at least 600 feet to 700 feet were observed.
- Doral Boulevard/NW 41st Street at NW 107th Avenue:
  - Excessive queues were observed on the northbound and southbound approaches (i.e., over 600 feet were observed).
  - Northbound left turn queues were observed to extend into the adjacent through lane.
  - Westbound queues were observed to extend up to 1,000 feet.
- NW 58th Street at NW 107th Avenue
  - Westbound queues of up to 500 feet were observed.
  - Heavy delays/ queues were observed for the eastbound left turning vehicles with occasional cycle failures.

General Observations

- NW 109th Avenue is recently constructed and is continuous between Doral Boulevard and NW 58th Street.
- Intersection of NW 50th Street at NW 112th Avenue gets especially congested during the dismissal period of the John I Smith Elementary School for school pickup. Scores of conflicts were observed during this time.
- Trolley operations were observed on NW 50th Street and NW 114th Avenue.

Exhibits 3-3 thru **3-5** provide additional pictorial information regarding key observations made during the field reviews.

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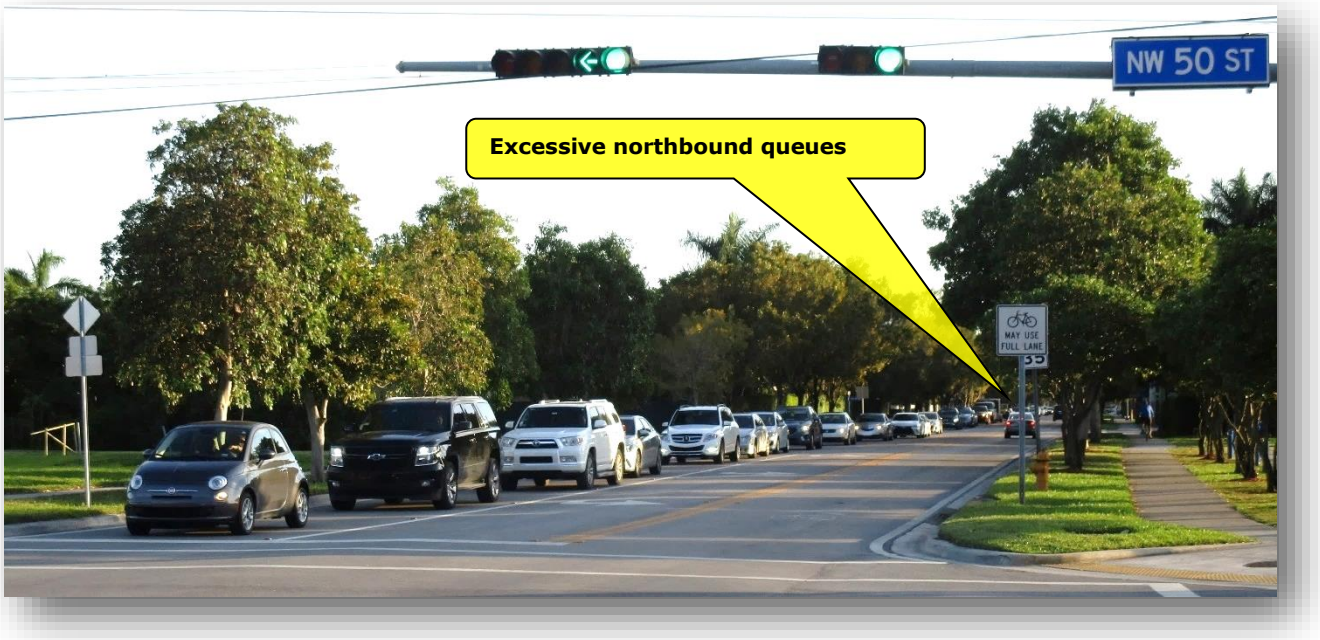
Exhibit 3-3: Northbound Queues at NW 112th Ave and NW 58th Street (AM Peak)

Exhibit 3-4: Northbound Queues at NW 114th Ave and NW 58th Street (AM Peak)

Exhibit 3-5: Northbound Queues at NW 114th Ave and NW 50th Street (PM Peak)



3.3 Existing Traffic Operations Analysis

A traffic operations analysis of the 2017 existing conditions of the roadway network within the study area was performed using the methodologies promulgated in the *Highway Capacity Manual (HCM) 2010*, developed and published by the Transportation Research Board (TRB) of the National Academies. The HCM methodologies are widely used to perform traffic operations analyses across the nation as well as internationally. The operations of roadway intersections within the study area were analyzed using *Chapters 18, 19 and 20* procedures in the HCM for signalized and un-signalized intersections (Two-Way Stop Controlled / All-Way Stop Controlled) respectively. The operations of the roadway corridors were analyzed using *Chapter 16* procedures of the HCM with respect to Urban Streets. The SYNCHRO version 9 traffic analysis software which is based on the methodologies contained in the HCM 2010, was used to perform the operational analysis of the existing AM and PM peak traffic periods.

3.3.1 Intersections Analysis

The primary Measures of Effectiveness (MOEs) used to assess the performance of the intersections within the study area include intersection delay in seconds per vehicle (s/veh) and Level of Service (LOS) on a scale of 'A' to 'F' where LOS 'A' represents the best LOS that can be achieved and 'F' being the worst LOS achievable. LOS 'D' is the minimum adopted LOS standard for local roads in the City of Doral. Existing signal timings were obtained from the Miami-Dade Traffic Signs & Signals Division database and as previously mentioned, are included in **Appendix A**. The results of the intersection operational analyses for the existing AM and PM peak hour conditions are summarized in **Table 3-2** and graphically depicted in **Exhibits 3-6** and **3-7** respectively.

Table 3-2: 2017 Existing Conditions Intersection Traffic Operations Summary

					Intersection Approach							
			Overall		EB		WB		NB		SB	
Corridor	Intersection	Peak Period	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
NW 114 Avenue	NW 58 Street	AM	50	D	64.8	E	93.6	F	40.1	D	29.1	C
		PM	47.1	D	21.7	C	41.9	D	31.5	C	65.2	E
	NW 50 Street	AM	19.8	B	55.8	E	50	D	8.9	A	8.8	A
		PM	14	B	39.3	D	39.6	D	10.8	B	9.3	A
	NW 41 Street	AM	58.6	E	35.7	D	51.4	D	77.1	E	122.9	F
		PM	110.5	F	49.3	D	24.9	C	287.2	F	149.4	F
NW 112 Avenue	NW 58 Street	AM	78.2	E	23	C	15.9	B	109.6	F	258.1	F
		PM	79.2	E	34.4	C	24.3	C	281.5	F	36.5	D
	NW 50 Street	AM	16.5	C	17.2	C	13.8	B	15.3	C	19.1	C
		PM	27.4	D	14.1	B	16.3	C	30.6	D	38.4	E
	NW 41 Street	AM	11.2	B	6.4	A	8.7	A	-	-	33.4	C
		PM	16.2	B	9	A	16.4	B	-	-	33	C
NW 109 Avenue	NW 58 Street	AM	32.1	D	-	-	1.7	A	174.8	F	-	-
		PM	5.9	A	-	-	1.1	A	39.1	E	-	-
	NW 50 Street	AM	9.7	A	9.7	A	10.1	B	8.5	A	8.6	A
		PM	9.5	A	8.8	A	10.2	B	8.2	A	8.5	A
	NW 41 Street	AM	0.3	A	0.2	A	-	-	-	-	15.3	C
		PM	1	A	1.4	A	-	-	-	-	20.8	C
NW 107 Avenue	NW 58 Street	AM	39.4	D	9.3	A	31.5	C	73.5	E	55.3	E
		PM	62.4	E	34.7	C	94.4	F	41.9	D	44.7	D
	NW 52 Street	AM	24.1	C	20.2	C	47.1	D	15.3	B	21.7	C
		PM	13.8	B	22.9	C	30.7	C	11.8	B	6.5	A
	NW 50 Street	AM	69.7	F	455.6	F	-	-	0.9	A	-	-
		PM	7.5	A	109.2	F	-	-	1.7	A	-	-
	NW 41 Street	AM	79.3	E	85.3	F	45.4	D	95.1	F	87	F
		PM	83.9	F	64.6	E	94.3	F	84.7	F	85.8	F

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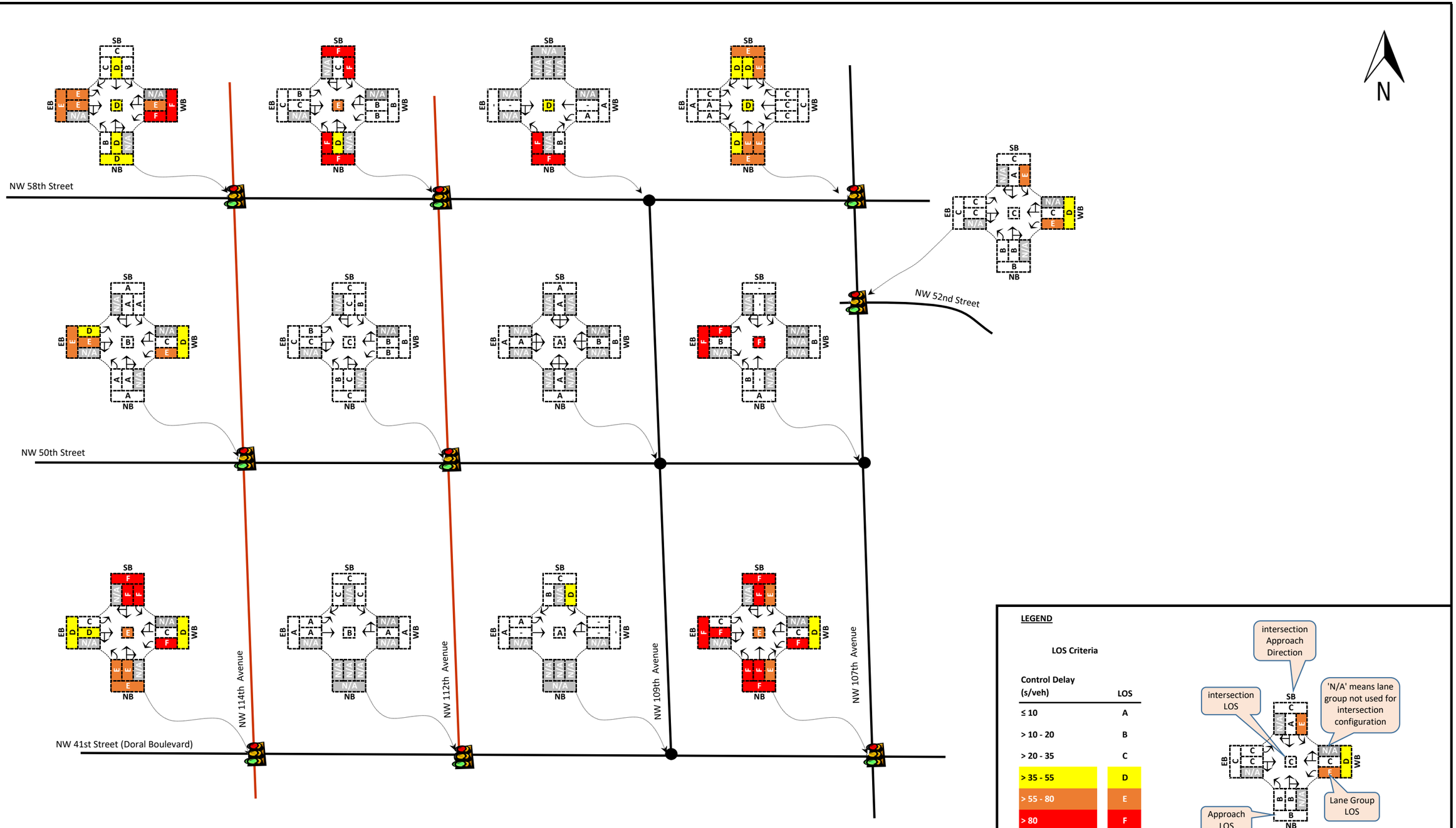


LEGEND

LOS Criteria

Control Delay (s/veh)	LOS
≤ 10	A
> 10 - 20	B
> 20 - 35	C
> 35 - 55	D
> 55 - 80	E
> 80	F

Project Name:

DORAL FLORIDA

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

Existing 2017 AM Peak Hour Traffic Operations Summary

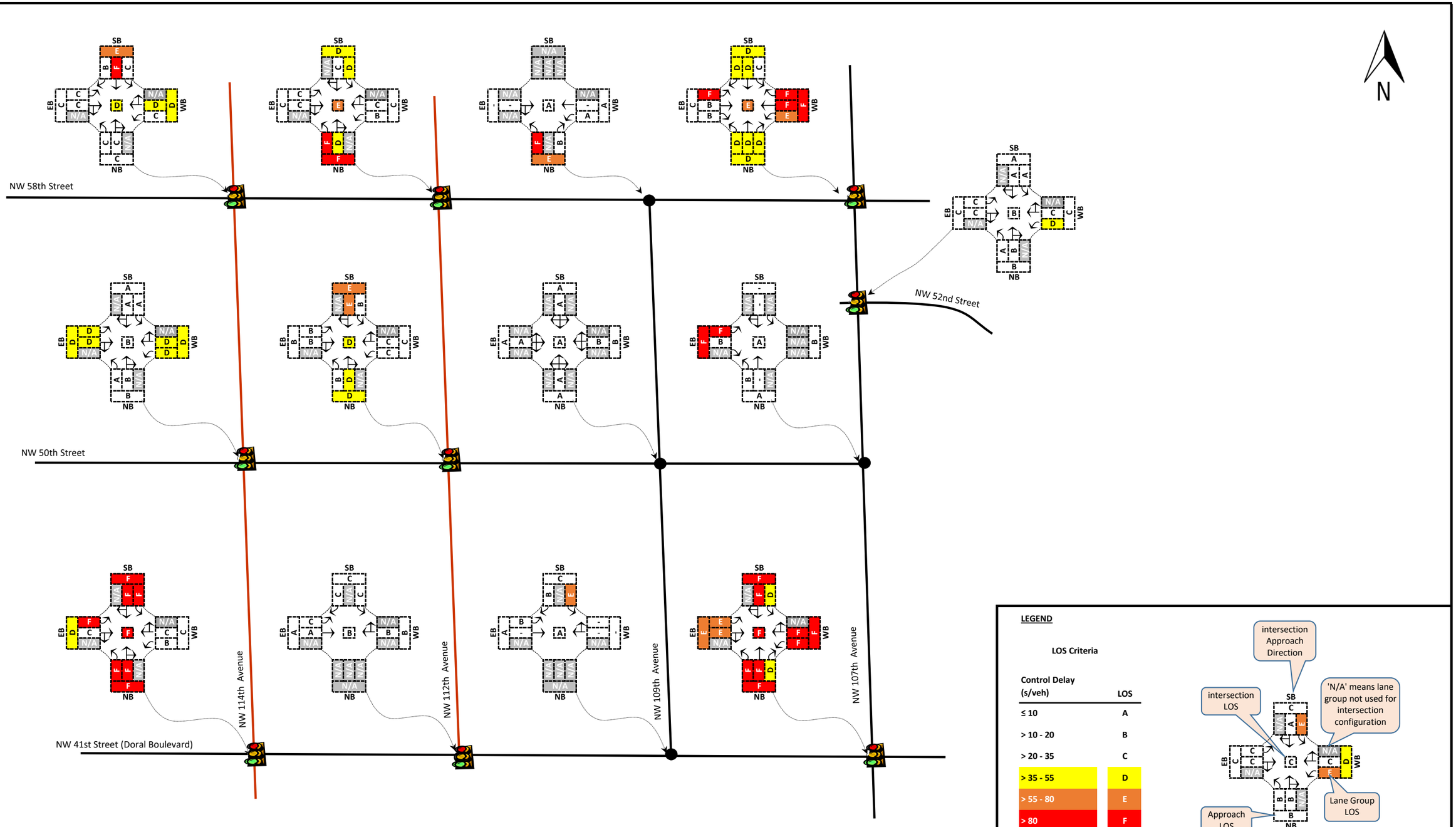
Prepared By:

BCC Engineering, Inc.
4901 NW 17th Way | Suite 506
Fort Lauderdale, FL 33309
Phone: 954-928-1828

Ex No. **3-6**

Pg No.

08/15/17



LEGEND

LOS Criteria

Control Delay (s/veh)	LOS
≤ 10	A
> 10 - 20	B
> 20 - 35	C
> 35 - 55	D
> 55 - 80	E
> 80	F

Project Name:

DORAL FLORIDA

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

Existing 2017 PM Peak Hour Traffic Operations Summary

Prepared By:

BCC Engineering, Inc.
4901 NW 17th Way | Suite 506
Fort Lauderdale, FL 33309
Phone: 954-928-1828

Ex No. **3-7**

Pg No.

08/15/17

As can be seen from the summary results, all intersections within the study area are operating at the minimum acceptable level of service 'D' or better except the following:

- ***NW 114th Avenue at Doral Boulevard*** – In the AM peak hour, this intersection is operating at LOS 'E' with critical operational failures in multiple lane groups on the southbound approach as well as the westbound left turn lane group. In the PM peak hour, this intersection is operating at LOS 'F' with critical operational failures in multiple lane groups on the southbound and northbound approaches as well as the eastbound left turn lane group.
- ***NW 112th Avenue at NW 58th Street*** – In the AM peak hour, this intersection is operating at LOS 'E' with critical operational failures in the northbound and southbound left turn lane groups. In the PM peak hour, this intersection is operating at LOS 'E' with critical operational failures on the northbound approach and northbound left turn lane group.
- ***NW 107th Avenue at Doral Boulevard*** – In the AM peak hour, this intersection is operating at LOS 'E' with critical operational failures in multiple lane groups on the southbound, northbound and eastbound approaches as well as the westbound left turn lane group. In the PM peak hour, this intersection is operating at LOS 'F' with critical operational failures in multiple lane groups on the southbound, northbound and westbound approaches.
- ***NW 107th Avenue at NW 50th Street*** – In the AM peak hour, the eastbound approach on the minor street of NW 50th Street is experiencing critical failure in the eastbound left turn lane group resulting in overall failing operations of LOS 'F' on the eastbound stop controlled approach.
- ***NW 107th Avenue at NW 58th Street*** – In the PM peak hour, this intersection is operating at LOS 'E' with critical operational failures in multiple lane groups on the westbound approach as well as the eastbound left turn lane group.

The results of this existing conditions operational analysis are generally consistent with the intersection operations observed in the field. Output SYNCHRO reports of the existing conditions intersection analyses for the AM and PM peak periods are included in **Appendix B.**

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3.3.2 Arterial Analysis

The primary MOEs used to assess the performance of the arterials within the study area include arterial speed in miles per hour (mph) and LOS on a scale of 'A' to 'F'. The posted speed limit was used as a surrogate for the free flow arterial speed (an important input parameter) to the arterial analysis. The results of the operational analyses for the existing AM and PM peak hour conditions are summarized in **Table 3-3**.

Table 3-3: 2017 Existing Conditions Arterial Traffic Operations Summary

			Direction			
			Northbound		Southbound	
Corridor	Limits	Peak Period	Speed (mph)	LOS	Speed (mph)	LOS
NW 114th Avenue	Between Doral Blvd and NW 58th Street	AM	21.5	C	15.3	D
		PM	21.4	C	13.5	E
NW 112th Avenue	Between Doral Blvd and NW 58th Street	AM	11.3	E	20.2	C
		PM	5.5	F	21.7	C

As can be seen from the results in **Table 3-3**, NW 114th Avenue southbound between Doral Boulevard and NW 58th Street was analyzed to be operating at level of service 'E' during the PM Peak Hour which is below the minimum adopted level of service standard 'D' for local roads in the City of Doral. NW 112th Avenue in the northbound direction between Doral Boulevard and NW 58th Street was analyzed to be operating at a failing LOS 'F' during the existing PM peak hour and at LOS 'E' during the AM peak hour. Output SYNCHRO arterial reports along the roadway network for the AM and PM peak periods for the existing conditions are included in **Appendix B.**

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4.0 PUBLIC OUTREACH

The NW 114 Avenue & NW 112 Avenue Improvement Study has garnered much attention from residents living within the study area. This attention is due mainly to strong concerns regarding the perceived disruption to traffic circulation and safety related to the possible conversion of the study corridors to one-way streets, which were among the preliminary alternatives identified at the outset of the study.

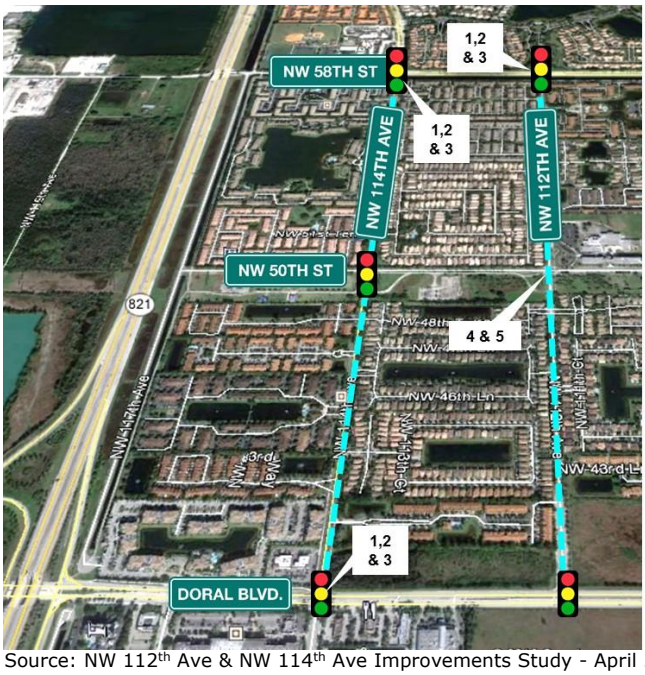
4.1 Coordination

Anticipating the intense public interest in this project and with a desire to provide a forum to receive feedback from the community, the City of Doral convened a public workshop on April 20, 2017 at the Doral Park Country Club to discuss the project. Close to 80 people attended the workshop. The workshop was noticed a month in advance providing local residents and Home Owner Associations (HOAs) the opportunity to submit feedback to the City in advance of the meeting. The results of the existing conditions analysis were presented at the meeting as well as a preliminary discussion of the initial alternative strategies that were being considered in this study including:

- Targeted Intersection Improvements (Including Signal Timing Optimization, Turn Lane Improvements, etc.)
- One-way pair alternatives between Doral Boulevard and NW 58th Street
    - NW 114th Avenue (Northbound Only) and NW 112th Avenue (Southbound Only)
    - NW 114th Avenue (Southbound Only) and NW 112th Avenue (Northbound Only)

Exhibits 4-1, 4-2 and **4-3** respectively, graphically illustrate the potential alternative strategies discussed at the April 20, 2017 Public Workshop (See **Appendix C** for workshop flyer, Powerpoint presentation, sign-in sheets and comments from the public).

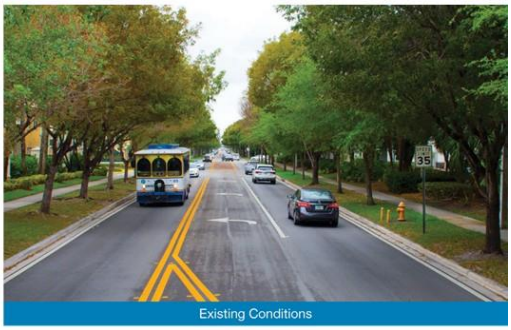
Exhibit 4-1: Targeted Intersection Improvements Illustration



1. Change the way signals are timed
2. Turn lane improvements
3. Change the way lanes are used
4. Install new traffic signal
5. Install Roundabout

Source: NW 112th Ave & NW 114th Ave Improvements Study - April 20, 2017 Public Workshop

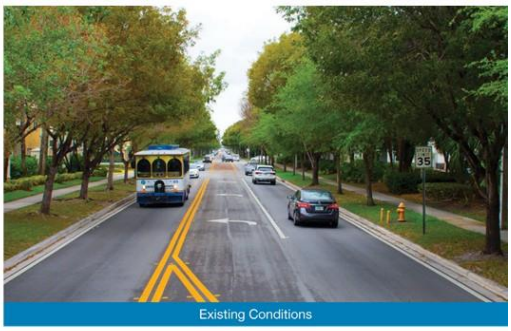
Exhibit 4-2: One-Way (NW 114 Ave Northbound & NW 112 Ave Southbound)



Typical Section 'A'- 'A'

Source: NW 112th Ave & NW 114th Ave Improvements Study - April 20, 2017 Public Workshop

Exhibit 4-3: One-Way (NW 114 Ave Southbound & NW 112 Ave Northbound)



Typical Section 'A'- 'A'

Source: NW 112th Ave & NW 114th Ave Improvements Study - April 20, 2017 Public Workshop

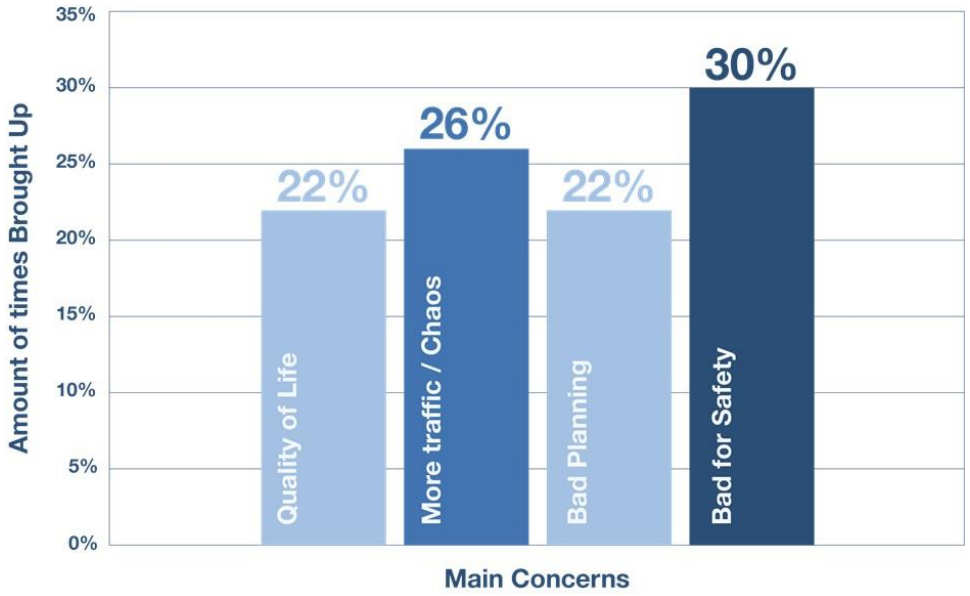
4.2 Public Feedback

During the period leading up to the April 20, 2017 workshop and shortly thereafter, comments from approximately 100 residents were received. While a few comments acknowledged the traffic problems on NW 114th Avenue and NW 112th Avenue and that solutions were needed to address these deficiencies, all comments roundly opposed any alternative that would convert the study corridors to one-way streets. Taken together with the feedback received during the workshop, it is clear that alternatives involving converting the study corridors to one-way streets, are the least viable from a community cohesion perspective and would have the potential to engender intense public controversy if further pursued. In addition, according to a sampling of the comments reviewed, four key issues seemed to underpin the basis for the widespread opposition to any one-way alternative including:

- Negative impact on *Quality of life*
- Alternatives would lead to *more traffic* and create *chaos*
- Traffic Problems are a result of *bad planning* with "Over Development" as one example
- Alternatives would be *bad for safety* because of higher speeds

Exhibit 4-4 presents a summary of the frequency with which these concerns were raised based on the sample of comments reviewed.

Exhibit 4-4: Public Comment Summary and Frequent Concerns



As can be seen from the summary, at 30%, safety was the number one issue raised followed by a perception that one-way alternatives would lead to more traffic and chaos (26%). The perceived negative impact on quality of life and bad planning were each tied at 22% as secondary issues in opposing the one-way alternatives.

5.0 ALTERNATIVES SCREENING & RANKING

Based on the deficiencies identified in the existing conditions analysis as well as a preliminary review of potential solutions, the following alternatives were screened:

- No Build Option – where no improvements are proposed beyond programmed improvements.
- Targeted Intersection Improvements (Including Signal Timing Optimization, Turn Lane Improvements, etc.)
- One-way pair alternatives between Doral Boulevard and NW 58th Street
    - NW 114th Avenue (Northbound Only) and NW 112th Avenue (Southbound Only)
    - NW 114th Avenue (Southbound Only) and NW 112th Avenue (Northbound Only)

In this section of the report, the alternatives are further defined, screening criteria are established and the alternatives are ranked.

5.1 Identification of Alternatives

1. *No Build Option* – The only programmed improvement reflected in the No-Build Option is the recent connection of NW 109th Avenue from just north of Doral Boulevard to just south of NW 43rd Lane. The gap in network that previously existed between these limits was recently closed to now provide a continuous corridor along NW 109th Avenue from Doral Boulevard to NW 58th Street. No additional programmed improvements were noted within the study area.

2. *Targeted Intersection Improvements* – were identified to address deficiencies at roadway intersections within the study area and are described as follows:

    A. *NW 114th Avenue at Doral Boulevard* - Lengthen eastbound left turn lane, install exclusive southbound right turn lane, install exclusive westbound right turn lane & Optimize Signal Timing.
    B. *NW 114th Avenue at NW 58th Street* - Lengthen northbound shared thru/right turn lane, change existing lane utilization on westbound approach to exclusive left turn lane / one through lane / exclusive right turn lane and optimize signal timing.
    C. *NW 112th Avenue at Doral Boulevard* - Install exclusive westbound right turn lane & optimize signal timing.
    D. *NW 112th Avenue at 50th Street* – The two improvement options considered for this location include either a roundabout or traffic signal (not both).
    E. *NW 112th Avenue at NW 58th Street* - Lengthen northbound left turn lane and optimize signal timing.

3. *One Way Pair Improvement Option 1* – This option includes converting NW 114th Avenue to a one-way northbound only traffic flow and NW 112th Avenue to a southbound only traffic flow between Doral Boulevard and NW 58th Street. Each corridor in the one-way pair would be restriped to include two through lanes and a separated exclusive bike lane (as shown in **Exhibit 4-2** of the preceding section).

4. *One Way Pair Improvement Option 2* – This option includes converting NW 114th Avenue to a one-way southbound only traffic flow and NW 112th Avenue to a northbound only traffic flow between Doral Boulevard and NW 58th Street. Each corridor in the one-way pair would be restriped to include two through lanes and a separated exclusive bike lane (as shown in **Exhibit 4-3** of the preceding section).

5.2 Screening of Alternatives

This section of the report presents a brief discussion of the screening criteria used, as well as a summary of the screening results for the alternatives considered. Also included is a ranking of the alternatives.

5.2.1 Screening Criteria

The screening criteria developed were broken down as follows:

- Socio-Economic Impact
  - *Existing and Future Land Use* – This criterion considers the extent to which a proposed alternative strategy is compatible with existing or future land uses.
  - *Community Cohesion* – This criterion considers the extent to which a proposed alternative strategy may affect community cohesion including the potential for physical separation or degradation in connectivity between communities.
  - *Potential for Controversy* – This criterion assesses the potential for stakeholder and/or constituent opposition or controversy related to the alternative strategy proposed.
- Expected Performance
  - *Mobility* – This criterion assesses the extent to which the proposed alternative will lead to better connectivity to improve the movement of all transportation modes (i.e., multimodal) within the study area.
  - *Operational* – This criterion assesses the likely enhancements and improvements to the operations within the study area because of the proposed alternative.
  - *Safety* - This criterion assesses the likely improvement in safety within the study area because of the proposed alternative. Alternatives that will lead to reductions in conflicts between modes or overall congestion in the study area are generally regarded as having a positive effect on safety.
- Implementation
  - *Right-of-Way / Utility Conflicts* - This criterion assesses the likely impact of the alternative on ROW or utilities within the study area.
  - *Constructability* – This criterion generally assesses potential obstacles that might affect the design and construction of the alternative proposed.
- Cost
  - *Engineering, CEI & Construction* – This criterion contemplates the relative orders of magnitude of the engineering, CEI & construction costs associated with the proposed alternative.

To screen the alternatives, a scoring scale of 1 to 5 was developed to assess each criterion with 1 representing the most negative impact and 5 representing the most positive impact. Following is a brief description of the meaning of each score:

1. Substantial Negative Effect or Challenges
2. Generally Negative Effect or Challenges
3. Generally No Effect or Moderate Challenges
4. Generally Positive Effect
5. Substantial Positive Effect

In addition to the scoring scale, a weight was applied to each score based on its assumed relative importance in evaluating the alternative considered. The weights were developed to balance the priorities of the stakeholders highlighted in the public outreach and the expected level of performance of each alternative to address the needs of the study area, against the criteria related to implementation of the alternatives. Criteria anticipated to have a direct bearing on the public perception including "Socio-economic" and "Expected Performance" (in which negative perceptions /experiences are typically harder to overcome) were therefore given a relatively higher weight compared to criteria related to "Implementation" where constraints may not be as insurmountable if adequate funding can be identified. The weights assigned are based on the assumed relative importance of each criterion. It should be noted that the weights applied to all nine (9) criteria sum to 100.

5.2.2 Ranking of Alternatives

A qualitative assessment using the weighted scoring system introduced in the preceding section was performed to rank the alternatives presented in **Section 5.2**. **Table 5-1** on the following page, summarizes the results of alternatives screening. All the intersection improvements listed in **Section 5.2** were combined to form a collective group of "Targeted Intersection Improvements" which were then compared to Option 1 and Option 2 One-Way Pair Alternatives.

As can be seen from the comparative screening matrix, the Targeted Intersection Improvements are ranked higher than either One-Way pair option. While the One-Way pair options were comparable to the "Targeted Intersection Improvements" with respect to a few of the screening criteria listed, poor scores in the Socio-Economic and Expected Performance criteria group, resulted in their relatively lower ranking. The widespread opposition to the One-way pair alternatives as discussed in the Public Outreach Section **4.0** of the report, is reflected in the low scores that these alternatives received in the Socio-Economic Group.

With, the high density of access driveways along the study corridors (ref. **Exhibit 2-2** in **Section 2.2** of this report), the one-way pair alternatives would create circuitous routes for residents entering and exiting residential communities along the study corridors. In addition, these alternatives would require Routes # 1 and #3 of the City's Trolley service to be rerouted (ref. **Exhibit 2-1** in **Section 2.1** of this report) potentially reducing the transit options for residents living within the study area. As a result of these two factors, it is anticipated that overall mobility within the study area could be negatively affected by the one-way alternatives. -

All alternatives were evaluated in remaining sections of the report.

Table 5-1: Alternatives Screening Matrix

SCORING SCALE

1 SUBSTANTIAL NEGATIVE EFFECT OR CHALLENGES
2 GENERALLY NEGATIVE EFFECT OR CHALLENGES
3 GENERALLY NO EFFECT OR MODERATE CHALLENGES
4 GENERALLY POSITIVE EFFECT
5 SUBSTANTIAL POSITIVE EFFECT

Alternatives			EVALUATION CRITERIA									WEIGHTED SCORE (WS)[1]	RANK[2]
			Socio-Economic			Expected Performance			Implementation				
		Criteria weights	16	16	16	13	8	13	6	6	6		
Type	No.	Description Of Alternative	Existing and Future Land Use	Community Cohesion	Potential for Controversy	Mobility	Operational	Safety	ROW /Utility Conflicts	Constructability	Cost		
NO-BUILD	1	No Build Condition - No improvements on NW 114th Avenue or NW 112th Avenue between Doral Boulevard and NW 58th Street	**2**	**2**	**3**	**1**	**1**	**1**	**3**	**3**	**3**	**200**	**N/A**
TARGETED INTERSECTION IMPROVEMENTS	2	NW 114th Avenue at Doral Boulevard - Lengthen eastbound left turn lane, install exclusive southbound right turn lane, install exclusive westbound right turn lane & Optimize Signal Timing	3	3	3	4	4	4	2	4	4	340	N/A
	3	NW 114th Avenue at NW 58th Street - Lengthen northbound shared thru/right turn lane, change existing lane utilization on westbound approach to exclusive left turn lane / one through lane / exclusive right turn lane and Optimize Signal Timing	3	3	3	3	4	4	3	3	4	327	N/A
	4	NW 112th Avenue at Doral Boulevard - Install exclusive westbound right turn lane & Optimize Signal Timing	3	3	3	3	4	4	2	3	4	321	N/A
	5A[3]	NW 112th Avenue at NW 50th Street - Install Roundabout	3	3	3	3	4	4	2	3	3	315	N/A
	5B[3]	NW 112th Avenue at NW 50th Street - Install Traffic Signal	3	3	3	3	4	4	3	4	4	333	N/A
	6	NW 112th Avenue at NW 58th Street - Lengthen northbound left turn lane and optimize signal timing	3	3	3	3	4	4	3	3	3	321	N/A
	AVERAGE[4]		**3**	**3**	**3**	**3**	**4**	**4**	**3**	**3**	**4**	**326**	**1**
ONE-WAY PAIR ALTERNATIVES	7[5]	NW 114th Avenue One-Way Southbound & NW 112th Avenue One-Way Northbound	1	1	1	2	4	2	3	4	4	198	**2**
	8[5]	NW 114th Avenue One-Way Northbound & NW 112th Avenue One-Way Southbound	1	1	1	2	4	2	3	4	4	198	**2**

1. The Weighted score (WS) or each alternative concept/strategy, is the sum of the product of the assigned weight (Wi) x the assigned score (Si) for each evaluation criterion, i.e. WS = Σ(Wi Si)*

2. Represents the rank of alternative relative to the specified alternative(s) where noted.

3. Either one of these alternatives will be proposed, not both. Based on their relative total scores, implementing a signal may be more favorable than a roundabout. However, the option to signalize would be subject to confirmation via a signal warrant study (per MUTCD Guidelines) requiring more data collection at the subject intersection.

4. The total of the average scores for the targeted intersection improvements were compared to the total scores for the one way alternatives and ranked accordingly. It is anticipated that all of the "Target Intersection Improvements" can be implemented together (subject to funding) in lieu of either of the two one-way pair alternatives at the City's discretion.

5. The total score for these alternatives were compared to the average score of the Targeted Intersection Improvements and ranked accordingly. As noted in the ranking, the One-Way Pair alternatives are anticipated to be inferior to the Targeted Intersection Improvements.

6.0 FUTURE TRAFFIC VOLUME DEVELOPMENT

Design hour traffic volumes for this Improvement study were developed using the procedures promulgated in the *2014 FDOT Project Traffic Forecasting Handbook* as well as Chapter 6 of the *National Cooperative Highway Research Program (NCHRP) Report 765: Analytical Travel Forecasting Approaches for Project-Level Planning*. These procedures generally involve applying growth rates from a travel demand model or growth rates based on historical trends (as appropriate) to existing traffic counts to derive future traffic projections.

6.1 Growth Rates

The growth derived from the regional travel demand model was compared to the growth rate based on historical trends in the study area to determine the appropriate rate to use to estimate the future traffic in this study.

6.1.1 Travel Demand Model Growth

A limited review of the South East Regional Planning Model (SERPM) Version 7 travel demand model (maintained by the Florida Department of Transportation) was conducted as part of determining the model growth within the study area. Within the study area, the socio-economic input data and transportation network were checked for the 2010 model base year as well as 2040 adopted model future year. Some edits were performed for the purpose of determining a model growth rate that might be used to project existing volumes into the future 2020 planning time frame. **Exhibit 6-1** illustrates the SERPM model networks for 2010 and 2040 Cost Feasible (CF) Plan that were compared in the model growth rate review**.** It should be noted that although the planning horizon year for this improvement study is 2020, a future year of 2040 from the SERPM model was reviewed, since this is the only future year available to develop model growth rates.

Exhibit 6-1: SERPM Model Network

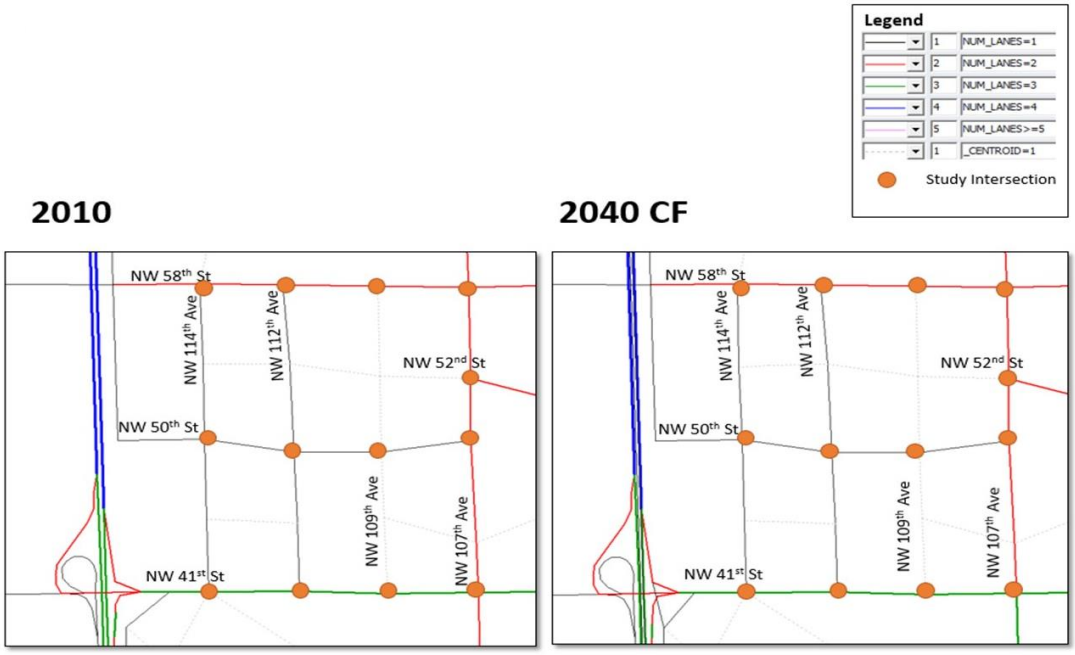


Table 6-1 presents a calculation of the 2010 to 2040 model growth. Based on a comparison of model 2040 volumes to 2010 volumes on roadway link segments, the model growth rate for the study area was found to be 0.34% which is relatively low.

Table 6-1: SERPM 7 Model Growth Rate Review

Corridor	2010		2040		2010 to 2040 Annual Growth Rate
	Total Volume (veh/day)	Average Volume (Veh/day)	Total Volume (veh/day)	Average Volume (Veh/day)	
NW 114th Ave	9,009 10,541 10,776 11,983	10,577	10,661 11,178 11,486 13,108	11,608	0.32%
NW 112th Ave	6,235 6,887 7,265 8,391	7,195	7,871 8,723 8,619 10,544	8,939	0.81%
NW 109th Ave	0 1,677 2,553 1,457	1,422	76 1,307 3,320 2,499	1,800	0.89%
NW 107th Ave	29,951 25,147 23,436 27,234	26,442	32,063 28,346 26,708 30,652	29,442	0.38%
NW 41st St	30,606 20,868 21,413 20,477	23,341	30,178 21,176 23,674 22,915	24,486	0.16%
NW 50th St	234 0 8,650 8,416	4,325	911 675 8,159 9,168	4,728	0.31%
NW 58th St	6,456 14,281 17,760 17,760	14,064	7,074 16,116 19,272 19,287	15,437	0.33%
NW 52nd St	7,562	7,562	8,268	8,268	0.31%
Total	***357,026***	***94,928***	***394,035***	***104,710***	***0.34%***

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6.1.2 Historical Growth

A review of the historical count data available from count sites (included in the Florida Traffic Online database maintained by FDOT) within the study area was conducted to determine the historical trends for growth. **Exhibit 6-2**, graphically illustrates the locations of the historical count sites considered.

Exhibit 6-2: Historical Count Site Locations

Source: FDOT Florida Traffic Online Website

Table 6-2 presents a calculation of the 3-year growth rate based on count sites within the study area.

Table 6-2: Historical Growth Trend Analysis

	Historical AADT (veh /day)					Projected AADT (veh /day)			1 Year Growth	3 Year Growth
Location	2011	2012	2013	2014	2015	2016	2017	2020	GR: 16-17	GR: 17-20
NW 41ST, 250 FT EAST OF NW 114 AVE			40,000	40,000	44,000	45,333	47,333	53,333	4.41%	4.23%
NW 41ST, 200 FT EAST OF NW 114 AVE			42,500	42,500	44,000	44,500	45,250	47,500	1.69%	1.66%
NW 107TH AVE, 200 FT NORTH OF NW 41ST STREET		25,500	25,500	25,500	27,000	27,000	27,450	28,800	1.67%	1.64%
NW 112 AVE, 300 FT SOUTH OF NW 50 STREET				7,100	7,300	7,500	7,700	8,300	2.67%	2.60%
NW 50 STREET 900 FT EAST OF NW 112 AVE			3,600	3,600	3,800	3,867	3,967	4,267	2.59%	2.52%
NW 58 STREET 500 FT EAST OF NW 114 AVE				11,500	11,900	12,300	12,700	13,900	3.25%	3.15%
Areawide AADT / Growth				130,200	138,000	140,500	144,400	156,100	**2.78%**	**2.70%**

As can be seen, the 1 -year historical growth rate is 2.78% and the total 3-year historical growth rate is 2.70%. Given the nominal model growth calculated for the study area, the 3-year 2.70% growth rate was deemed to be more indicative of the anticipated growth trend for the short term 3-year study time frame.

6.2 Design Hour Traffic Volume Development

Design Hour turning movement traffic volumes were developed for the AM and PM peak periods for the 2020 No-Build as well as Build conditions respectively. The following sections provide details of the methodology used to develop the various volume scenarios as well as summaries of those volumes.

6.2.2 No-Build Future Volume Development

Future volume projections for intersections within the study area were developed for the 2020 No-Build conditions. The No-Build future traffic projections were derived by applying the 3-year growth rate calculated in **Section 6.1.2** to the balanced existing 2017 volumes developed in **Section 3.1** of this report.

Exhibits 6-3 to **6-4** on the following pages summarize the AM and PM design peak hour traffic volumes for 2020. Worksheets and input summaries for the No-Build future volume development are included in **Appendix D.**

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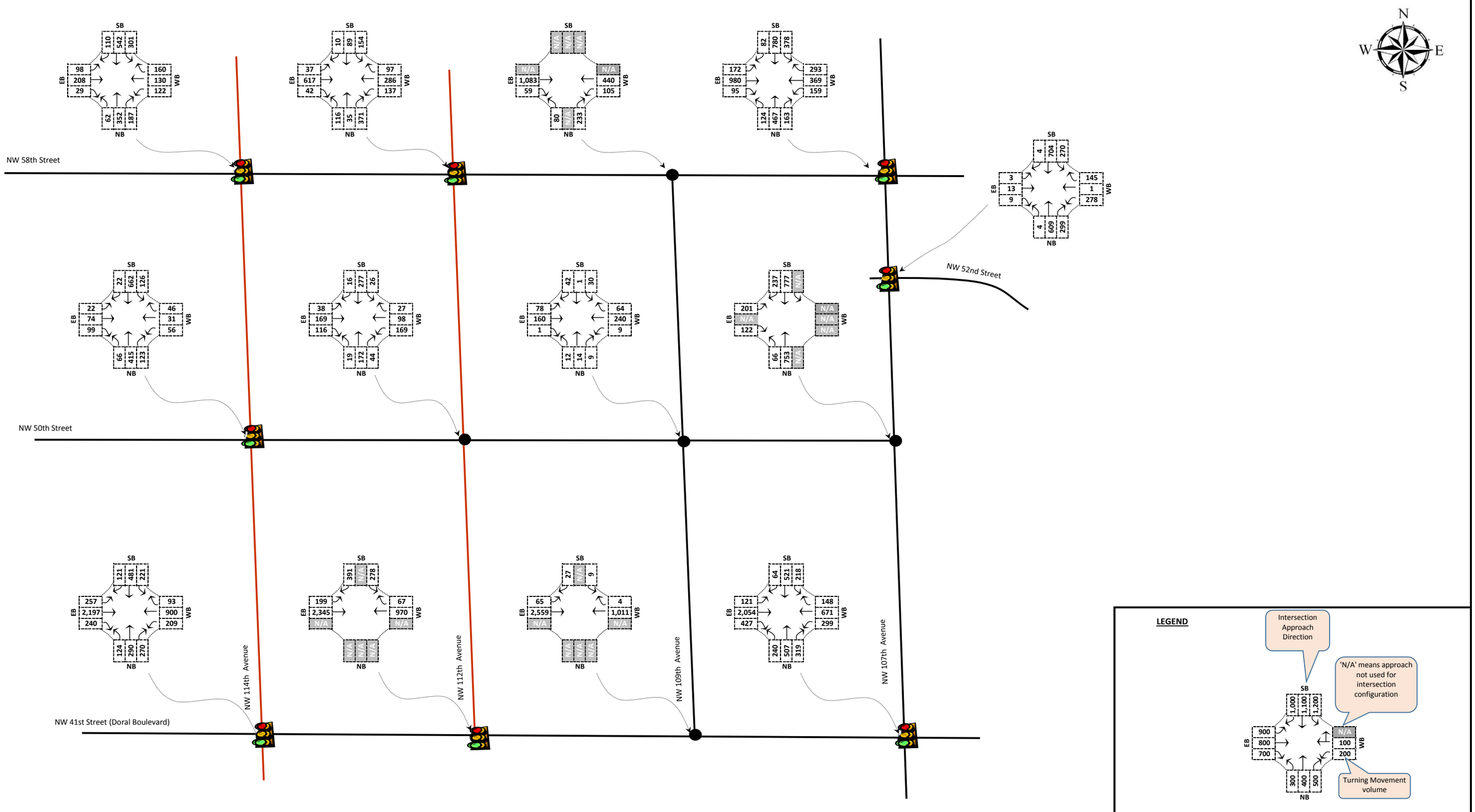


LEGEND

Project Name:

DORAL FLORIDA

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

2020 No-Build AM Peak Hour Volumes

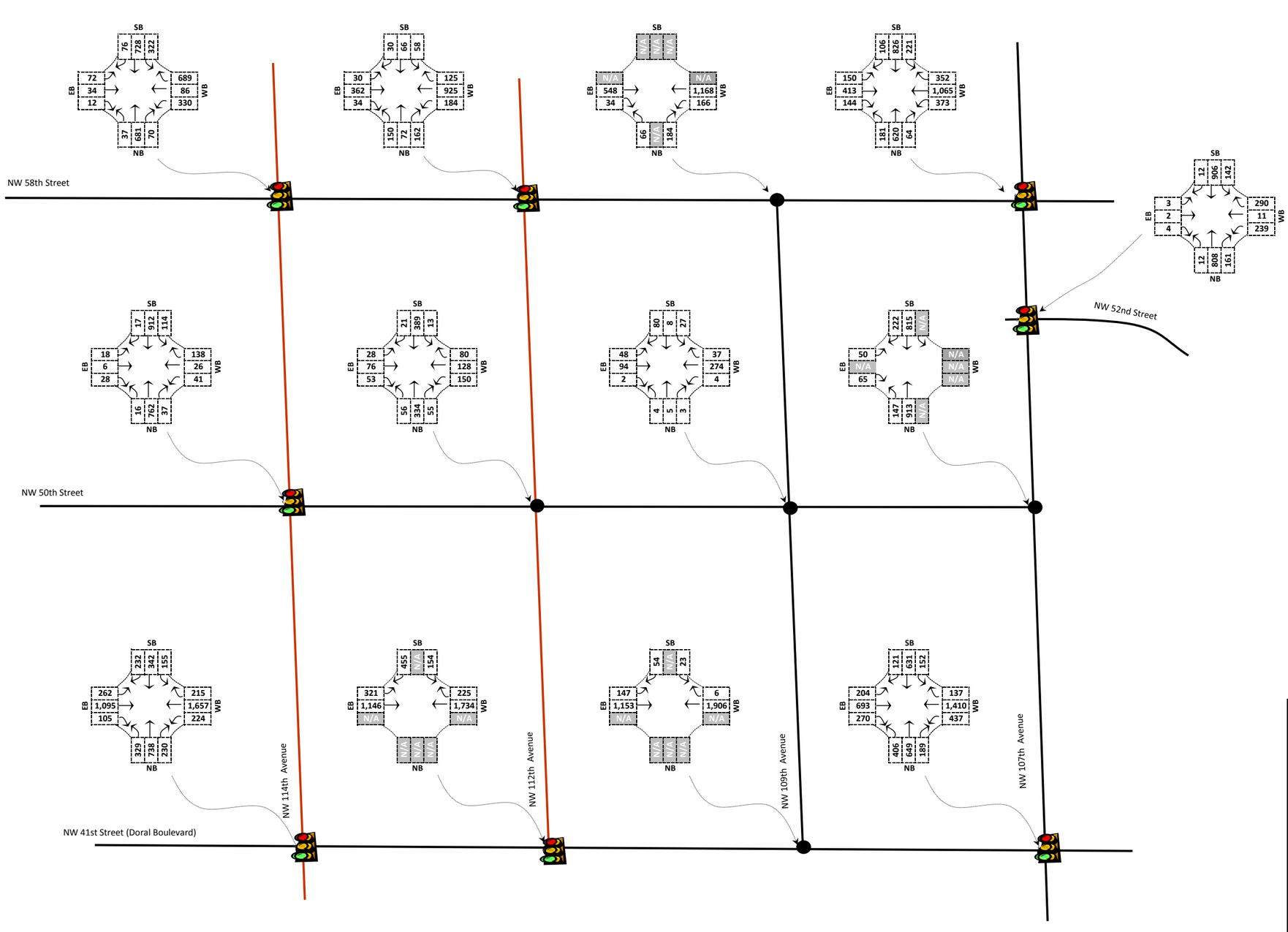
Prepared By:

BCC Engineering, Inc.
4901 NW 17th Way | Suite 506
Fort Lauderdale, FL 33309
Phone: 954-928-1828

Exhibit No. 6-3

Page No.

Date 08/16/17



Proiect Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **2020 No-Build PM Peak Hour Volumes**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 6-4
			Page No.
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6.2.3 Build Future Volume Development

The Build Alternative design traffic for future year 2020 was developed from the No-Build Alternative design traffic by reassigning traffic according to the Build Alternative designs for Options 1 & 2 (i.e., the One-Way Pair alternatives). For the "Targeted Intersection Improvements" Build alternative, the No-Build volumes will still apply since no change in traffic circulation patterns is anticipated due to this alternative. The methodology used to develop the future volumes for build Option 1 (NW 114th Avenue Northbound / NW 112th Avenue Southbound) and build Option 2 (NW 114th Avenue Southbound / NW 112th Avenue Northbound) is as follows:

- Eight (8) corridors within the study area to be impacted by either Option 1 or 2 were first defined to include:
  - Corridor 1: NW 58th St
  - Corridor 2: NW 52nd St
  - Corridor 3: NW 50th St
  - Corridor 4: NW 41st St
  - Corridor 5: NW 107th Ave
  - Corridor 6: NW 109th Ave
  - Corridor 7: NW 112th Ave
  - Corridor 8: NW 114th Ave
- The SERPM7 Build 1, Build2 output volumes were compared to the output volumes from the No-Build scenario model to calculate the percentage impact by corridor due to each alternative.
- The 2020 No-Build turning volumes were then logically diverted to develop new TMVs for the Build 1 and Build 2 alternatives. This was an iterative process and included additional adjustments as necessary to maintain the percentage impacts by corridor forecasted by the models arising from traffic diversions due to the build alternatives.

Exhibits 6-5 to **6-8** on the following pages summarize the AM and PM peak hour Traffic volumes for the 2020 Build Options 1 & 2 conditions. Worksheets and input summaries for the Build future volume development are included in **Appendix D.**

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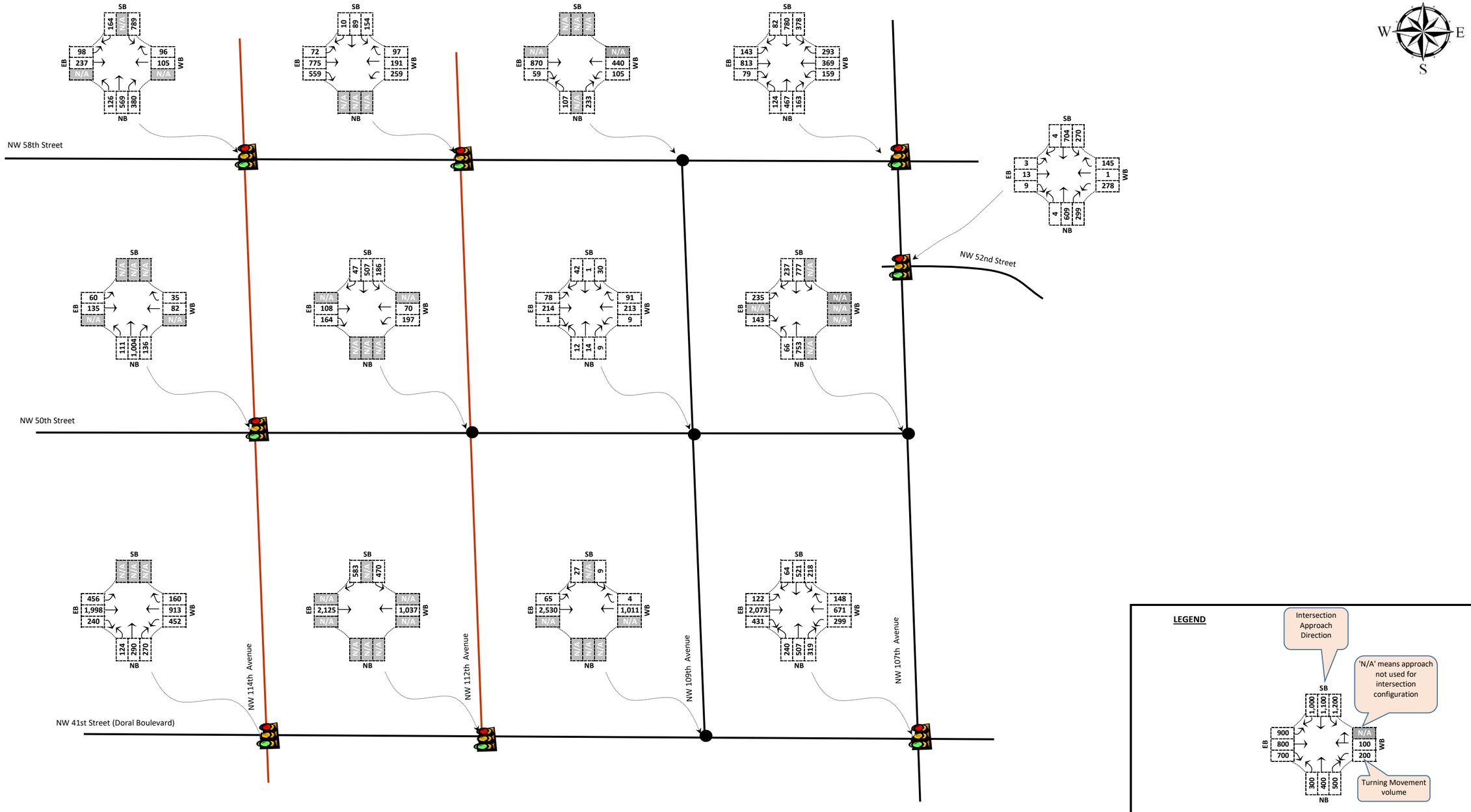
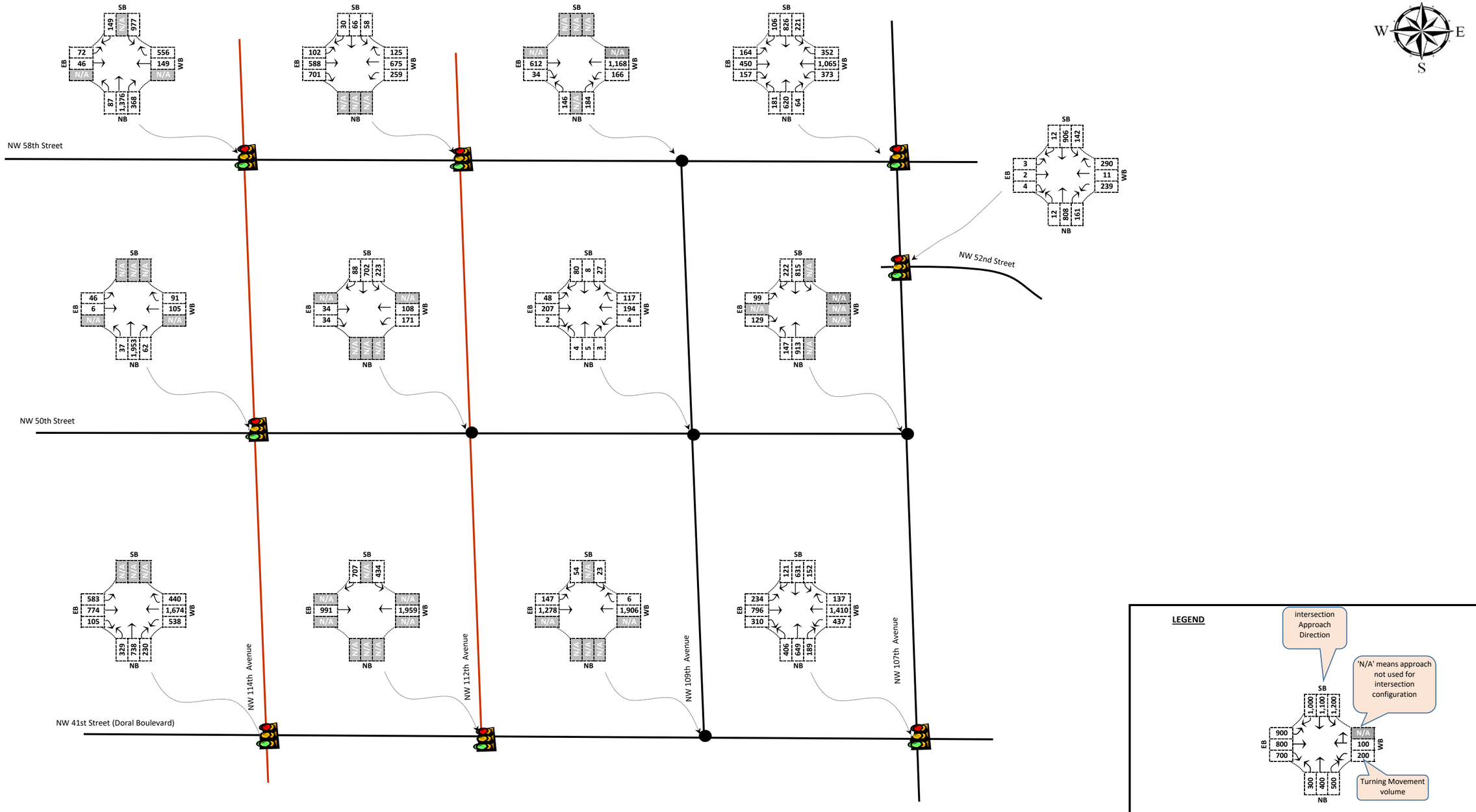


Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **2020 Build Scenario 1 - AM Peak Hour Volumes**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 6-5 *Page No.* *Date* 08/09/17



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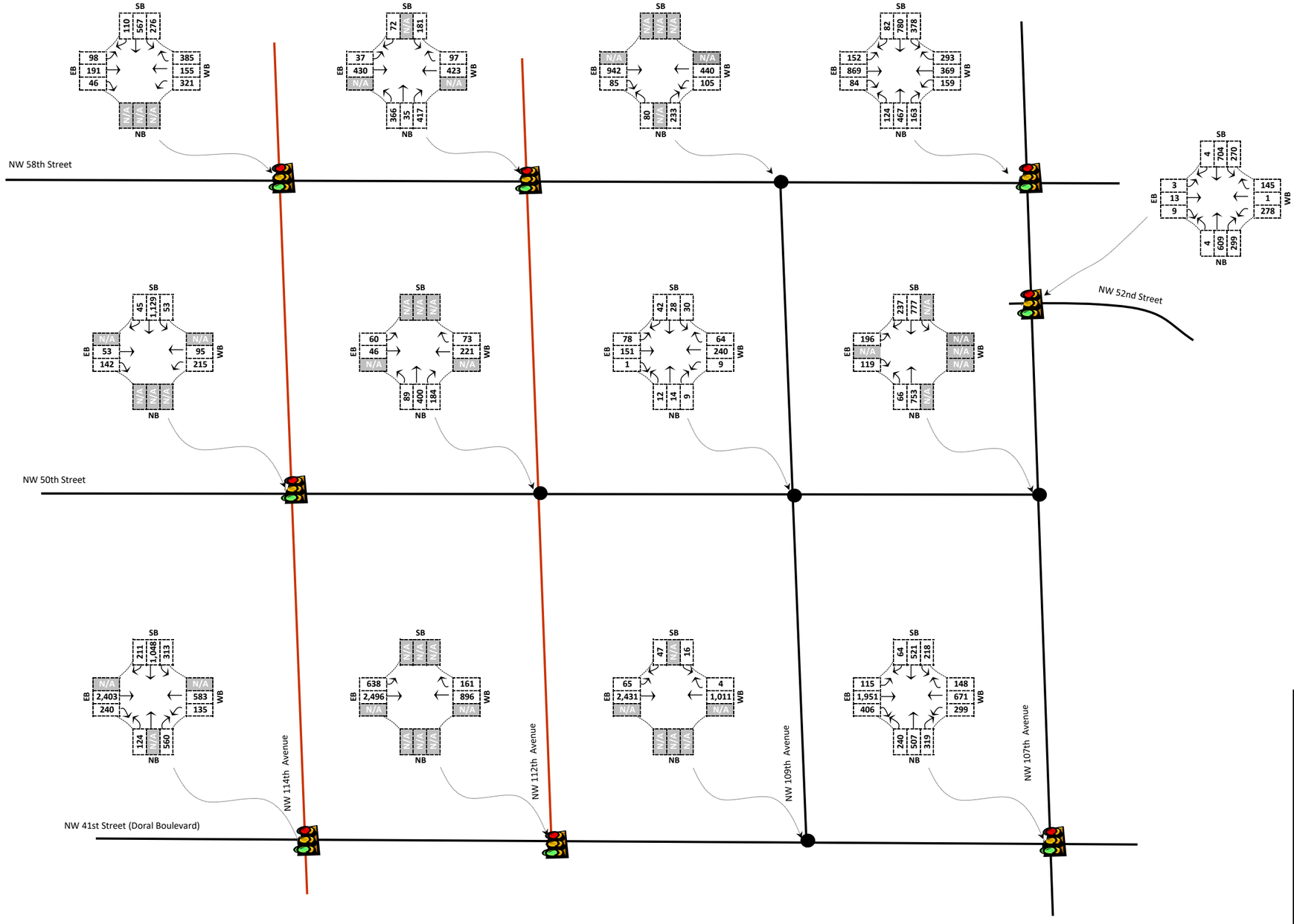
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **2020 Build Scenario 1 - PM Peak Hour Volumes**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 6-6 *Page No.* *Date* 08/09/17



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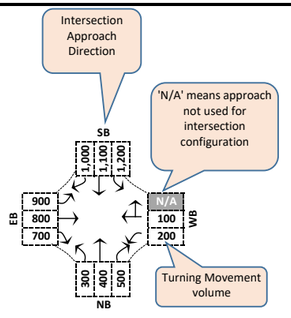

Project Name:

DORAL FLORIDA

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

2020 Build Scenario 2 - AM Peak Hour Volumes

Prepared By:

BCC Engineering, Inc.
4901 NW 17th Way | Suite 506
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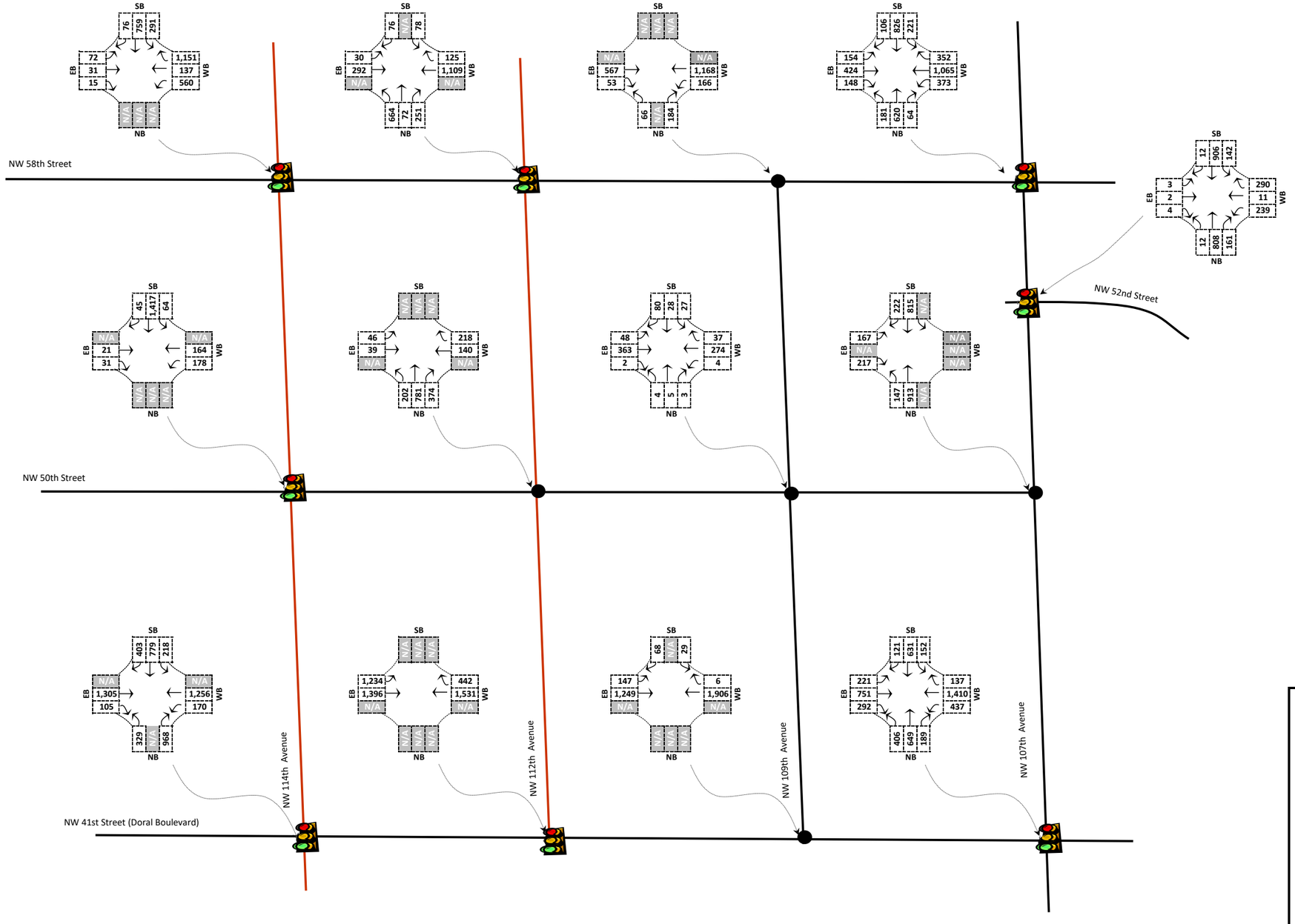
Phone: 954-928-1828

Exhibit No.	6-7
Page No.	
Date	08/09/17



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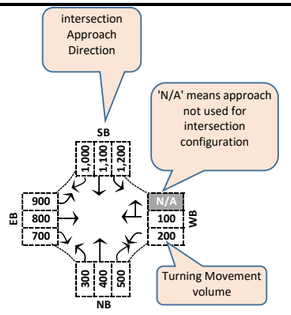


Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **2020 Build Scenario 2 - PM Peak Hour Volumes**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 6-8 *Page No.* *Date* 08/09/17

7.0 FUTURE NO-BUILD TRAFFIC OPERATIONS ANALYSIS

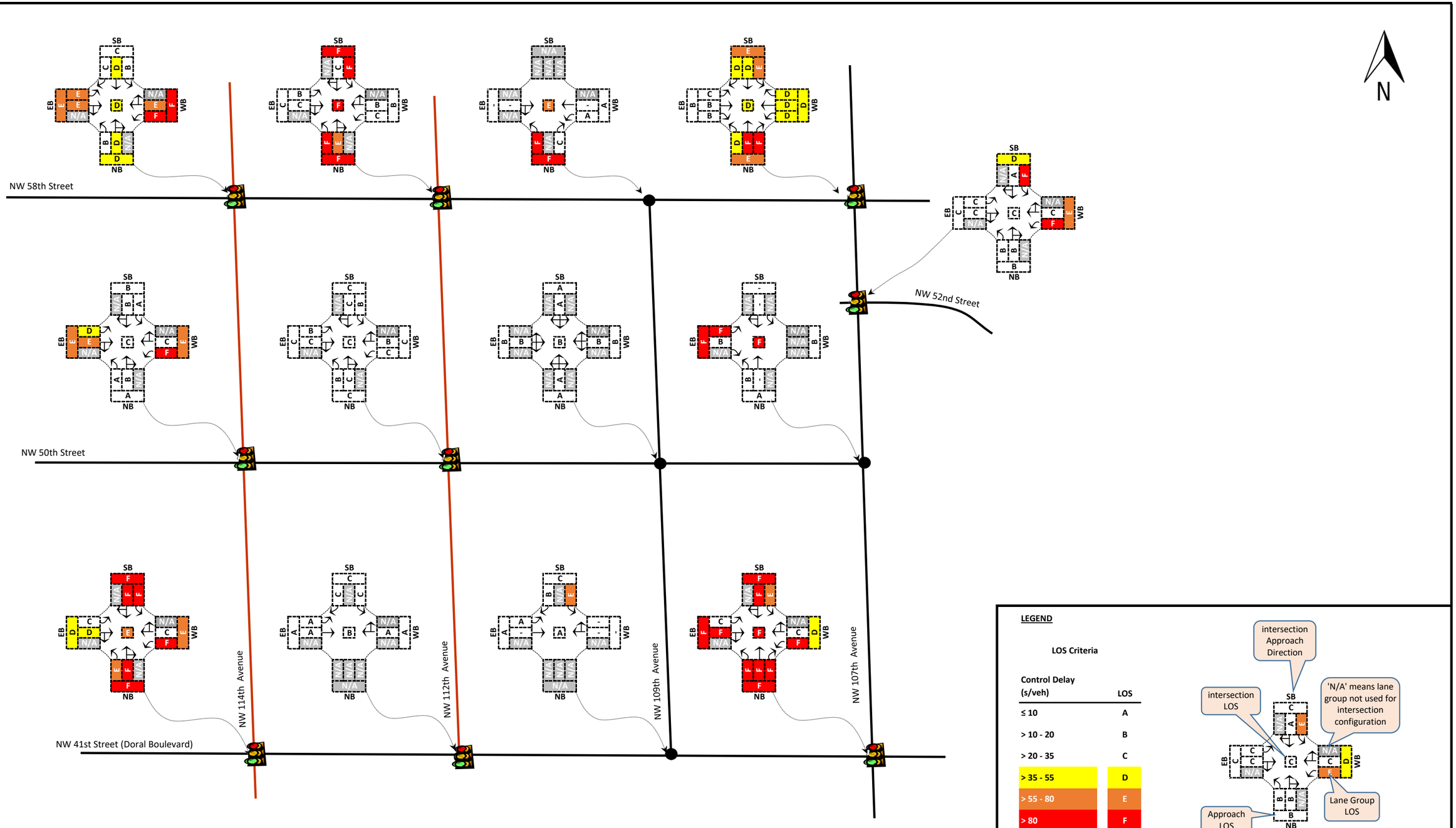
A traffic operations analysis of the 2020 future No-Build conditions within the study area was performed using the methodologies promulgated in the *(HCM) 2010*. Like the analysis performed in **Section 3.3** for existing conditions, traffic operations at the study intersections as well as along the study arterials were analyzed for no-build conditions.

7.1 Intersections Analysis

The operational analysis performed for the 2020 No-Build AM and PM peak traffic periods used the SYNCHRO version 9 traffic analysis software which is based on the HCM 2010. Signal timings were optimized to the extent possible to accommodate the new traffic demand resulting from the future no-build conditions. The results of the intersection operational analyses for the future No-Build AM and PM peak hour conditions are summarized in **Table 7-1** and graphically depicted in **Exhibits 7-1** and **7-2** respectively.

Table 7-1: 2020 No-Build Conditions Intersection Traffic Operations Summary

					Intersection Approach							
			Overall		EB		WB		NB		SB	
Corridor	Intersection	Peak Period	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
NW 114 Avenue	NW 58 Street	AM	53.9	D	66.6	E	106.8	F	41.1	D	31	C
		PM	56.5	E	21.9	C	39.5	D	35.8	D	89.8	F
	NW 50 Street	AM	23.1	C	67.7	E	56	E	9.6	A	10.3	B
		PM	15.3	B	39.5	D	39.7	D	12.3	B	10.7	B
	NW 41 Street	AM	67.4	E	40.8	D	58.4	E	82.7	F	149	F
		PM	135	F	67.4	E	27.1	C	346.1	F	186.2	F
NW 112 Avenue	NW 58 Street	AM	96.7	F	23.8	C	17.3	B	138.3	F	328.2	F
		PM	86.9	F	34.8	C	24.5	C	317.7	F	38.7	D
	NW 50 Street	AM	19.4	C	20.6	C	15.3	C	17.5	C	23.2	C
		PM	41.2	E	15.7	C	18.7	C	47.5	E	63.1	F
	NW 41 Street	AM	12	B	7.1	A	9.7	A	-	-	33.1	C
		PM	18.3	B	12.7	B	17.7	B	-	-	32.8	C
NW 109 Avenue	NW 58 Street	AM	49.9	E	-	-	1.8	A	273.7	F	-	-
		PM	8.7	A	-	-	1.1	A	60.6	F	-	-
	NW 50 Street	AM	10.1	B	10.1	B	10.6	B	8.7	A	8.8	A
		PM	9.8	A	9	A	10.7	B	8.3	A	8.7	A
	NW 41 Street	AM	0.3	A	0.2	A	-	-	-	-	17.3	C
		PM	1.2	A	1.5	A	-	-	-	-	26.9	D
NW 107 Avenue	NW 58 Street	AM	43.7	D	14.9	B	38.5	D	78.9	E	55.6	E
		PM	79	E	40.8	D	130.6	F	44.3	D	47.2	D
	NW 52 Street	AM	34	C	20.3	C	61.8	E	16.1	B	38.9	D
		PM	14.9	B	22.5	C	31.9	C	13.6	B	7.1	A
	NW 50 Street	AM	106.1	F	694.7	F	-	-	1	A	-	-
		PM	13.1	B	197.3	F	-	-	1.9	A	-	-
	NW 41 Street	AM	100	F	120.3	F	47.6	D	108.2	F	98.7	F
		PM	104.9	F	70.7	E	128.5	F	100.4	F	105.2	F



LEGEND

LOS Criteria

Control Delay (s/veh)	LOS
≤ 10	A
> 10 - 20	B
> 20 - 35	C
> 35 - 55	D
> 55 - 80	E
> 80	F

Project Name:

DORAL FLORIDA

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

No-Build 2020 AM Peak Hour Traffic Operations Summary

Prepared By:

BCC Engineering, Inc.
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Ex No. **7-1**

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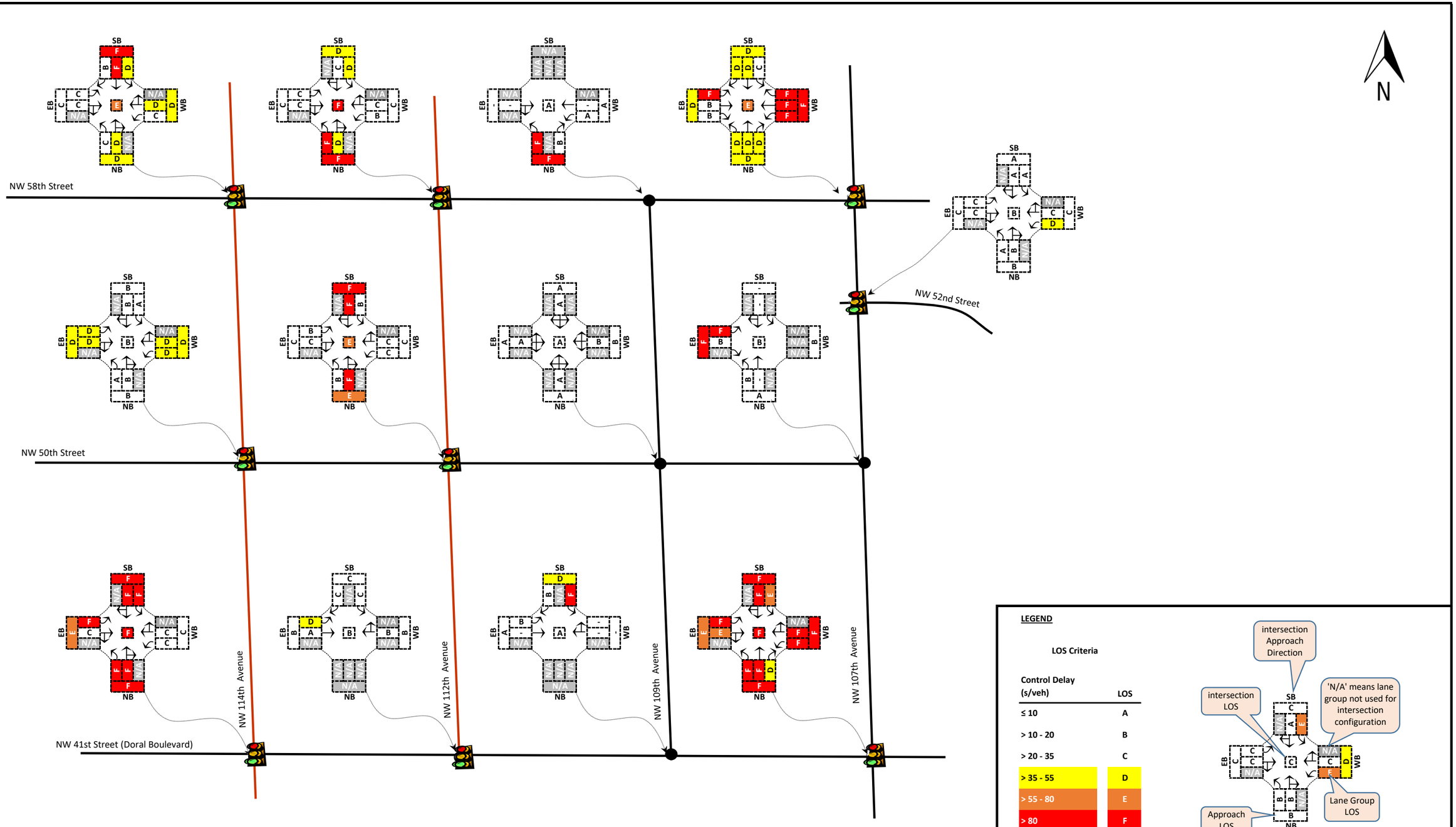
08/15/17



LEGEND

LOS Criteria

Control Delay (s/veh)	LOS
≤ 10	A
> 10 - 20	B
> 20 - 35	C
> 35 - 55	D
> 55 - 80	E
> 80	F

Project Name:

DORAL FLORIDA

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

No-Build 2020 PM Peak Hour Traffic Operations Summary

Prepared By:

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Ex No. **7-2**

Pg No.

08/15/17

As can be seen from the summary results, for the future 2020 no-build condition, several intersections within the study area are projected to operate below the minimum acceptable level of service 'D' standard as follows:

- ***NW 114th Avenue at Doral Boulevard*** – In the AM peak hour, this intersection is projected to operate at LOS 'E' with critical operational failures in multiple lane groups on the northbound and southbound approaches as well as the westbound left turn lane group. In the PM peak hour, this intersection is projected to operate at LOS 'F' with critical operational failures in multiple lane groups on the southbound and northbound approaches as well as the eastbound left turn lane group.
- ***NW 114th Avenue at NW 58th Street*** – In the PM peak hour, overall operations at this intersection are projected to degrade to LOS 'E' with critical operational failures in the southbound through lane group and southbound approach.
- ***NW 112th Avenue at NW 50th Street*** –In the PM peak hour, overall operations at this intersection are projected to degrade to LOS 'E' with critical operational failures in the southbound and northbound through lane groups as well as the overall southbound approach.
- ***NW 112th Avenue at NW 58th Street*** – In the AM peak hour, overall operations at this intersection are projected to degrade to LOS 'F' with critical operational failures in the northbound and southbound left turn lane groups as well as the overall northbound and southbound approaches. In the PM peak hour, overall operations at this intersection are projected to degrade to LOS 'F' with critical operational failures in the northbound left turn lane group as well as the overall northbound approach.
- ***NW 109th Avenue at NW 58th Street*** – In the AM peak hour, overall operations at this intersection are projected to degrade to LOS 'E' with critical operational failures in the northbound left turn lane group as well as the overall northbound approach.
- ***NW 107th Avenue at Doral Boulevard*** – In the AM peak hour, overall operations at this intersection are projected to degrade to LOS 'F' with critical operational failures in multiple lane groups on the southbound, northbound and eastbound approaches as well as the westbound left turn lane group. In the PM peak hour, overall operations at this intersection are projected to degrade further into LOS 'F' with critical operational failures in multiple lane groups on the southbound, northbound and westbound approaches as well as the eastbound left turn lane group.
- ***NW 107th Avenue at NW 50th Street*** – In the AM peak hour, overall operations on the eastbound stop controlled approach of the minor street of NW 50th Street are projected to degrade further into LOS 'F'.
- ***NW 107th Avenue at NW 58th Street*** – In the PM peak hour, overall intersection operations at this intersection are still projected at LOS 'E' with critical operational failures in multiple lane groups on the westbound approach as well as the eastbound left turn lane group.

Output SYNCHRO reports of the existing conditions intersection analyses for the AM and PM peak periods are included in **Appendix E.**

7.2 Arterial Analysis

The results of the operational analyses for the 2020 No-Build AM and PM peak hour conditions are summarized in **Table 7-2**.

Table 7-2: No-Build 2020 Conditions Arterial Traffic Operations Summary

			Direction			
			Northbound		Southbound	
Corridor	Limits	Peak Period	Speed (mph)	LOS	Speed (mph)	LOS
NW 114th Avenue	Between Doral Blvd and NW 58th Street	AM	21.2	C	14.1	D
		PM	20.1	C	11.9	E
NW 112th Avenue	Between Doral Blvd and NW 58th Street	AM	9.8	F	20.2	C
		PM	5.1	F	21.4	C

As can be seen from the results in **Table 7-2**, NW 114th Avenue southbound between Doral Boulevard and NW 58th Street is projected to degrade further into level of service 'E' during the PM Peak Hour which is below the minimum adopted level of service standard 'D' for local roads in the City of Doral. NW 112th Avenue in the northbound direction between Doral Boulevard and NW 58th Street is projected to operate at LOS 'F' during the 2020 no-build PM peak hour and degrade to LOS 'F' during the AM peak hour. Output SYNCHRO arterial reports along the roadway network for the AM and PM peak periods for the 2020 No-build conditions are included in **Appendix E.**

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8.0 ALTERNATIVES DEVELOPMENT & EVALUATION

All alternatives screened in **Section 5.0** of this report were further evaluated. This evaluation included the development of conceptual layouts as well as a general assessment of the potential right of way impacts and an analysis of traffic operations.

8.1 Targeted Intersection Improvements Layout

The targeted intersection improvements presented in this section were proposed to address specific intersection deficiencies. Based on offline sensitivity operations analyses conducted for the 2020 No-build conditions, the following intersection specific intersection improvements were developed:

NW 114th Avenue at Doral Boulevard

The proposed improvements at this intersection are depicted in **Exhibit 8-1** on the following pages and include:

- Proposed installation of an exclusive westbound right turn lane.
- Proposed installation of an exclusive southbound right turn lane with minimum storage length of 150 feet. This improvement will require additional right-of-way since the additional lane will encroach on the sidewalk on the west side of NW 114th Avenue as well as impact the adjacent parking lot in the northwest corner of the intersection.
- Proposed extension of the exclusive eastbound left turn lane on NW 114th Avenue to approximately 270 feet.
- Optimization of signal cycle splits.

NW 114th Avenue at NW 58th Street

The proposed improvements at this intersection are depicted in **Exhibit 8-2** on the following pages and include:

- Proposed modification of lane utilization on the westbound approach to one exclusive left turn lane, one exclusive through lane and one exclusive right turn lane.
- Proposed extension of northbound exclusive left turn lane from 100 feet to 175 feet.
- Optimization of signal cycle splits.

NW 112th Avenue at Doral Boulevard

The proposed improvements at this intersection are depicted in **Exhibit 8-3** on the following pages and include:

- Proposed installation of an exclusive westbound right turn lane on Doral Boulevard. This improvement may require modification of the existing signal mast arm in the northwest corner of the intersection.
- Optimization of signal cycle splits.

NW 112th Avenue at NW 50th Street

The proposed improvements at this intersection considered two options including:

- Roundabout Option depicted in **Exhibit 8-4** in the following pages:
  - This option considers a single lane urban roundabout with an inscribed diameter of approximately 80 feet. The current design would not require additional right-of-way
- Signalization Option depicted in **Exhibit 8-5** in the following pages:
  - This improvement will require utility call outs for further refinement.
  - Optimization of signal cycle splits.
  - A signal warrant study should be conducted at this location according to the guidelines promulgated in *Chapter 4 of the Manual of Uniform Traffic Control Devices (MUTCD) published by FHWA*, to confirm that traffic conditions meet national and state thresholds for a traffic signal.

NW 112th Avenue at NW 58th Street

The proposed improvements at this intersection are depicted in **Exhibit 8-6** on the following pages and include:

- Proposed extension of northbound exclusive left turn lane from 150 feet to 200 feet.
- Optimization of signal cycle splits.

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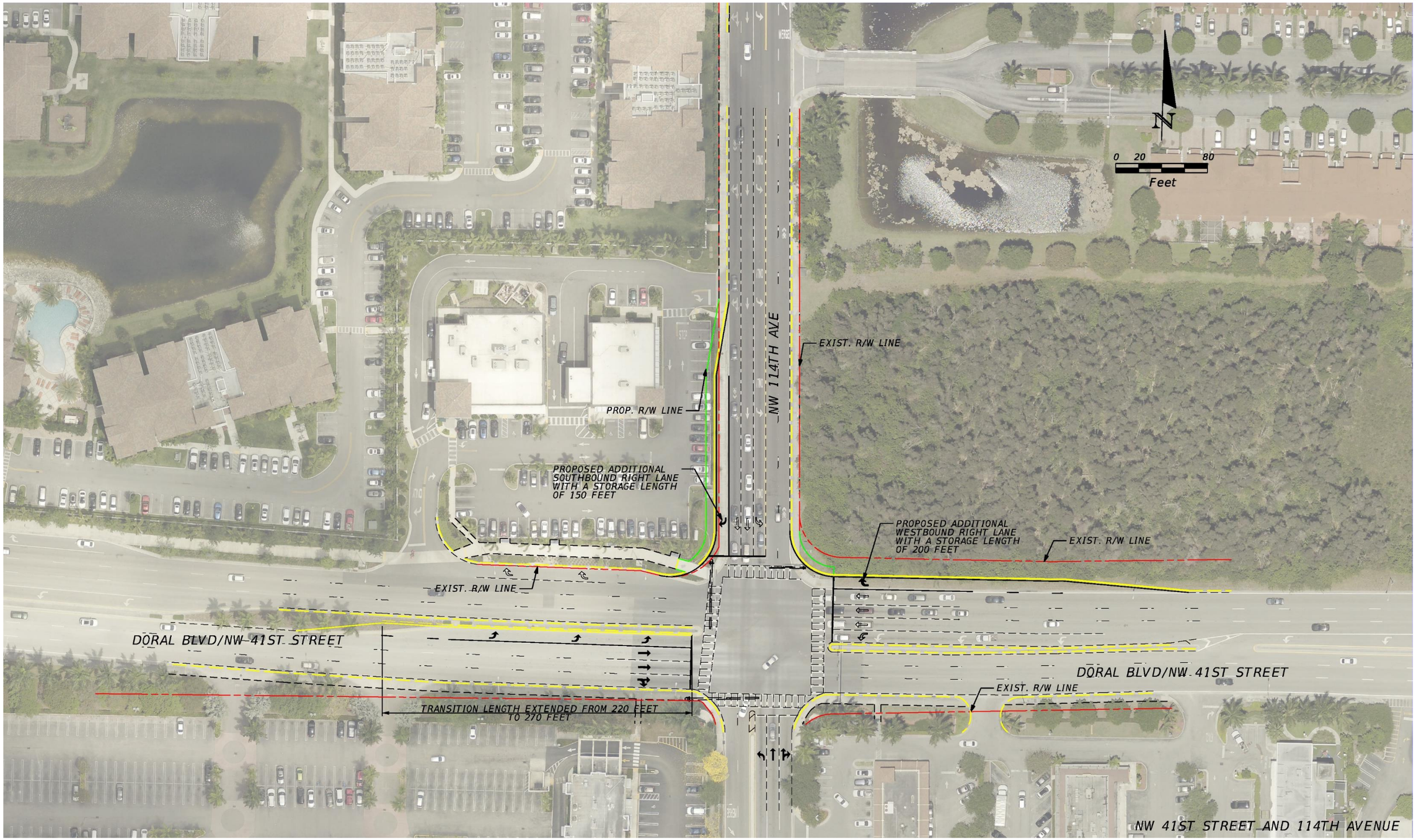
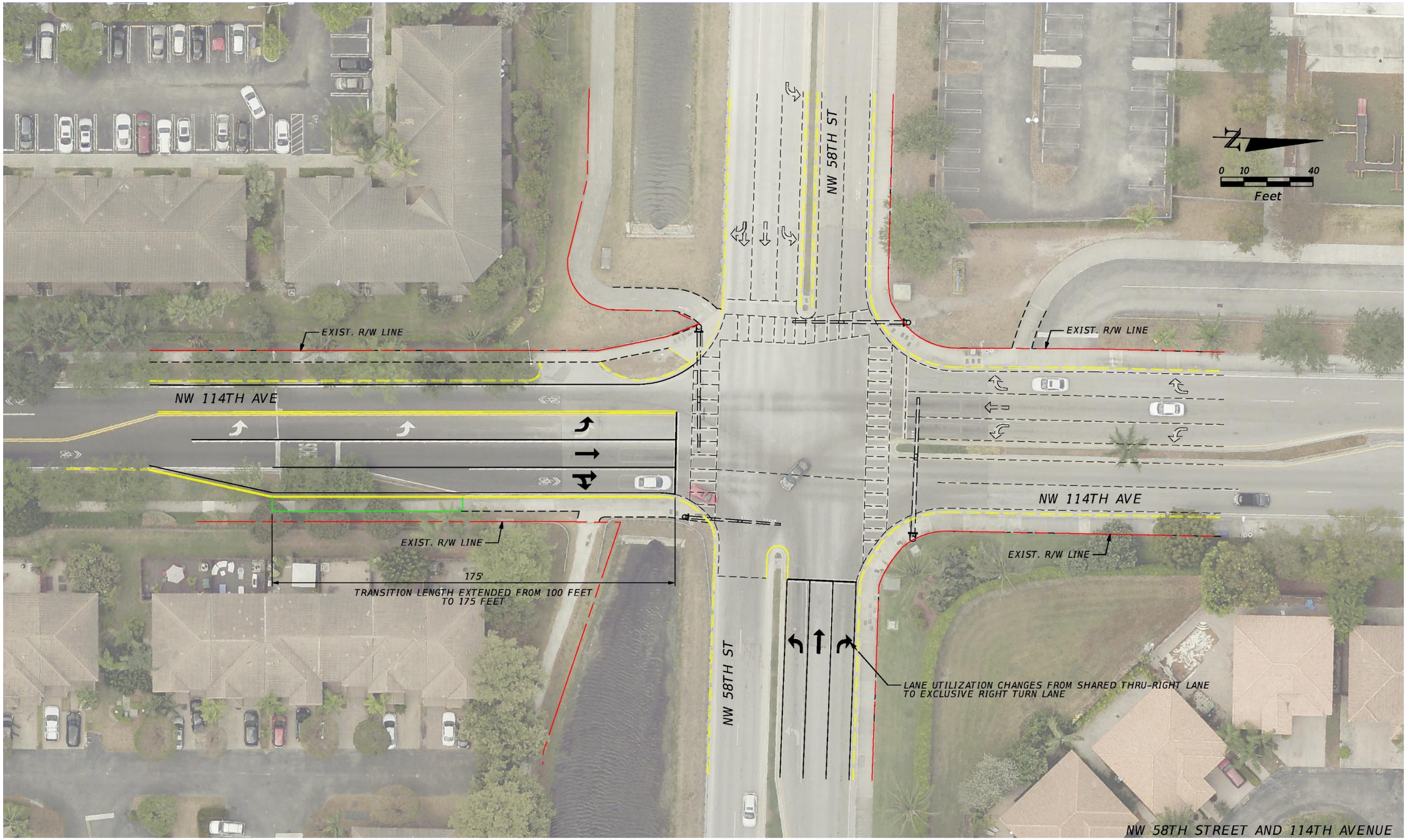
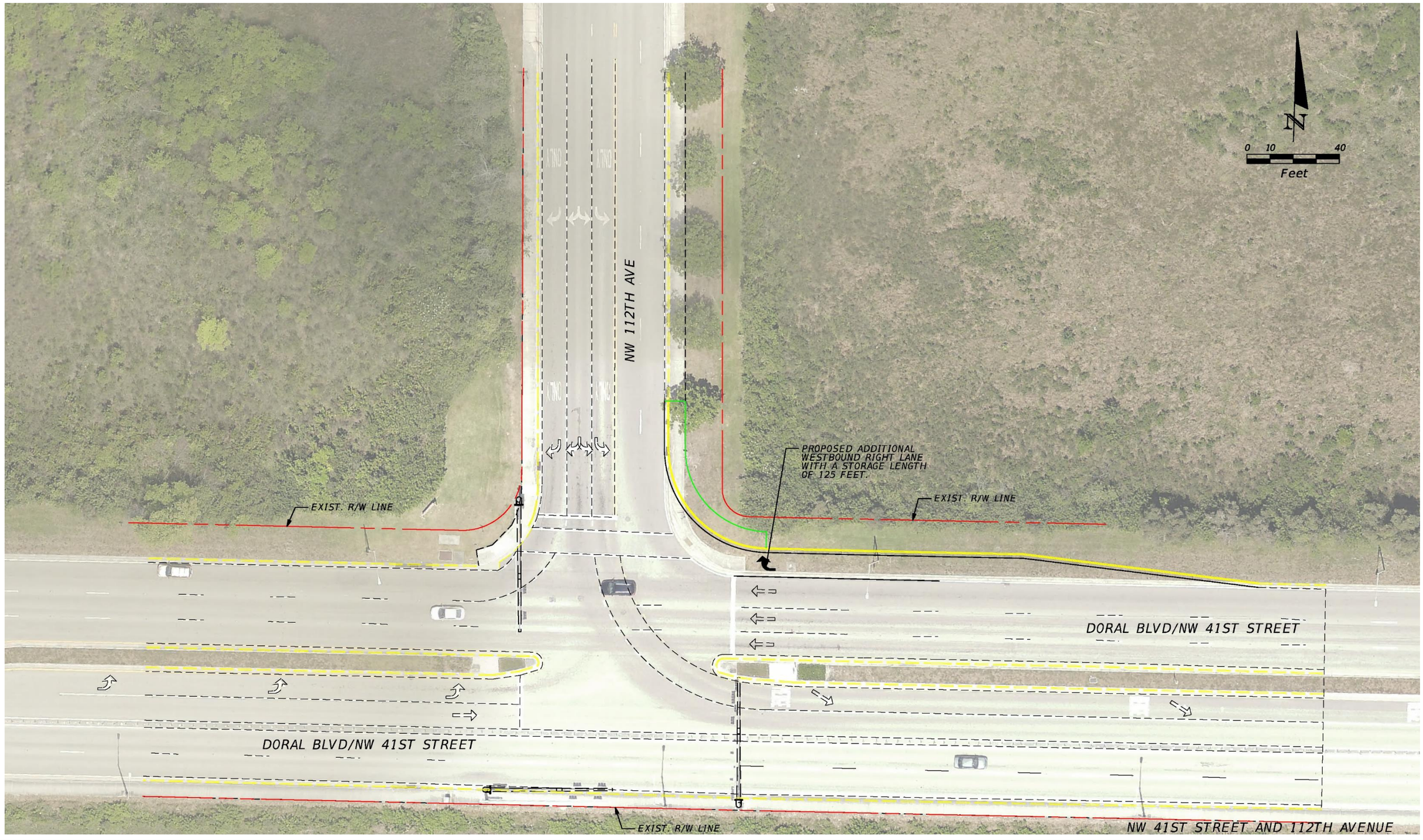


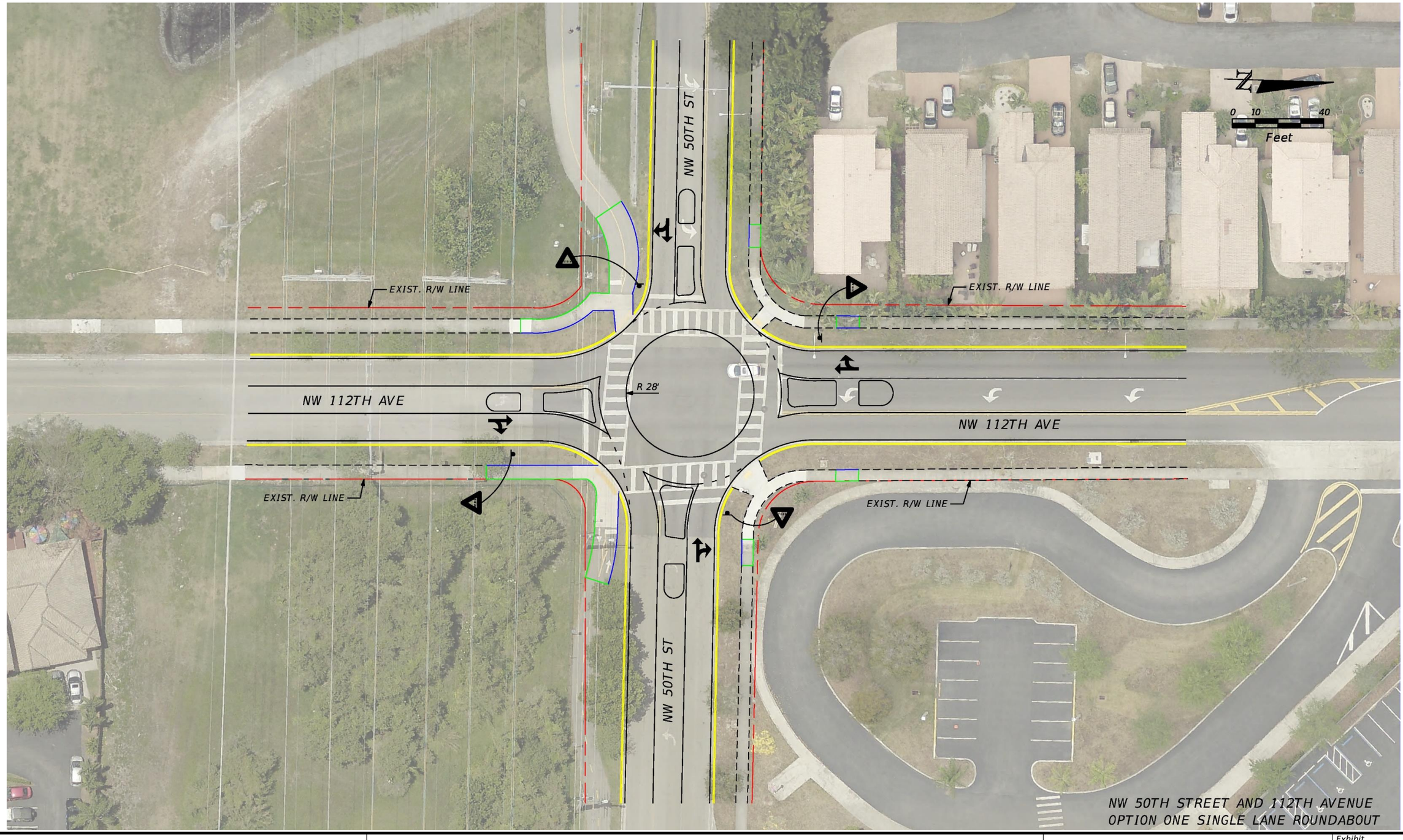
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **NW 114th Avenue at Doral Boulevard Improvements Layout**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-1 *Page No.* *Date:* 8/9/17



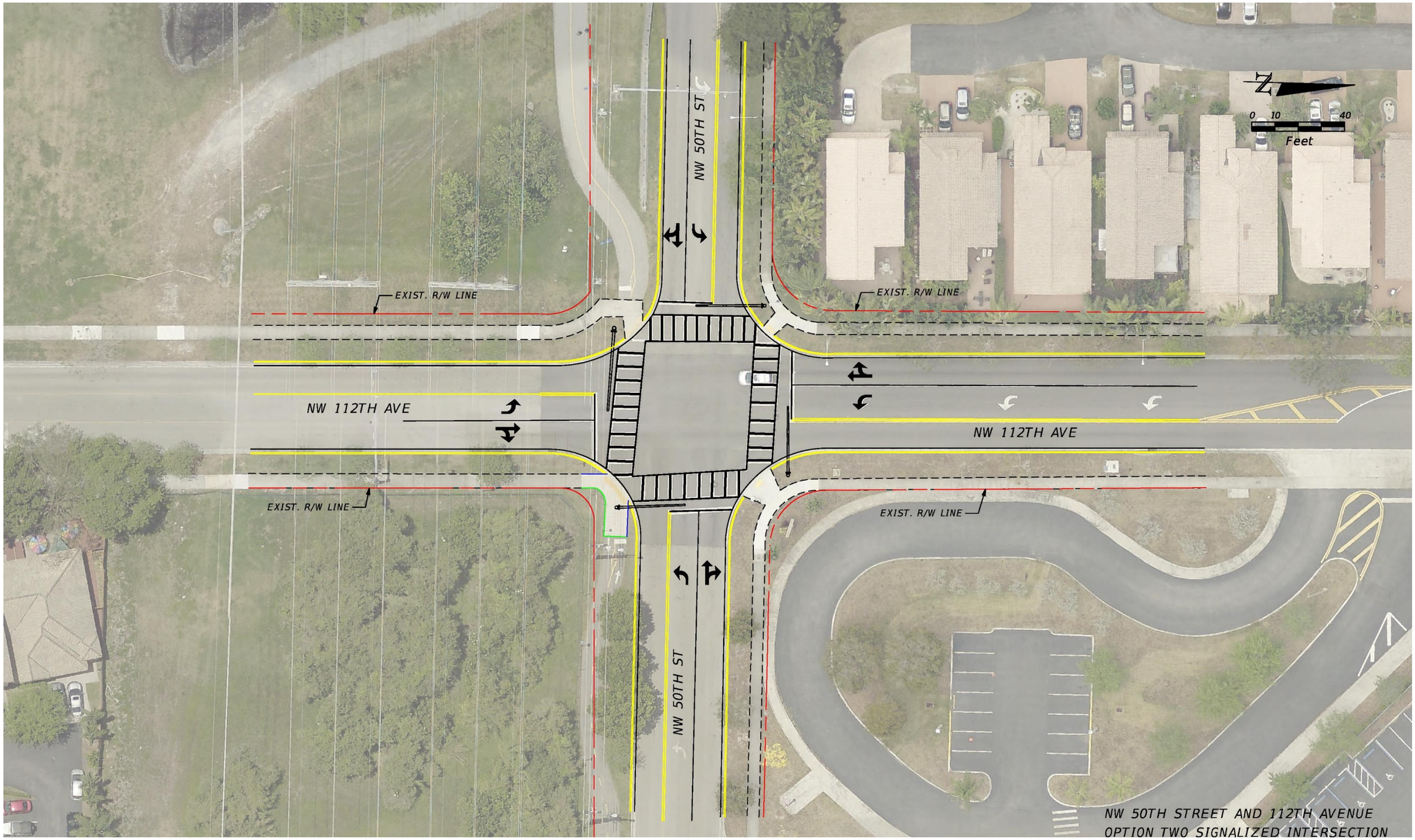
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **NW 114th Avenue at NW 58th Street Improvements Layout**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-2 *Page No.* *Date:* 8/9/17



Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **NW 112th Avenue at Doral Boulevard Improvements Layout**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-3 *Page No.* *Date:* 8/9/17



Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **NW 112th Avenue at NW 50th Street Improvements Layout (Roundabout Option)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-4 *Page No.* *Date:* 8/9/17



Project Name:

DORAL FLORIDA

NW 114 Ave & NW 112 Ave Improvement Study

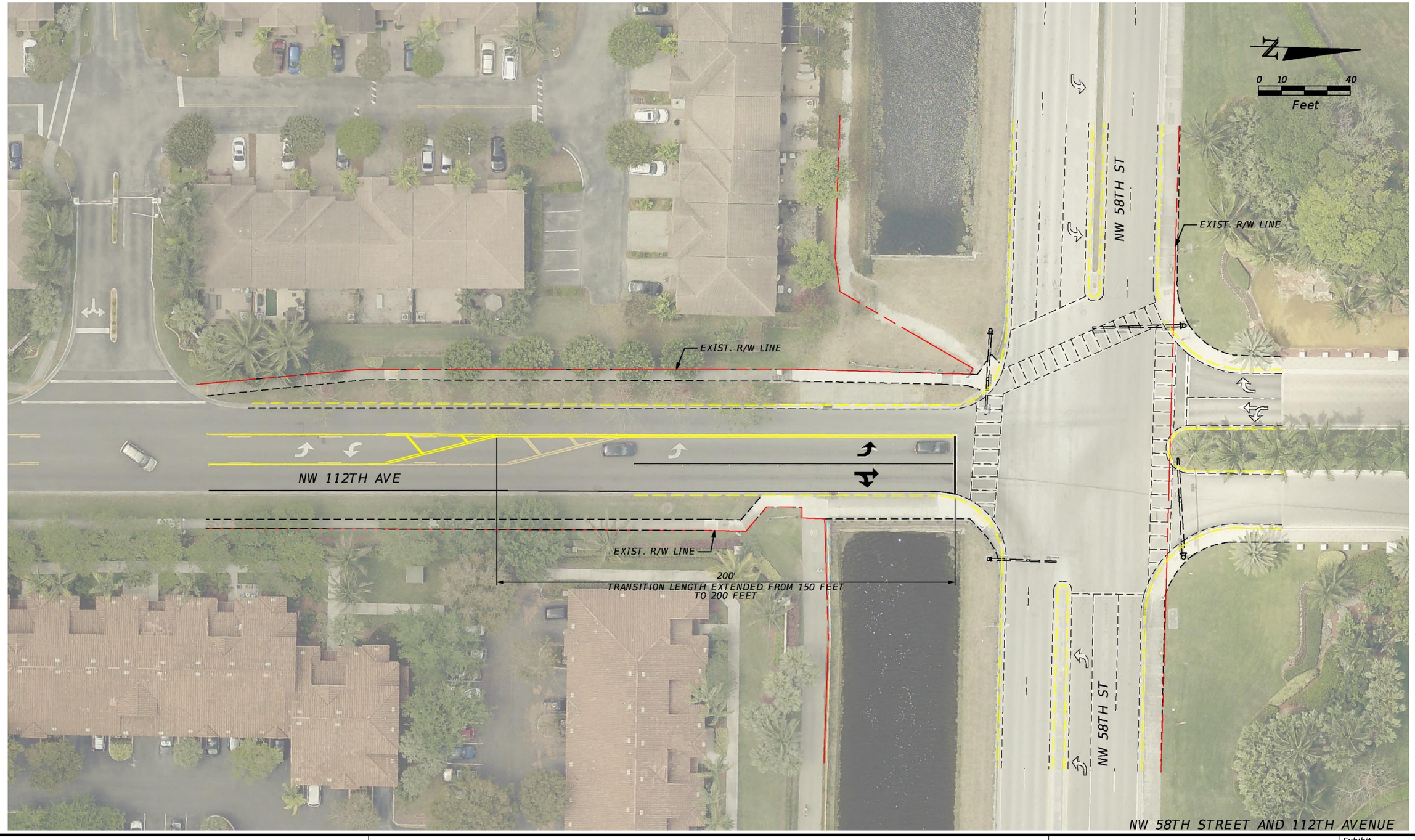
Exhibit Name:

NW 112th Avenue at NW 50th Street Improvements Layout (Signalization Option)

Prepared By:

BCC Engineering, Inc.
4901 NW 17th Way | Suite 506
Fort Lauderdale, FL 33309
Phone: 954-928-1828

Exhibit No.	8-5
Page No.	
Date:	8/9/17



Project Name:

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

NW 112th Avenue at NW 58th Street Improvements Layout

Prepared By:

BCC Engineering, Inc.
4901 NW 17th Way | Suite 506
Fort Lauderdale, FL 33309
Phone: 954-928-1828

Exhibit No.	8-6
Page No.	
Date:	8/9/17

8.2 Build Option 1 Improvements Layout

This option includes converting NW 114th Avenue to a one-way northbound only traffic flow and NW 112th Avenue to a southbound only traffic flow between Doral Boulevard and NW 58th Street. Each corridor in the one-way pair would be restriped to include two through lanes and a separated exclusive bike lane. The milling and resurfacing of both study corridors would be necessary to facilitate the restriping of the corridor. Following are important design considerations with respect to these alternatives:

- Since this improvement will potentially result in a lane being centered on the roadway, it should be noted that the cross slope of the roadway would fall within that lane. Per FDOT Plans Preparation Manual (PPM) Volume 1, Section 2.1.5 the cross slope must be applied uniformly over all travel lanes. This requirement for uniformity of cross slope across travel lanes could make matching existing elevations difficult. Accordingly, it may become necessary to modify the cross slope to match the existing ground. If the elevation(s) of the existing ground cannot be tied into, it would then become necessary to reconstruct the curb and gutter.
- The preceding consideration could affect the location of the low points for drainage.
- All driveways would require modification and possible reconfiguration of entrances/exits.
- Intersections of the study corridors at NW 41st and at NW 58th Street will need to be reconfigured to conform to the flow of traffic.

Exhibits 8-7 through **8-22** presents the possible layout and typical sections associated with these improvements.

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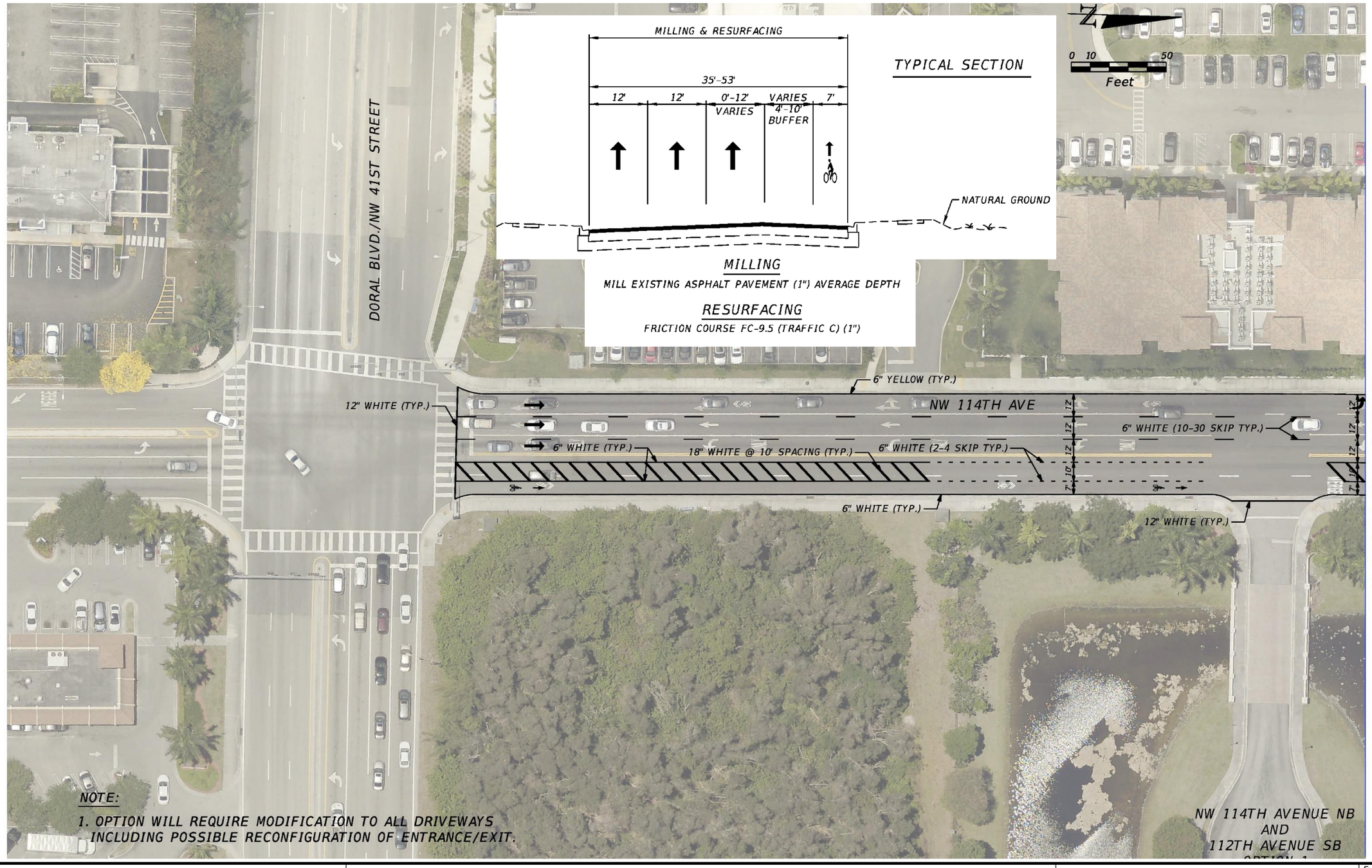
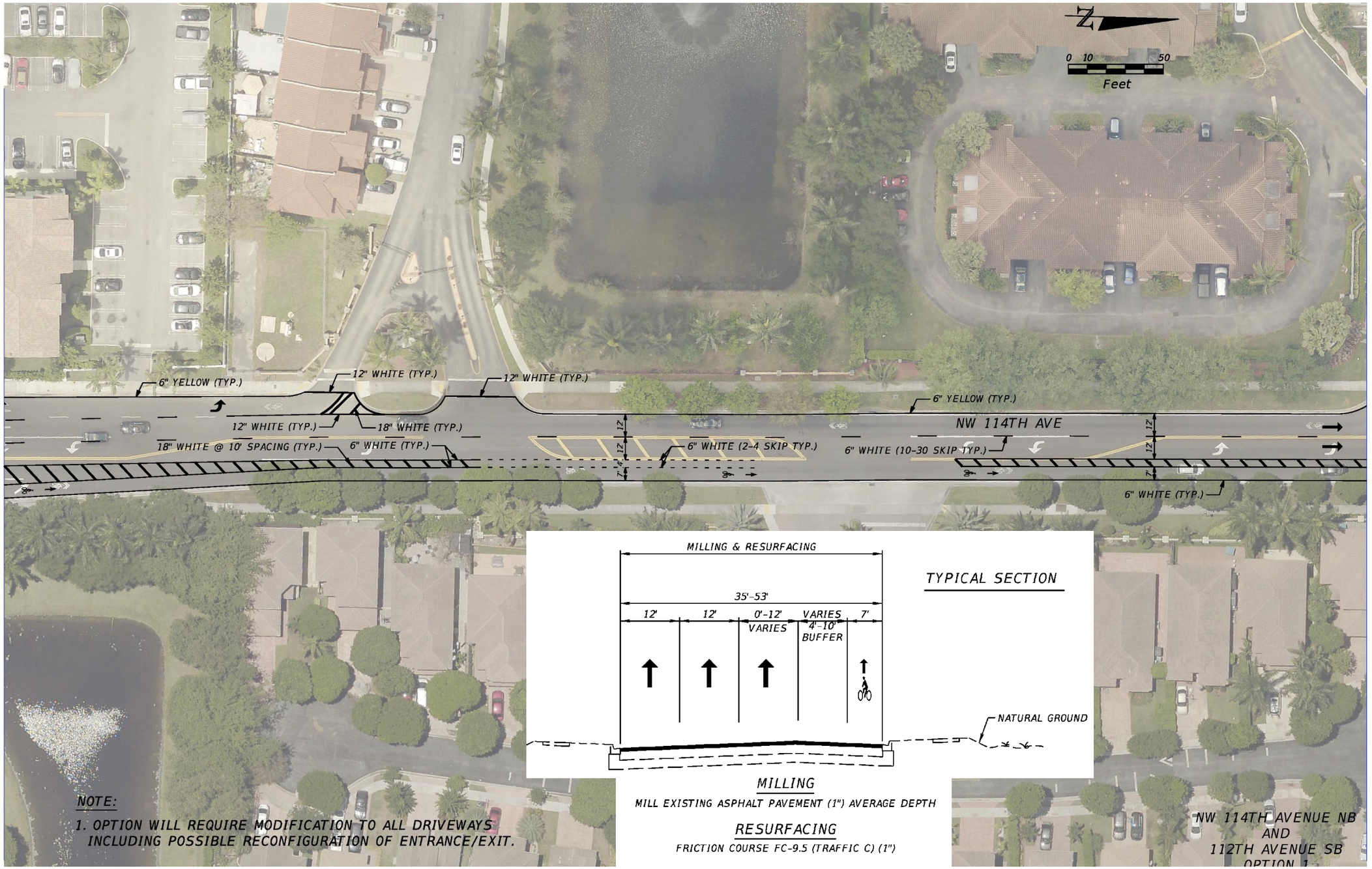


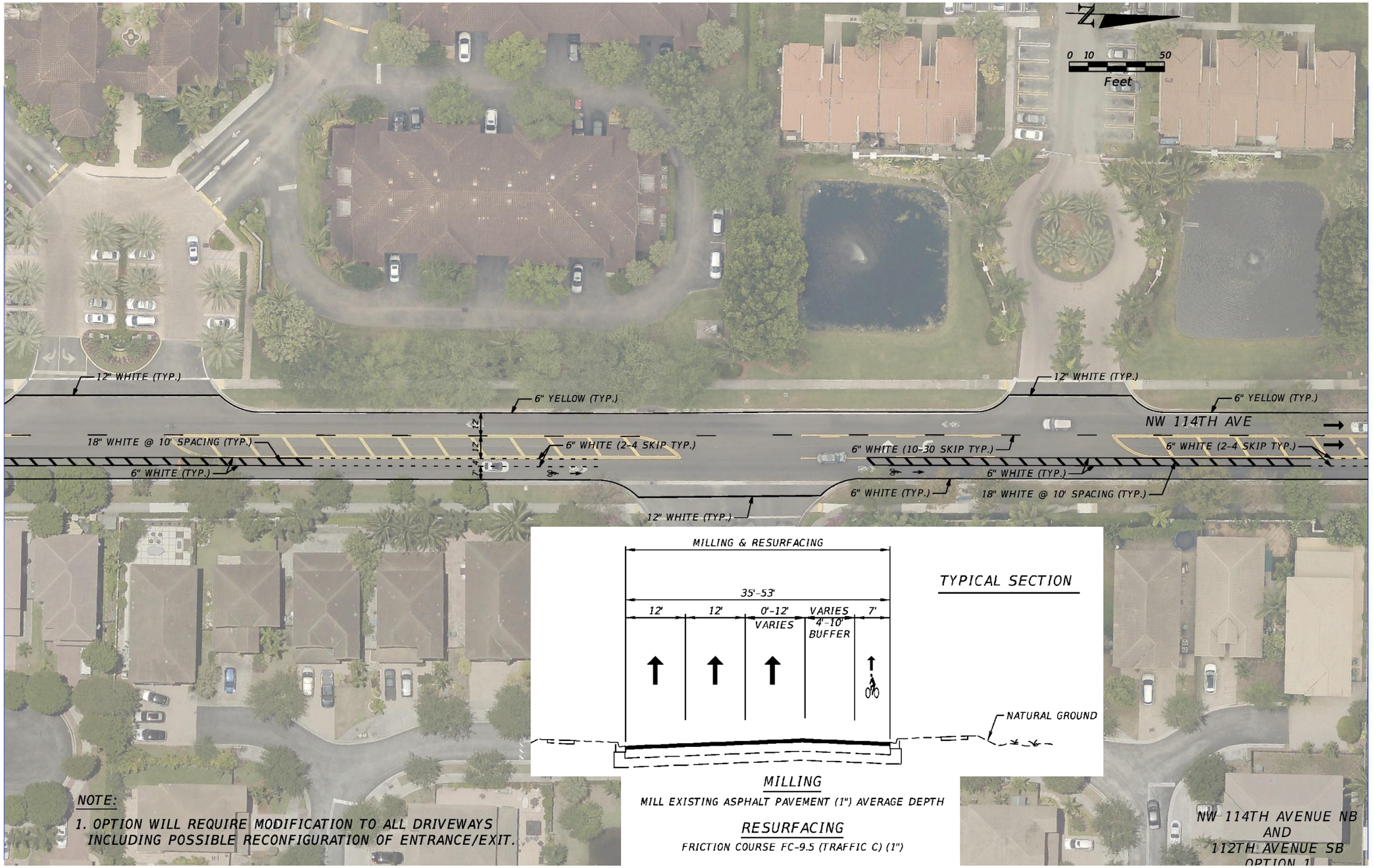
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 1: NW 114th Avenue Northbound Only Layout (Sheet 1 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-7 *Page No.* *Date:* 8/9/17

MATCHLINE SHEET 1

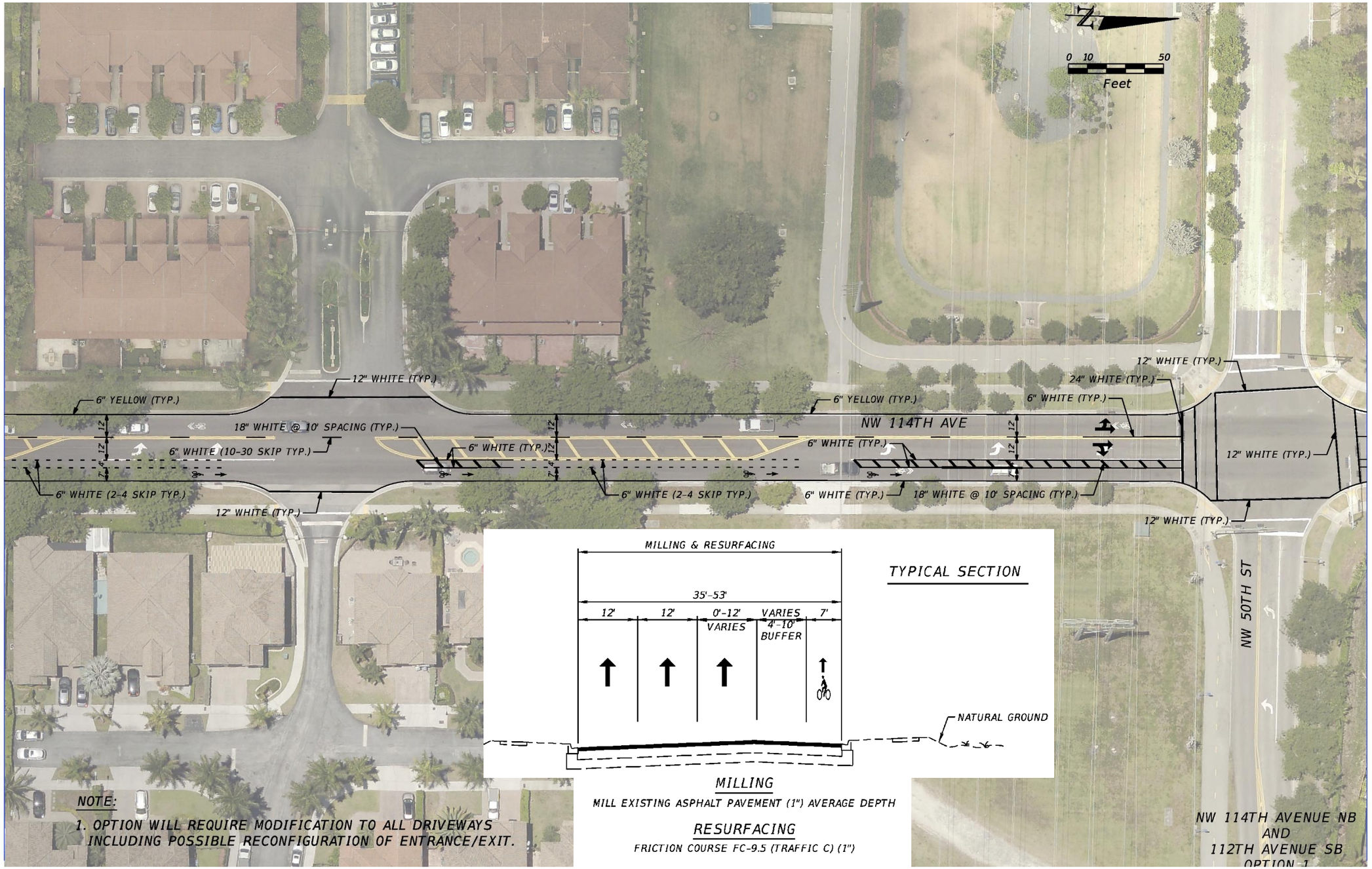
MATCHLINE SHEET 3



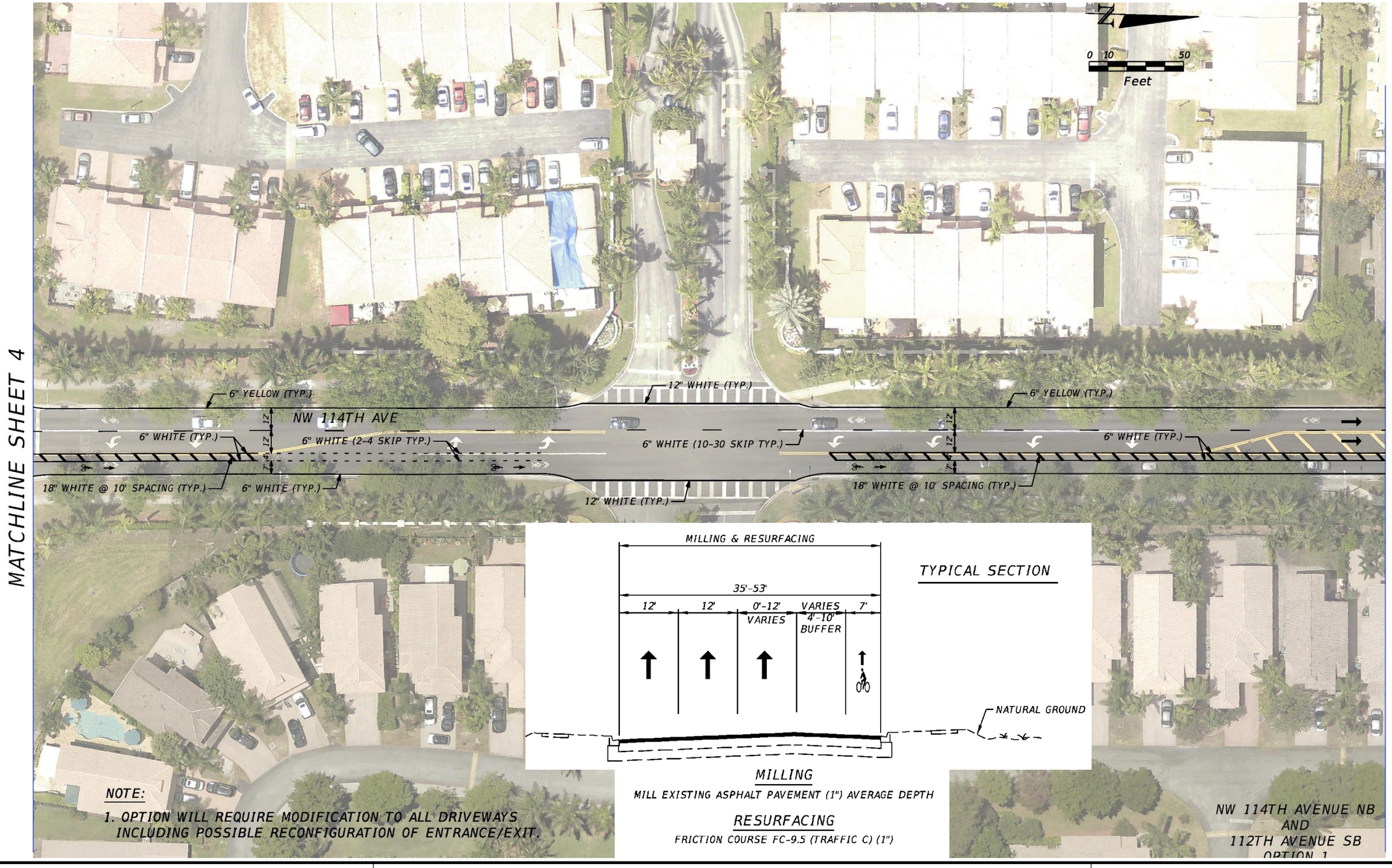
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 1: NW 114th Avenue Northbound Only Layout (Sheet 2 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-8 Page No. Date: 8/9/17



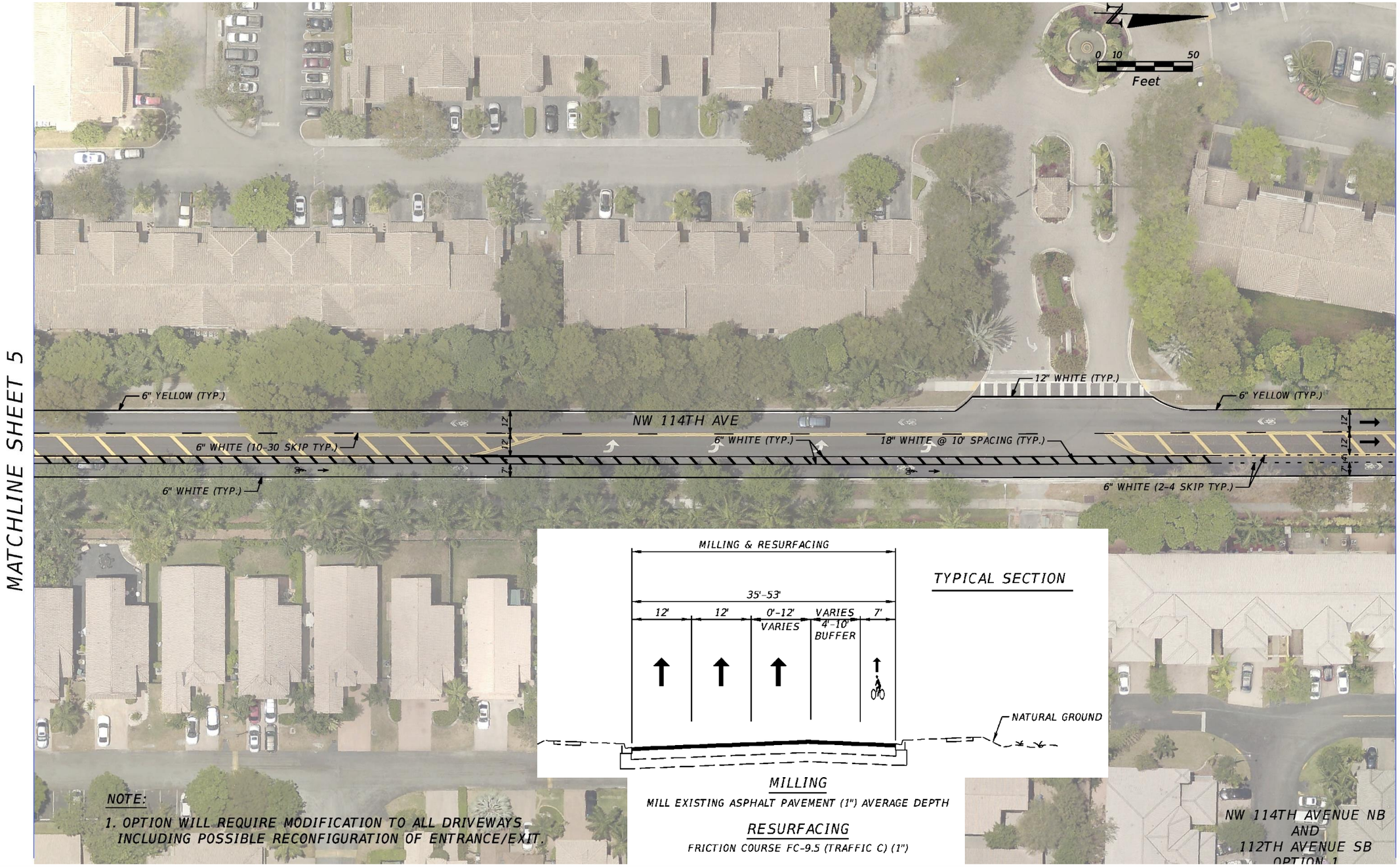
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 1: NW 114th Avenue Northbound Only Layout (Sheet 3 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-9 Page No. Date: 8/9/17



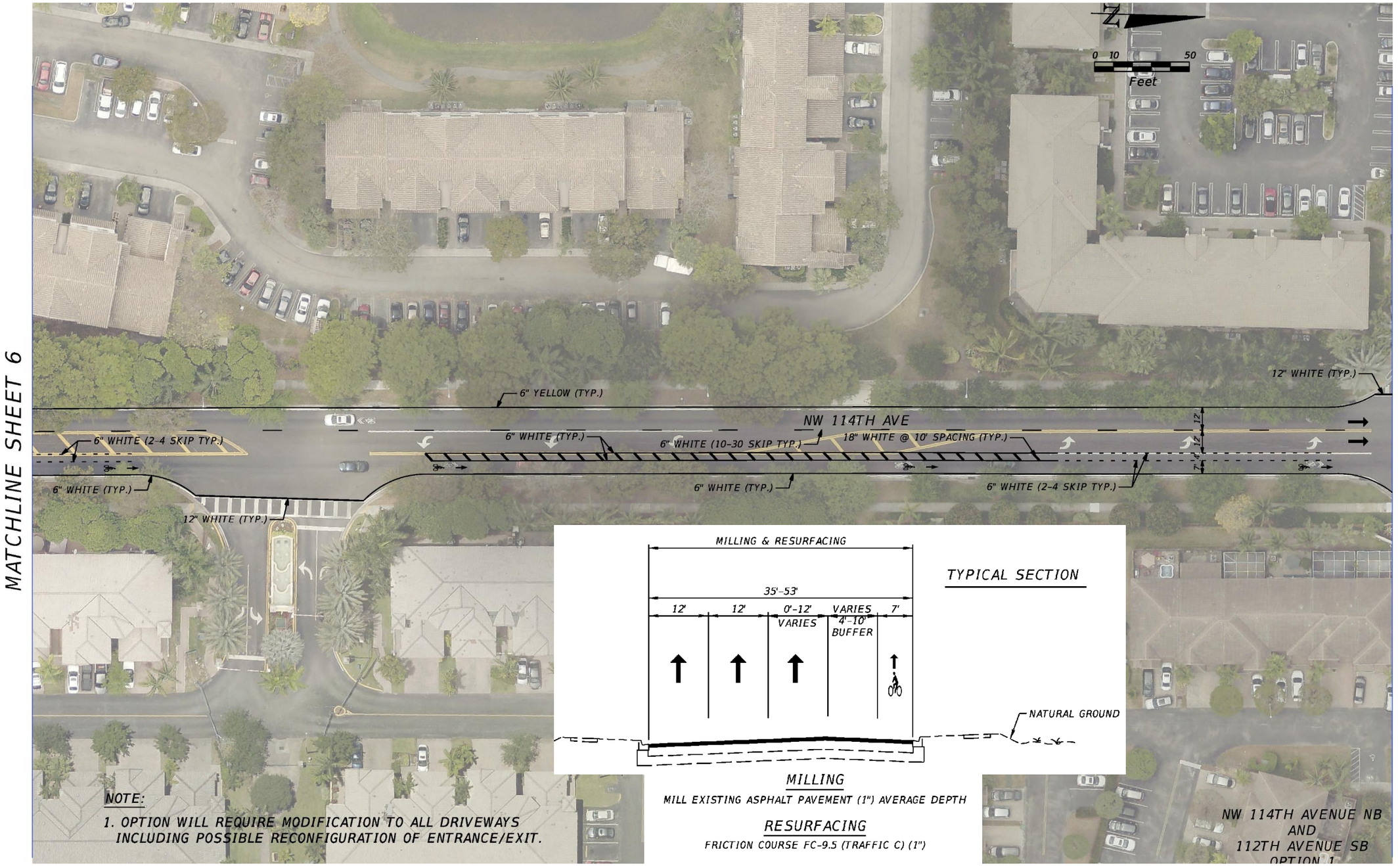
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 1: NW 114th Avenue Northbound Only Layout (Sheet 4 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-10 Page No. Date: 8/9/17



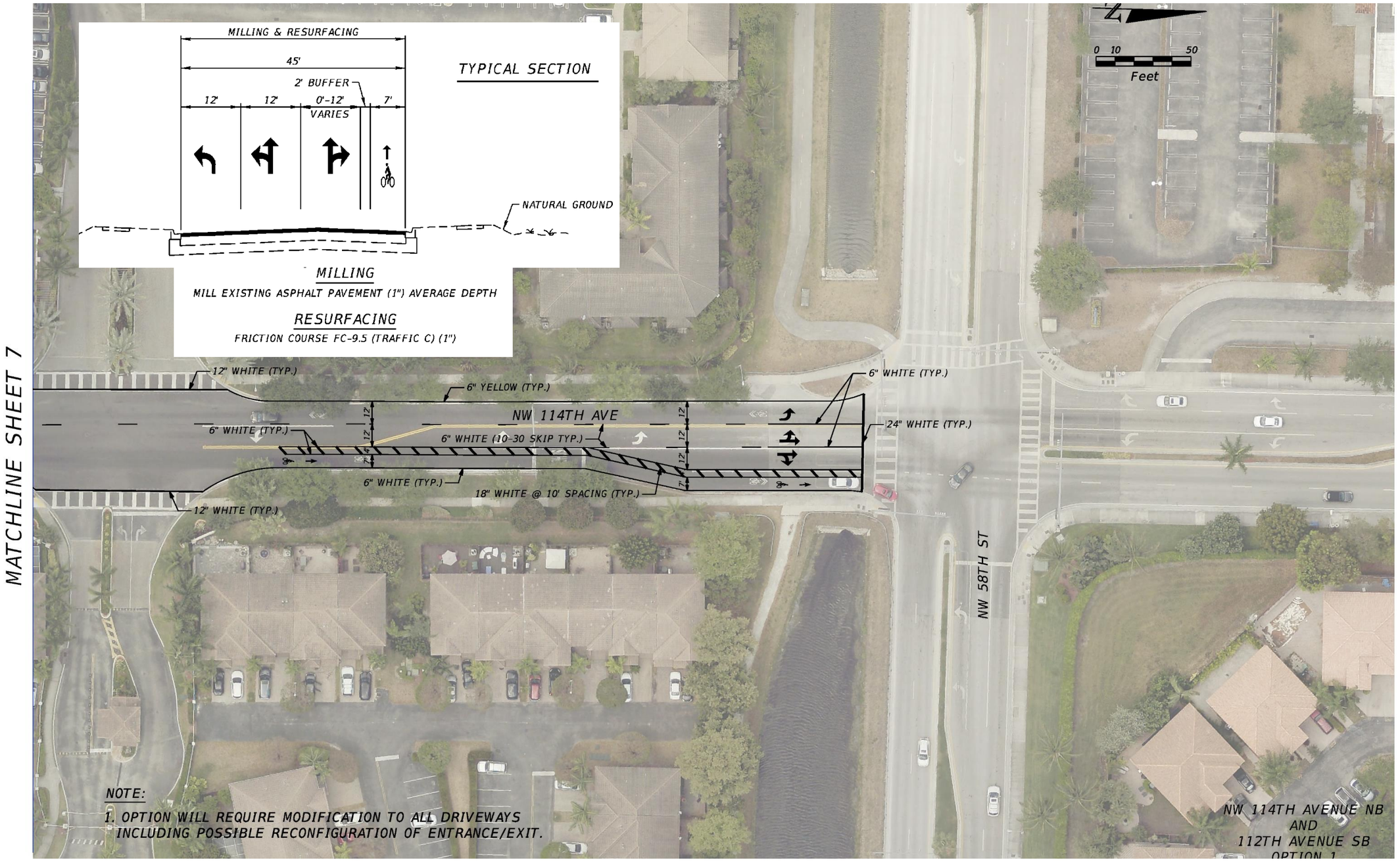
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 1: NW 114th Avenue Northbound Only Layout (Sheet 5 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-11 *Page No.* *Date:* 8/9/17



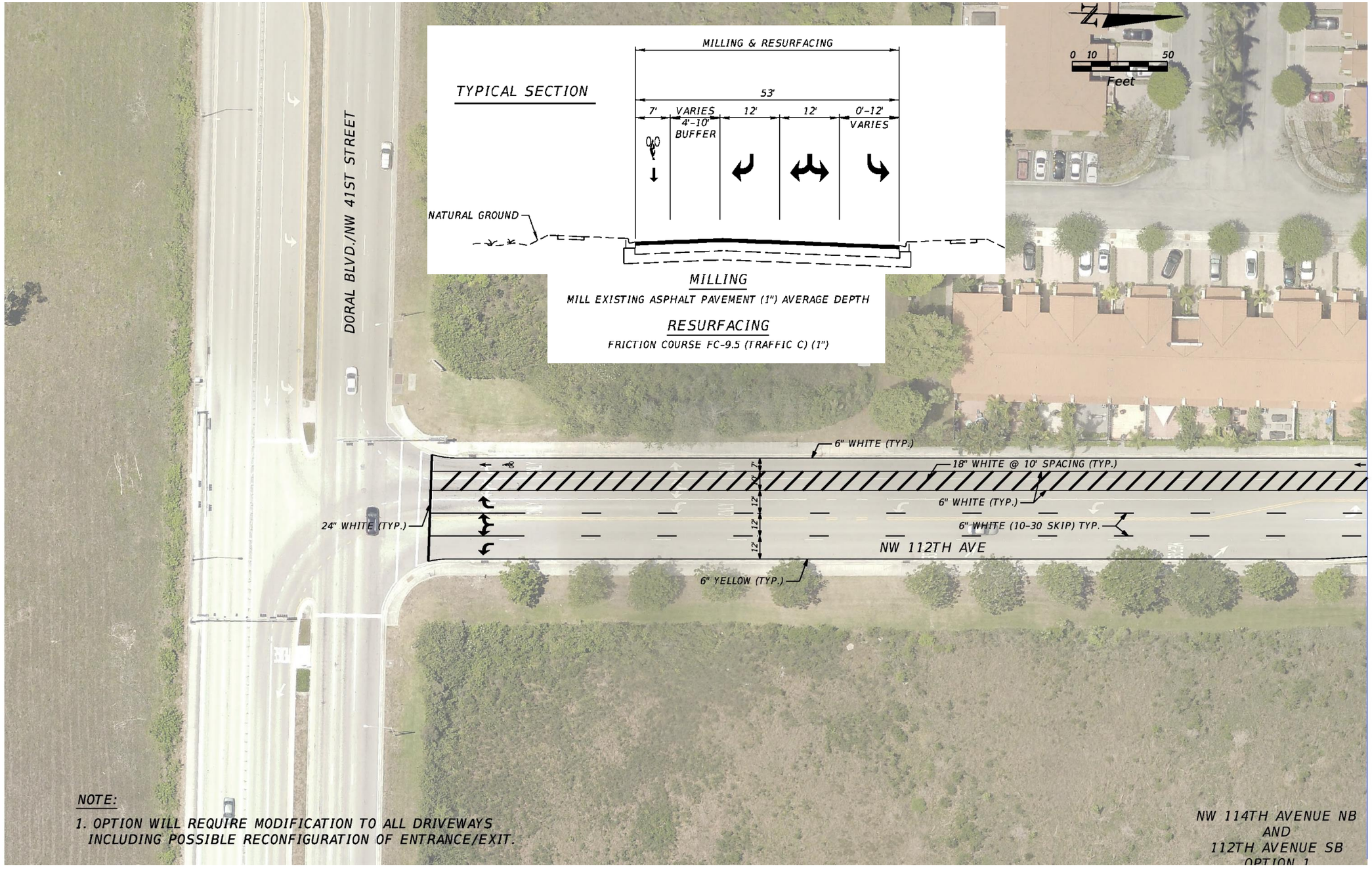
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 1: NW 114th Avenue Northbound Only Layout (Sheet 6 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-12 *Page No.* *Date:* 8/9/17



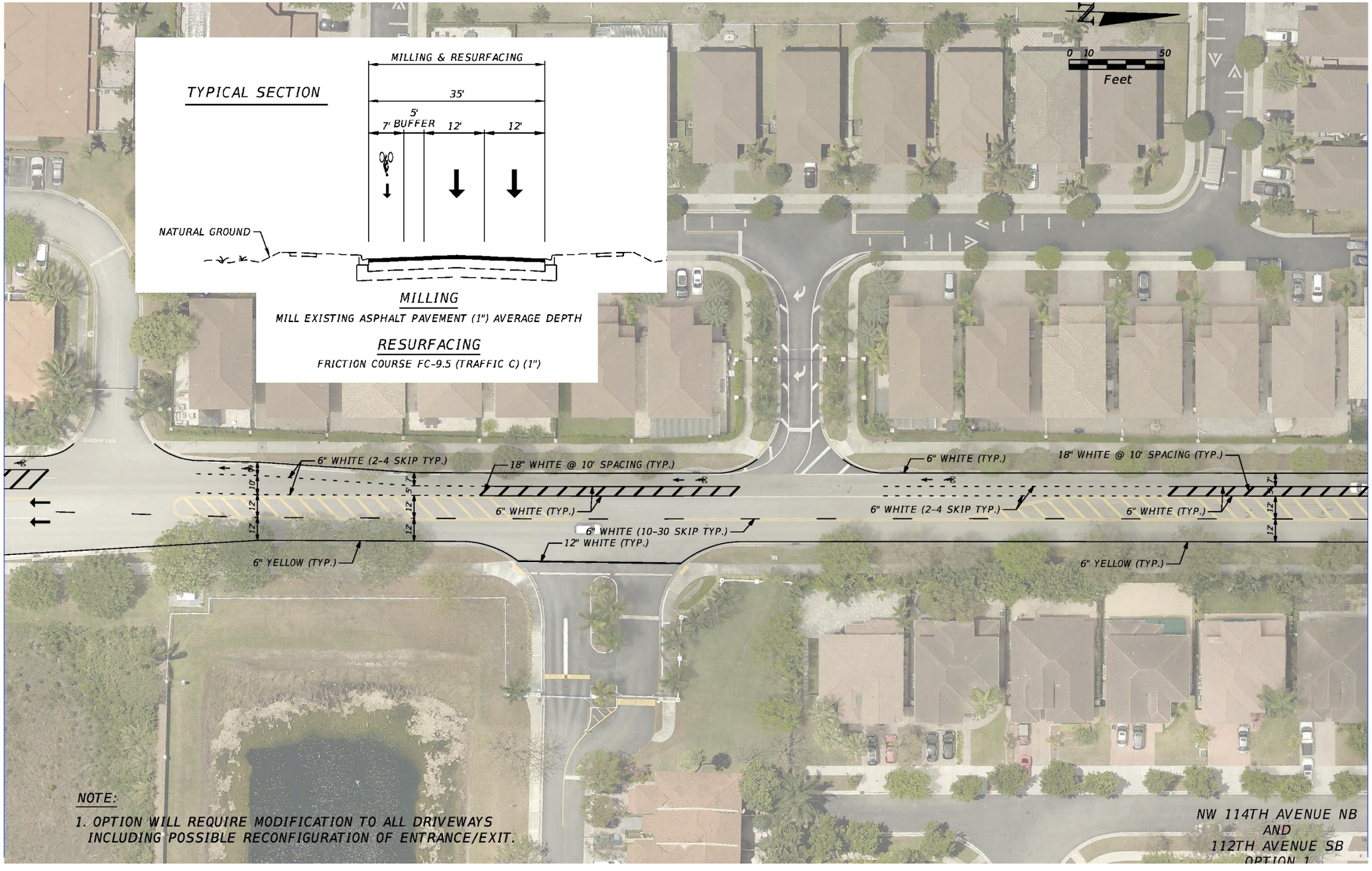
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 1: NW 114th Avenue Northbound Only Layout (Sheet 7 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-13 Page No. Date: 8/9/17



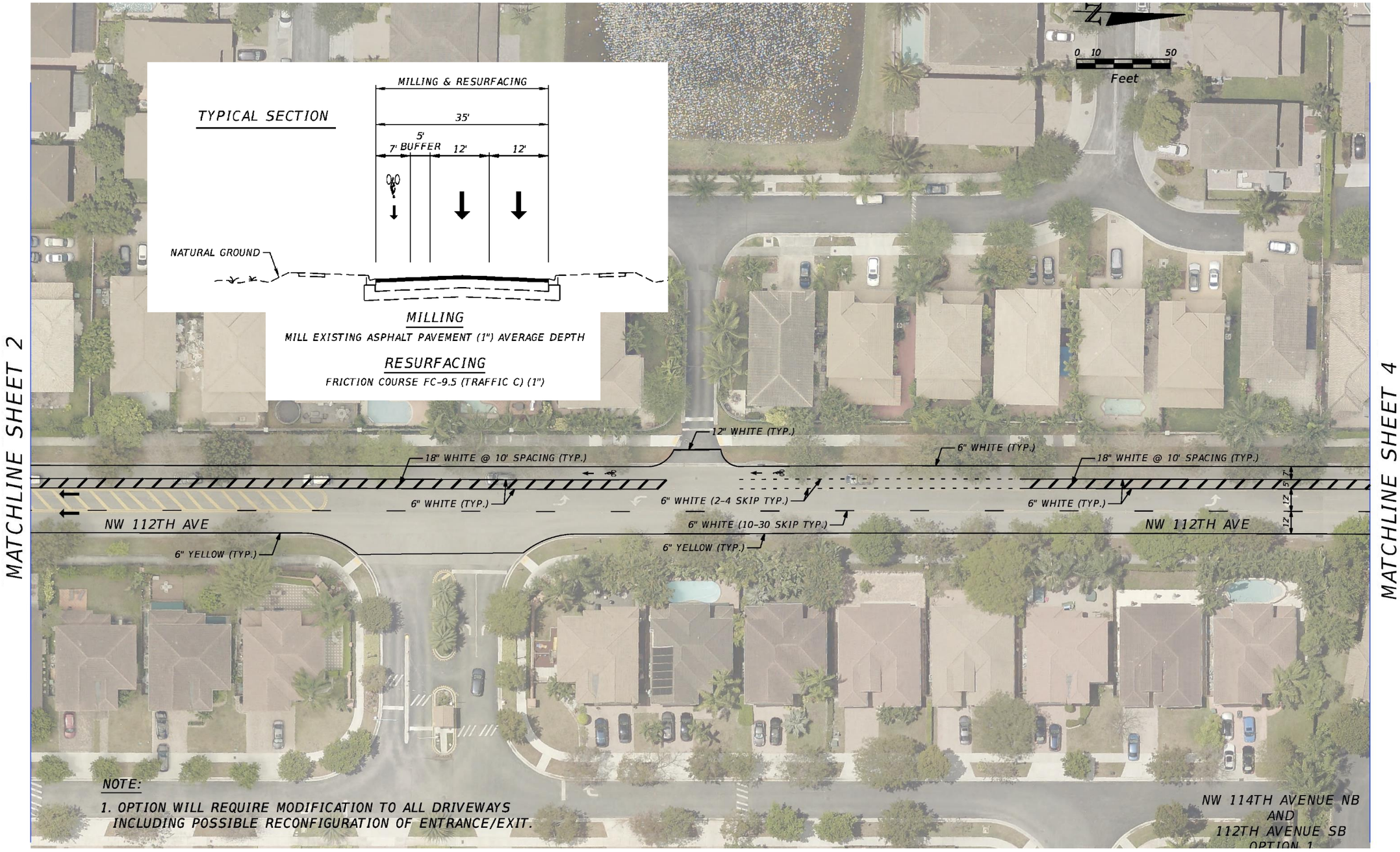
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 1: NW 114th Avenue Northbound Only Layout (Sheet 8 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-14 *Page No.* *Date:* 8/9/17



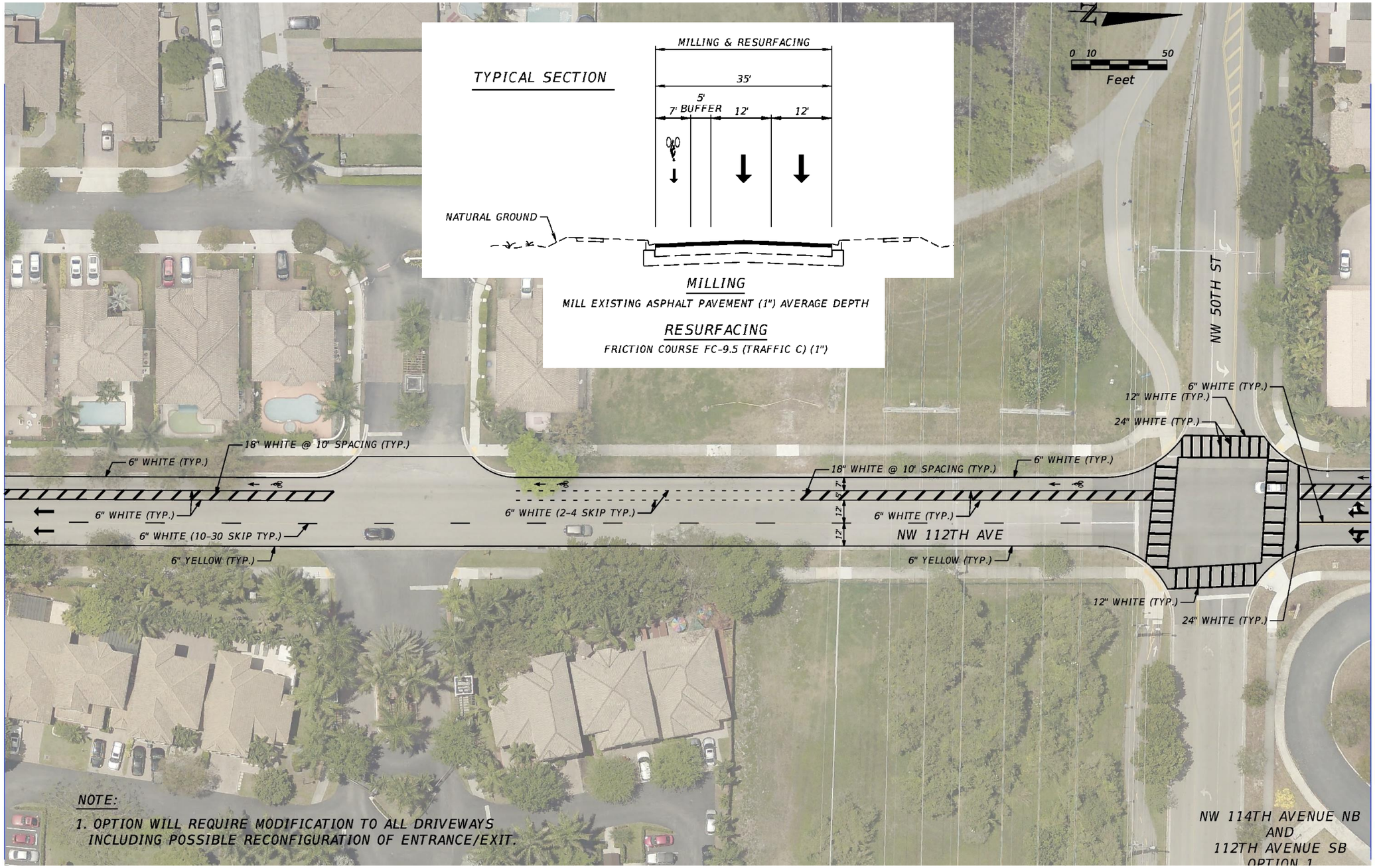
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 1: NW 112th Avenue Southbound Only Layout (Sheet 1 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-15 *Page No.* *Date:* 8/9/17



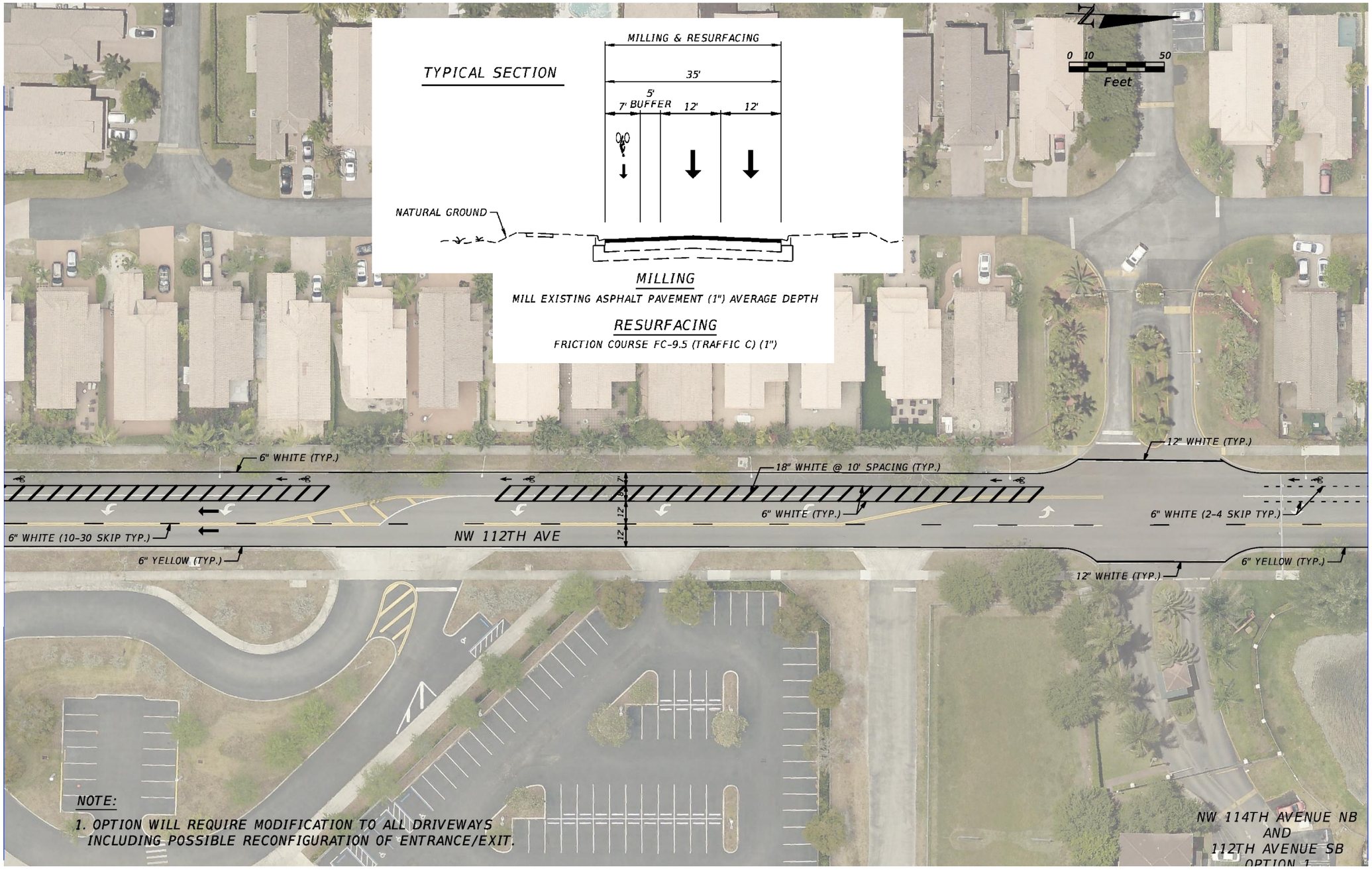
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 1: NW 112th Avenue Southbound Only Layout (Sheet 2 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-16 / Page No. / Date: 8/9/17



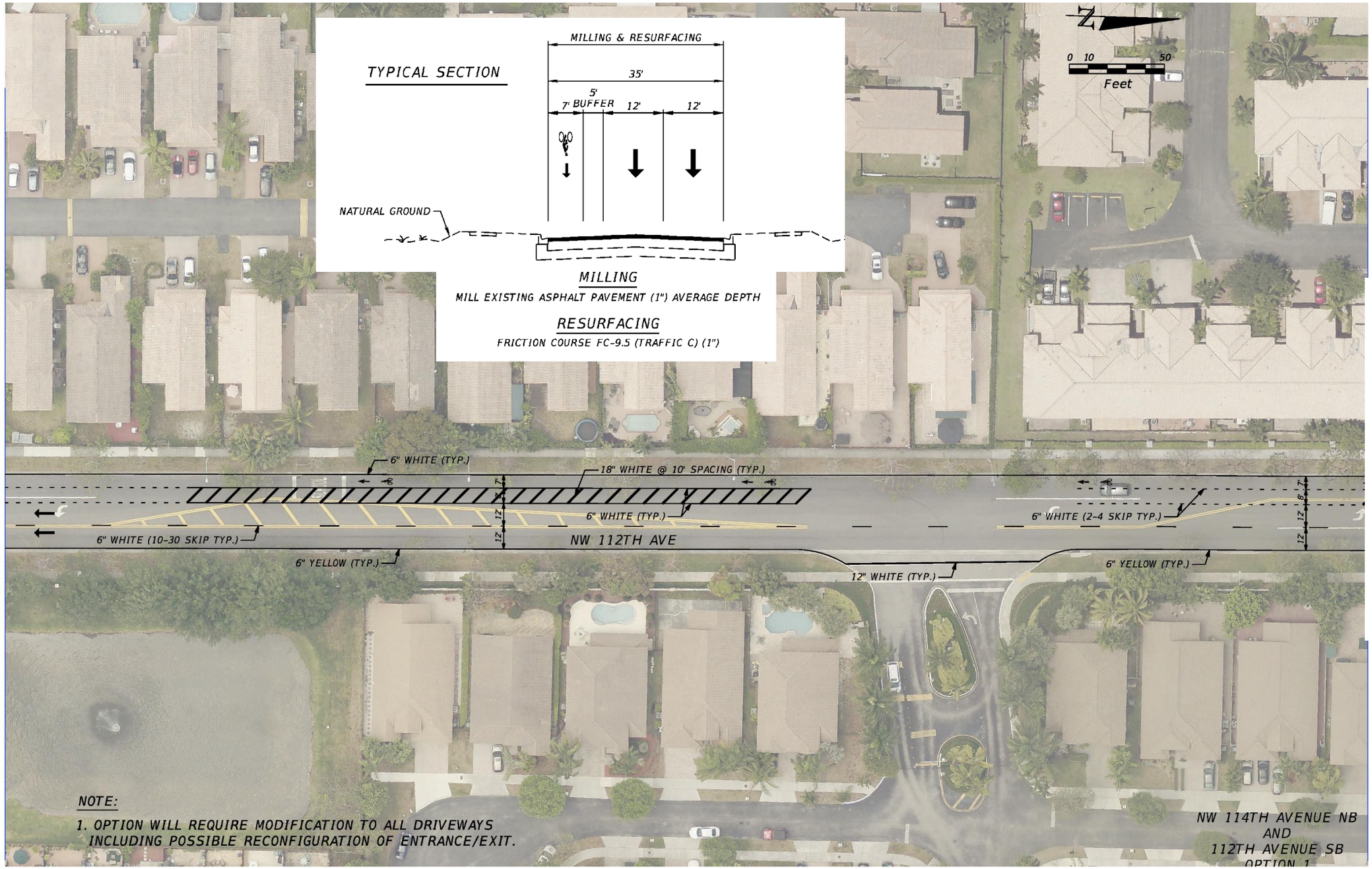
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 1: NW 112th Avenue Southbound Only Layout (Sheet 3 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-17 / Page No. / Date: 8/9/17



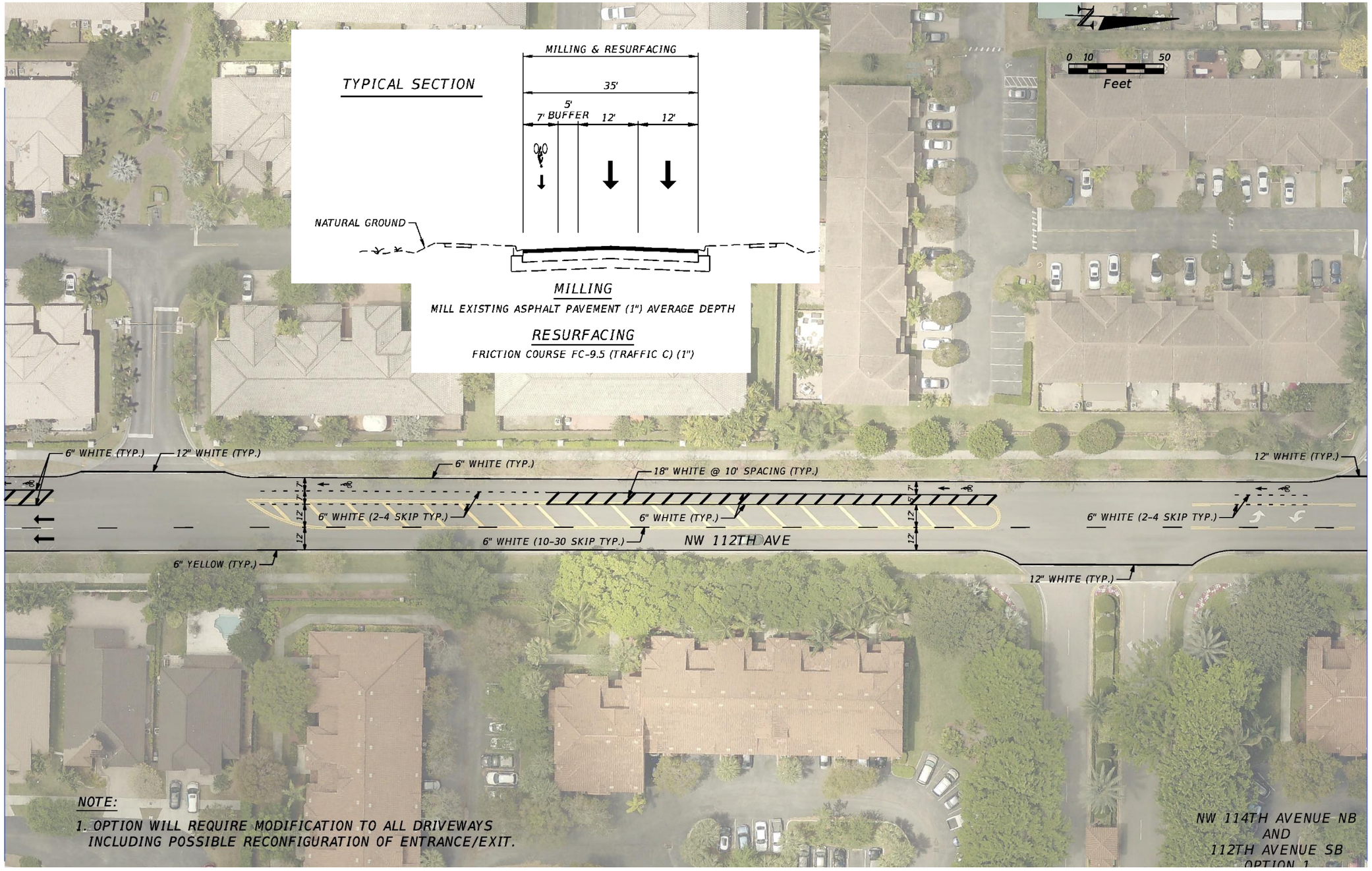
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 1: NW 112th Avenue Southbound Only Layout (Sheet 4 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-18 *Page No.* *Date:* 8/9/17



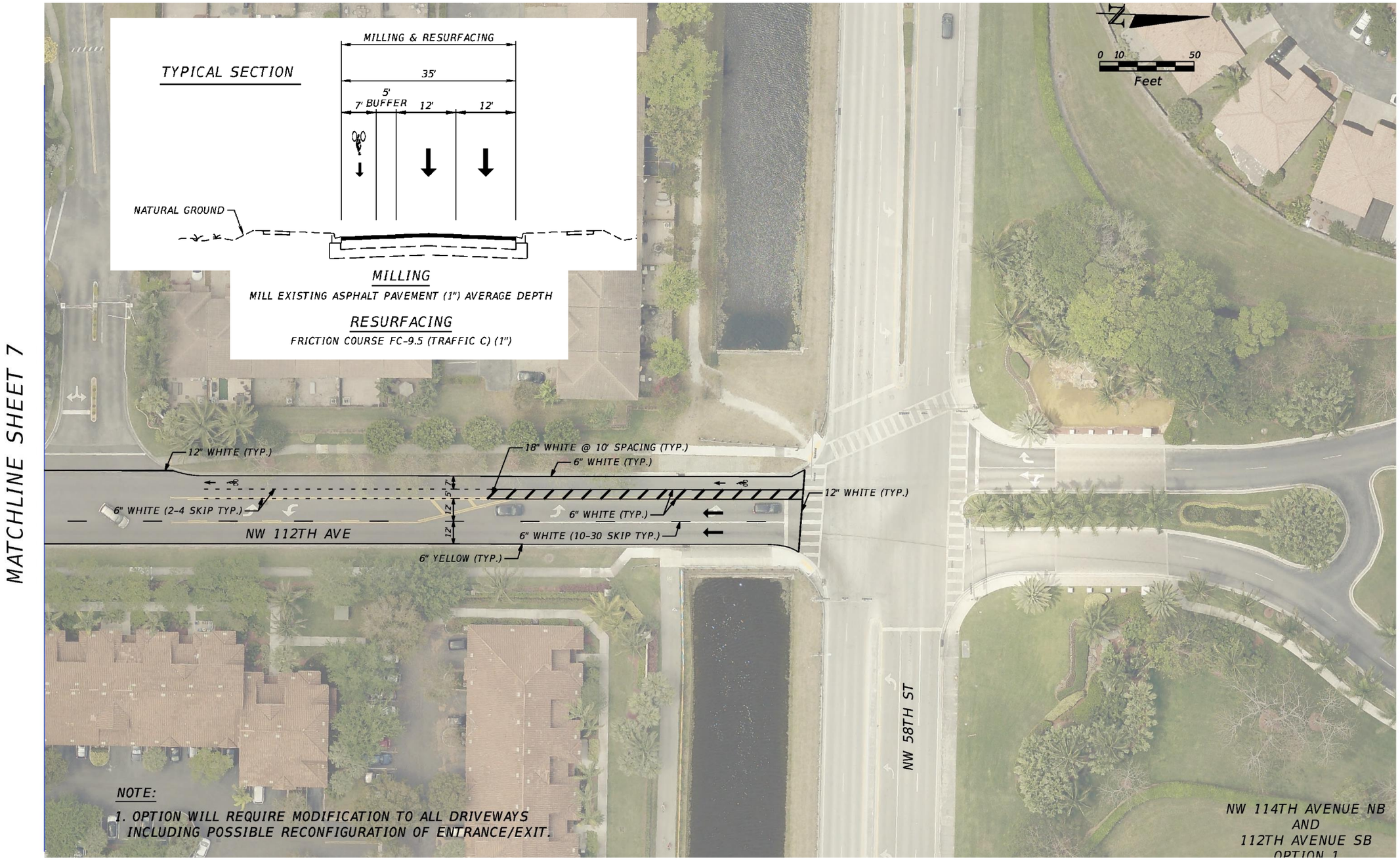
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 1: NW 112th Avenue Southbound Only Layout (Sheet 5 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-19 / Page No. / Date: 8/9/17



Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 1: NW 112th Avenue Southbound Only Layout (Sheet 6 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-20 / Page No. / Date: 8/9/17



Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 1: NW 112th Avenue Southbound Only Layout (Sheet 7 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-21 *Page No.* *Date:* 8/9/17



Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 1: NW 112th Avenue Southbound Only Layout (Sheet 8 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-22 / Page No. / Date: 8/9/17

8.3 Build Option 2 Improvements Layout

This option includes converting NW 114th Avenue to a one-way southbound only traffic flow and NW 112th Avenue to a northbound only traffic flow between Doral Boulevard and NW 58th Street. Similar to Option 1, each corridor in the one-way pair would be restriped to include two through lanes and a separated exclusive bike lane. The milling and resurfacing of both study corridors would be necessary to facilitate the restriping of the corridor. Following are important design considerations with respect to these alternatives:

- Since this improvement will potentially result in a lane being centered on the roadway, it should be noted that the cross slope of the roadway would fall within that lane. Per FDOT Plans Preparation Manual (PPM) Volume 1, Section 2.1.5 the cross slope must be applied uniformly over all travel lanes. This requirement for uniformity of cross slope across travel lanes could make matching existing elevations difficult. Accordingly, it may become necessary to modify the cross slope to match the existing ground. If the elevation(s) of the existing ground cannot be tied into, it would then become necessary to reconstruct the curb and gutter.
- The preceding consideration could affect the location of the low points for drainage.
- All driveways would require modification and possible reconfiguration of entrances/exits.
- Intersections of the study corridors at NW 41st and at NW 58th Street will need to be reconfigured to conform to the flow of traffic.

Exhibits 8-23 through **8-38** presents the possible layout and typical sections associated with these improvements.

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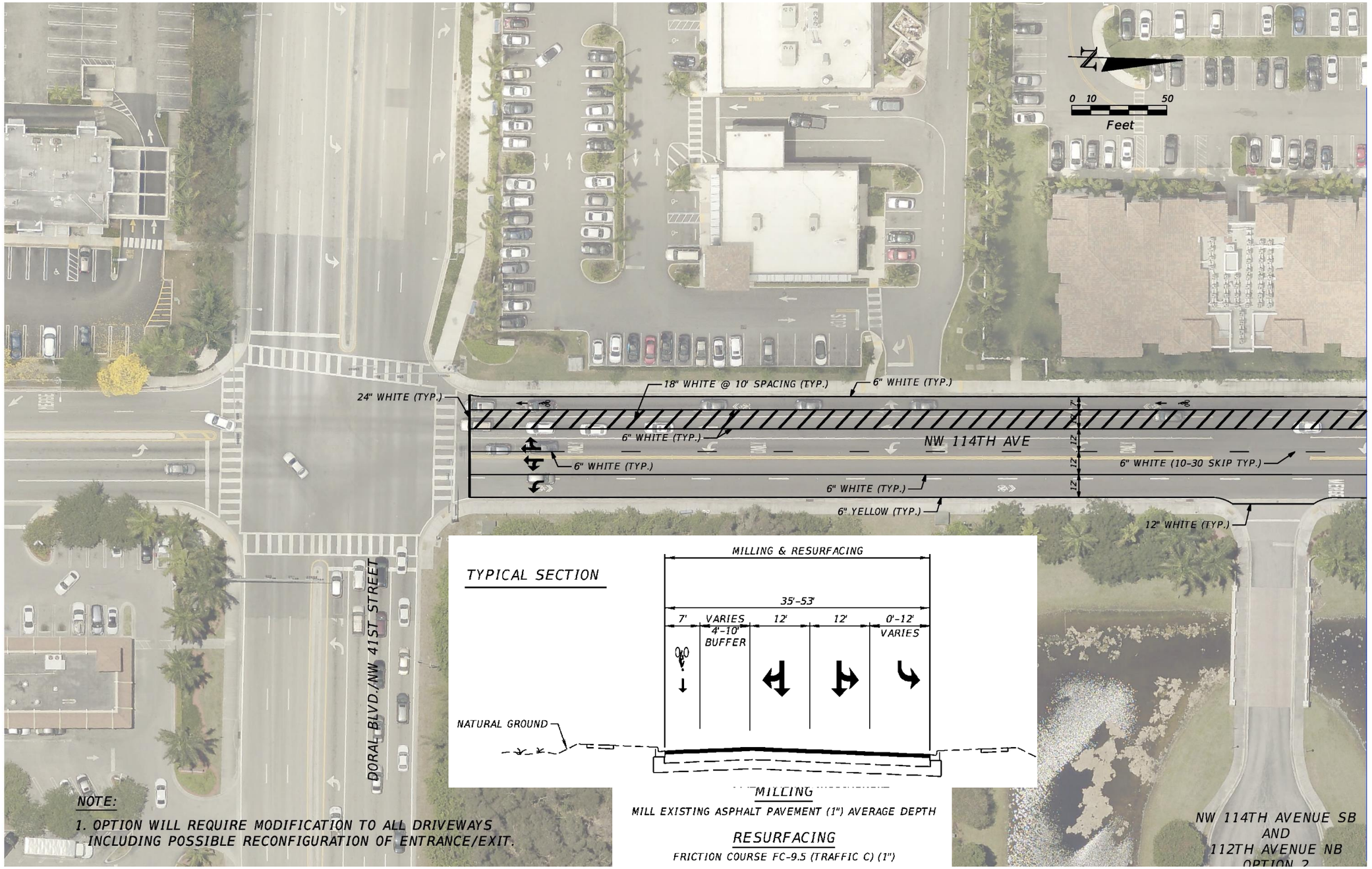
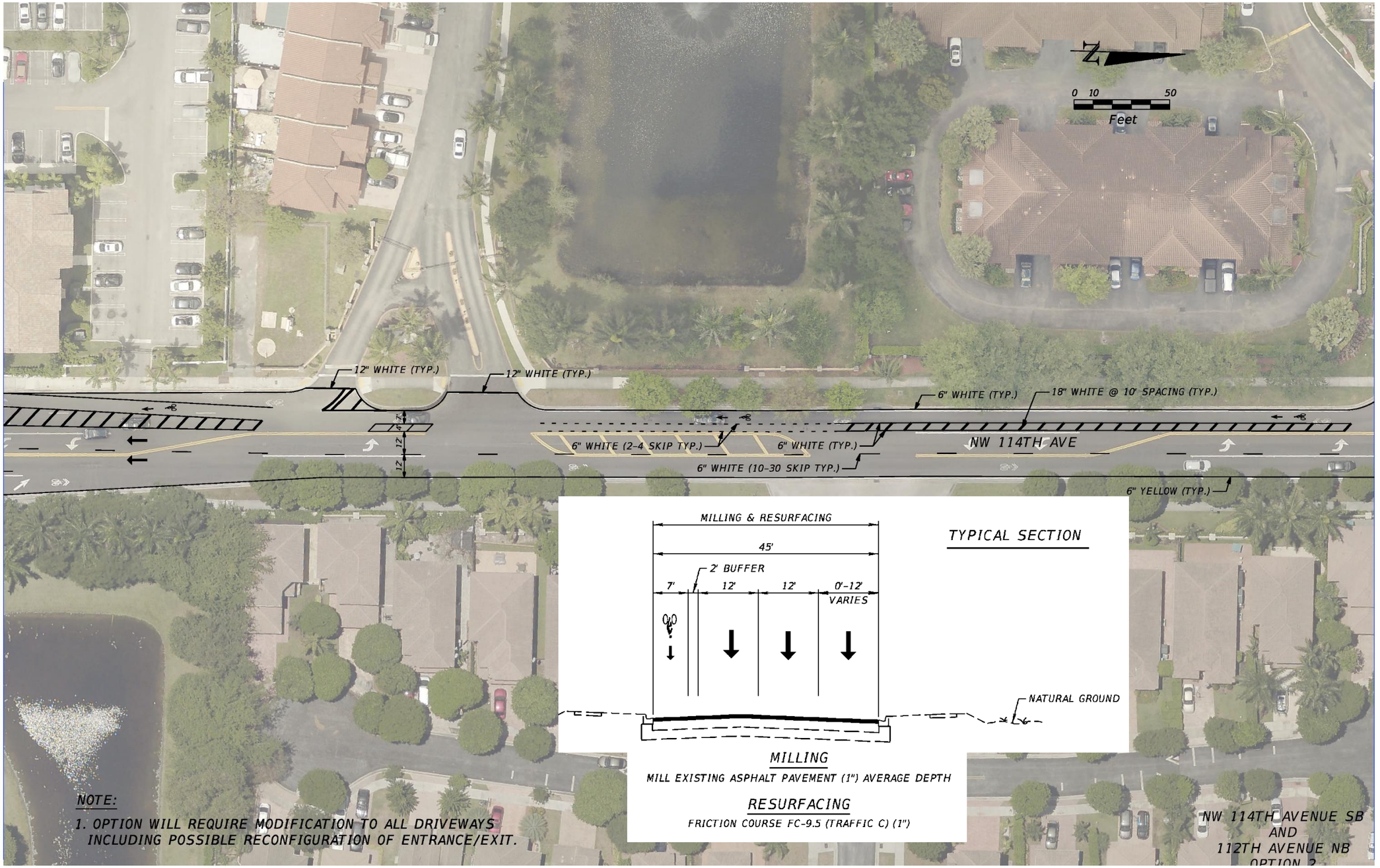
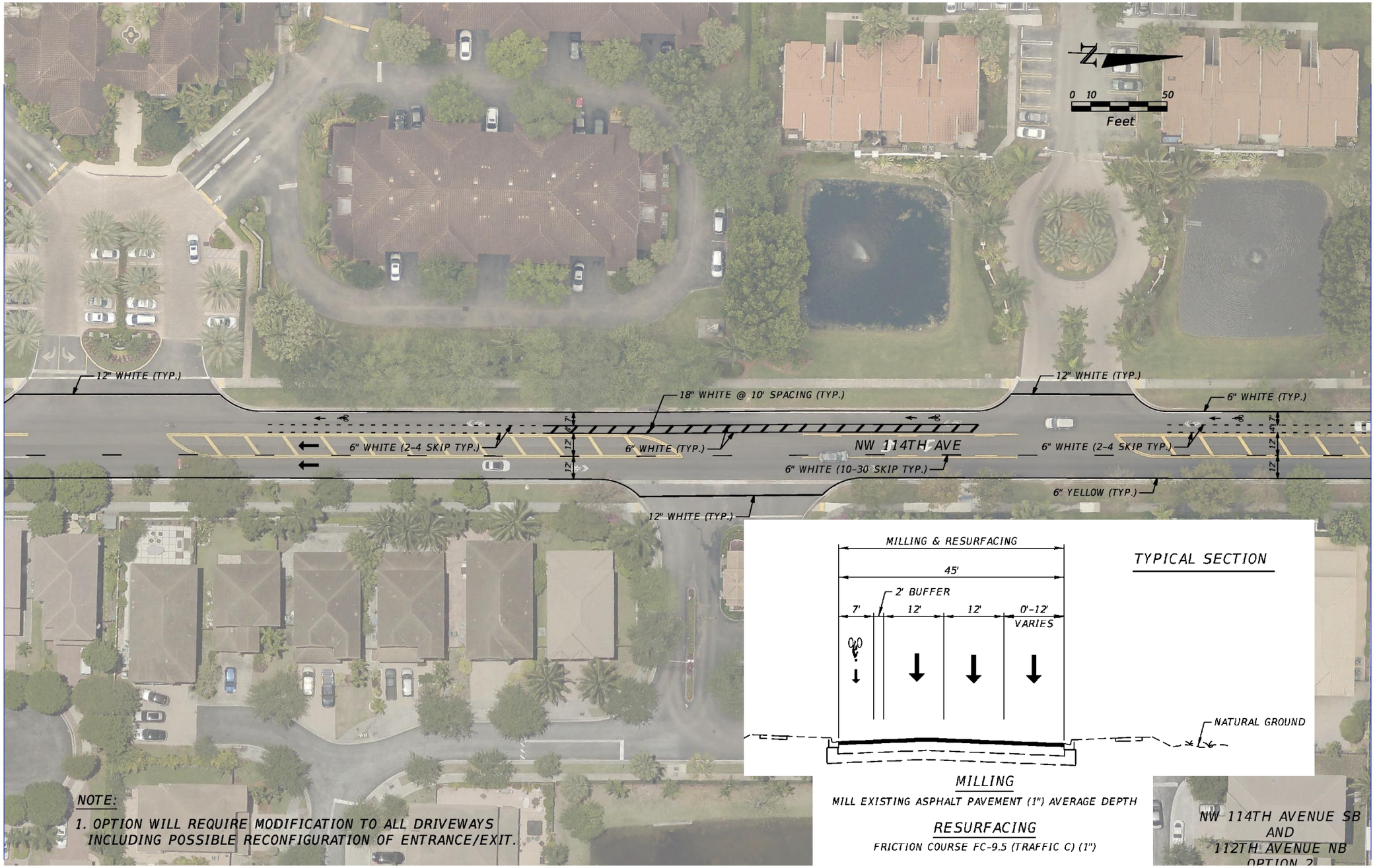


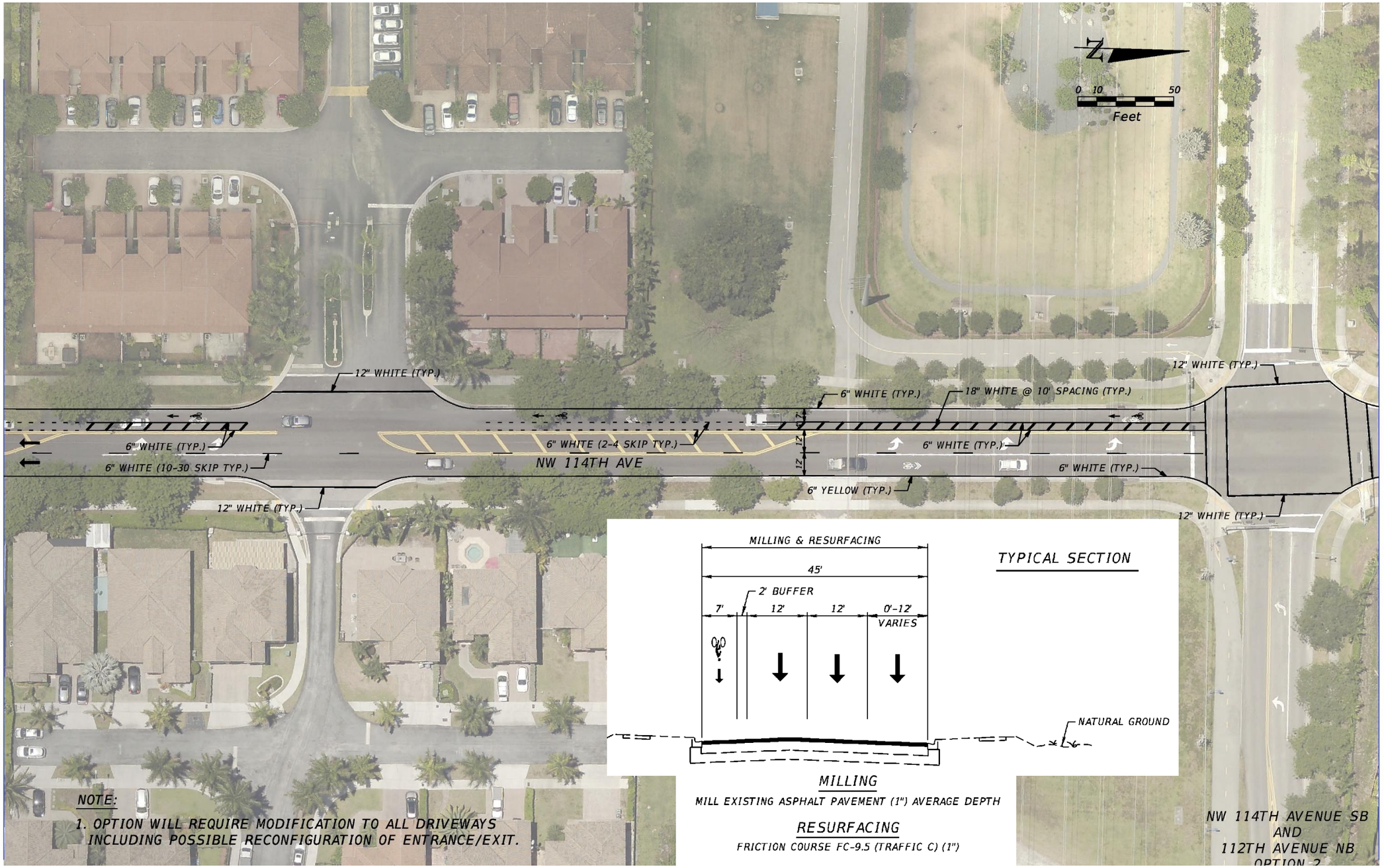
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 2: NW 114th Avenue Southbound Only Layout (Sheet 1 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-23 Page No. Date: 8/9/17



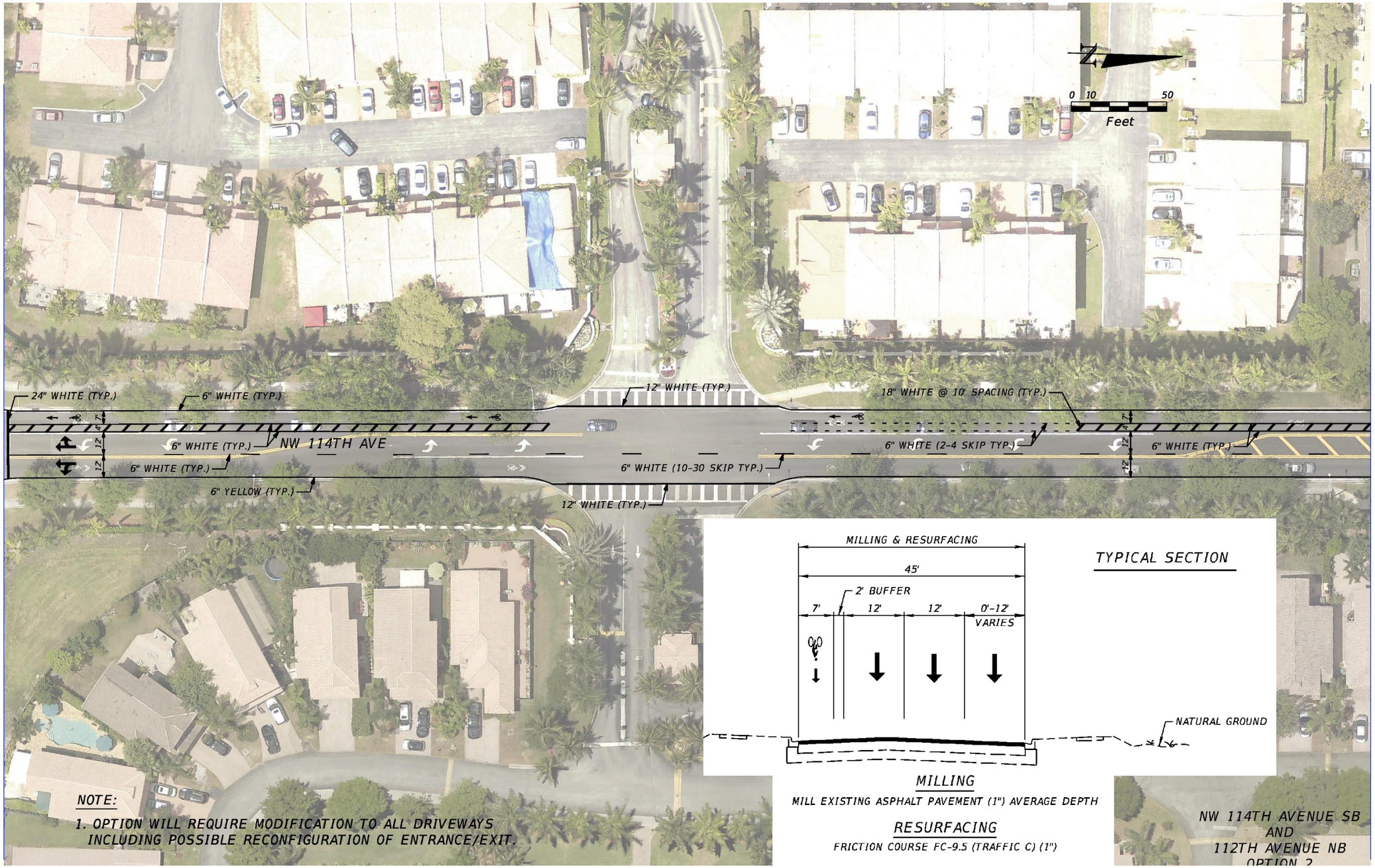
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 2: NW 114th Avenue Southbound Only Layout (Sheet 2 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-24 Page No. Date: 8/9/17



Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 2: NW 114th Avenue Southbound Only Layout (Sheet 3 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-25 Page No. Date: 8/9/17



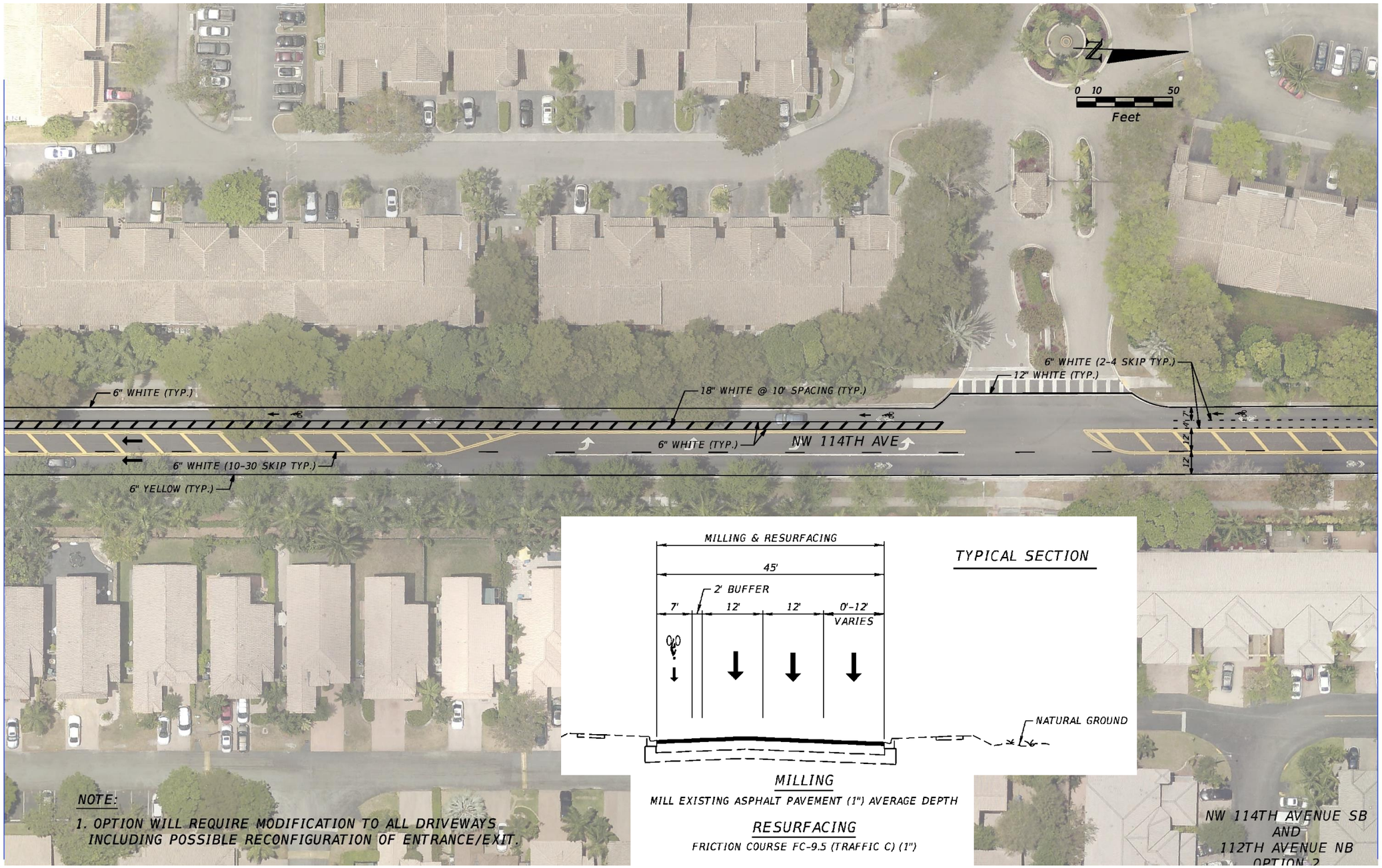
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 2: NW 114th Avenue Southbound Only Layout (Sheet 4 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-26 Page No. Date: 8/9/17



Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 2: NW 114th Avenue Southbound Only Layout (Sheet 5 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-27 Page No. Date: 8/9/17

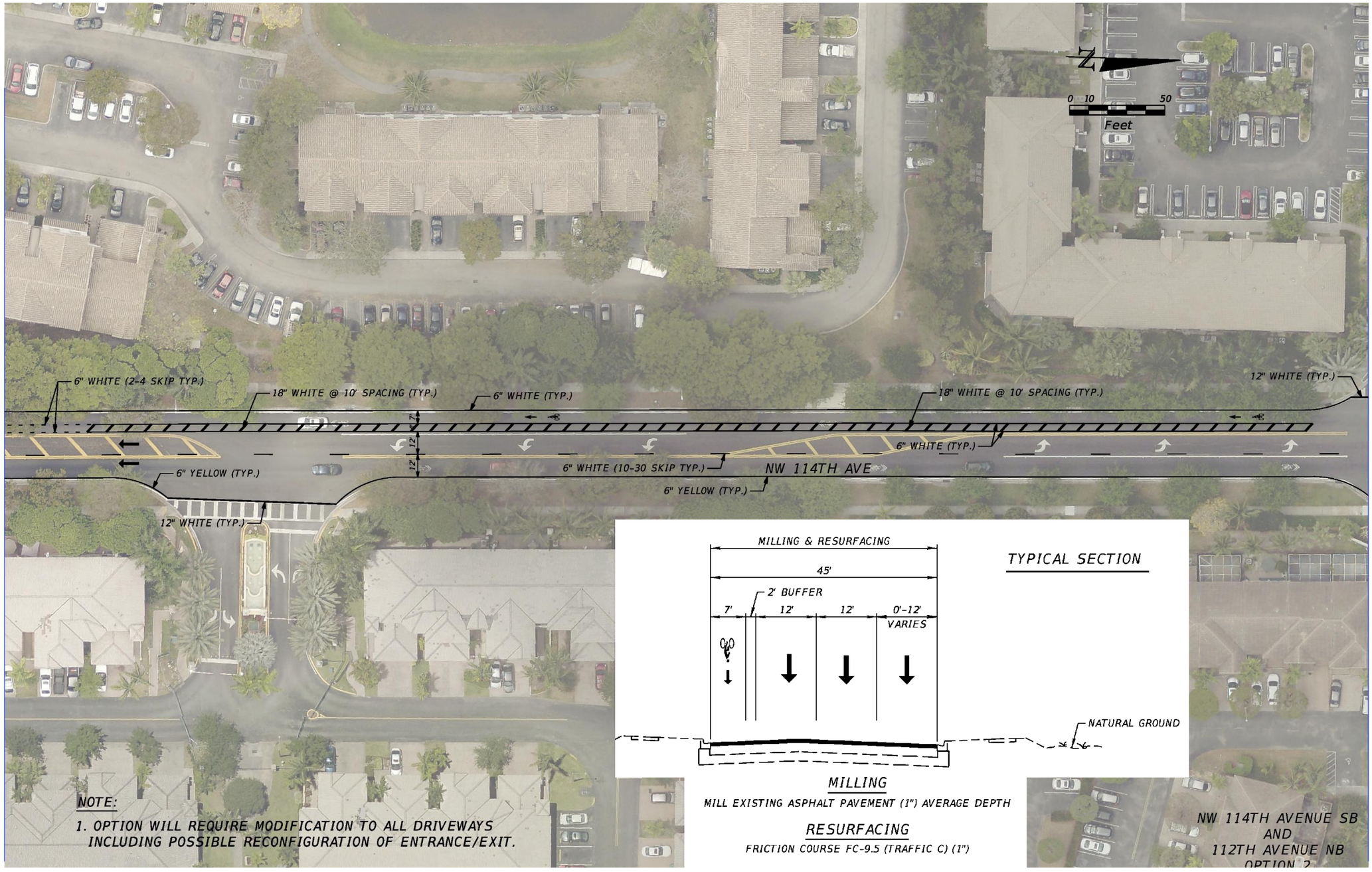
MATCHLINE SHEET 5

MATCHLINE SHEET 7



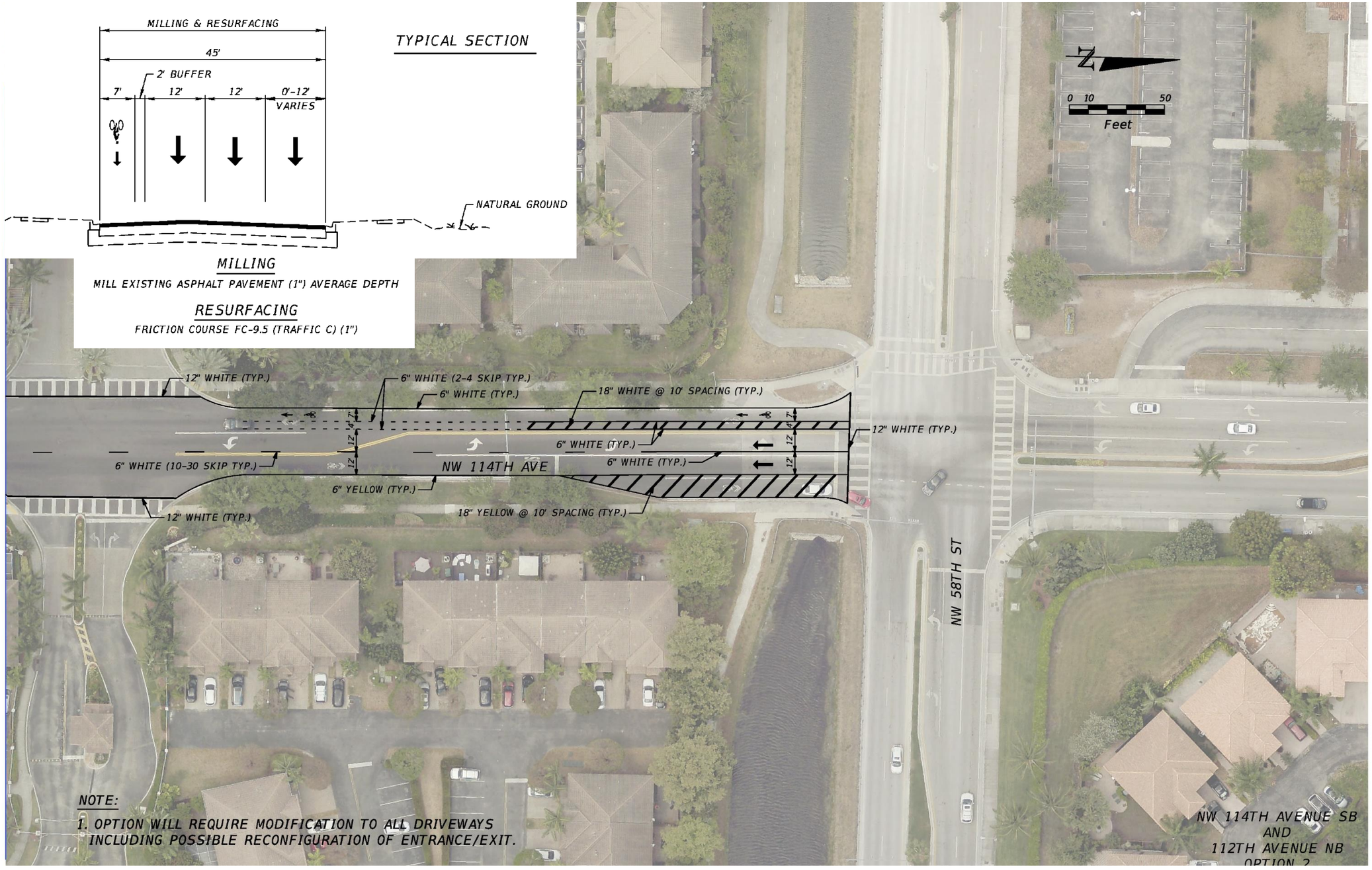
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 2: NW 114th Avenue Southbound Only Layout (Sheet 6 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-28 Page No. Date: 8/9/17

MATCHLINE SHEET 6

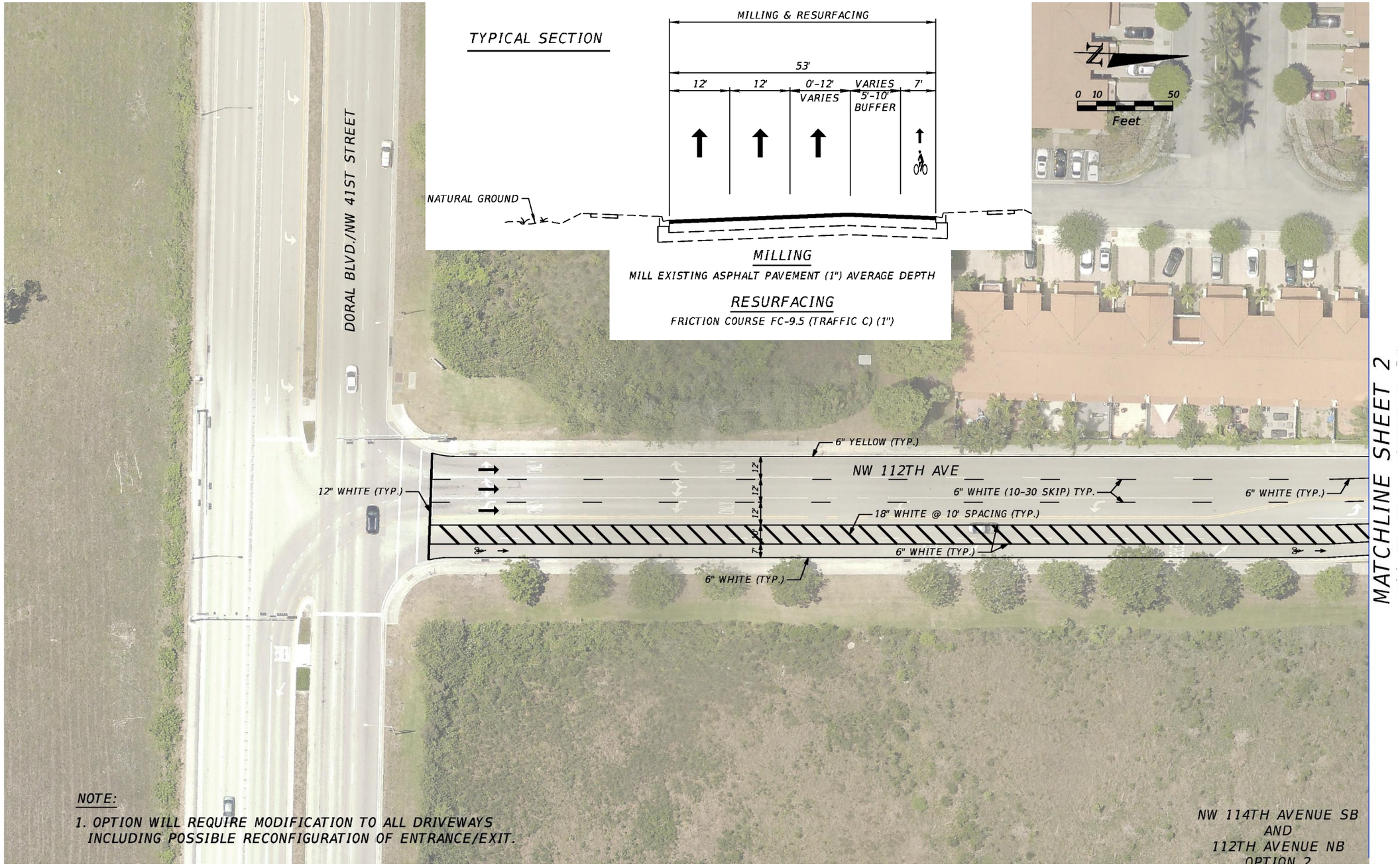


MATCHLINE SHEET 8

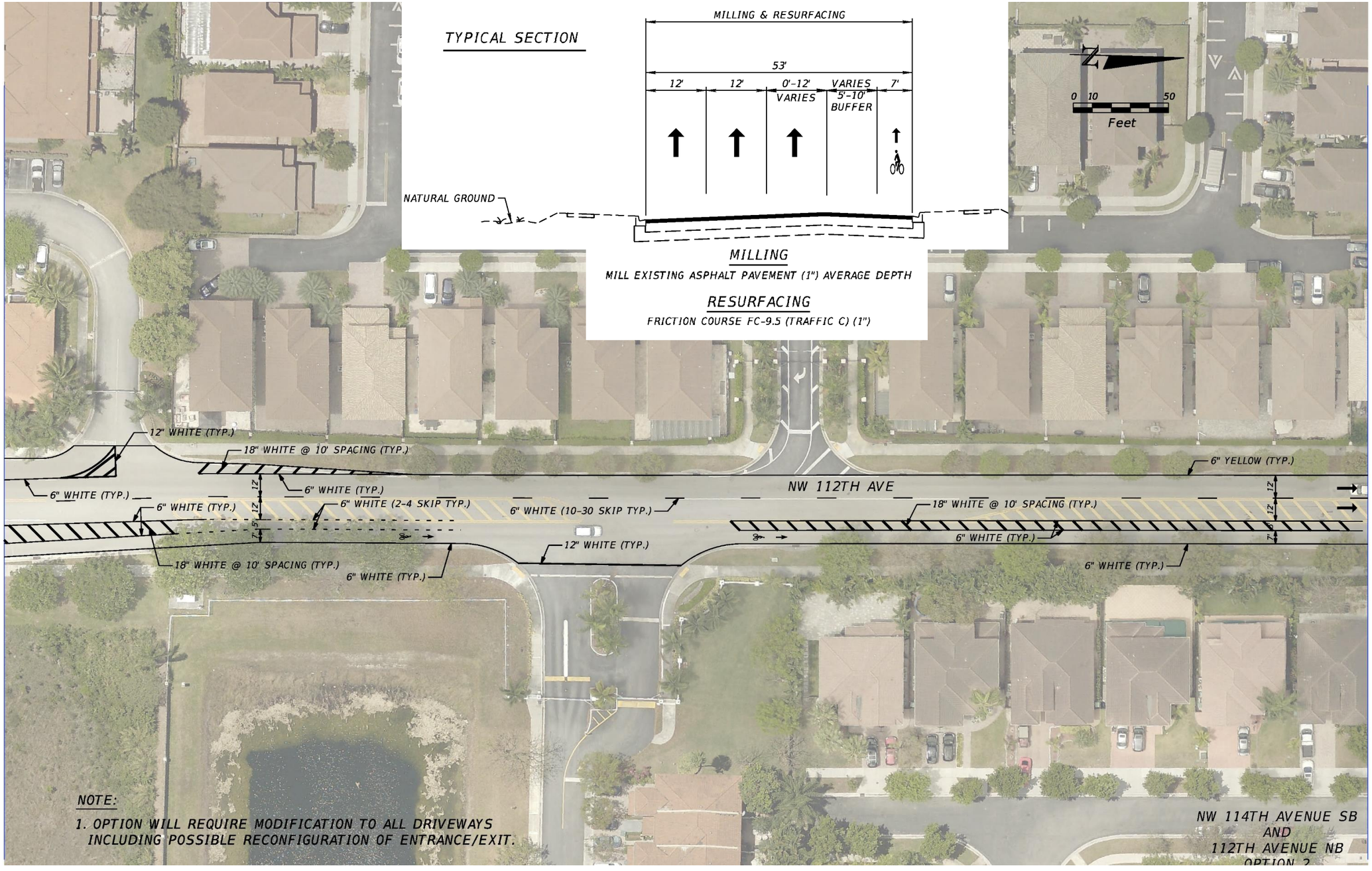
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 2: NW 114th Avenue Southbound Only Layout (Sheet 7 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-29 *Page No.* *Date:* 8/9/17



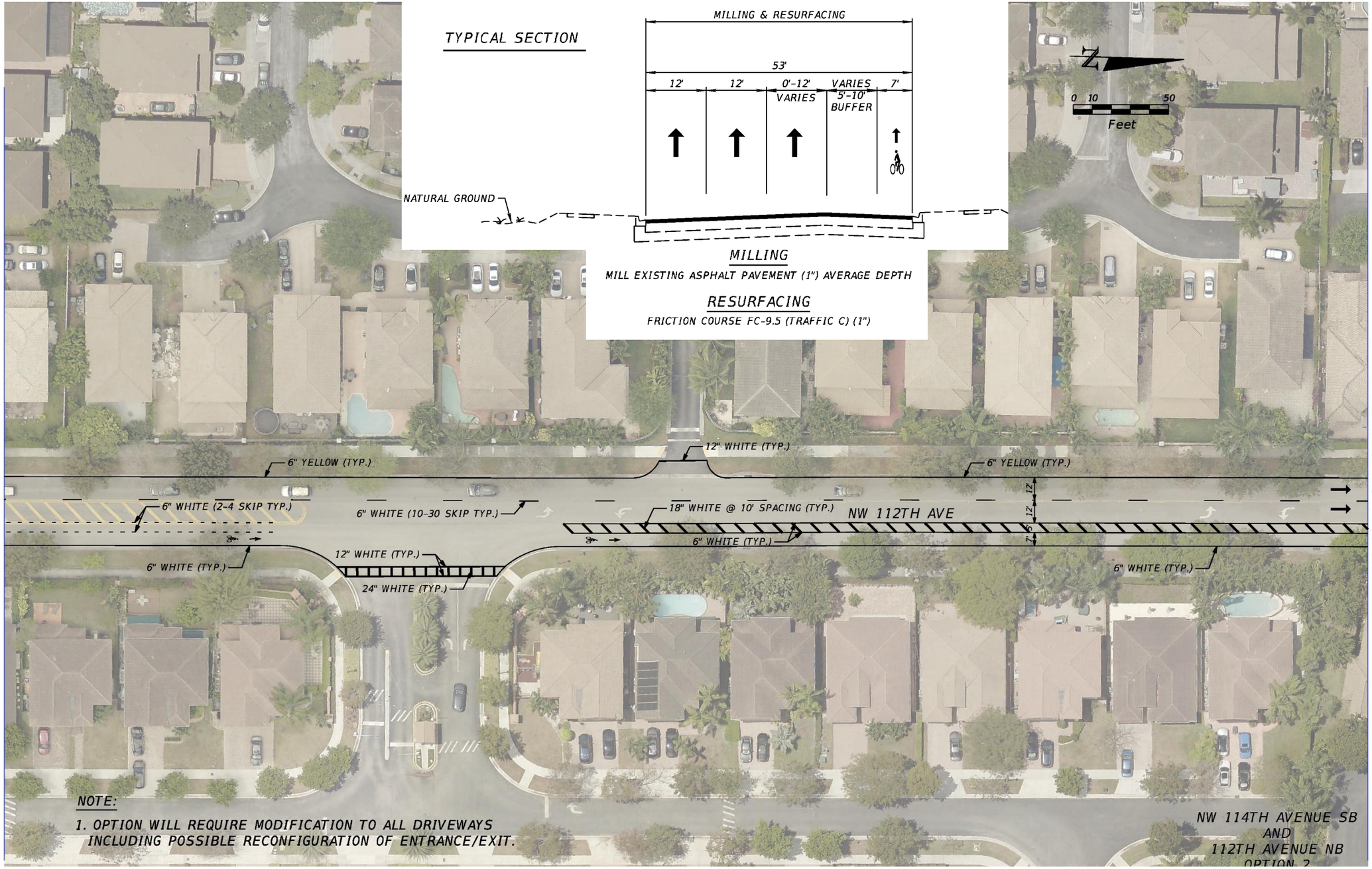
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 2: NW 114th Avenue Southbound Only Layout (Sheet 8 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-30 *Page No.* *Date:* 8/9/17



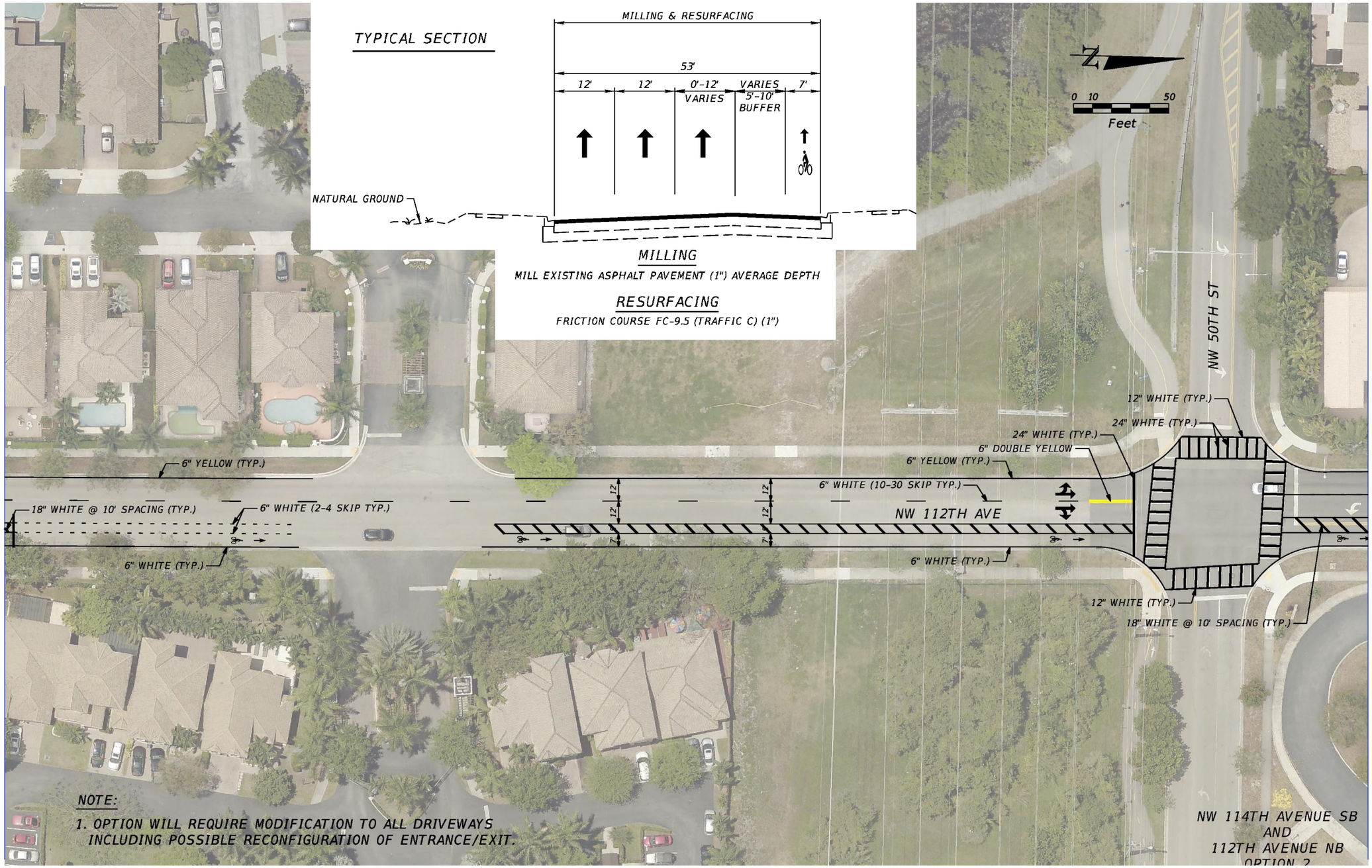
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 2: NW 112th Avenue Northbound Only Layout (Sheet 1 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-31 *Page No.* *Date:* 8/9/17



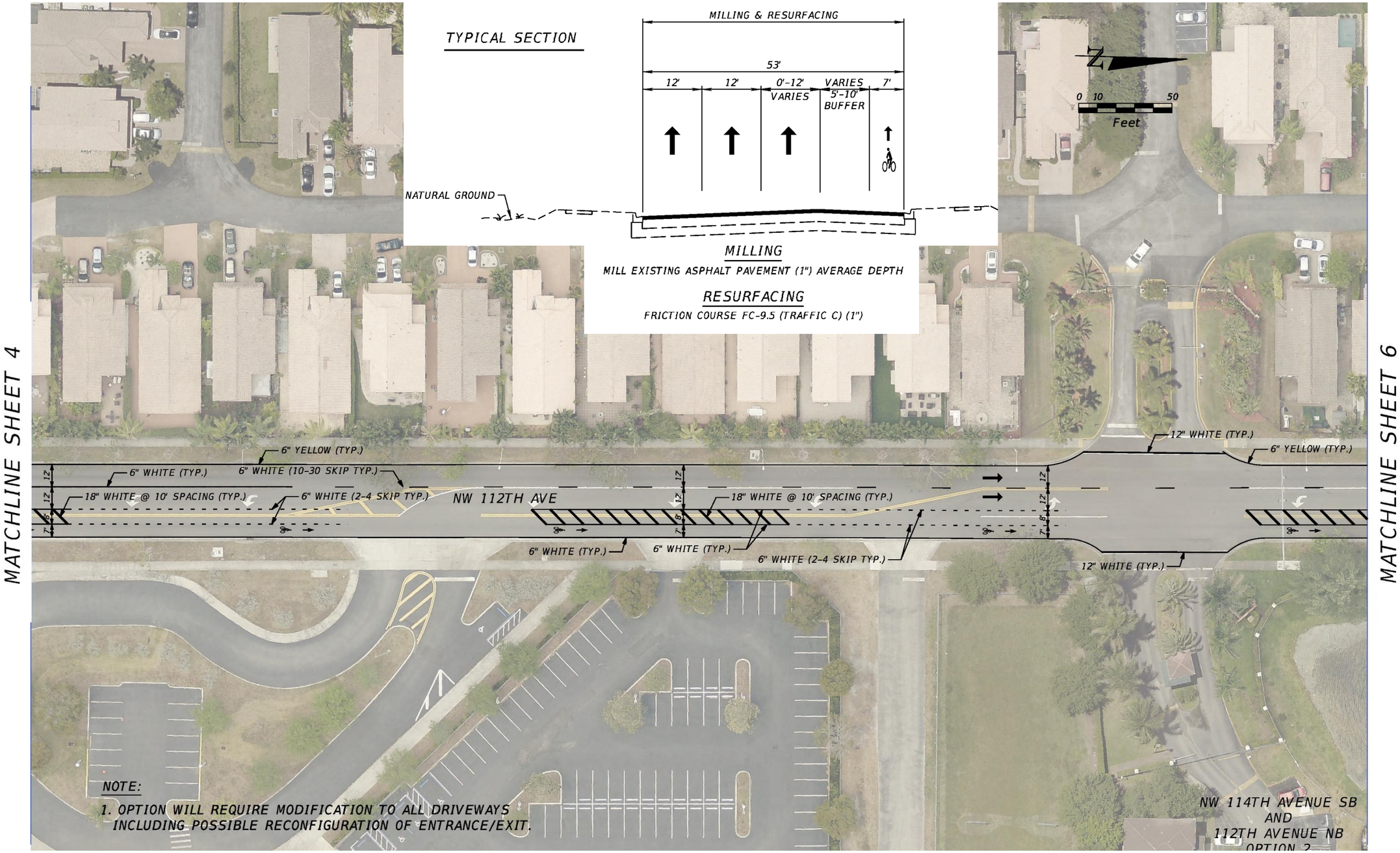
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 2: NW 112th Avenue Northbound Only Layout (Sheet 2 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-32 *Page No.* *Date:* 8/9/17



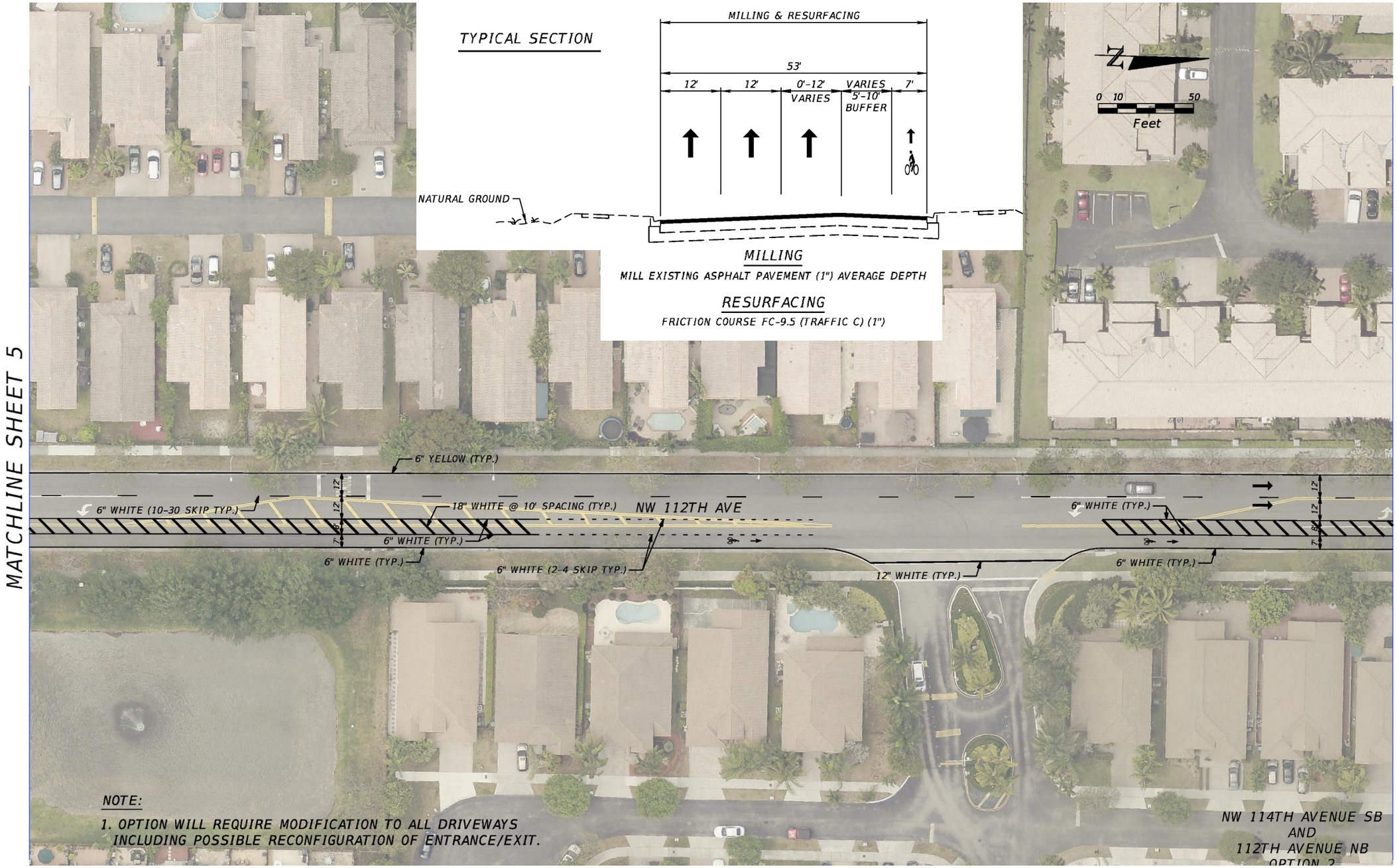
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 2: NW 112th Avenue Northbound Only Layout (Sheet 3 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-33 Page No. Date: 8/9/17



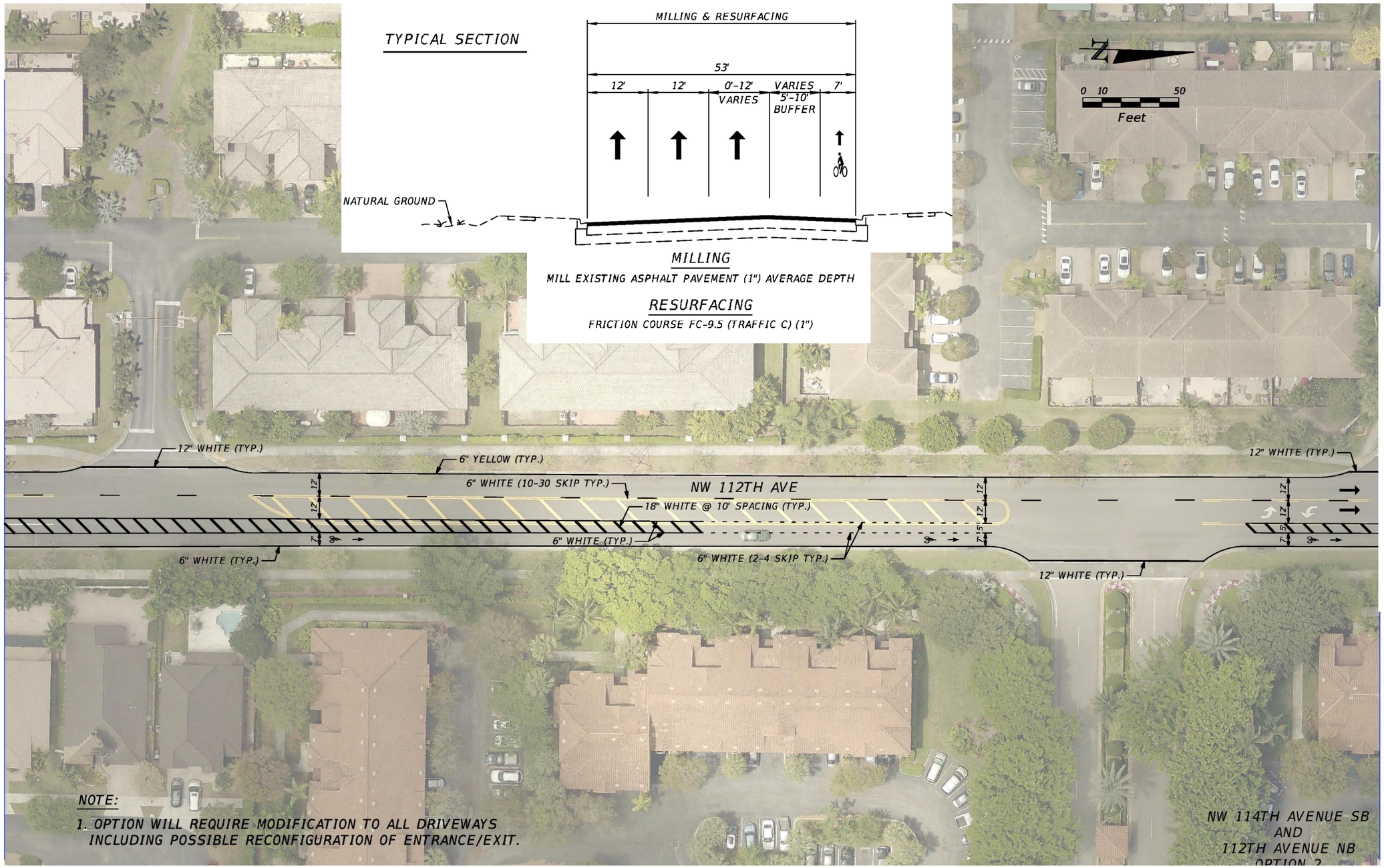
Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 2: NW 112th Avenue Northbound Only Layout (Sheet 4 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-34 *Page No.* *Date:* 8/9/17



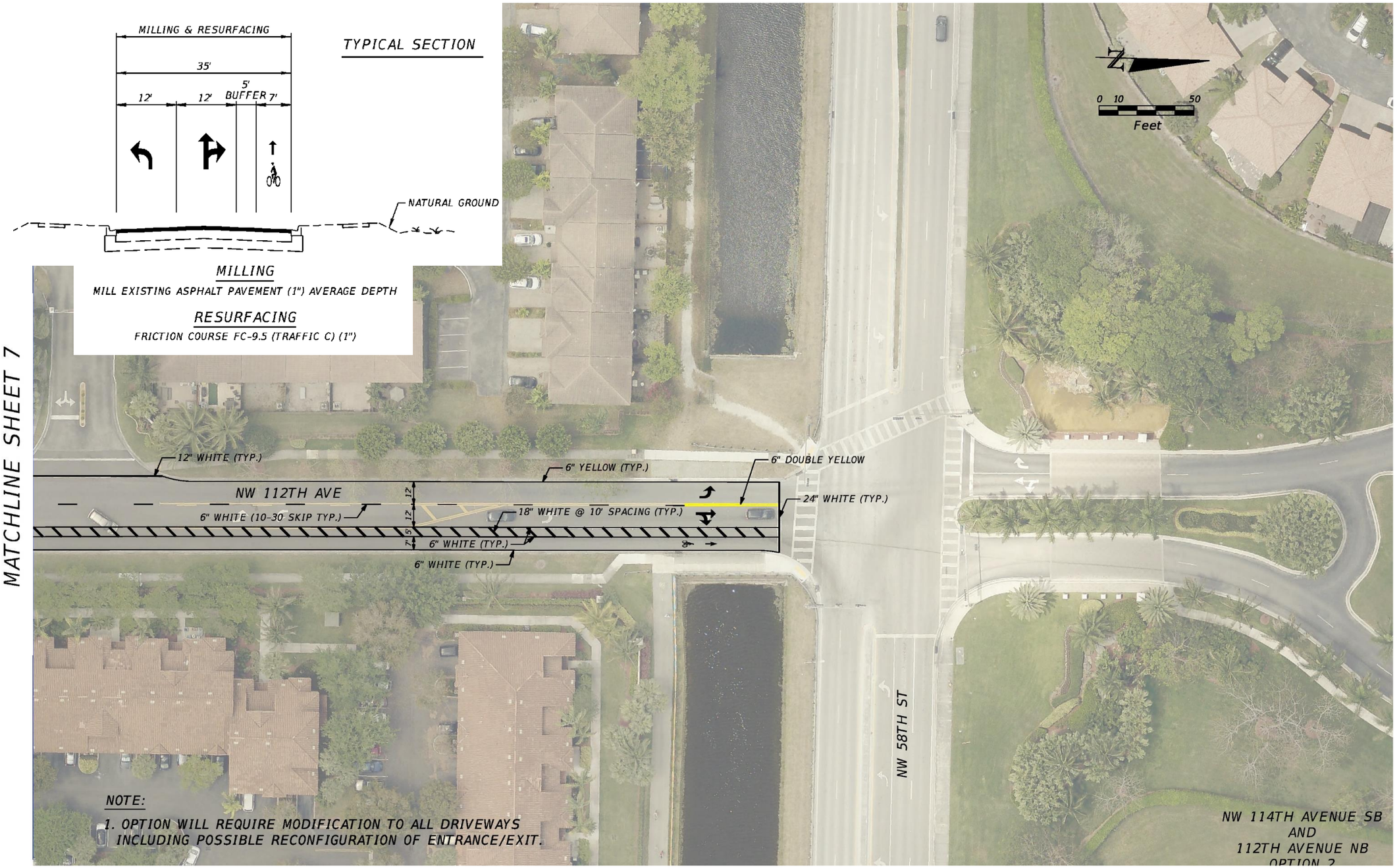
Project Name: DORAL FLORIDA **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 2: NW 112th Avenue Northbound Only Layout (Sheet 5 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-35 Page No. Date: 8/9/17



Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 2: NW 112th Avenue Northbound Only Layout (Sheet 6 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-36 / Page No. / Date: 8/9/17



Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	*Exhibit Name:* **Option 2: NW 112th Avenue Northbound Only Layout (Sheet 7 of 8)**	*Prepared By:* **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	*Exhibit No.* 8-37 *Page No.* *Date:* 8/9/17



Project Name: **NW 114 Ave & NW 112 Ave Improvement Study**	Exhibit Name: **Option 2: NW 112th Avenue Northbound Only Layout (Sheet 8 of 8)**	Prepared By: **BCC Engineering, Inc.** 4901 NW 17th Way | Suite 506 Fort Lauderdale, FL 33309 Phone: 954-928-1828	Exhibit No. 8-38 / Page No. / Date: 8/9/17

8.4 Traffic Operations

Using the methodologies promulgated in the *(HCM) 2010*, the traffic operations resulting from the proposed alternatives were analyzed and compared to the no-build traffic operations to quantify their relative impacts on the study intersections and arterials.

8.4.1 Targeted Improvements versus Future No-Build

Intersection Analysis: The operational analysis performed for the 2020 Build AM and PM peak traffic conditions used the SYNCHRO version 9 traffic analysis software which is based on the HCM 2010. Signal timings were optimized to the extent possible to further maximize the operations associated with the proposed improvements. The results of the intersection operational analyses comparing this future Build alternative to the future No-Build AM and PM peak hour conditions are summarized on the following pages in **Table 8-1** and graphically depicted in **Exhibits 8-39** and **8-40** respectively.

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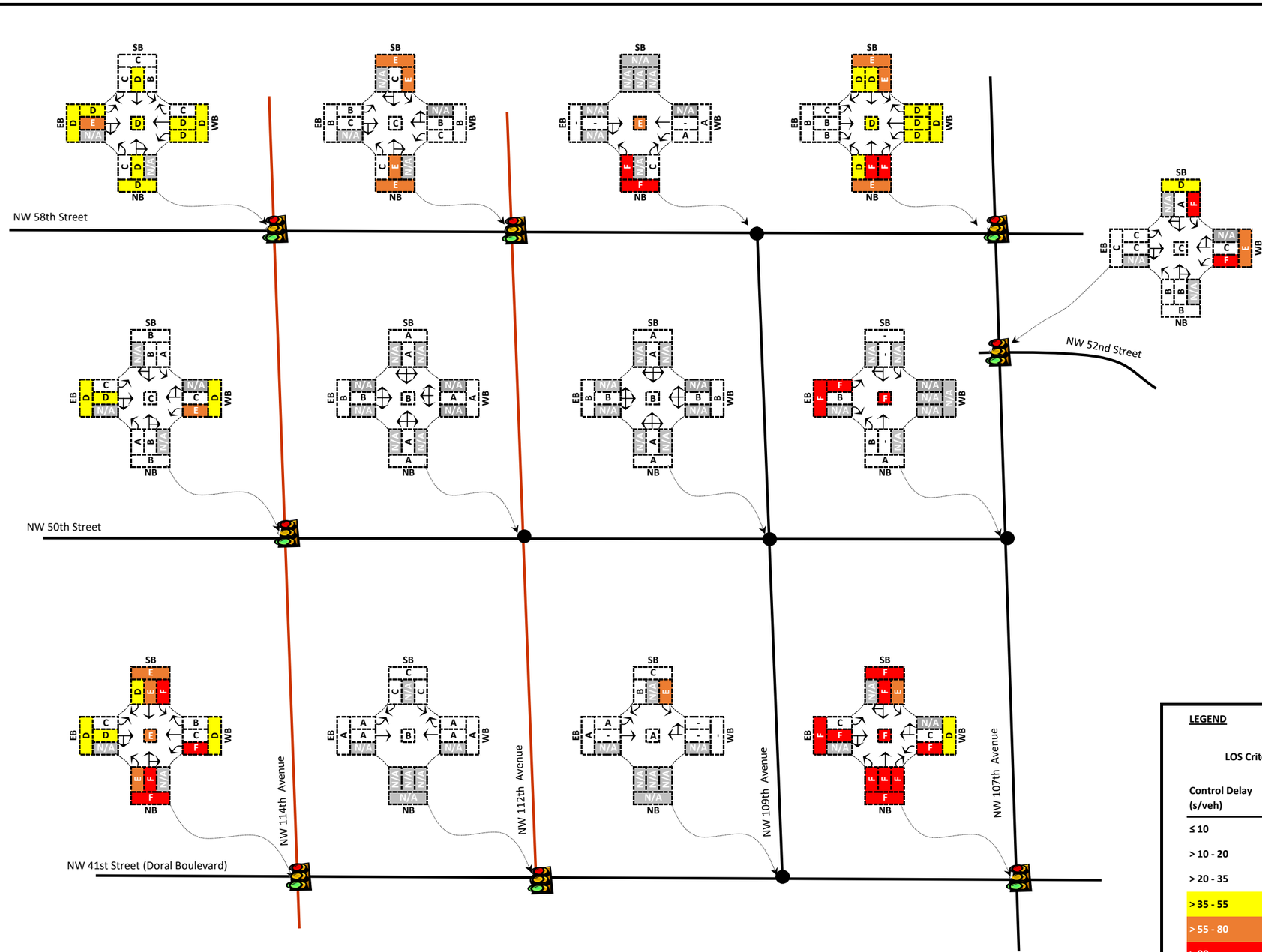
Table 8-1: 2020 Targeted Operations Analysis Summary Build vs No-Build

		2020 No-Build										2020 Build										2020 Build Vs 2020 No-Build									
			Overall		Approach								Overall		Approach								Overall		Approach							
					EB		WB		NB		SB				EB		WB		NB		SB				EB		WB		NB		SB	
Corridor	Intersection	Peak Period	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Peak Period	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Peak Period	Δ Delay %[1]	Δ LOS[2]	Δ Delay %[1]	Δ LOS[2]	Δ Delay %[1]	Δ LOS[2]	Δ Delay %[1]	Δ LOS[2]	Δ Delay %[1]	Δ LOS[2]
NW 114 Avenue	NW 58 Street	AM	53.9	D	66.6	E	106.8	F	41.1	D	31	C	AM	36.7	D	52.8	D	38.7	D	35.7	D	30.1	C	AM	-31.9%	Same	-20.7%	Better	-63.8%	Better	-13.1%	Same	-2.9%	Same
		PM	56.5	E	21.9	C	39.5	D	35.8	D	89.8	F	PM	44.7	D	21.8	C	17.5	B	35.8	D	78.1	E	PM	-20.9%	Better	-0.5%	Same	-55.7%	Better	0.0%	Same	-13.0%	Better
	NW 50 Street	AM	23.1	C	67.7	E	56	E	9.6	A	10.3	B	AM	20.1	C	42.3	D	48.1	D	11.9	B	12.6	B	AM	-13.0%	Same	-37.5%	Better	-14.1%	Better	24.0%	Lower	22.3%	Same
		PM	15.3	B	39.5	D	39.7	D	12.3	B	10.7	B	PM	15.3	B	39.5	D	39.6	D	12.4	B	10.8	B	PM	0.0%	Same	0.0%	Same	-0.3%	Same	0.8%	Same	0.9%	Same
	NW 41 Street	AM	67.4	E	40.8	D	58.40	E	82.7	F	149	F	AM	58.8	E	46.6	D	54	D	86.7	F	79.2	E	AM	-12.8%	Same	14.2%	Same	-7.5%	Better	4.8%	Same	-46.8%	Better
		PM	135	F	67.4	E	27.10	C	346.1	F	186.2	F	PM	96.9	F	54.1	D	27.5	C	261.8	F	77.2	E	PM	-28.2%	Same	-19.7%	Better	1.5%	Same	-24.4%	Same	-58.5%	Better
NW 112 Avenue	NW 58 Street	AM	96.7	F	23.8	C	17.3	B	138.3	F	328.2	F	AM	34.3	C	19.6	B	17.1	B	55.5	E	59.3	E	AM	-64.5%	Better	-17.6%	Better	-1.2%	Same	-59.9%	Better	-81.9%	Better
		PM	86.9	F	34.8	C	24.5	C	317.7	F	38.7	D	PM	30.1	C	34.3	C	24.5	C	40.4	D	31.8	C	PM	-65.4%	Better	-1.4%	Same	0.0%	Same	-87.3%	Better	-17.8%	Better
	NW 50 Street (Roundabout)	AM	19.4	C	20.6	C	15.3	C	17.5	C	23.2	C	AM	10.2	B	14.2	B	8.4	A	7.5	A	9.8	A	AM	-47.4%	Better	-31.1%	Better	-45.1%	Better	-57.1%	Better	-57.8%	Better
		PM	41.2	E	15.7	C	18.7	C	47.5	E	63.1	F	PM	10	B	7.5	A	10.8	B	9	A	11.4	B	PM	-75.7%	Better	-52.2%	Better	-42.2%	Better	-81.1%	Better	-81.9%	Better
	NW 50 Street (Signal)	AM	19.4	C	20.6	C	15.3	C	17.5	C	23.2	C	AM	15.5	B	12.7	B	15.7	B	16.4	B	17.5	B	AM	-20.1%	Better	-38.3%	Better	2.6%	Better	-6.3%	Better	-24.6%	Better
		PM	41.2	E	15.7	C	18.7	C	47.5	E	63.1	F	PM	19.8	B	19.6	B	22.3	C	13.8	B	24	C	PM	-51.9%	Better	24.8%	Better	19.3%	Same	-70.9%	Better	-62.0%	Better
	NW 41 Street	AM	12.2	B	7.6	A	9.8	A	-	-	33.1	C	AM	11.9	B	7.2	A	9.2	A	-	-	32.9	C	AM	-2.5%	Same	-5.3%	Same	-6.1%	Same	-	-	-0.6%	Same
		PM	18	B	12.3	B	17.7	B	-	-	32.8	C	PM	16.6	B	10.2	B	16.1	B	-	-	32.7	C	PM	-7.8%	Same	-17.1%	Same	-9.0%	Same	-	-	-0.3%	Same
NW 109 Avenue	NW 58 Street	AM	49.9	E	-	-	1.8	A	273.7	F	-	-	AM	49.9	E	-	-	1.8	A	273.7	F	-	-	AM	0%	Same	-	-	0%	Same	0%	Same	-	-
		PM	8.7	A	-	-	1.1	A	60.6	F	-	-	PM	8.7	A	-	-	1.1	A	60.6	F	-	-	PM	0%	Same	-	-	0%	Same	0%	Same	-	-
	NW 50 Street	AM	10.1	B	10.1	B	10.6	B	8.7	A	8.8	A	AM	10.1	B	10.1	B	10.6	B	8.7	A	8.8	A	AM	0%	Same	0%	Same	0%	Same	0%	Same	0%	Same
		PM	9.8	A	9	A	10.7	B	8.3	A	8.7	A	PM	9.8	A	9	A	10.7	B	8.3	A	8.7	A	PM	0%	Same	0%	Same	0%	Same	0%	Same	0%	Same
	NW 41 Street	AM	0.3	A	0.2	A	-	-	-	-	17.3	C	AM	0.3	A	0.2	A	-	-	-	-	17.3	C	AM	0%	Same	0%	Same	-	-	-	-	0%	Same
		PM	1.2	A	1.5	A	-	-	-	-	26.9	D	PM	1.2	A	1.5	A	-	-	-	-	26.9	D	PM	0%	Same	0%	Same	-	-	-	-	0%	Same
NW 107 Avenue	NW 58 Street	AM	43.7	D	14.9	B	38.5	D	78.9	E	55.6	E	AM	43.7	D	14.9	B	38.5	D	78.9	E	55.6	E	AM	0%	Same	0%	Same	0%	Same	0%	Same	0%	Same
		PM	79	E	40.8	D	130.6	F	44.3	D	47.2	D	PM	79	E	40.8	D	130.6	F	44.3	D	47.2	D	PM	0%	Same	0%	Same	0%	Same	0%	Same	0%	Same
	NW 52 Street	AM	34	C	20.3	C	61.8	E	16.1	B	38.9	D	AM	34	C	20.3	C	61.8	E	16.1	B	38.9	D	AM	0%	Same	0%	Same	0%	Same	0%	Same	0%	Same
		PM	14.9	B	22.5	C	31.9	C	13.6	B	7.1	A	PM	14.9	B	22.5	C	31.9	C	13.6	B	7.1	A	PM	0%	Same	0%	Same	0%	Same	0%	Same	0%	Same
	NW 50 Street	AM	106.1	F	694.7	F	-	-	1	A	-	-	AM	106.1	F	694.7	F	-	-	1	A	-	-	AM	0%	Same	0%	Same	-	-	0%	Same	-	-
		PM	13.1	B	197.3	F	-	-	1.9	A	-	-	PM	13.1	B	197.3	F	-	-	1.9	A	-	-	PM	0%	Same	0%	Same	-	-	0%	Same	-	-
	NW 41 Street	AM	100	F	120.3	F	47.6	D	108.2	F	98.7	F	AM	100	F	120.3	F	47.6	D	108.2	F	98.7	F	AM	0%	Same	0%	Same	0%	Same	0%	Same	0%	Same
		PM	104.9	F	70.7	E	128.5	F	100.4	F	105.2	F	PM	104.9	F	70.7	E	128.5	F	100.4	F	105.2	F	PM	0%	Same	0%	Same	0%	Same	0%	Same	0%	Same

Notes:

1. % Change in Delay = Build $_{Delay}$ versus No-Build $_{Delay}$

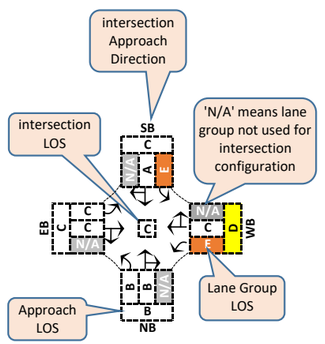
2. Relative change in LOS from No-Build to Build.



LEGEND

LOS Criteria

Control Delay (s/veh)	LOS
≤ 10	A
> 10 - 20	B
> 20 - 35	C
> 35 - 55	D
> 55 - 80	E
> 80	F



Project Name:

DORAL FLORIDA

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

2020 Intersection Improvements Operations Summary AM Peak Hour

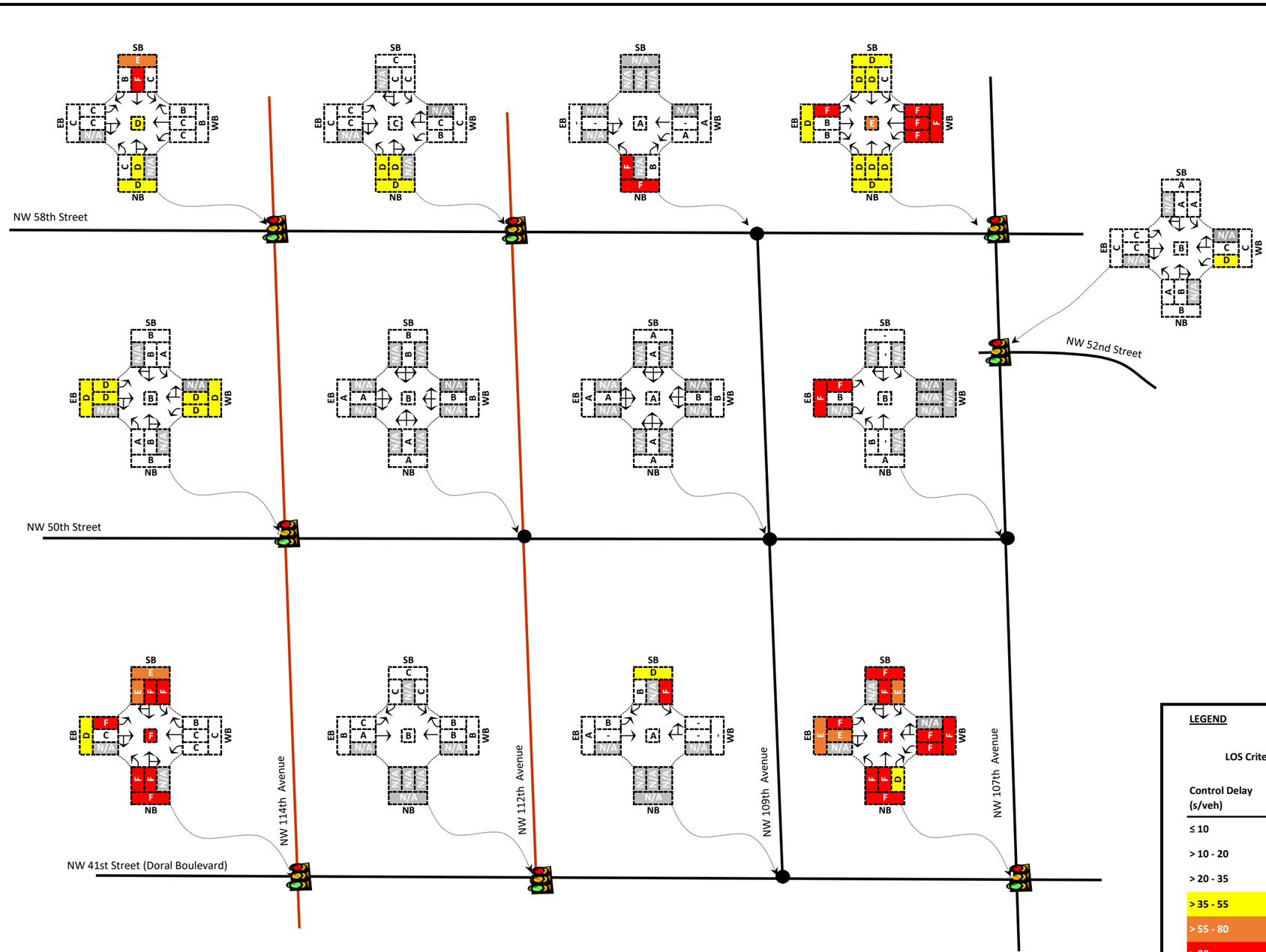
Prepared By:

BCC Engineering, Inc.
4901 NW 17th Way | Suite 506
Fort Lauderdale, FL 33309
Phone: 954-928-1828

Ex No. **8-39**

Pg No.

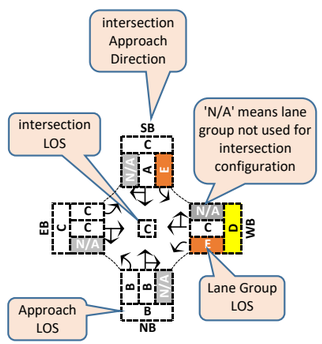
08/15/17



LEGEND

LOS Criteria

Control Delay (s/veh)	LOS
≤ 10	A
> 10 - 20	B
> 20 - 35	C
> 35 - 55	D
> 55 - 80	E
> 80	F



Project Name:

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

2020 Intersection Improvements Operations Summary PM Peak Hour

Prepared By:

BCC Engineering, Inc.
4901 NW 17th Way | Suite 506
Fort Lauderdale, FL 33309
Phone: 954-928-1828

Ex No. **8-40**

Pg No.

08/15/17

As can be seen from the summary results, for the future 2020 build condition (with targeted intersection improvements), the proposed intersection improvements are projected to improve traffic operations at the study intersections as follows:

- ***NW 114th Avenue at Doral Boulevard*** – In the AM peak hour, while the overall intersection is still projected to operate at LOS 'E', the overall intersection delay is projected to reduce by over 10% with projected upgrades to the levels of service on the westbound and southbound approaches to LOS 'D' and LOS'E' respectively compared to the no-build operations. A significant decrease of close to 50% in delay on the southbound approach compared to no-build is projected in the AM peak hour. In the PM peak hour, while the overall intersection is still projected to operate at LOS 'F', the overall intersection delay is projected to reduce by close to 30% with projected upgrades to the levels of service on the eastbound and southbound approaches to LOS 'D' and LOS'E' respectively compared to the no-build operations. A significant decrease of over 50% in delay on the southbound approach compared to no-build is projected in the PM peak hour.
- ***NW 114th Avenue at NW 58th Street*** – In the PM peak hour, overall operations at this intersection are projected to upgrade to LOS 'D' along with upgrades on the westbound and southbound approaches of LOS 'B' and LOS 'E' respectively, compared to the no-build operations.
- ***NW 112th Avenue at NW 50th Street*** –The two options for improvements at this intersection including the possible installation of a roundabout or traffic signal provided the following operational results:
    - *Roundabout Option* - In the PM peak hour, overall operations at this intersection are projected to upgrade to LOS 'B' along with commensurate LOS upgrades on all intersection approaches compared to the no-build option. The overall intersection delay during the PM Peak hour is projected to reduce by close to 80% compared to the no-build option.
    - *Signal Option* - In the PM peak hour, overall operations at this intersection are projected to upgrade to LOS 'B' along with commensurate LOS upgrades on the eastbound, northbound and southbound intersection approaches compared to the no-build option. The overall intersection delay during the PM Peak hour is projected to reduce by just 50% compared to the no-build option.
- ***NW 112th Avenue at NW 58th Street*** – In the AM peak hour, overall operations at this intersection are projected to upgrade significantly from LOS 'F' (no-build) to LOS 'C' with commensurate LOS upgrades on the eastbound, northbound and southbound approaches compared to the no-build option. In the PM peak hour, overall operations at this intersection are projected to upgrade significantly from LOS 'F' (no-build) to LOS 'C' with commensurate LOS upgrades on the northbound and southbound approaches compared to the no-build option.

The projected operations at the remaining study intersections are projected to remain the same given that the targeted intersection improvements are not anticipated to affect their operations. Output SYNCHRO reports of the existing conditions intersection analyses for the AM and PM peak periods are included in **Appendix F.**

Arterial Analysis: The results of the arterial operational analyses comparing this future Build alternative to the future No-Build AM and PM peak hour conditions are summarized in **Table 8-2**.

Table 8-2: Targeted 2020 Build versus 2020 No-Build Arterial Traffic Operations

			No-Build				Build				Build versus No-Build			
			Direction				Direction				Direction			
			Northbound		Southbound		Northbound		Southbound		Northbound		Southbound	
Corridor	Limits	Peak Period	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS	Δ Speed %[1]	Δ LOS[2]	Δ Speed %[1]	Δ LOS[2]
NW 114th Avenue	Between Doral Blvd and NW 58th Street	AM	21.2	C	14.1	D	21.7	C	17.5	D	2.4%	Same	24.1%	Same
		PM	20.1	C	11.9	E	20.1	C	16.9	D	0.0%	Same	42.0%	Better
NW 112th Avenue (with Roundabout at NW 50th St)	Between Doral Blvd and NW 58th Street	AM	9.8	F	20.2	C	16.9	D	20.3	C	72.4%	Better	0.5%	Same
		PM	5.1	F	21.4	C	19.7	C	21.8	C	286.3%	Better	1.9%	Same
NW 112th Avenue (with Signal at NW 50th St)	Between Doral Blvd and NW 58th Street	AM	9.8	F	20.2	C	19.8	C	21.7	C	102.0%	Better	7.4%	Same
		PM	5.1	F	21.4	C	22.4	C	21.7	C	339.2%	Better	1.4%	Same

Notes:

1. % Change in Speed = Build $_{Speed}$ versus No-Build $_{Speed}$

2. Relative change in LOS from No-Build to Build.

As can be seen from the results in **Table 8-2**, with the build improvements, NW 114th Avenue southbound operations between Doral Boulevard and NW 58th Street are projected to upgrade to LOS 'D' during the PM Peak Hour compared to the no-build conditions. For NW 112th Avenue between Doral Boulevard and NW 58th Street, northbound operations are projected to upgrade significantly to LOS 'C' in both the AM and PM peak hours compared to the 2020 no-build operations. Output SYNCHRO arterial reports along the roadway network for the AM and PM peak periods for the 2020 build conditions are included in **Appendix F.**

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8.4.2 Build Option 1 versus Future No-Build

Intersection Analysis: The operational analysis performed for the 2020 Build Option 1 (i.e., NW 114th Avenue northbound and NW 112th Avenue southbound) AM and PM peak traffic conditions used the SYNCHRO version 9 traffic analysis software. Signal timings were optimized to the extent possible to further maximize the operations associated with the proposed improvements. The results of the intersection operational analyses comparing this future Build Option 1 alternative to the future No-Build AM and PM peak hour conditions are summarized on the following pages in **Table 8-3** and graphically depicted in **Exhibits 8-41** and **8-42** respectively.

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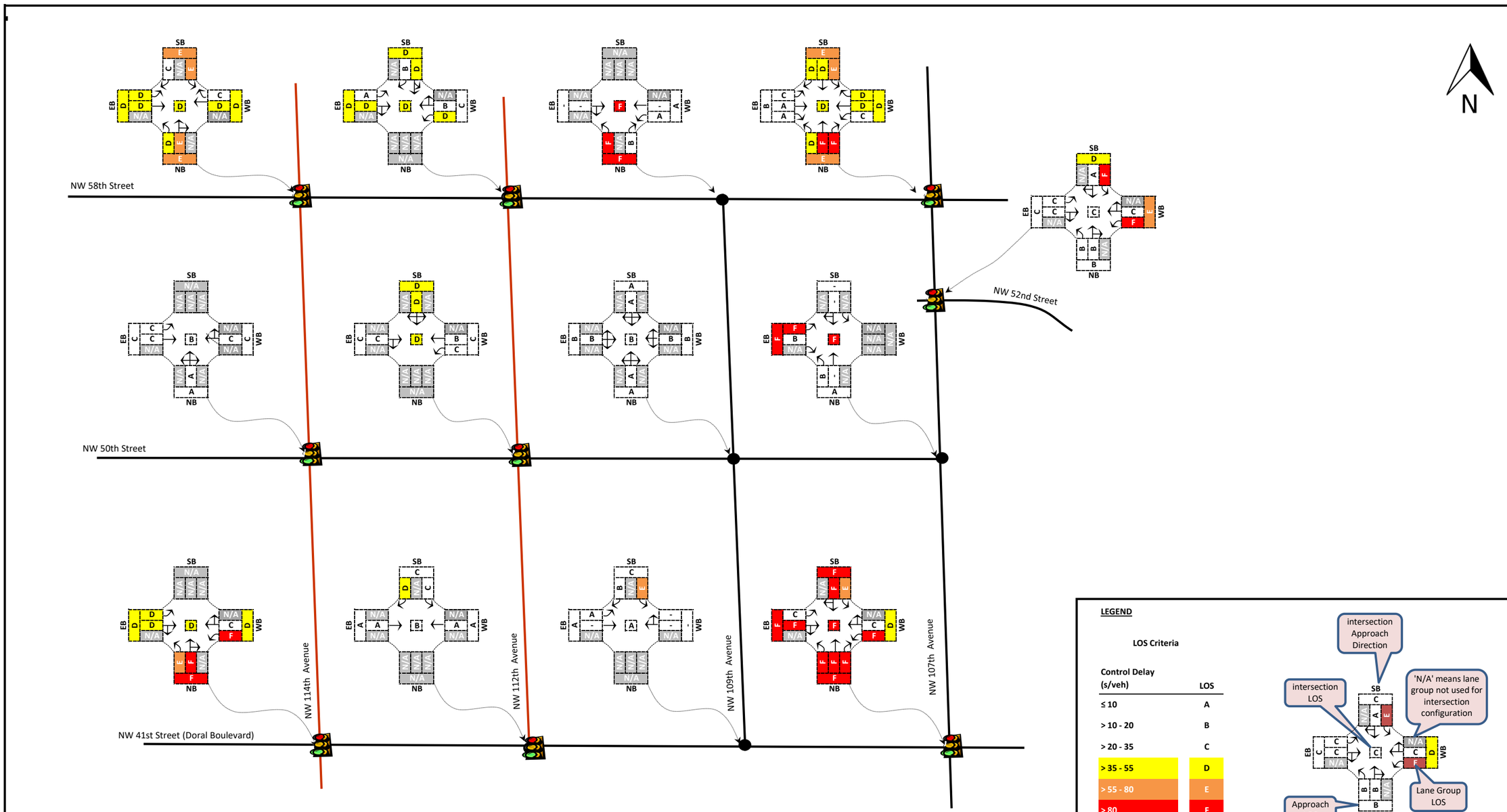
Table 8-3: 2020 Option 1 Intersection Operations Analysis Summary Build vs No-Build

		2020 No-Build											2020 Build											2020 Build Vs 2020 No-Build									
			Overall		Approach									Overall		Approach									Overall		Approach							
					EB		WB		NB		SB					EB		WB		NB		SB			Δ	Δ	EB Δ	EB Δ	WB Δ	WB Δ	NB Δ	NB Δ	SB Δ	SB Δ
Corridor	Intersection	Peak Period	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Peak Period	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Peak Period	Delay %[1]	LOS[2]	Delay %[1]	LOS[2]	Delay %[1]	LOS[2]	Delay %[1]	LOS[2]	Delay %[1]	LOS[2]
NW 114 Avenue	NW 58 Street	AM	53.9	D	66.6	E	106.8	F	41.1	D	31	C	AM	54	D	51.8	D	42	D	55.8	E	55.7	E	AM	0.2%	Same	-22.2%	Better	-60.7%	Better	35.8%	Lower	79.7%	Lower
		PM	56.5	E	21.9	C	39.5	D	35.8	D	89.8	F	PM	167.2	F	56.6	E	68.5	E	216.1	F	170.2	F	PM	195.9%	Lower	158%	Lower	73.4%	Lower	504%	Lower	89.5%	Same
	NW 50 Street	AM	23.1	C	67.7	E	56	E	9.6	A	10.3	B	AM	14.5	B	28.2	C	23.7	C	9.4	A	-	-	AM	-37.2%	Better	-58.3%	Better	-57.7%	Better	-2.1%	Same	-	-
		PM	15.3	B	39.5	D	39.7	D	12.3	B	10.7	B	PM	25.8	C	46.1	D	28.5	C	24.2	C	-	-	PM	68.6%	Lower	16.7%	Same	-28.2%	Better	96.7%	Lower	-	-
	NW 41 Street	AM	67.4	E	40.8	D	58.40	E	82.7	F	149	F	AM	50	D	47	D	39.5	D	83.9	F	-	-	AM	-25.8%	Better	15.2%	Same	-32.4%	Better	1.5%	Same	-	-
		PM	135	F	67.4	E	27.10	C	346.1	F	186.2	F	PM	121.6	F	77.8	E	54.9	D	302.2	F	-	-	PM	-9.9%	Same	15.4%	Same	103%	Lower	-12.7%	Same	-	-
NW 112 Avenue	NW 58 Street	AM	96.7	F	23.8	C	17.3	B	138.3	F	328.2	F	AM	39.8	D	43.7	D	31	C	-	-	37.2	D	AM	-58.8%	Better	83.6%	Lower	79.2%	Lower	-	-	-88.7%	Better
		PM	86.9	F	34.8	C	24.5	C	317.7	F	38.7	D	PM	24.7	C	31.2	C	14.3	B	-	-	31.6	C	PM	-71.6%	Better	-10.3%	Same	-41.6%	Better	-	-	-18.3%	Better
	NW 50 Street	AM	19.4	C	20.6	C	15.3	C	17.5	C	23.2	C	AM	26.5	D	18	C	15.8	C	-	-	33.5	D	AM	36.6%	Lower	-12.6%	Same	3.3%	Same	-	-	44.4%	Lower
		PM	41.2	E	15.7	C	18.7	C	47.5	E	63.1	F	PM	45.4	E	11	B	14.2	B	-	-	56.3	F	PM	10.2%	Same	-29.9%	Better	-24.1%	Better	-	-	-10.8%	Same
	NW 41 Street	AM	12.2	B	7.6	A	9.8	A	-	-	33.1	C	AM	14.7	B	9.8	A	7.8	A	-	-	31.5	C	AM	20.5%	Same	28.9%	Same	-20.4%	Same	-	-	-4.8%	Same
		PM	18	B	12.3	B	17.7	B	-	-	32.8	C	PM	22.2	C	11.2	B	15.3	B	-	-	43.7	D	PM	23.3%	Lower	-8.9%	Same	-13.6%	Same	-	-	33.2%	Lower
NW 109 Avenue	NW 58 Street	AM	49.9	E	-	-	1.8	A	273.7	F	-	-	AM	60.1	F	-	-	1.6	A	273.4	F	-	-	AM	20%	Lower	-	-	-11%	Same	0%	Same	-	-
		PM	8.7	A	-	-	1.1	A	60.6	F	-	-	PM	180.3	F	-	-	1	A	1067.1	F	-	-	PM	1972%	Lower	-	-	-9%	Same	1661%	Same	-	-
	NW 50 Street	AM	10.1	B	10.1	B	10.6	B	8.7	A	8.8	A	AM	10.6	B	11	B	10.7	B	8.9	A	8.9	A	AM	5%	Same	9%	Same	1%	Same	2%	Same	1%	Same
		PM	9.8	A	9	A	10.7	B	8.3	A	8.7	A	PM	10.2	B	10.4	B	10.6	B	8.6	A	9.1	A	PM	4%	Lower	16%	Lower	-1%	Same	4%	Same	5%	Same
	NW 41 Street	AM	0.3	A	0.2	A	-	-	-	-	17.3	C	AM	0.3	A	0.2	A	-	-	-	-	17.1	C	AM	0%	Same	0%	Same	-	-	-	-	-1%	Same
		PM	1.2	A	1.5	A	-	-	-	-	26.9	D	PM	1.2	A	1.3	A	-	-	-	-	27.6	D	PM	0%	Same	-13%	Same	-	-	-	-	3%	Same
NW 107 Avenue	NW 58 Street	AM	43.7	D	14.9	B	38.5	D	78.9	E	55.6	E	AM	44	D	12.1	B	36.6	D	78.9	E	55.6	E	AM	1%	Same	-19%	Same	-5%	Same	0%	Same	0%	Same
		PM	79	E	40.8	D	130.6	F	44.3	D	47.2	D	PM	80.2	F	31.5	C	80.5	F	77.4	E	114.1	F	PM	2%	Lower	-23%	Better	-38%	Same	75%	Lower	142%	Lower
	NW 52 Street	AM	34	C	20.3	C	61.8	E	16.1	B	38.9	D	AM	34	C	20.3	C	61.8	E	16.1	B	38.9	D	AM	0%	Same	0%	Same	0%	Same	0%	Same	0%	Same
		PM	14.9	B	22.5	C	31.9	C	13.6	B	7.1	A	PM	13.7	B	21.8	C	29	C	12.8	B	6.5	A	PM	-8%	Same	-3%	Same	-9%	Same	-6%	Same	-8%	Same
	NW 50 Street	AM	106.1	F	694.7	F	-	-	1	A	-	-	AM	147.1	F	845.4	F	-	-	1	A	-	-	AM	39%	Same	22%	Same	-	-	0%	Same	-	-
		PM	13.1	B	197.3	F	-	-	1.9	A	-	-	PM	50.8	F	506.5	F	-	-	1	A	-	-	PM	288%	Lower	157%	Same	-	-	-47%	Same	-	-
	NW 41 Street	AM	100	F	120.3	F	47.6	D	108.2	F	98.7	F	AM	99.9	F	118.7	F	49.8	D	108.6	F	98.7	F	AM	0%	Same	-1%	Same	5%	Same	0%	Same	0%	Same
		PM	104.9	F	70.7	E	128.5	F	100.4	F	105.2	F	PM	79.6	E	70.9	E	77	E	80.6	F	96.8	F	PM	-24%	Better	0%	Same	-40%	Better	-20%	Same	-8%	Same

Notes:

1. % Change in Delay = Build $_{Delay}$ versus No-Build $_{Delay}$

2. Relative change in LOS from No-Build to Build.



LEGEND

LOS Criteria

Control Delay (s/veh)	LOS
≤ 10	A
> 10 - 20	B
> 20 - 35	C
> 35 - 55	D
> 55 - 80	E
> 80	F

Project Name:

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

2020 Option 1 Operations Analysis Summary AM Peak Hour

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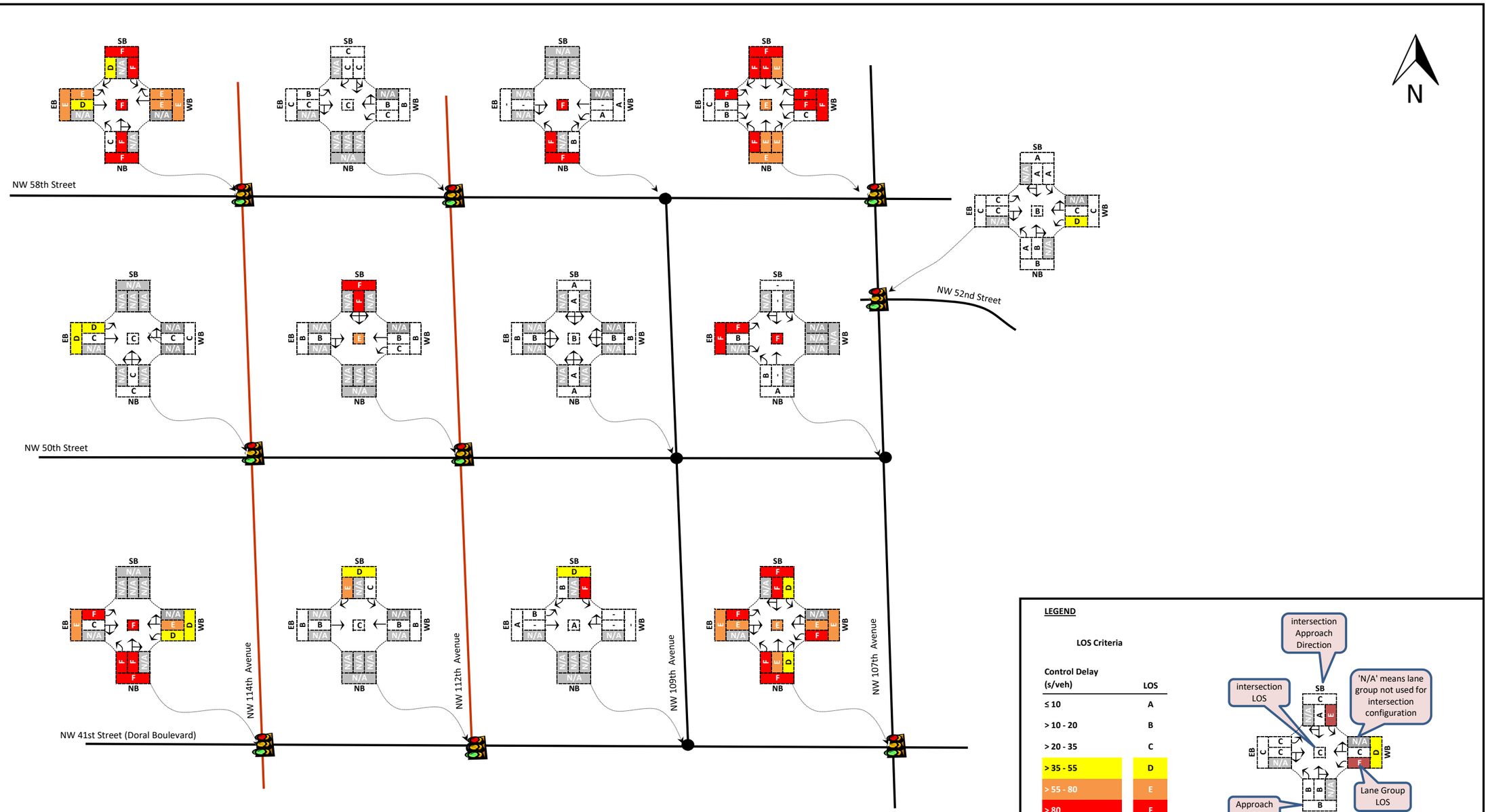
Ex No. **8-41**

Pg No.

08/15/17



LEGEND

LOS Criteria

Control Delay (s/veh)	LOS
≤ 10	A
> 10 - 20	B
> 20 - 35	C
> 35 - 55	D
> 55 - 80	E
> 80	F

Project Name:

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

2020 Option 1 Operations Analysis Summary PM Peak Hour

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As can be seen from the summary results, for the future 2020 build Option 1 condition (NW 114th Avenue northbound and NW 112th Avenue southbound) the following changes in traffic operations are projected:

- ***NW 114th Avenue at Doral Boulevard*** – In the AM peak hour, the overall intersection operation is projected to upgrade to LOS 'D'. In the PM peak hour, while the overall intersection is still projected to operate at LOS 'F', the overall intersection delay is projected to reduce by approximately 10% compared to the no-build operations.
- ***NW 114th Avenue at NW 50th Street*** – In the PM peak hour, overall operations at this intersection are projected to degrade to LOS 'C' compared to the no-build operations but is still acceptable since this is better than the minimum adopted LOS 'D' standard.
- ***NW 114th Avenue at NW 58th Street*** – In the PM peak hour, overall operations at this intersection are projected to degrade further to LOS 'F' compared to the no-build operations.
- ***NW 112th Avenue at Doral Boulevard*** – In the PM peak hour, overall operations at this intersection are projected to degrade to LOS 'C' compared to the no-build operations but is still acceptable since this is better than the minimum adopted LOS 'D' standard.
- ***NW 112th Avenue at NW 50th Street*** – In the AM peak hour, overall operations at this intersection are projected to degrade to LOS 'D' compared to the no-build operations but is still acceptable since this at the minimum adopted LOS 'D' standard. In the PM peak hour, overall operations at this intersection are projected to degrade further into LOS 'E' compared to the no-build operations.
- ***NW 112th Avenue at NW 58th Street*** – In the AM peak hour, overall operations at this intersection are projected to upgrade significantly from LOS 'F' (no-build) to LOS 'D'. In the PM peak hour, overall operations at this intersection are projected to upgrade significantly from LOS 'F' (no-build) to LOS 'C' with commensurate LOS upgrades on the northbound and southbound approaches compared to the no-build option.
- ***NW 109th Avenue at NW 58th Street*** – In the AM peak hour, overall operations at this intersection are projected to degrade to LOS 'F' compared to the no-build operations which is below the minimum adopted LOS 'D' standard. In the PM peak hour, overall operations at this intersection are projected to significantly degrade from LOS 'A' to LOS 'F' compared to the no-build operations.
- ***NW 107th Avenue at Doral Boulevard*** –In the PM peak hour, while the overall operations at this intersection are projected to upgrade to LOS 'E'' compared to the no-build operations.

Output SYNCHRO reports of the existing conditions intersection analyses for the AM and PM peak periods are included in **Appendix F.**

Arterial Analysis: The results of the arterial operational analyses comparing this future Build Option 1 alternative to the future No-Build AM and PM peak hour conditions are summarized in **Table 8-4**.

Table 8-4: 2020 Build Option 1 versus 2020 No-Build Arterial Traffic Operations

			No-Build				Build				Build versus No-Build			
			Direction				Direction				Direction			
			Northbound		Southbound		Northbound		Southbound		Northbound		Southbound	
Corridor	Limits	Peak Period	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS	Δ Speed %[1]	Δ LOS[2]	Δ Speed %[1]	Δ LOS[2]
NW 114th Avenue	Between Doral Blvd and NW 58th Street	AM	21.2	C	14.1	D	19.6	C	n/a[3]	n/a[3]	-7.5%	Same	n/a[3]	n/a[3]
		PM	20.1	C	11.9	E	10.1	E	n/a[3]	n/a[3]	-49.8%	Lower	n/a[3]	n/a[3]
NW 112th Avenue	Between Doral Blvd and NW 58th Street	AM	9.8	F	20.2	C	n/a[3]	n/a[3]	21	C	n/a[3]	n/a[3]	4.0%	Same
		PM	5.1	F	21.4	C	n/a[3]	n/a[3]	20.9	C	n/a[3]	n/a[3]	-2.3%	Same

Notes:

1. % Change in Speed = Build $_{Speed}$ versus No-Build $_{Speed}$

2. Relative change in LOS from No-Build to Build.

3. Because of One-Way Only configuration in the opposite direction with the Build alternative, MOEs are not available for this direction.

It should be noted that because of the one-way only configuration of northbound only on NW 114th Avenue and southbound only on NW 112th Avenue, operational statistics are not available for the opposite directions on these facilities for the build Option 1 alternative. As can be seen from the results in **Table 8-4**, with the build improvements, NW 114th Avenue northbound operations between Doral Boulevard and NW 58th Street are projected to degrade to LOS 'E' during the PM Peak Hour compared to the no-build conditions. For NW 112th Avenue between Doral Boulevard and NW 58th Street, southbound operations are generally projected to remain the same at LOS 'C' in both the AM and PM peak hours compared to the 2020 no-build operations. Output SYNCHRO arterial reports along the roadway network for the AM and PM peak periods for the 2020 build Option 1 conditions are included in **Appendix F.**

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8.4.3 Build Option 2 versus Future No-Build

Intersection Analysis: The operational analysis performed for the 2020 Build Option 2 (i.e., NW 114th Avenue southbound and NW 112th Avenue northbound) AM and PM peak traffic conditions used the SYNCHRO version 9 traffic analysis software. Signal timings were optimized to the extent possible to further maximize the operations associated with the proposed improvements. The results of the intersection operational analyses comparing this future Build Option 2 alternative to the future No-Build AM and PM peak hour conditions are summarized on the following pages in **Table 8-5** and graphically depicted in **Exhibits 8-43** and **8-44** respectively.

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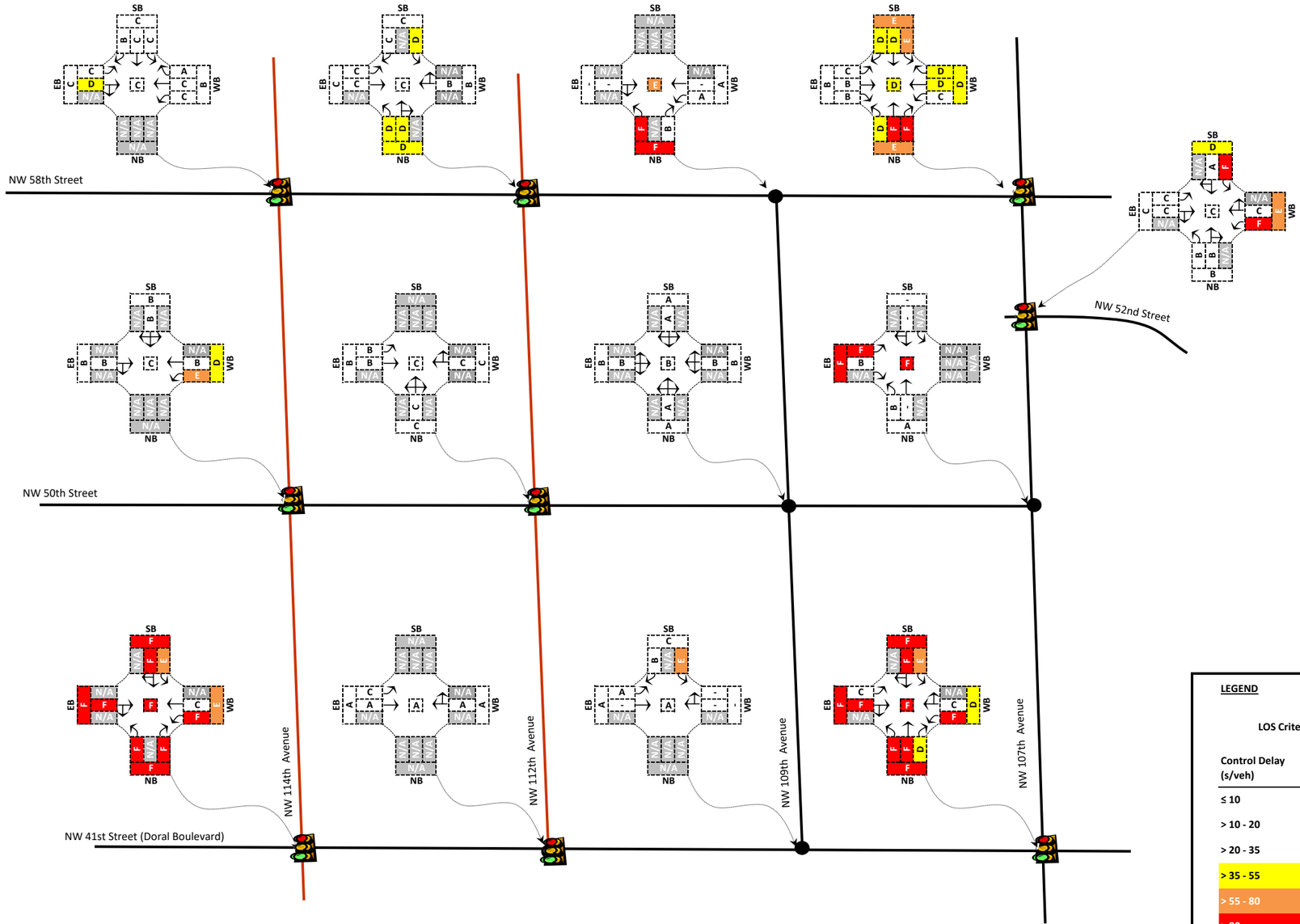
Table 8-5: 2020 Option 2 Intersection Operations Analysis Summary Build vs No-Build

		2020 No-Build										2020 Build										2020 Build Vs 2020 No-Build									
			Overall		Approach								Overall		Approach								Overall		Approach							
					EB		WB		NB		SB				EB		WB		NB		SB				EB		WB		NB		SB	
Corridor	Intersection	Peak Period	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Peak Period	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Peak Period	Δ Delay %[1]	Δ LOS[2]	Δ Delay %[1]	Δ LOS[2]	Δ Delay %[1]	Δ LOS[2]	Δ Delay %[1]	Δ LOS[2]	Δ Delay %[1]	Δ LOS[2]
NW 114 Avenue	NW 58 Street	AM	53.9	D	66.6	E	106.8	F	41.1	D	31	C	AM	24.7	C	34.8	C	16.2	B	-	-	29.7	C	AM	-54.2%	Better	-47.7%	Better	-84.8%	Better	-	-	-4.2%	Same
		PM	56.5	E	21.9	C	39.5	D	35.8	D	89.8	F	PM	48.7	D	45.9	D	38.9	D	-	-	67.4	E	PM	-13.8%	Better	110%	Lower	-1.5%	Same	-	-	-24.9%	Better
	NW 50 Street	AM	23.1	C	67.7	E	56	E	9.6	A	10.3	B	AM	21.1	C	18.7	B	45	D	-	-	14.2	B	AM	-8.7%	Same	-72.4%	Better	-19.6%	Better	-	-	37.9%	Same
		PM	15.3	B	39.5	D	39.7	D	12.3	B	10.7	B	PM	14.6	B	20.5	C	25.9	C	-	-	10.9	B	PM	-4.6%	Same	-48.1%	Better	-34.8%	Better	-	-	1.9%	Same
	NW 41 Street	AM	67.4	E	40.8	D	58.40	E	82.7	F	149	F	AM	144.2	F	159.6	F	58.3	E	129.4	F	167.4	F	AM	113.9%	Lower	291%	Lower	-0.2%	Same	56.5%	Same	12.3%	Same
		PM	135	F	67.4	E	27.10	C	346.1	F	186.2	F	PM	96.3	F	65.1	E	54.6	D	106.9	F	159.3	F	PM	-28.7%	Same	-3.4%	Same	101%	Lower	-69.1%	Same	-14.4%	Same
NW 112 Avenue	NW 58 Street	AM	96.7	F	23.8	C	17.3	B	138.3	F	328.2	F	AM	31.2	C	21.6	C	18.1	B	43.2	D	33.5	C	AM	-67.7%	Better	-9.2%	Same	4.6%	Same	-68.8%	Better	-89.8%	Better
		PM	86.9	F	34.8	C	24.5	C	317.7	F	38.7	D	PM	62.4	E	24.6	C	72	E	65.3	E	43.4	D	PM	-28.2%	Better	-29.3%	Same	194%	Lower	-79.4%	Better	12.1%	Same
	NW 50 Street	AM	19.4	C	20.6	C	15.3	C	17.5	C	23.2	C	AM	16.8	C	11	B	17.2	C	17.5	C	-	-	AM	-13.4%	Same	-46.6%	Better	12.4%	Same	0.0%	Same	-	-
		PM	41.2	E	15.7	C	18.7	C	47.5	E	63.1	F	PM	118.2	F	11.7	B	22	C	150.3	F	-	-	PM	186.9%	Lower	-25.5%	Better	17.6%	Same	216%	Lower	-	-
	NW 41 Street	AM	12.2	B	7.6	A	9.8	A	-	-	33.1	C	AM	6.8	A	7	A	6.4	A	-	-	-	-	AM	-44.3%	Better	-7.9%	Same	-34.7%	Same	-	-	-	-
		PM	18	B	12.3	B	17.7	B	-	-	32.8	C	PM	62.9	E	58.8	E	68.3	E	-	-	-	-	PM	249.4%	Lower	378%	Lower	286%	Lower	-	-	-	-
NW 109 Avenue	NW 58 Street	AM	49.9	E	-	-	1.8	A	273.7	F	-	-	AM	37.7	E	-	-	1.7	A	195.3	F	-	-	AM	-24%	Same	-	-	-6%	Same	-29%	Same	-	-
		PM	8.7	A	-	-	1.1	A	60.6	F	-	-	PM	31.5	D	-	-	1	A	245.6	F	-	-	PM	262%	Lower	-	-	-9%	Same	305%	Same	-	-
	NW 50 Street	AM	10.1	B	10.1	B	10.6	B	8.7	A	8.8	A	AM	10.3	B	10.2	B	10.9	B	8.8	A	9.2	A	AM	2%	Same	1%	Same	3%	Same	1%	Same	5%	Same
		PM	9.8	A	9	A	10.7	B	8.3	A	8.7	A	PM	13.2	B	15.1	C	12.1	B	9.2	A	10.2	B	PM	35%	Lower	68%	Lower	13%	Same	11%	Same	17%	Lower
	NW 41 Street	AM	0.3	A	0.2	A	-	-	-	-	17.3	C	AM	0.4	A	0.2	A	-	-	-	-	17.3	C	AM	33%	Same	0%	Same	-	-	-	-	0%	Same
		PM	1.2	A	1.5	A	-	-	-	-	26.9	D	PM	1.4	A	1.4	A	-	-	-	-	28.1	D	PM	17%	Same	-7%	Same	-	-	-	-	4%	Same
NW 107 Avenue	NW 58 Street	AM	43.7	D	14.9	B	38.5	D	78.9	E	55.6	E	AM	43.8	D	12.8	B	37.2	D	78.9	E	55.6	E	AM	0%	Same	-14%	Same	-3%	Same	0%	Same	0%	Same
		PM	79	E	40.8	D	130.6	F	44.3	D	47.2	D	PM	79.9	E	31.5	C	74.1	E	81.9	F	120.1	F	PM	1%	Same	-23%	Better	-43%	Better	85%	Lower	154%	Lower
	NW 52 Street	AM	34	C	20.3	C	61.8	E	16.1	B	38.9	D	AM	34	C	20.3	C	61.8	E	16.1	B	38.9	D	AM	0%	Same	0%	Same	0%	Same	0%	Same	0%	Same
		PM	14.9	B	22.5	C	31.9	C	13.6	B	7.1	A	PM	13.9	B	21.8	C	29	C	12.8	B	6.8	A	PM	-7%	Same	-3%	Same	-9%	Same	-6%	Same	-4%	Same
	NW 50 Street	AM	106.1	F	694.7	F	-	-	1	A	-	-	AM	100.5	F	672.4	F	-	-	1	A	-	-	AM	-5%	Same	-3%	Same	-	-	0%	Same	-	-
		PM	13.1	B	197.3	F	-	-	1.9	A	-	-	PM	144.1	F	921.3	F	-	-	1.8	A	-	-	PM	1000%	Lower	367%	Same	-	-	-5%	Same	-	-
	NW 41 Street	AM	100	F	120.3	F	47.6	D	108.2	F	98.7	F	AM	86.9	F	95.4	F	47.1	D	100.8	F	98.7	F	AM	-13%	Same	-21%	Same	-1%	Same	-7%	Same	0%	Same
		PM	104.9	F	70.7	E	128.5	F	100.4	F	105.2	F	PM	103.8	F	53.2	D	70.9	E	164.8	F	163.6	F	PM	-1%	Same	-25%	Better	-45%	Better	64%	Same	56%	Same

Notes:

1. % Change in Delay = Build $_{Delay}$ versus No-Build $_{Delay}$

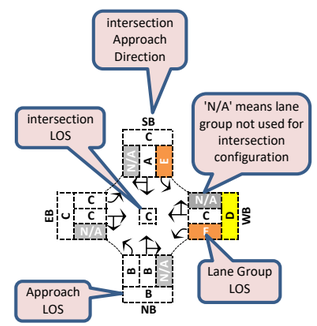
2. Relative change in LOS from No-Build to Build.



LEGEND

LOS Criteria

Control Delay (s/veh)	LOS
≤ 10	A
> 10 - 20	B
> 20 - 35	C
> 35 - 55	D
> 55 - 80	E
> 80	F



Project Name:

DORAL FLORIDA

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

2020 Option 2 Operations Analysis Summary AM Peak Hour

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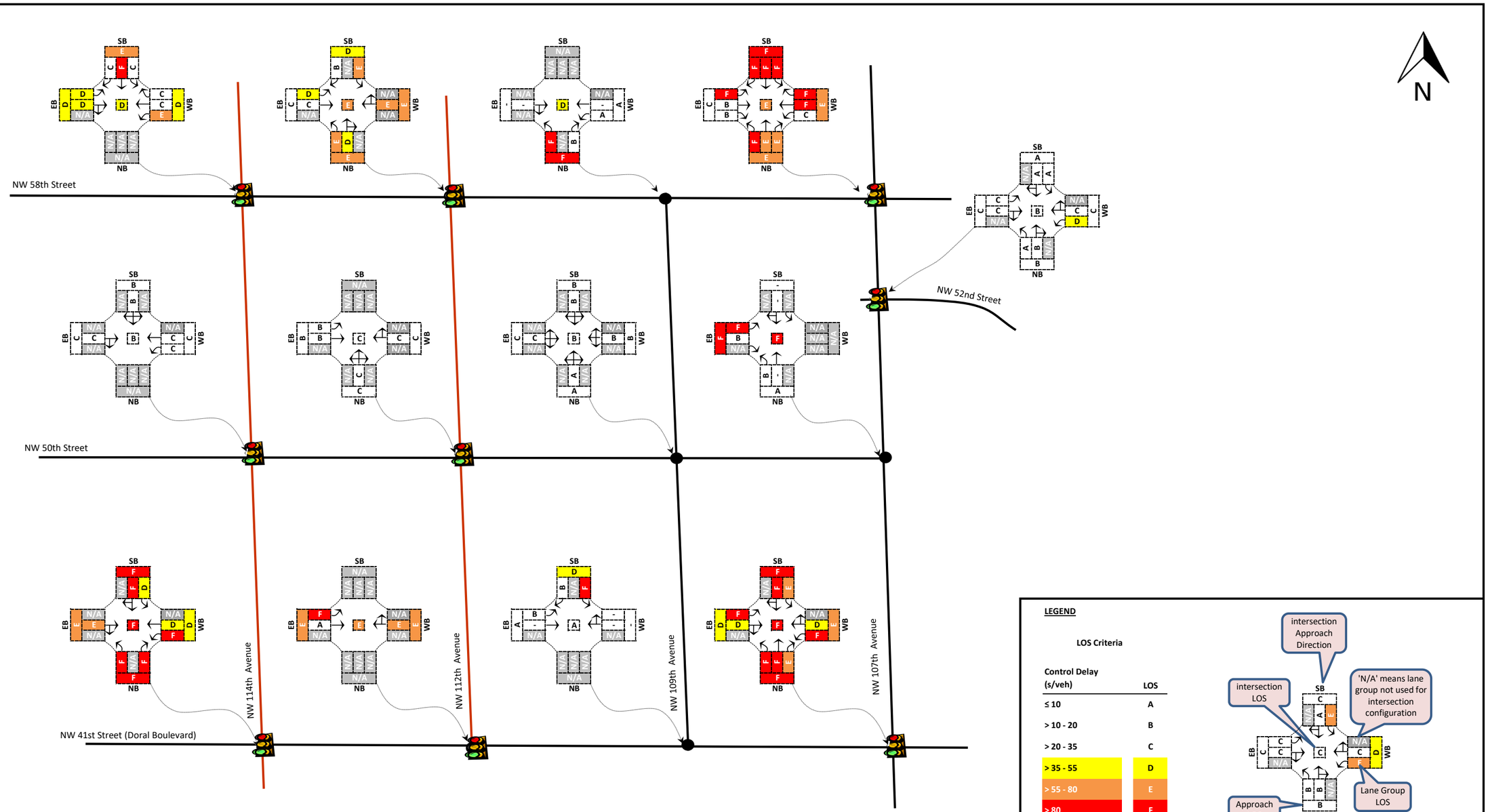
Pg No.

08/15/17



LEGEND

LOS Criteria

Control Delay (s/veh)	LOS
≤ 10	A
> 10 - 20	B
> 20 - 35	C
> 35 - 55	D
> 55 - 80	E
> 80	F

Project Name:

NW 114 Ave & NW 112 Ave Improvement Study

Exhibit Name:

2020 Option 2 Operations Analysis Summary PM Peak Hour

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Pg No.

08/15/17

As can be seen from the summary results, for the future 2020 build Option 2 condition (NW 114th Avenue southbound and NW 112th Avenue northbound) the following changes in traffic operations are projected:

- ***NW 114th Avenue at Doral Boulevard*** – In the AM peak hour, the overall intersection operation is projected to degrade from LOS 'E' to LOS 'F'. In the PM peak hour, while the overall intersection is still projected to operate at LOS 'F', the overall intersection delay is projected to reduce by approximately 30% compared to the no-build operations.
- ***NW 114th Avenue at NW 50th Street*** – In the AM and PM peak hours, overall operations at this intersection are generally projected to remain the same compared to the no-build operations.
- ***NW 114th Avenue at NW 58th Street*** – In the AM peak hour, the overall intersection operation is projected to upgrade to LOS 'C' from LOS 'E' compared to the no-build condition. In the PM peak hour, the overall intersection operation is projected to upgrade to LOS 'D' from LOS 'E' compared to the no-build condition.
- ***NW 112th Avenue at Doral Boulevard*** – In the PM peak hour, overall operations at this intersection are projected to degrade from LOS 'B' to LOS 'E' compared to the no-build operations which is below the minimum adopted LOS 'D' standard.
- ***NW 112th Avenue at NW 50th Street*** – In the PM peak hour, overall operations at this intersection are projected to degrade from LOS 'E' to LOS 'F' compared to the no-build operations.
- ***NW 112th Avenue at NW 58th Street*** – In the AM peak hour, overall operations at this intersection are projected to upgrade significantly from LOS 'F' (no-build) to LOS 'C'. In the PM peak hour, overall operations at this intersection are projected to upgrade from LOS 'F' (no-build) to LOS 'E' compared to the no-build option.
- ***NW 109th Avenue at NW 58th Street*** – In the PM peak hour, overall operations at this intersection are projected to significantly degrade to LOS 'D' from LOS 'A' compared to the no-build operations which is at minimum adopted LOS 'D' standard.
- ***NW 107th Avenue at NW 50th Street*** –In the PM peak hour, overall operations at this intersection are projected to significantly degrade to LOS 'F' from LOS 'B' compared to the no-build operations which is below the minimum adopted LOS 'D' standard.

Output SYNCHRO reports of the existing conditions intersection analyses for the AM and PM peak periods are included in **Appendix F.**

Arterial Analysis: The results of the arterial operational analyses comparing this future Build Option 2 alternative to the future No-Build AM and PM peak hour conditions are summarized in **Table 8-6**.

Table 8-6: 2020 Build Option 2 versus 2020 No-Build Arterial Traffic Operations

			No-Build				Build				Build versus No-Build			
			Direction				Direction				Direction			
			Northbound		Southbound		Northbound		Southbound		Northbound		Southbound	
Corridor	Limits	Peak Period	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS	Δ Speed %[1]	Δ LOS[2]	Δ Speed %[1]	Δ LOS[2]
NW 114th Avenue	Between Doral Blvd and NW 58th Street	AM	21.2	C	14.1	D	n/a[3]	n/a[3]	12	E	n/a[3]	n/a[3]	-14.9%	Lower
		PM	20.1	C	11.9	E	n/a[3]	n/a[3]	12.2	E	n/a[3]	n/a[3]	2.5%	Same
NW 112th Avenue	Between Doral Blvd and NW 58th Street	AM	9.8	F	20.2	C	18.5	C	n/a[3]	n/a[3]	88.8%	Better	n/a[3]	n/a[3]
		PM	5.1	F	21.4	C	19.7	C	n/a[3]	n/a[3]	286.3%	Better	n/a[3]	n/a[3]

Notes:

1. % Change in Speed = Build $_{Speed}$ versus No-Build $_{Speed}$

2. Relative change in LOS from No-Build to Build.

3. Because of One-Way Only configuration in the opposite direction with the Build alternative, MOEs are not available for this direction.

It should be noted that because of the one-way only configuration of southbound only on NW 114th Avenue and northbound only on NW 112th Avenue, operational statistics are not available for the opposite directions on these facilities for the build Option 2 alternative. As can be seen from the results in **Table 8-6**, with the build improvements, NW 114th Avenue southbound operations between Doral Boulevard and NW 58th Street are projected to degrade to LOS 'E' during the AM Peak Hour compared to the no-build conditions. For NW 112th Avenue between Doral Boulevard and NW 58th Street, northbound operations are projected to upgrade significantly from LOS 'F' to LOS 'C' in both the AM and PM peak hours compared to the 2020 no-build operations. Output SYNCHRO arterial reports along the roadway network for the AM and PM peak periods for the 2020 build Option 2 conditions are included in **Appendix F.**

9.0 CONCLUSION & RECOMMENDATIONS

This Improvement Study was undertaken to quantify traffic deficiencies along the study corridors of NW 114th Avenue and NW 112th Avenue from Doral Boulevard (aka NW 41st Street) to NW 58th Street as well as to evaluate possible improvements that can be implemented by the City of Doral to address these deficiencies. With a minimum adopted level of service standard of LOS 'D' for traffic operations on City Roads (where LOS 'A' is best and 'F' is worst), the study confirms that several traffic deficiencies along the study corridors exist today including:

- *Intersection of NW 114th Avenue at Doral Boulevard*- Operating at LOS'E' conditions during the AM Peak Hour and LOS 'F' in the PM Peak hour.
- *Intersection of NW 112th Avenue at Doral Boulevard* – Operating at LOS'E' conditions during the AM and PM Peak Hours.
- *NW 114th Avenue between Doral Boulevard and NW 58th Street* – Operating at LOS'E' conditions in the southbound direction during the PM peak hour.
- *NW 112th Avenue between Doral Boulevard and NW 58th Street* – Operating at LOS'F' conditions in the northbound direction during the AM & PM peak hours.

With growth in the near term (2020 conditions) and new development, additional deficiencies are projected including:

- *Intersection of NW 114th Avenue at NW 58th Street*- Overall operations projected to degrade to LOS'E' conditions during the PM Peak hour.
- *Intersection of NW 112th Avenue at NW 50th Street*- Overall operations projected to degrade to LOS'E' conditions during the PM Peak hour.
- *Intersection of NW 112th Avenue at NW 58th Street*- Overall operations projected to degrade to LOS'F conditions during the AM & PM Peak hours.

The improvements that were evaluated in this study to address deficiencies included:

- Targeted localized improvements at intersections along the study corridors
- One-way pair alternatives between Doral Boulevard and NW 58th Street
    - NW 114th Avenue (Northbound Only) and NW 112th Avenue (Southbound Only)
    - NW 114th Avenue (Southbound Only) and NW 112th Avenue (Northbound Only)

These alternatives were screened and ranked according to their anticipated "Socio-Economic Impact", "Expected Performance", and "Potential Challenges for Implementation" which were among the critical criteria considered. Based on these criteria, the "Targeted Intersection Improvements" collectively ranked higher than either one-way pair alternative. The highly negative "socio-economic impact" (i.e. intense public opposition) as well as negative impact on "expected performance" (e.g., potential reduction in mobility due to the creation of circuitous routes for many residential communities as well as the adverse impact to trolley service which could reduce transit options), weighed heavily on the negative ranking that the one-way alternatives received.

To improve traffic operations along NW 114th Avenue and NW 112th Avenue between Doral Boulevard and NW 58th Street, the following targeted intersection improvements are recommended to the City of Doral for consideration and implementation:

NW 114th Avenue at Doral Boulevard

- Install exclusive westbound right turn lane.
- Install exclusive southbound right turn lane. This improvement will require additional right-of-way since the additional lane will encroach on the sidewalk on the west side of NW 114th Avenue as well as impact the adjacent parking lot in the northwest corner of the intersection.
- Extend exclusive eastbound left turn lane on NW 114th Avenue to approximately 270 feet.
- Optimize traffic signal operations.

NW 114th Avenue at NW 58th Street

- Change lane utilization on the westbound approach to one exclusive left turn lane, one exclusive through lane and one exclusive right turn lane.
- Extend northbound exclusive left turn lane from 100 feet to 175 feet.
- Optimize traffic signal operations.

NW 112th Avenue at Doral Boulevard

- Install exclusive westbound right turn lane on Doral Boulevard. This improvement may require modification of the existing signal mast arm in the northwest corner of the intersection.
- Optimize traffic signal operations.

NW 112th Avenue at NW 50th Street

The proposed improvements at this intersection includes two options:

- *Install roundabout* -This option considers a single lane urban roundabout with an inscribed diameter of approximately 80 feet. The current design would not require additional right-of-way

Or,

- *Install traffic signal* - This improvement will require utility call outs for further refinement.
- Optimize traffic signal operations.
- A signal warrant study should be conducted at this location to confirm that traffic conditions meet national and state thresholds for a traffic signal.

NW 112th Avenue at NW 58th Street

- Extend northbound exclusive left turn lane from 150 feet to 200 feet.
- Optimize traffic signal operations.

In addition to the alternatives evaluated in this study, another parallel study was commissioned by the City to evaluate the benefits of connecting NW 112th Avenue between NW 34th Street and Doral Boulevard. Preliminary findings indicate that this improvement is a viable alternative that can also improve traffic operations in the western part of the City.