



Department of Transportation
Division Traffic Engineering and Operations
Montgomery County, Maryland

SCHOOL WALKING AREA ANALYSIS

I. IDENTIFICATION:

Location: Forest Knolls Elementary School

Study By: Boris Calderon

Walking Area

Recommended Approval _____

Study Date: 09/17/2019

Approved _____

Police District: Silver Spring

T.O. # _____ W.O. # _____

Logger #:

Forest Knolls Elementary School

II. ANALYSIS:

Overview:

Forest Knolls Elementary School is located at 10830 Eastwood Ave in Silver Spring. The school’s walking area is bound by to the east by the Northwest Branch river; Dennis Avenue and Colesville Road to the south and University Blvd West to the west. Forest Knolls Elementary School’s enrollment for the 2019-2020 school year is 761 and has been assigned 7 general education buses and 4 special education buses. Forest Knolls ES runs both day-care and Pre-K programs.

The school has three access points, the main entrance off Eastwood Avenue that is accessed by way of Caddington Avenue and two access points in the rear along Hannes Street. Both parent vehicles and buses access their respective loops by way of Caddington Avenue to Eastwood Avenue. The school’s one assigned crossing guard is stationed at this intersection. Some parents use Hannes Street to park or drop-off students who access the school by one of the two gate openings in the back.

A comprehensive school study was conducted for Forest Knolls ES in 2006 and established the existing school zone along Caddington Avenue. Parking restrictions and crosswalks in the immediate vicinity were also established at this time.

Walking Route Analysis:

The walking area for Forest Knolls ES has a near complete sidewalk network, with only five secondary roadways not having sidewalk on at least one of its sides. All these roads are located

south of Belton Road and see low volumes of traffic. Three other locations (Glenwild Road, Mountain Quail Road and Eastwood Avenue) have missing sidewalk segments but offer sidewalk accessibility on the opposite side of the roadway. It is therefore recommended that sidewalk be installed along roadways with no existing sidewalks. The walking area also has an extensive crosswalk network and has seen various crosswalk additions/improvements be added within the past five years.

Currently, DTEO is in the process of adding a set of crosswalks at the newly converted “All-way” stop intersection of Eisner Street with Edgewood Avenue. This project is in addition to the two crosswalk/sidewalk improvements that were completed at the Edgewood Avenue/Hannes Street intersection and Edgewood Avenue/Kerwin Road intersection.

There is a lack of north-south crossing points for pedestrians originating along the southeastern portion of the walking area, most notably for crossing over Lockridge Drive. It is recommended that new crosswalks with accompanying ADA compliant ramps be installed at the intersections of Lombardy Road with Lockridge Drive and Belton Road/Glenwild Road with Lockridge Drive (Recommendations #25, #23). This will ensure pedestrians needing to cross over Lockridge Drive do not have to walk an excessive distance to the only existing crosswalk at the intersection of Lockridge Drive and Dennis Avenue.

New crosswalk markings are also recommended for stop controlled Belton Road at Cavalier Drive. This would serve a crossing point for all pedestrians walking to and from the east side of the walking area that use Cavalier Drive to access the rear entrance point to the school. With this new crossing point, Cavalier Drive joins Edgewood Avenue as collector roadways for pedestrians that provide sidewalk accessibility to the school grounds.

ADA ramp improvements will be assessed and completed where standard sidewalks currently exist and right-of-way permits. New crosswalks will also be recommended at intersections with existing “Stop” controls.

Safety & Operational Issues:

Observations were conducted for the four following intersections during morning arrival (8:30AM-9:30AM) and afternoon dismissal times (3PM-4PM):

- Eastwood Avenue at Caddington Avenue - September 17, 2019
- Cavalier Drive at Hannes Street – September 18, 2019
- Hannes Street at Edgewood Avenue - September 19, 2019
- Edgewood Avenue at Eisner Street – September 19, 2019

Even though both the parent and bus loop are accessed by Eastwood Avenue and Caddington Avenue, no major conflicts were found to exist at the intersection or respective loops. No significant queuing or delays were seen along Caddington Avenue. When traffic was stopped for pedestrian crossings at the marked school crosswalk, the queue reached a maximum of seven vehicles in the southwest direction and waited for a total of 45 seconds. This brief delay allowed the traffic signal at Caddington Avenue and MD-193 to cycle through and allow for the queued vehicles to clear out for the upcoming phase.

It was also noticed that parents use both sides of Caddington Avenue in the vicinity of Eastwood Avenue to park and/or drop-off students. Those who use the northwest side of Caddington Avenue then proceed to use the school crosswalk to access the front entrance and return in the same manner. Overgrown foliage at this intersection reduces sight distance and will need to be trimmed and/or removed.

No vehicle or pedestrian operational issues were observed at the intersection of Cavalier drive and Hannes Street. As in the front, parents use both sides of Hannes Street to park and/or pick-up students. During the 15-minute peak time period in the afternoon, vehicles take up most of the parking spaces along Hannes Street. While morning drop-offs are less congested, no major delays, queuing or operational issues were witnessed at this intersection. No pedestrian delays, lack of crossing gaps or conflicts with vehicles were witnessed and adherence to the existing “Stop” control was 100%. Parking availability returns after the peak-period is over as seen in the attached photos.

Currently, DTEO is conducting a separate and independent traffic study for this intersection and will make a determination on the conversion to an “All-way” stop. In the event this were to occur, we recommend crosswalk markings be added to intersection for the new stop controlled Cavalier Drive.

The Luther Rice Memorial Baptist Church and school driveway serves as the third leg of the Hannes Street and Edgewood Avenue intersection. While the pedestrian count shows a low number of pedestrians who use that existing crosswalk, the geometry of the intersection makes the existing crosswalk need additional treatments. The free flow movement of southwest bound Hannes Street vehicles turning left onto Edgewood Avenue have less time to recognize pedestrians waiting to cross at the crosswalk. It is therefore recommended that the existing crosswalk be converted to a raised crosswalk (Recommendation #20, water drainage permitting). This treatment should allow for reduced speeds when vehicles are engaging the intersection and allow for more time to see waiting pedestrians.

Crash data for the walking area revealed six pedestrian/bicycle related crashes were reported within the period of January 2014 to September 2019, with two of these crashes occurring during school arrival and dismissal times. The first crash was located at the intersection of Hannes Street and Hannes Court. Report #MCP3029000C lists crash occurring at 3:35 pm and lists the non-motorists as at fault. It is recommended that a new crosswalk and stop bar markings (Recommendation #19) be installed at this intersection. This, as well as the previously discussed raised crosswalk should improve pedestrian operations in this area.

The second recorded crash is at the intersection of Southwood Avenue and Colesville Road (MD-29). These two roads make up the southern limit of the walking area and students walkers would not be expected to cross either of them.

III. ATTACHMENTS:	Walking Area Map	<u> X </u>	Sidewalk Map	<u> X </u>
	Recommendation Map	<u> X </u>	Accident Study	<u> X </u>
	Photos	<u> X </u>	Concept Plans	<u> X </u>
	Count Data	<u> X </u>		

IV. RECOMMENDED IMPROVEMENTS:

Map ID	Location	Issue	Recommendation	Timeframe*
1	Caddington Avenue at MD-193	New Signings	New extended corner clearance restrictions on Caddington Ave during school arrival and departure times. Will allow vehicle access to right turn lane.	Short
1	Caddington Avenue at MD-193	New Signings	Upgrade SL25 from 18" to 24"	Short
2	Caddington Avenue at Whittington Terrace	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
3	Caddington Avenue from MD-193 to Loxford Terrace	New Markings	New DYCL, existing is severely faded	Short
4	Caddington Avenue at Eastwood Avenue	New Signings	New extended corner clearance restrictions on Caddington Ave for vehicles exiting Eastwood Avenue	Short
4	Caddington Avenue at Eastwood Avenue	New Markings	New DYCL on Eastwood Avenue	Short
4	Caddington Avenue at Eastwood Avenue	New Markings	New stop bar crosswalk markings (2)	Short
4	Caddington Avenue at Eastwood Avenue	ADA ramps not to standard	Bring ADA ramps to standard (3). Install mountable curb or reduce radius to prevent buses from mounting curb during turns.	Intermediate
5	Caddington Avenue at Chiswell Lane	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate

Map ID	Location	Issue	Recommendation	Timeframe*
6	Caddington Avenue at Loxford Terrace	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
6	Caddington Avenue at Loxford Terrace	New Markings	New crosswalks and stop bar markings (2)	Short
7	Caddington Avenue at Playford Lane	New Signing	Upgrade Stop sign from 24" to 30"	Short
7	Caddington Avenue at Playford Lane	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
8	Caddington Avenue at Malta Lane	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
9	Malta Lane at Loxford Terrace	New Markings	New crosswalk and stop bar markings	Short
9	Malta Lane at Loxford Terrace	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
10	Foxglove Lane at Hannes Street	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
11	Foxglove Lane at Loxford Terrace	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
12	Loxford Terrace at Court	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
13	Malta Lane at Playford Terrace	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
13	Malta Lane at Playford Terrace	New Markings	New crosswalk and stop bar markings	Short

Map ID	Location	Issue	Recommendation	Timeframe*
14	Playford Lane at Loxford Terrace	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
15	Playford Lane at Caddington Ave	New Signing	Upgrade Stop sign from 24" to 30"	Short
15	Playford Lane at Caddington Ave	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
16	Chiswell Lane at Loxford Terrace	New Markings	New crosswalk and stop bar markings	Short
16	Chiswell Lane at Loxford Terrace	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
17	Cavalier Drive at Hannes Street	New Markings	Upgrade all crosswalks to ladder bar markings	Short
17	Cavalier Drive at Hannes Street	New Signing	Upgrade crosswalk signage to back-to-back assemblies	Short
18	Cavalier Drive at Chiswell Lane	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
18	Cavalier Drive at Chiswell Lane	New Markings	New crosswalk markings	Short
19	Hannes Court at Hannes Street	New Signing	Upgrade Stop sign from 24" to 30"	Short
19	Hannes Court at Hannes Street	New Markings	New crosswalk and stop bar markings	Short
20	Hannes Street at Edgewood Avenue	New Raised Crosswalk	Install raised crosswalk at existing crosswalk location	Intermediate
20	Hannes Street at Edgewood Avenue	New Signing	Install raised crosswalk signing assembly	Short

Map ID	Location	Issue	Recommendation	Timeframe*
20	Hannes Street at Edgewood Avenue	Upgrade Signing	Relocate School signage to more visible location	Short
21	Glenwild Court at Glenwild Road	New Markings	New crosswalk markings	Short
22	Margate Road at Glenwild Road	New Signing	Upgrade 2 Stop signs from 24" to 30"	Short
22	Margate Road at Glenwild Road	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
22	Margate Road at Glenwild Road	Sidewalk segment missing	Construct 50 feet of missing sidewalk segment	Intermediate
22	Margate Road at Glenwild Road	New Markings	New crosswalk and stop bar markings	Short
23	Belton Road at Lockridge Drive	New proposed crossing (A-2)	New sidewalk and ADA ramps	Intermediate
23	Belton Road at Lockridge Drive	New Markings	New crosswalk and stop bar markings	Short
23	Belton Road at Lockridge Drive	New Signing	New crosswalk signing assemblies and upgrade Stop sign from 24" to 30"	Short
24	Lombardy Road at Margate Road	ADA ramps not to standard	Bring ADA ramps to standard	Intermediate
24	Lombardy Road at Margate Road	New Markings	New stop bar marking	Short
25	Lombardy Road at Lockridge Drive	New proposed crossing (A-3)	New sidewalk and ADA ramps	Intermediate
25	Lombardy Road at Lockridge Drive	New Markings	New crosswalk and stop bar markings	Short

Map ID	Location	Issue	Recommendation	Timeframe*
25	Lombardy Road at Lockridge Drive	New Signing	New crosswalk signing assemblies	Short
26	Mountain Quail Road at Snowy Owl Drive	New Signing	Upgrade 2 Stop signs from 24" to 30"	Short
26	Mountain Quail Road at Snowy Owl Drive	New Markings	New crosswalk and stop bar markings	Short
27	Kinsman View Circle at Mountain Quail Road	New Signing	Upgrade 2 Stop signs from 24" to 30"	Short
28	Eisner Street at Irwin Street	New Signing	Upgrade 2 Stop signs from 24" to 30"	Short
29	Eastwood Avenue at Belton Road	New Signing	Upgrade 2 Stop signs from 24" to 30"	Short
30	Ordway Drive at Belton Road	New Signing	Upgrade 2 Stop signs from 24" to 30"	Short
31	Ordway Drive at Eisner Street	New Signing	Upgrade Stop sign from 24" to 30"	Short
32	Cavalier Court at Cavalier Drive	New Signing	Upgrade Stop sign from 24" to 30"	Short
33	Cavalier Drive at Belton Road	New Signing	Upgrade 2 Stop signs from 24" to 30" and New "State Law Stop for Pedestrians" R1-6a(2) assemblies (2)	Short
33	Cavalier Drive at Belton Road	New Markings	New crosswalk markings	Short
34	Cavalier Drive at Lockridge Drive	New Signing	Upgrade Stop sign from 24" to 30"	Short
34	Cavalier Drive at Lockridge Drive	New Markings	New crosswalk and stop bar markings	Short

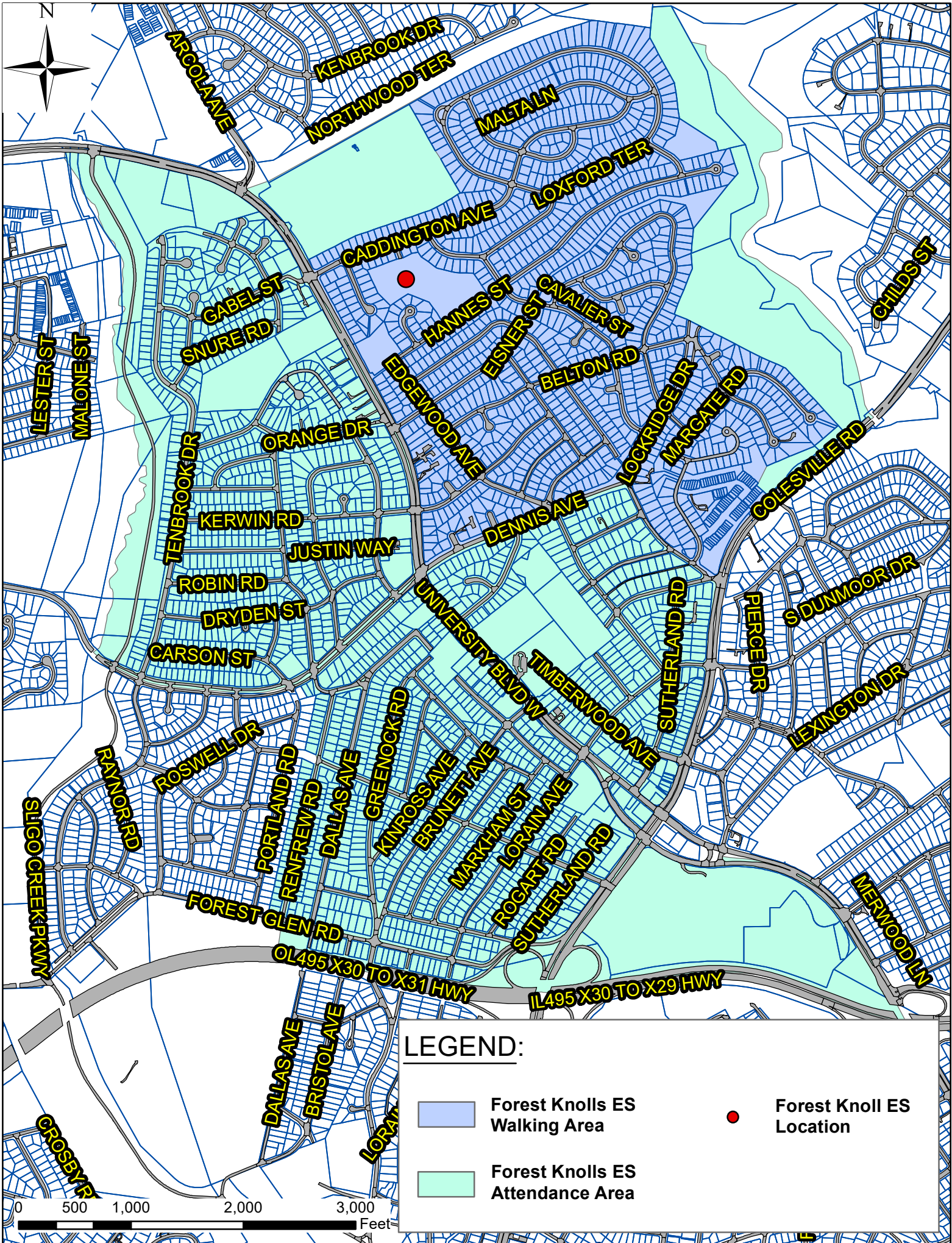
Map ID	Location	Issue	Recommendation	Timeframe*
35	407-417 Dennis Avenue Cul-De-Sac	New Signing	Upgrade Stop sign from 24" to 30"	Short
35	407-417 Dennis Avenue Cul-De-Sac	New Markings	New crosswalk and stop bar markings	Short
36	503-515 Dennis Avenue Cul-De-Sac	New Signing	Upgrade Stop sign from 24" to 30"	Short
36	503-515 Dennis Avenue Cul-De-Sac	New Markings	New crosswalk and stop bar markings	Short
37	Kerwin Road at Edgewood Avenue	New Markings	New Stop bar markings (2)	Short
38	Eisner Street at Edgewood Avenue	New Signing	New parking restrictions for extended corner clearances	Short
39	Belton Court at Belton Road	New Signing	Upgrade Stop sign from 24" to 30"	Short
40	Lombardy Road at Belton Road	New Signing	Upgrade 2 Stop signs from 24" to 30"	Short

Timeframe:

Short - MCDOT DTEO has direct control over contractor or work can be done in house. Minimal or no community involvement necessary.

Intermediate - MCDOT DTEO to work through other agency, such as MCDOT DTE, and their contractors. Timeframe dependent on other agencies schedule. May require community input.

Long - Will require community involvement, such as a public hearing, and/or designated CIP funding.



ARCOLA AVE

KENBROOK DR

NORTHWOOD TER

MALTA LN

LOXFORD TER

CADDINGTON AVE

GABEL ST

SNURE RD

HANNES ST

EISNER ST

CAVALIER ST

CHILDS ST

LESTER ST

MALONE ST

EDGEWOOD AVE

BELTON RD

LOCKRIDGE DR

MARGATE RD

COLESVILLE RD

TENBROOK DR

ORANGE DR

KERWIN RD

JUSTIN WAY

DENNIS AVE

ROBIN RD

DRYDEN ST

UNIVERSITY BLVD W

TIMBERWOOD AVE

SUTHERLAND RD

PIERCE DR

S DUNMOOR DR

CARSON ST

LEXINGTON DR

RAYNOR DR

ROSWELL DR

PORTLAND RD

RENFREW RD

DALLAS AVE

GREENOCK RD

KINROSS AVE

BRUNETT AVE

MARKHAM ST

LORAIN AVE

ROGART RD

SUTHERLAND RD

SLIGO CREEK PKWY

FOREST GLEN RD

OL 495 X30 TO X31 HWY

IL 495 X30 TO X29 HWY

MERWOOD LN

DALLAS AVE

BRISTOL AVE

LORAIN

CROSBY R



**Forest
Knolls
ES**

LEGEND:



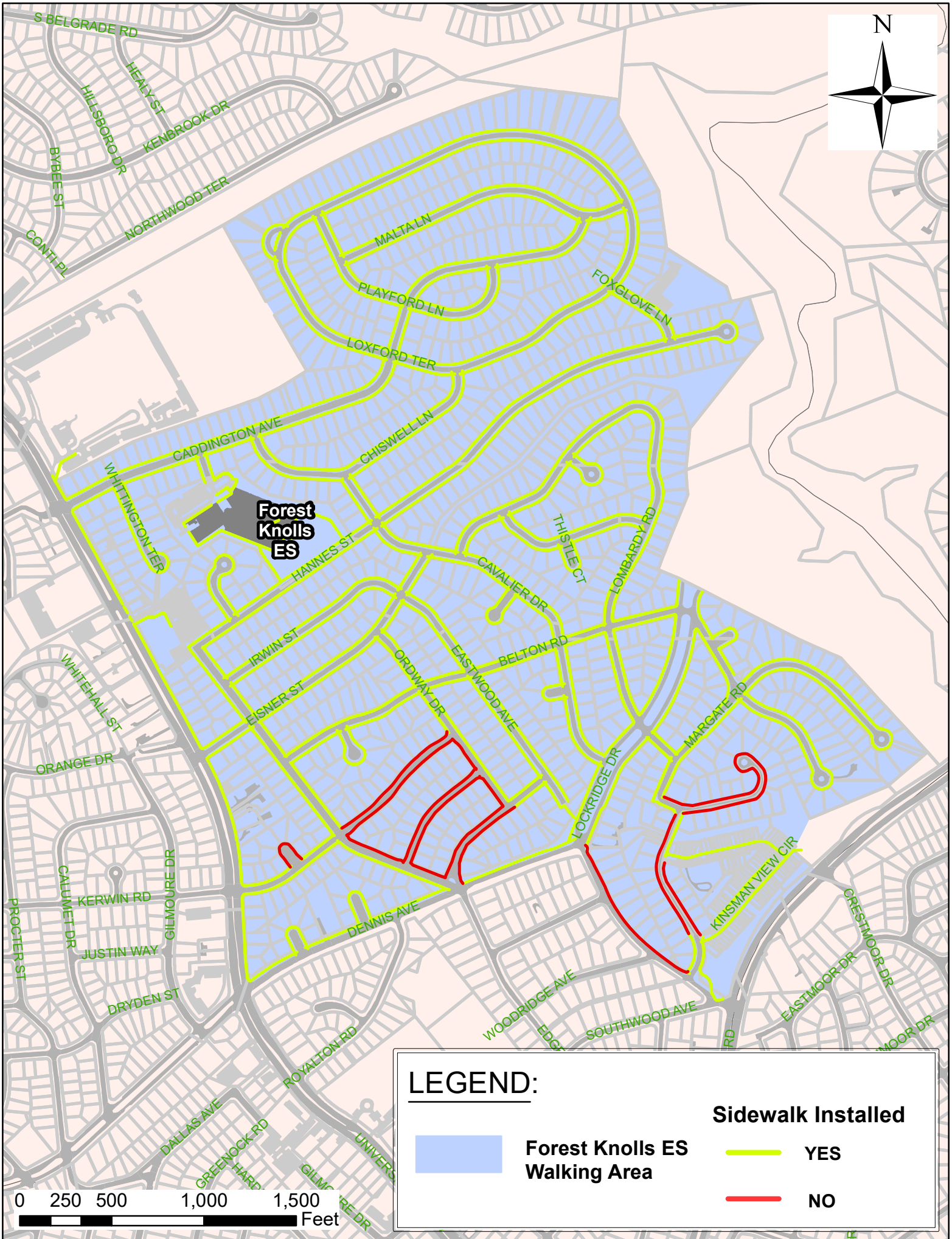
**Forest Knolls ES
Walking Area**

Sidewalk Installed

 **YES**

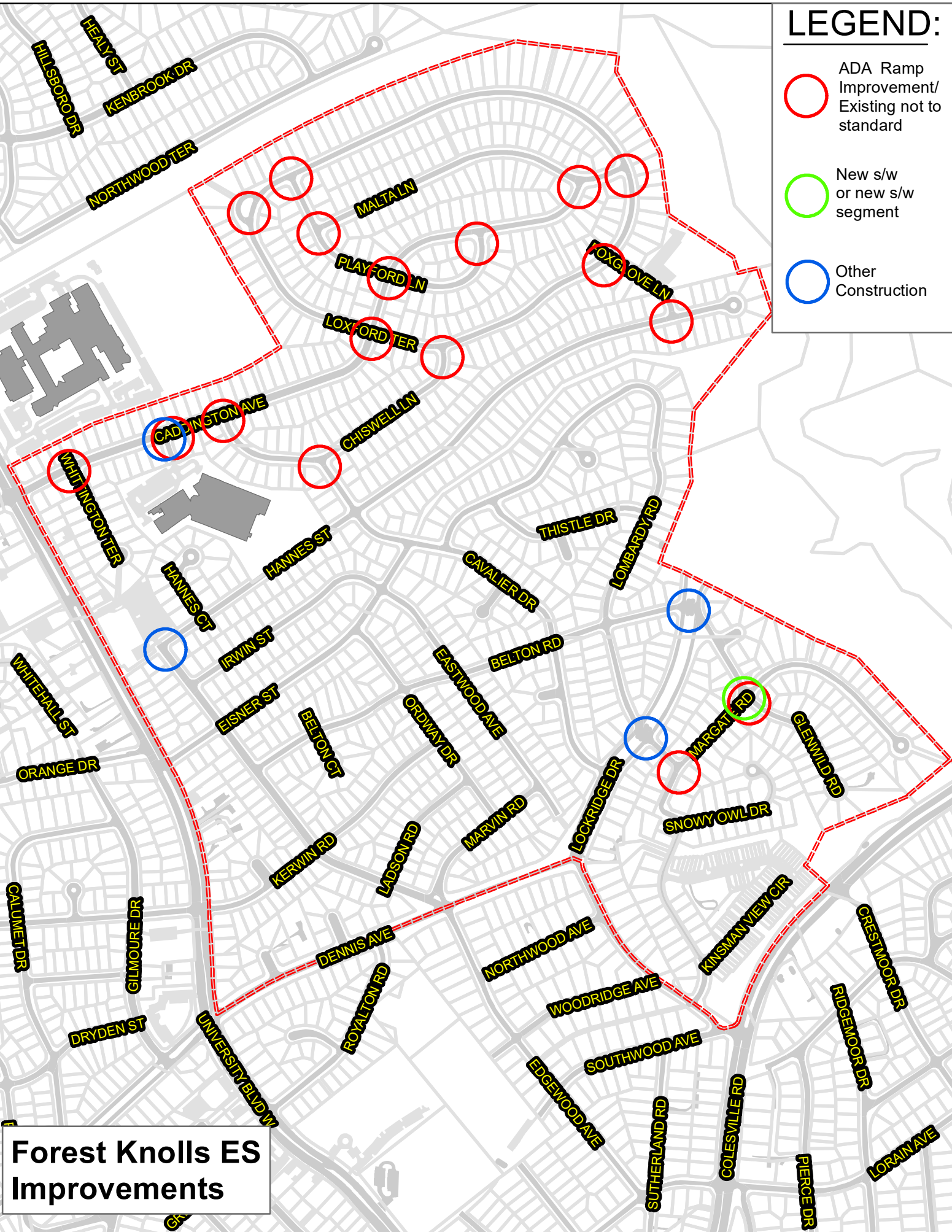
 **NO**

0 250 500 1,000 1,500 Feet





LEGEND:

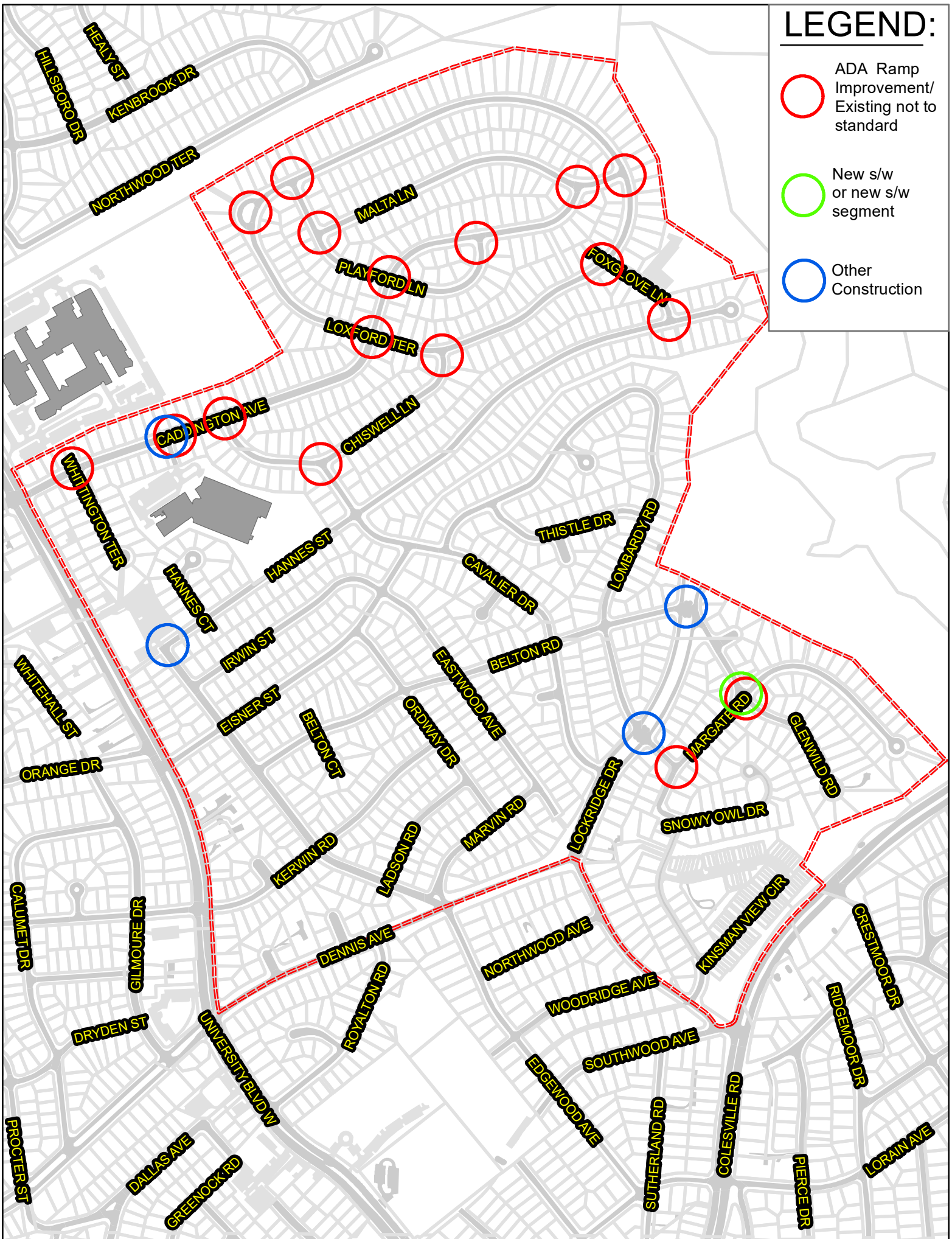
- ADA Ramp Improvement/ Existing not to standard
- New s/w or new s/w segment
- Other Construction



**Forest Knolls ES
Improvements**

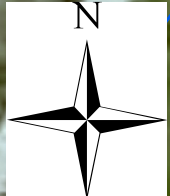
LEGEND:

-  ADA Ramp Improvement/ Existing not to standard
-  New s/w or new s/w segment
-  Other Construction



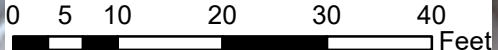
**A-3
Recommendation #25**

- Notes:
- Install 4 Pedestrian Crossing W11-2 assemblies, 2 per direction
 - Install 2 Pedestrian Crossing Ahead assemblies
 - Install Guard Rail at rear end of new sidewalk segment on median



LOMBARDY RD

LOCKRIDGE DR





DEAD END

DEAD END

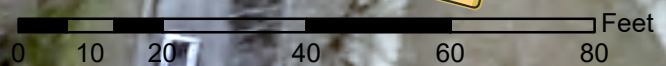
BELTON RD

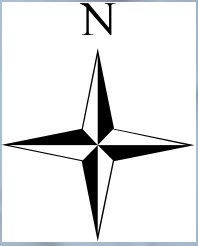
LOCKRIDGE DR

GLENWILD RD

**A-2
Recommendation #23**

- Notes:
- Install 4 Pedestrian Crossing W11-2 assemblies, 2 per direction
 - Install 1 Pedestrian Crossing Ahead assembly for the north bound direction
 - Install Guard Rail at rear end of new sidewalk segment on median

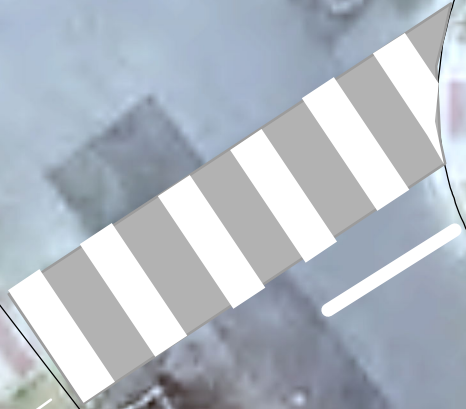




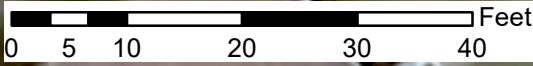
HANNES ST

**A-1
Recommendation #20**

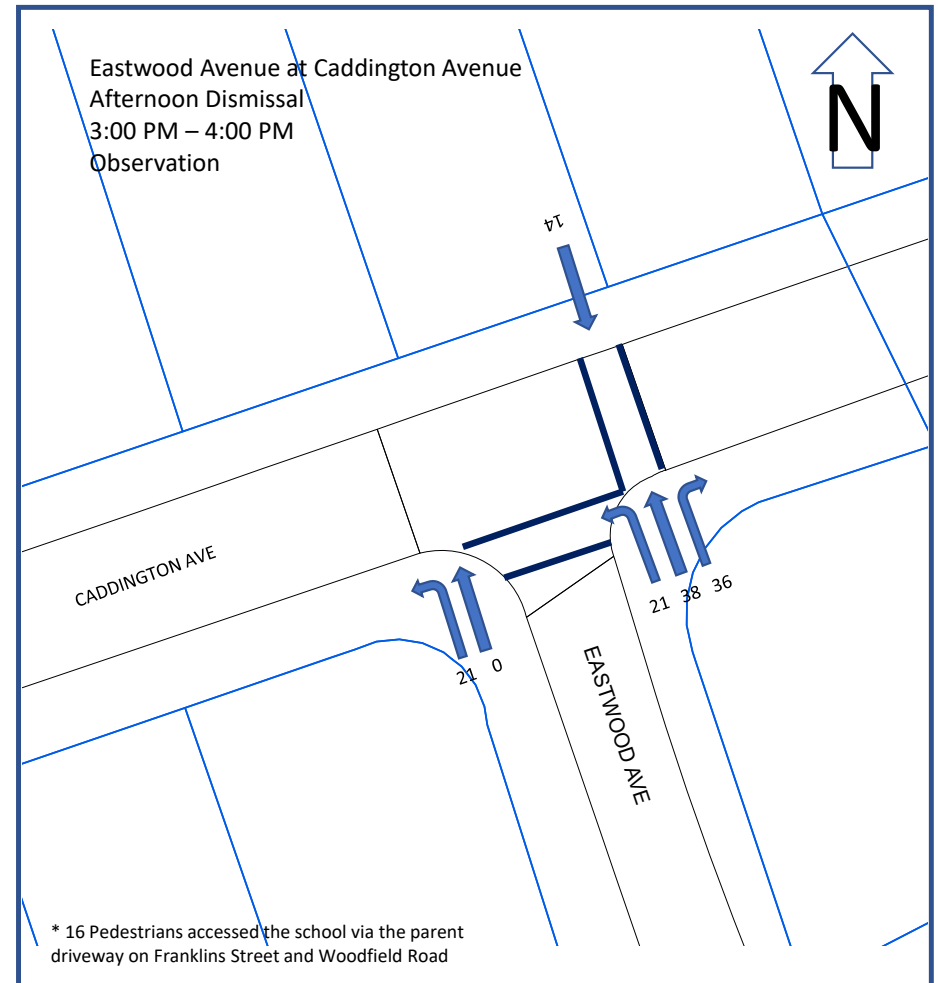
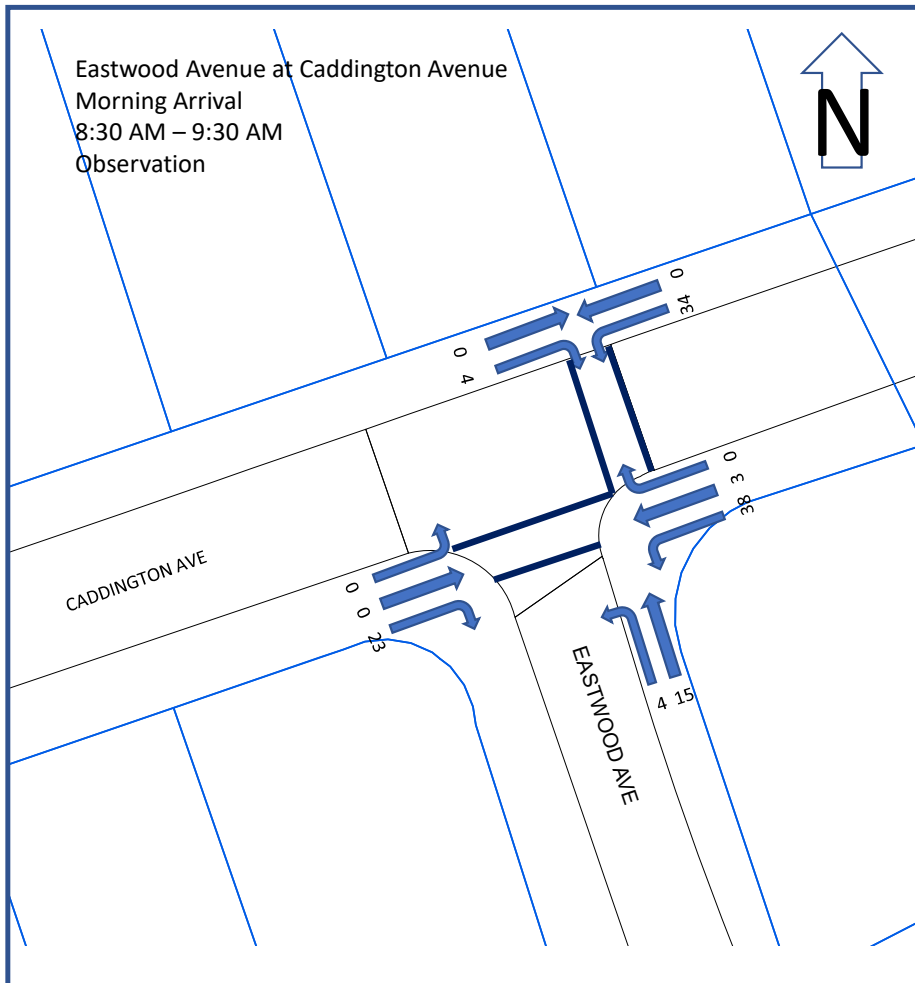
- Notes:
- Raised crosswalk to be installed as to current County standards and specifications
 - Install back-to-back raised crosswalk sign assembly



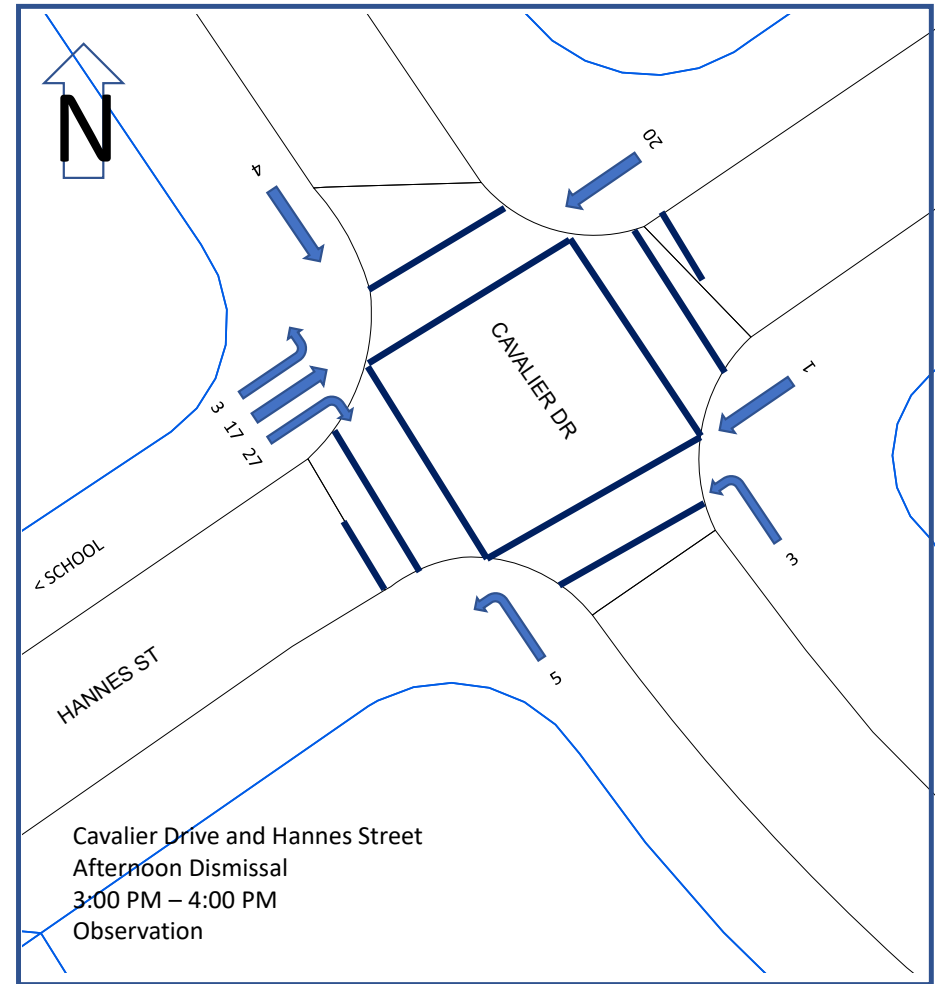
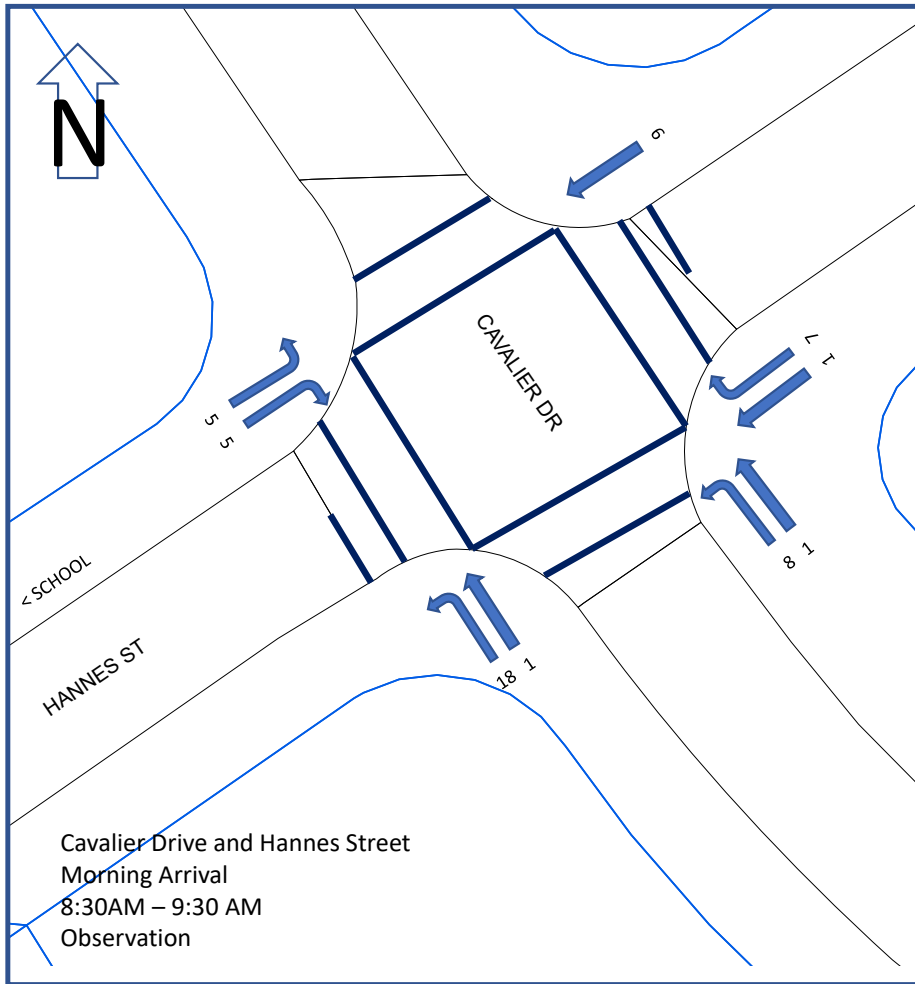
EDGEWOOD AVE



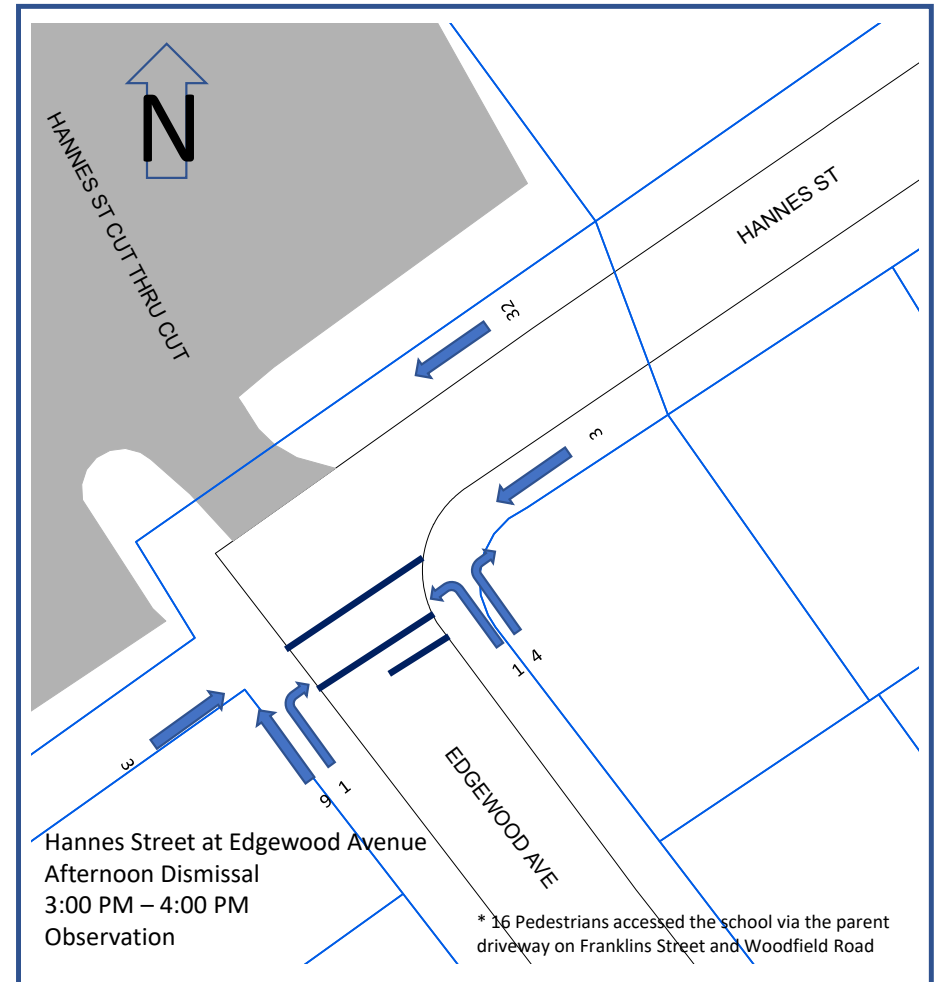
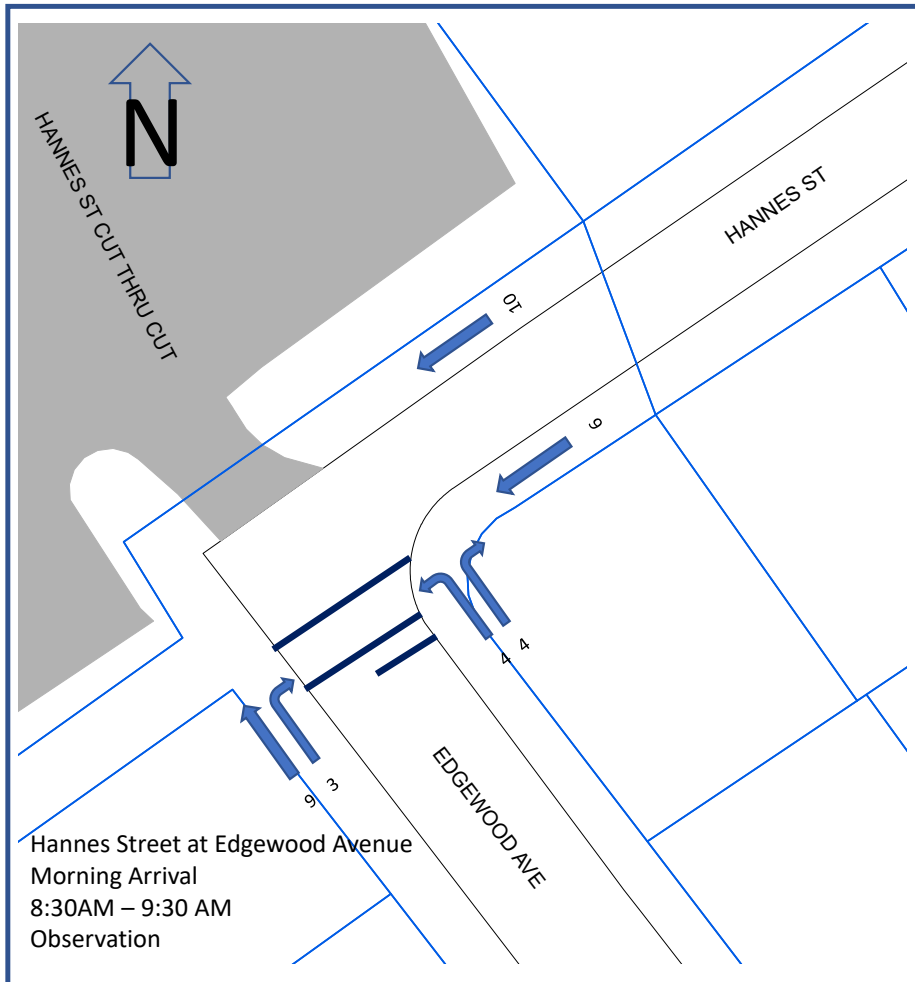
PEDESTRIAN COUNTS FOR FOREST KNOLLS ES



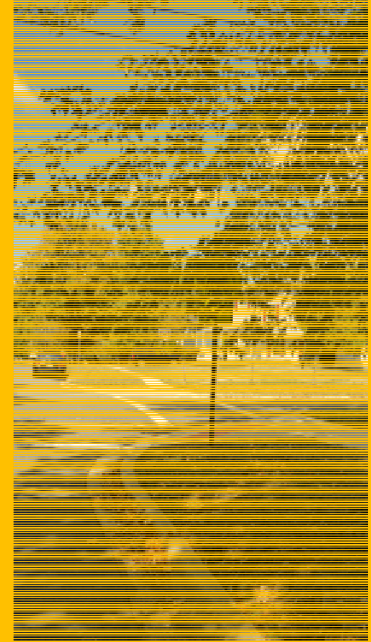
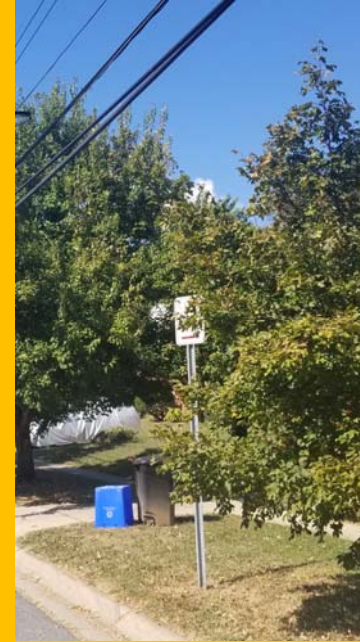
PEDESTRIAN COUNTS FOR FOREST KNOLLS ES



PEDESTRIAN COUNTS FOR FOREST KNOLLS ES



FOLIAGE



Various locations need pruning of overgrown foliage that was obstructing sight distance or traffic/parking signs.

HANNES STREET



Vehicles using Hannes St access point during afternoon dismissal period. Vehicles parked on both sides of the street.



Hannes Street after the 15-minute dismissal period.

ADA RAMP IMPROVEMENTS



Various ADA ramps within the walking area that need to be brought to standard.

Crash Data - Forest Knoll ES - January 2014 to September 2019

Report Number	Crash Date/Time	Road Name	Cross-Street Name	Related Non-Motorist	At Fault	Collision Type	Weather	Surface Condition	Light	Traffic Control	Intersection Type
MCP2608001G	6/7/2016 14:21	EASTWOOD AVE	MOUNTAIN QUAIL RD	BICYCLIST	DRIVER	HEAD ON	CLEAR	DRY	DAYLIGHT	NO CONTROLS	FOUR-WAY INTERSECTION
MCP3029000C	3/6/2017 15:35	HANNES ST	HANNES CT	PEDESTRIAN	NON-MOTORIST	N/A	CLEAR	DRY	DAYLIGHT	NO CONTROLS	NON INTERSECTION
MCP2813002R	1/27/2017 19:23	EISNER ST	EDGEWOOD AVE	PEDESTRIAN	DRIVER	SINGLE VEHICLE	CLEAR	DRY	DARK NO LIGHTS	NO CONTROLS	FOUR-WAY INTERSECTION
MCP1220003G	2/26/2016 13:27	MOUNTAIN QUAIL RD	EASTWOOD AVE	PEDESTRIAN	NON-MOTORIST	SINGLE VEHICLE	CLEAR	DRY	DAYLIGHT	N/A	NON INTERSECTION
MCP3162000S	9/28/2018 16:15	SOUTHWOOD AVE	COLESVILLE RD	PEDESTRIAN	BOTH	OTHER	CLEAR	DRY	DAYLIGHT	TRAFFIC SIGNAL	T-INTERSECTION
MCP2046006W	5/31/2017 7:20	DENNIS AVE	ROYALTON RD	PEDESTRIAN	NON-MOTORIST	STRAIGHT MOVEMENT ANGLE	CLOUDY	WET	DAYLIGHT	NO CONTROLS	NON INTERSECTION

