Government of the District of Columbia

Department of Transportation

Traffic Safety Assessment of Reno Rd, 39th St, & Ingomar St NW

INTRODUCTION

Based on requests from the Advisory Neighborhood Commission (ANC 3/4G and ANC 3E), the District Department of Transportation (DDOT) conducted a preliminary evaluation of traffic safety at the intersection of Reno Road, 39th Street and Ingomar Street in Northwest, Washington DC. Safety concerns were brought to the attention of DDOT as a result of several vehicular crashes at the intersection. The issues with the intersection were summarized as:

- Limited sight distance for vehicles on approaches of 39th Street at Reno Road NW due to street trees and landscaping
- Closely spaced intersections lead to multiple conflict points
- Vehicular right-of-way (meaning which vehicles have the right-of-way) challenges as a result of the complex configuration of the Reno -39th - Ingomar intersections

To properly address traffic safety issues at the intersection, an evaluation of crash data, traffic volumes, and an assessment of alternative traffic operations concepts was necessary. This report summarizes the methodology, findings, and suggestions developed during the study.

CRASH DATA

The safety concerns at the subject intersection include limited sight distance on the north- and southbound approaches of 39th Street, as well as the complicated geometry and multiple conflict points created by the intersection of the three roadways: Reno Road, 39th Street, and Ingomar Street NW. The Metropolitan Police Department (MPD) crash database shows that, between January 1, 2012 and August 31, 2015, a total of 17 crashes occurred at the intersection. Of the 17 crashes, one three-car rear end crash occurred on the southbound approach of the intersection, while 16 angular crashes occurred in the intersection between a car approaching the intersection on Reno Road and another vehicle approaching the intersection on 39th Street.

The attached crash diagram shows the breakdown of crashes.

TRAFFIC VOLUMES

Traffic volume data was derived from the most recent Average Annual Daily Traffic (AADT) volumes (2014) as well as turning movement counts conducted on Reno Road. The AADT data shows that Reno Road carries between 5,100 and 9,600 vehicles per day (about 6,000 near 39th Street). The turning movement data shows that i Reno Road carries approximately 600 vehicle per

hour (VPH) in the p.m. peak hour. The AADT on 39th Street is approximately 2,100 with an estimated 120 VPH (both directions) at its highest peak hour[1].

ALTERNATIVE INTERSECTION CONCEPTS

Based on review the crash data, operational observations obtained during field reconnaissance, and existing volume data it was determined that modifications to the existing roadway are appropriate and several alternatives were identified. The alternatives are identified below with the advantages and disadvantages.

Alternative 1: Do Nothing.

Due to the safety concerns at the intersection, Alternative 1 is the least acceptable alternative.

Alternative 2: Convert 39th Street to One-Way Northbound between Reno Road and Jenifer Street

Alternative 2 proposes to convert the southbound approach of the 39th Street NW between Reno Road and Jenifer St NW to one-way northbound. It includes the following changes:

- Remove on-street parking on west side of 39th St NW between Reno Road and Jenifer Street NW to allow for the installation of a contra-flow bike lane;
- Convert Ingomar St NW between 39th Street and Reno Road NW to one-way eastbound;
- Remove on-street parking on north side of Jenifer St NW between 39th Street and Reno Road NW to accommodate increase in vehicle trips on this segment;
- Install signing and marking improvements, including high-visibility crosswalks; and
- Remove street trees/vegetation to improve the sight distance for northbound 39th Street NW.

Alternative 2 would greatly simplify the cluster of intersection and remove the several conflict points. It will require traffic heading southbound on 39th Street to take a less direct path toward Reno Road via Jenifer Street.

Alternative 3: Multi-way STOP control at Reno Road and 39th Street

Alternative 3 proposes to the convent the existing two-way STOP controlled intersection to an all-way stop.

Based on the data gathered, the operating conditions at the intersection of Reno Road and 39th Street do not meet criteria stipulated by the Federal Highway Administration (FHWA) for the installation of multi-way stop control for the following reasons:

- All-way STOP controlled are appropriate at intersection where the traffic volume on the intersecting roadways are approximately equal. Reno Road carries at least four times the amount of traffic as 39th Street
- Based on peak hour estimates derived from the AADT, the 39th Street would fail to meet the minimum required volume threshold levels of conflicting traffic of at least 200 per hour.

[1] Hourly volume was derived from AADT using a K-Factor.

Alternative 4: Signal control at Reno Road and 39th Street

The installation of a signal must also satisfy one or more of the FHWA nine (9) warrants. Only tbe volume warrants (Warrants 1, 2 and 4) and the Crash Experience (7) are applicable to this intersection.

Warrant 1: Eight Hour Vehicle Volume
The minimum vehicular volume condition of Warrant 1 specifies that at least 500 vehicles must enter the intersection on the major street and at least 150 vehicles must enter the intersection in one direction on the minor street for eight (8) hours in a typical day. This volume condition is not met at this location, as noted above.

Warrant 2: Four Hour Vehicle Volume
The minimum vehicular volume condition of Warrant 2 specifies that at a volume level of 500 to 600 vehicles on the major street, the minor street must meet a minimum of 220 to 260 vehicles for four (4) hours in a typical day. This volume condition is not met at this location, as noted above.

Warrant 4: Pedestrian Volume
The minimum pedestrian volume condition of Warrant 4 specifies that at a volume level of 500 to 600 vehicles on the major street, the pedestrian volume must meet a minimum of 280 for four (4) hours in a typical day; OR in a single hour on the major street (assume peak hour volume of 600), the corresponding pedestrians per hour crossing the major street must exceed 480. This volume condition is not met at this location, as noted above.

Warrant 7: Crash Experience
The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal. Three criteria needs to be met to satisfy the warrant for a signal:

Condition A: Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency;
Condition B: Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and
Condition C: Volume Warrant 4 is satisfied at 80%.

Warrant 7 is not met because Condition A is not satisfied.

Preferred Alternative:
Alternative 2 is recommended to improve the safety around the intersection of Reno Road and 39th Street. It include converting the block of 39th St between Reno Rd and Jenifer St NW to one-way northbound in order to mitigate the sight-distance concern primarily for the southbound approach and simplify the overall operations of the intersection. Existing trees and shrubs will be pruned to improve sight line on the northbound approach.

This change is incremental and reversible. DDOT will monitor the impact of the changes to determine if the simplified intersection improves the overall safety of the intersection, including the northbound approach.

hour (VPH) in the p.m. peak hour. The AADT on 39th Street is approximately 2,100 with an estimated 120 VPH (both directions) at its highest peak hour[1].

ALTERNATIVE INTERSECTION CONCEPTS

Based on review the crash data, operational observations obtained during field reconnaissance, and existing volume data it was determined that modifications to the existing roadway are appropriate and several alternatives were identified. The alternatives are identified below with the advantages and disadvantages.

Alternative 1: Do Nothing.

Due to the safety concerns at the intersection, Alternative 1 is the least acceptable alternative.

Alternative 2: Convert 39th Street to One-Way Northbound between Reno Road and Jenifer Street

Alternative 2 proposes to convert the southbound approach of the 39th Street NW between Reno Road and Jenifer St NW to one-way northbound. It includes the following changes:

- Remove on-street parking on west side of 39th St NW between Reno Road and Jenifer Street NW to allow for the installation of a contra-flow bike lane;
- Convert Ingomar St NW between 39th Street and Reno Road NW to one-way eastbound;
- Remove on-street parking on north side of Jenifer St NW between 39th Street and Reno Road NW to accommodate increase in vehicle trips on this segment;
- Install signing and marking improvements, including high-visibility crosswalks; and
- Remove street trees/vegetation to improve the sight distance for northbound 39th Street NW.

Alternative 2 would greatly simplify the cluster of intersection and remove the several conflict points. It will require traffic heading southbound on 39th Street to take a less direct path toward Reno Road via Jenifer Street.

Alternative 3: Multi-way STOP control at Reno Road and 39th Street

Alternative 3 proposes to the convent the existing two-way STOP controlled intersection to an all-way stop.

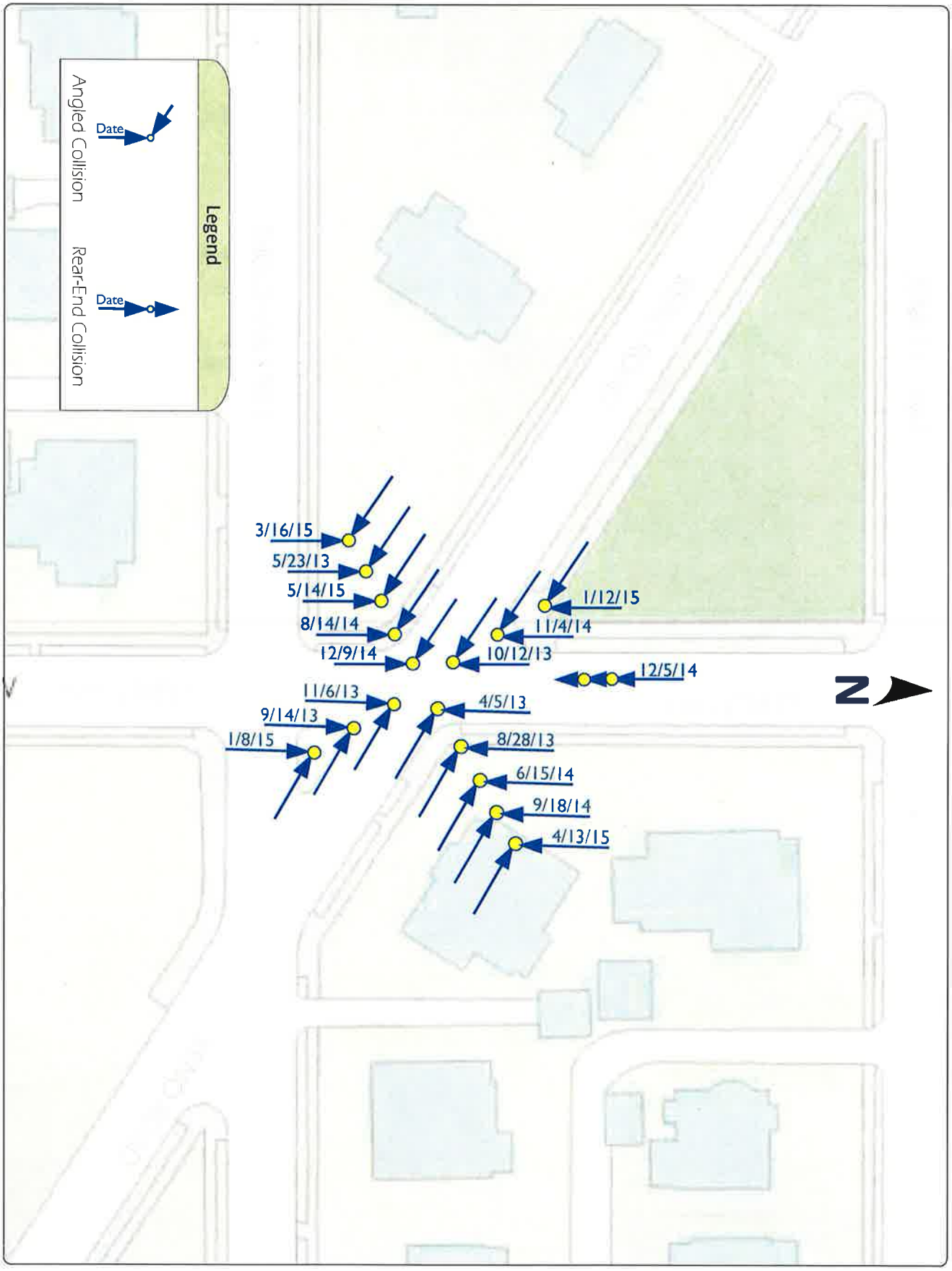
Based on the data gathered, the operating conditions at the intersection of Reno Road and 39th Street do not meet criteria stipulated by the Federal Highway Administration (FHWA) for the installation of multi-way stop control for the following reasons:

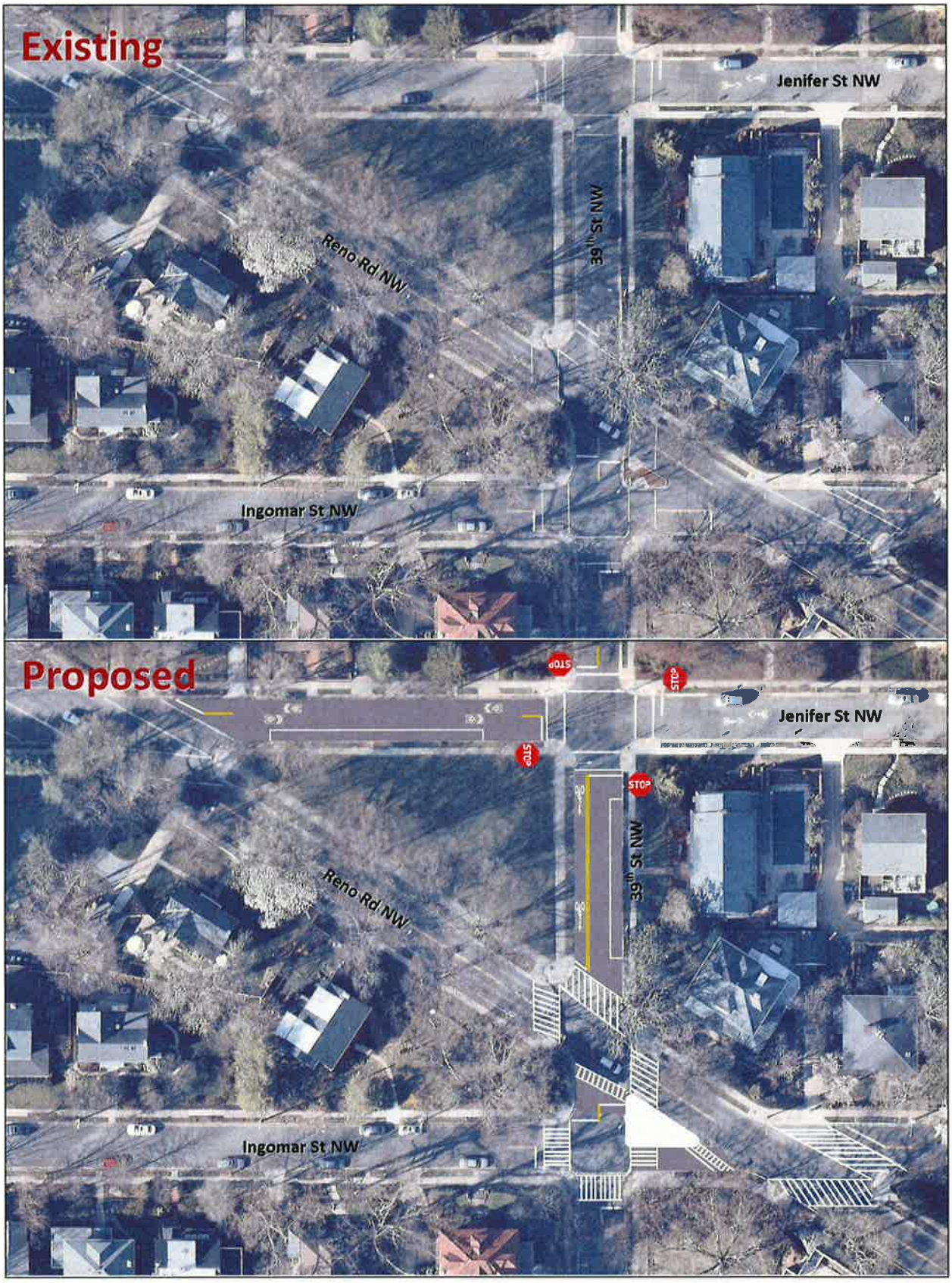
- All-way STOP controlled are appropriate at intersection where the traffic volume on the intersecting roadways are approximately equal. Reno Road carries at least four times the amount of traffic as 39th Street
- Based on peak hour estimates derived from the AADT, the 39th Street would fail to meet the minimum required volume threshold levels of conflicting traffic of at least 200 per hour.

[1] Hourly volume was derived from AADT using a K-Factor.

The installation of an all-way stop or a signal is not recommended at this location as the intersection does not meet the criteria specified by FHWA. Of particular importance is that roadways must typically exhibit balanced traffic volumes for all-way stop control to be appropriate at an intersection. Numerous ITE and FHWA studies have shown that stop compliance and safety decreases with the installation of all-way stop control when the warrants are not met.

The FHWA warrants stipulate that a signal should not be installed at an intersection with a history of crashes before "adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency". The Preferred Alternative would be in line with this guidance and would need to be explored before further consideration can be given to a signal. Volume warrants would also need to be met at the 80% level if these other alternatives are deemed unsuccessful.

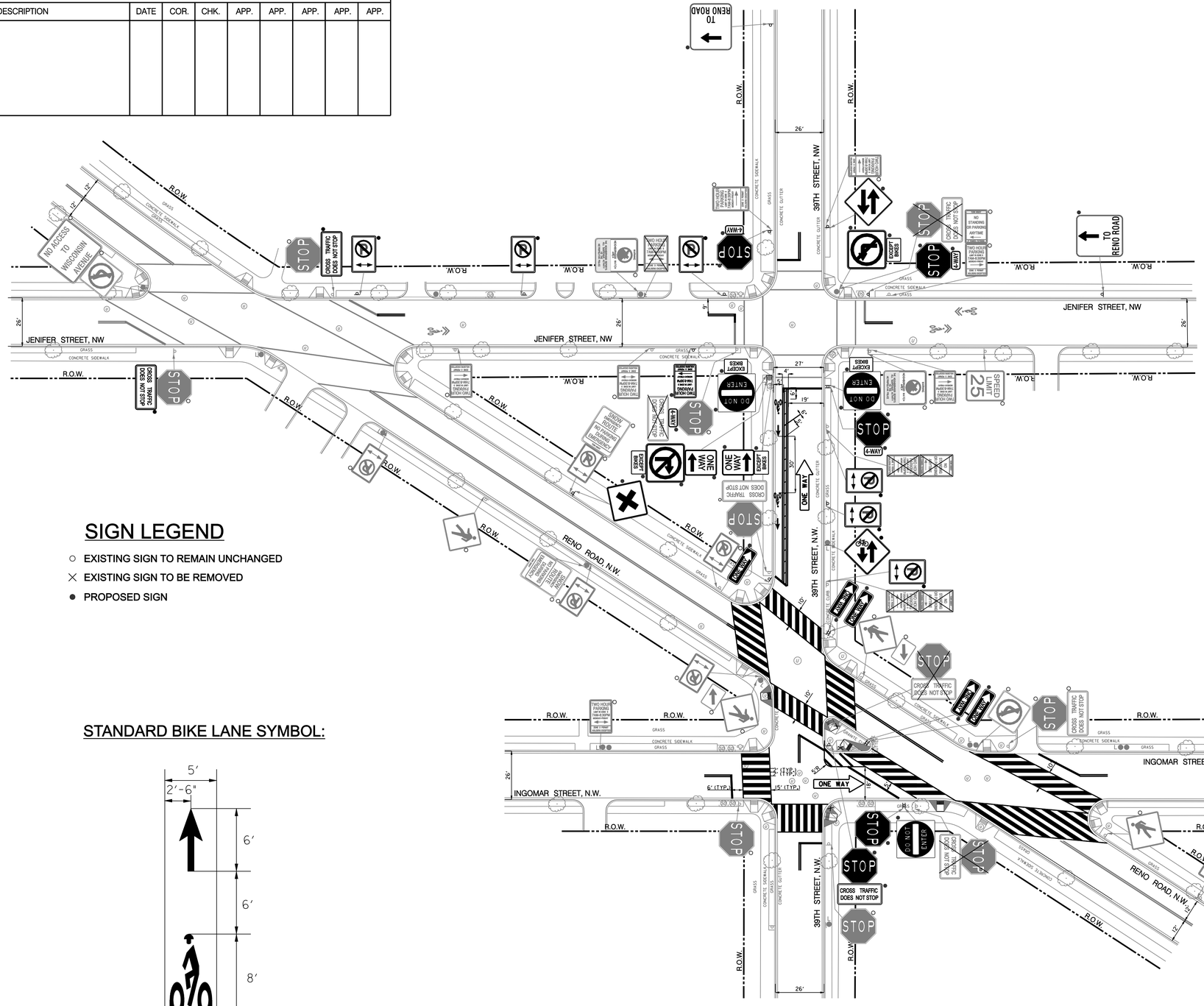

Legend
Angled Collision
Date
Rear-End Collision
Date
3/16/15
5/23/13
5/14/15
8/14/14
12/9/14
11/6/13
9/14/13
1/8/15
1/12/15
11/4/14
10/12/13
12/5/14
4/5/13
8/28/13
6/15/14
9/18/14
4/13/15
N



Intersection of Reno Rd, 39th St, & Ingomar St NW

REVISION								
DESCRIPTION	DATE	COR.	CHK.	APP.	APP.	APP.	APP.	APP.

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
3	D.C.			



SIGN LEGEND

- ○ EXISTING SIGN TO REMAIN UNCHANGED
- × EXISTING SIGN TO BE REMOVED
- ● PROPOSED SIGN

STANDARD BIKE LANE SYMBOL:

DESCRIPTION:

ONE WAY OPERATION ON INGOMAR STREET BETWEEN 39TH STREET AND RENO ROAD

ONE WAY OPERATION ON 39TH STREET BETWEEN RENO ROAD AND JENIFER STREET WITH ADDITIONAL CONTRA-FLOW BIKELANE

REMOVAL OF NORTH SIDE PARKING ON JENIFER STREET WEST OF 39TH STREET AND JENIFER STREET AND REMOVAL OF EAST SIDE PARKING ON 39TH STREET BETWEEN JENIFER STREET AND RENO ROAD

4-WAY STOP AT 39TH STREET AND JENIFER STREET

LEGEND:

- ● EXISTING WOOD POLE
- L● EXISTING WOOD POLE WITH LUMINAIRE
- SD SD SD EXISTING CATCH BASIN(S)
- EXISTING WHEELCHAIR RAMP
- PROPOSED WHEELCHAIR RAMP
- EXISTING TRAFFIC SIGN
- EXISTING FIRE HYDRANT
- EXISTING TREE
- R.O.W. RIGHT OF WAY LINE

GRAPHIC SCALE

30 15 0 30 60

1" = 30'-0"

PSI

Precision Systems, Inc.

Engineers, Planners and Architects

WASHINGTON, D.C.

NO.	DESCRIPTION	NAME	DATE

REVISIONS

D.C. DEPARTMENT OF TRANSPORTATION
TRANSPORTATION OPERATIONS ADMINISTRATION
TRAFFIC SAFETY DIVISION

TRAFFIC SAFETY AND ENGINEERING SERVICES

PROJECT ENG. WZ
DESIGNED BY MYH
CHECKED BY AYY
DRAWN BY YZ/AZ/SH
PROJECT MGR. WJW

39TH STREET AND RENO ROAD, N.W.
CONCEPT DESIGN

DIVISION CHIEF

DATE

FILE

SHEET OF

P:\70450\task 1 - four intersections in nw dc\working-temp\1-39th street and reno road nw\DSN-P000-70450-task 1_1 - alt 1 - 30.dgn
Friday, December 16, 2016 AT 08:41 AM