



Lakeside Area Mobility and Safety Improvements

Henrico County

Contract No.: 2078C

Purchase Order: PO 219105

May 2023



Prepared By:



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EXECUTIVE SUMMARY

Introduction: Henrico County has initiated a study to identify and evaluate cost-effective short-term and mid-term solutions to improve safety for pedestrians, bicyclists, and motorists in and around the Lakeside area in response to community concerns regarding speed and safety along neighborhood streets.

Figure 1 depicts the study area which extends from Parham Road to the north, North Run, Belmont Golf Course, and Upham Brook to the east, Bryan Park Avenue and Byrdhill Road to the south, and the CSX railroad to the west.

Study Approach: Field observations were conducted in October 2022 to identify potential study area improvements. Field observations in conjunction with StreetLight traffic volume and speed data and public community feedback obtained from a community meeting held in July 2022 was reviewed to identify a range of improvements to be considered including:

- Traffic calming including installation of speed humps and cushions
- Conversion of Yield signs to Stop signs
- All-way stop control
- Prohibition of on-street parking
- Signage to deter wrong way traffic on one-way roads
- Signalized and unsignalized pedestrian crossings
- Drainage improvements including curb ramp upgrades in areas with pedestrian activity

Public Outreach: A Public Information Meeting was held on Thursday, January 26, 2023 at Belmont Recreation Center to provide an opportunity for the public to provide comments on the potential study improvements under consideration. The meeting was well-attended by community members and was accompanied by a brochure (see Attachments), an online survey, and comment form for community members to provide feedback on the improvements under consideration.

Summary of Recommendations: Based on the feedback received at the Public Information Meeting, field observations, and StreetLight data, the study team, in conjunction with the County, identified both short-term and mid-term/long-term improvement recommendations. **Table 1** summarizes the proposed improvements. **Figure 1** depicts Ongoing and Recently Completed Projects, **Figure 2** depicts Short-Term Improvements, and **Figure 3** depicts Mid-Term/Long-Term Improvements.

Figure 1: Study Area





Lakeside Area Mobility and Safety Improvements Study Summary of Proposed Improvements May 2023

Location	Improvement	Improvement Justification/Comments
SHORT-TERM IMPROVEMENTS		
Install Speed Humps		
Impala Dr	<ul style="list-style-type: none"> • Install speed hump 145' north of Pinehurst Rd • Install speed hump 155' south of Kenwood Ave • Install speed hump 210' south of Irisdale Ave • Install Speed Hump (W17-1) signs at speed humps on both the NB and SB approaches 	<ul style="list-style-type: none"> • StreetLight 85th percentile speed is 25-37 mph between Dumbarton Rd and Hilliard Rd (37 mph between Briar Lane and Maplewood Rd) • Speeding noted by several survey respondents
Galaxie Rd	<ul style="list-style-type: none"> • Install speed hump 230' south of Overton Rd • Install speed hump 130' north of Putney Rd (avoid on-street parking) • Install speed hump 280' south of Alycia Ave • Install speed hump 160' south of Lafayette Ave (avoid on-street parking) • Install Speed Hump (W17-1) signs at speed humps on both the NB and SB approaches 	<ul style="list-style-type: none"> • StreetLight 85th percentile speed is 23-29 mph between Hilliard Rd and Irisdale Ave (28-29 mph between Hilliard Rd and Kenwood Ave) • StreetLight 85th percentile speed is 29-32 mph between Hilliard Rd and Galax Rd • Speeding noted by several survey respondents
Woodrow Terr	<ul style="list-style-type: none"> • Install speed hump 140' north of Greenway Ave • Install speed hump 410' north of Overton Rd • Install Speed Hump (W17-1) signs at speed humps on both the NB and SB approaches 	<ul style="list-style-type: none"> • StreetLight 85th percentile speed is 25-31 mph between Dumbarton Rd and Overton Rd • Speeding on longer section of Woodrow Terr with no stop signs between Hilliard Rd and Overton Rd • Speeding noted by several survey respondents



Lakeside Area Mobility and Safety Improvements Study

Summary of Proposed Improvements

May 2023

Location	Improvement	Improvement Justification/Comments
Linbrook Dr	<ul style="list-style-type: none"> • Install speed hump 155' north of Pershing Ave • Install speed hump 170' south of Lafayette Ave • Install Speed Hump (W17-1) signs at speed humps on both the NB and SB approaches 	<ul style="list-style-type: none"> • StreetLight 85th percentile speed is 27-35 mph between Hilliard Rd and Hermitage Rd (35 mph between Hermitage Rd and Pershing Ave) • Speeding noted by survey respondents
Cottage St	<ul style="list-style-type: none"> • Install speed hump 320' south of Fleet Ave • Install speed hump 270' south of Greenway Ave • Install Speed Hump (W17-1) signs at speed humps on both the NB and SB approaches 	<ul style="list-style-type: none"> • StreetLight 85th percentile speed is 30-32 mph between Waldo Ln and Dumbarton Rd • Speeding noted by survey respondents
Cedar Croft St	<ul style="list-style-type: none"> • Install speed hump 90' north of Irisdale Ave • Install speed hump 80' south of Ginter St • Install Speed Hump (W17-1) signs at speed humps on both the NB and SB approaches 	<ul style="list-style-type: none"> • StreetLight 85th percentile speed is 23-33 mph between Dumbarton Rd and Williams St (33 mph at the south end between Dumbarton Rd and Clarke St) • Speeding noted by several survey respondents
Hermitage Rd	<ul style="list-style-type: none"> • Install speed hump 140' north of Burnley Ave • Install speed hump 85' south of Oakwood Ln • Install speed hump 110' north of Ginter St • Install Speed Hump (W17-1) signs at speed humps on both the NB and SB approaches 	<ul style="list-style-type: none"> • StreetLight 85th percentile speed is 30-34 mph between Hilliard Rd and Dumbarton Rd (34 mph between Oakwood Ln and Parkside Ave) • Speeding noted by several survey respondents
Club Rd	<ul style="list-style-type: none"> • Install speed hump 90' north of Timberlake Ave • Install speed hump 260' north of Oak St 	<ul style="list-style-type: none"> • StreetLight 85th percentile speed is 28-35 mph between Hilliard Rd and Spruce St (35 mph between Hilliard Rd and Court St) approaching/departing Belmont Park ball fields



Lakeside Area Mobility and Safety Improvements Study Summary of Proposed Improvements May 2023

Location	Improvement	Improvement Justification/Comments
	<ul style="list-style-type: none"> • Install Speed Hump (W17-1) signs at speed humps on both the NB and SB approaches 	<ul style="list-style-type: none"> • Speeding noted by several survey respondents
Lourdes Road	<ul style="list-style-type: none"> • Install speed hump 210' east of Lydell Dr • Install speed hump 335' west of Notre Dame Dr • Install Speed Hump (W17-1) signs at speed humps on both the EB and WB approaches 	<ul style="list-style-type: none"> • StreetLight 85th percentile speed is 35-36 mph between Hermitage Rd and Woodman Rd • Speeding noted by survey respondents
Vernon Rd	<ul style="list-style-type: none"> • Install speed hump 600' west of Woodman Rd • Install speed hump 140' east of Dalmain Dr • Install Speed Hump (W17-1) signs at speed humps on both the EB and WB approaches 	<ul style="list-style-type: none"> • StreetLight 85th percentile speed is 25-27 mph between Hermitage Rd and Woodman Rd • Speeding noted by survey respondents



Lakeside Area Mobility and Safety Improvements Study

Summary of Proposed Improvements

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Location	Improvement	Improvement Justification/Comments
Install All-Way Stop Control		
Hermitage Rd at Maplewood Rd	<ul style="list-style-type: none"> • Install Stop (R1-1) signs with All Way (R1-3P) supplemental plaques on the northbound and southbound Hermitage Rd approaches to Maplewood Rd • Install All Way (R1-3P) supplemental plaques with the existing Stop (R1-1) signs on the EB and WB Maplewood Rd approaches • Install stop bars on all four approaches to the intersection 	<ul style="list-style-type: none"> • Residential fences on the northwest and southeast corners reduce corner sight distances on Maplewood Rd approaches • Speeding on both Hermitage Rd and Maplewood Rd in the vicinity of the intersection noted by several survey respondents • MUTCD guidance for installation of Multi-Way Stop control (Section 2B.07 paragraph 05.C and 0.5D provides options that may be considered in an engineering study to evaluate Multi-Way Stop control including: <ul style="list-style-type: none"> ○ <i>Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop.</i> ○ <i>An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.</i> <p>Both of these considerations are applicable at the Hermitage Rd at Maplewood Rd intersection.</p>
Replace Yield Sign with Stop Sign		
Thornrose Ave at Lafayette Ave/Laflin Pl	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> • Yield sign inconsistent with other similar intersections along Lafayette Ave
Thornrose Ave at Lincoln Ave	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> • Yield sign inconsistent with other similar intersections along Lincoln Ave
Linbrook Dr at Lincoln Ave	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> • Yield sign inconsistent with other similar intersections along Linbrook Dr
Pinehurst Rd at Galaxie Rd	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> • Yield sign inconsistent with other similar intersections along Galaxie Rd
Briar Ln at Galaxie Rd	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> • Yield sign inconsistent with other similar intersections along Galaxie Rd
Parkside Ave at Galaxie Rd	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> • Yield sign inconsistent with other similar intersections along Galaxie Rd



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Ginter St at Woodrow Terr	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Woodrow Terr
Willis Ln at Greenway Ave	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Greenway Ave
Edgemore St at Kenwood Ave	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Kenwood Ave
Martin Ave at Edgemore St	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Edgemore St
Oakwood Ln at Edgemore St	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Oakwood Ln
Nelson St at Edgemore St	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Nelson St
Irisdale Ave at Edgemore St	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Irisdale Ave
Kent St at Edgemore St	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Kent St
Greenway Ave at Wilson Ave	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Wilson Ave
Court St at Club Rd	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Club Rd
Oak St at Club Rd	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Club Rd
Kenmore Rd at Wedgewood Ave	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Wedgewood Ave
Alycia Ave at Bransford Dr	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Bransford Dr
Thornrose Ave at Vernon Rd	Replace Yield (R1-2) signs with Stop (R1-1) signs	<ul style="list-style-type: none"> Yield sign inconsistent with other similar intersections along Vernon Rd



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Location	Improvement	Improvement Justification/Comments
Drainage Improvements		
Cottage St at Williams St	<ul style="list-style-type: none"> • Install a minimum 2% crown on the walkway atop the culvert on the northeast corner between the roadway and fence • Blade off excessive sod along sidewalk within the fence and place trench on ditch side of sidewalk (east side of Cottage St) • Replace 3 panels of sidewalk within the fence area to enhance sheet flow off sidewalk 	<ul style="list-style-type: none"> • Drainage issues on the northeast radius return corner (standing water noted during field observations) • Pedestrians observed walking to/from Lakeside Elementary School
Cedar Croft St at Williams St	<ul style="list-style-type: none"> • Blade off accumulated silt around northwest radius return • Perform minor grading in ditch on inlet and outlet side of pipe crossing Cedar Croft St to restore positive drainage into and out of pipe 	<ul style="list-style-type: none"> • Drainage issues on the northwest side radius return (standing water noted during field observations) • Pedestrians observed walking to/from Lakeside Elementary School and crossing Cedar Croft St
Cottage St at Fleet Ave	<ul style="list-style-type: none"> • Blade off accumulated silt at beginning of grass ditch on the southeast corner • Extend minor ditch cleanout shaping for 65' to the south along Cottage St 	<ul style="list-style-type: none"> • Drainage issues on the southeast corner (standing water noted during field observations) • Standing water noted by survey respondents
MID-TERM/LONG-TERM IMPROVEMENTS		
Hilliard Rd at Impala Dr	Install pedestrian signals and pushbuttons (to be coordinated with VDOT)	<ul style="list-style-type: none"> • Curb ramps were recently constructed on all four corners of the intersection; no crosswalks or pedestrian signals as present • Traffic signal maintained by VDOT
Hilliard Rd at Hermitage Rd	Install pedestrian signals and pushbuttons (to be coordinated with VDOT)	<ul style="list-style-type: none"> • Curb ramps are provided on all four corners of the intersection (three of which were recently constructed/improved); no crosswalks or pedestrian signals as present • Traffic signal maintained by VDOT



Lakeside Area Mobility and Safety Improvements Study

Summary of Proposed Improvements

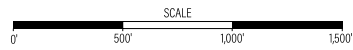
May 2023

Location	Improvement	Improvement Justification/Comments
Lakeside Ave at Timberlake Ave	Recommend evaluation for a potential mid-block pedestrian crossing of Lakeside Avenue including a Pedestrian Hybrid Beacon (PHB) or Rectangular Rapid Flashing Beacon (RRFB) (to be coordinated with VDOT)	<ul style="list-style-type: none"> Farmers Market and other commercial pedestrian generators are located on the west side of the intersection with residential uses east of Lakeside Ave Community support for pedestrian crossing noted in the survey Lakeside Ave is a VDOT-maintained roadway
<p>Hermitage Rd from Hilliard Road to Staples Mill Road</p> <p>Woodman Rd from Hermitage Road to Parham Road</p>	Evaluate roadway segments for sidewalk installation including consideration of traffic calming (e.g., bump-outs, chicanes, neighborhood roundabouts); begin evaluation of priority locations based on pedestrian activity followed by additional segments to create a continuous network of sidewalks	<ul style="list-style-type: none"> Roadway segments were prioritized for sidewalk installation based on StreetLight data where there were the highest concentration of pedestrian activity and connections to existing sidewalks. Segments in order of priority based on ped/bike data: <ul style="list-style-type: none"> Priority Segment 1 – Hermitage Rd between Hilliard Rd and Woodman Rd (60-103 pedestrians per day) Priority Segment 2 – Hermitage Rd between existing sidewalk east of Glazebrook Ave and Oakview Ave (120-136 pedestrians per day); tie into existing sidewalk on the south side of the road Priority Segment 3 – Woodman Rd between Hermitage Rd and Moody Middle School (49-96 pedestrians per day); tie into recently constructed sidewalk in front of Moody Middle School and Priority Segment 1 Following the evaluation of priority sidewalk segments, additional sidewalk segments should be evaluated to create a continuous network of sidewalks along Hermitage Rd between Hilliard Rd and Staples Mill Rd and along Woodman Rd between Hermitage Rd and Parham Rd
Hermitage Rd at Gibraltar Dr	Recommend additional traffic studies to evaluate intersection improvements	<ul style="list-style-type: none"> Speeding and cut-thru traffic on Hermitage Rd and Gibraltar Dr observed during field observations and noted by survey respondents 1 fatal injury angle crash in 2018 and 4 property damage only crashes (3 angle and 1 fixed object) Hermitage Rd is not eligible for the Henrico Neighborhood Traffic Management Program due to the 35 mph posted speed limit

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Figure 1: Ongoing and Recently Completed Projects

*Lakeside Area
Mobility and Safety
Improvements Study*
Henrico County, VA

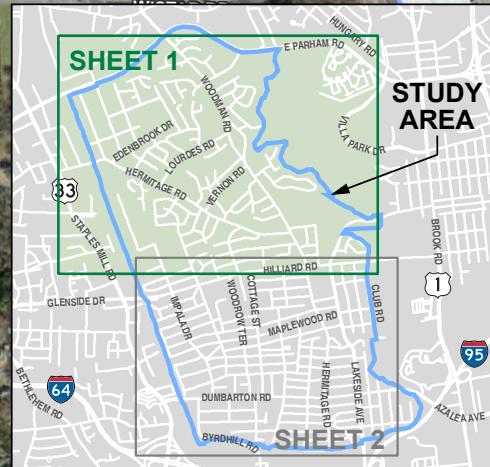
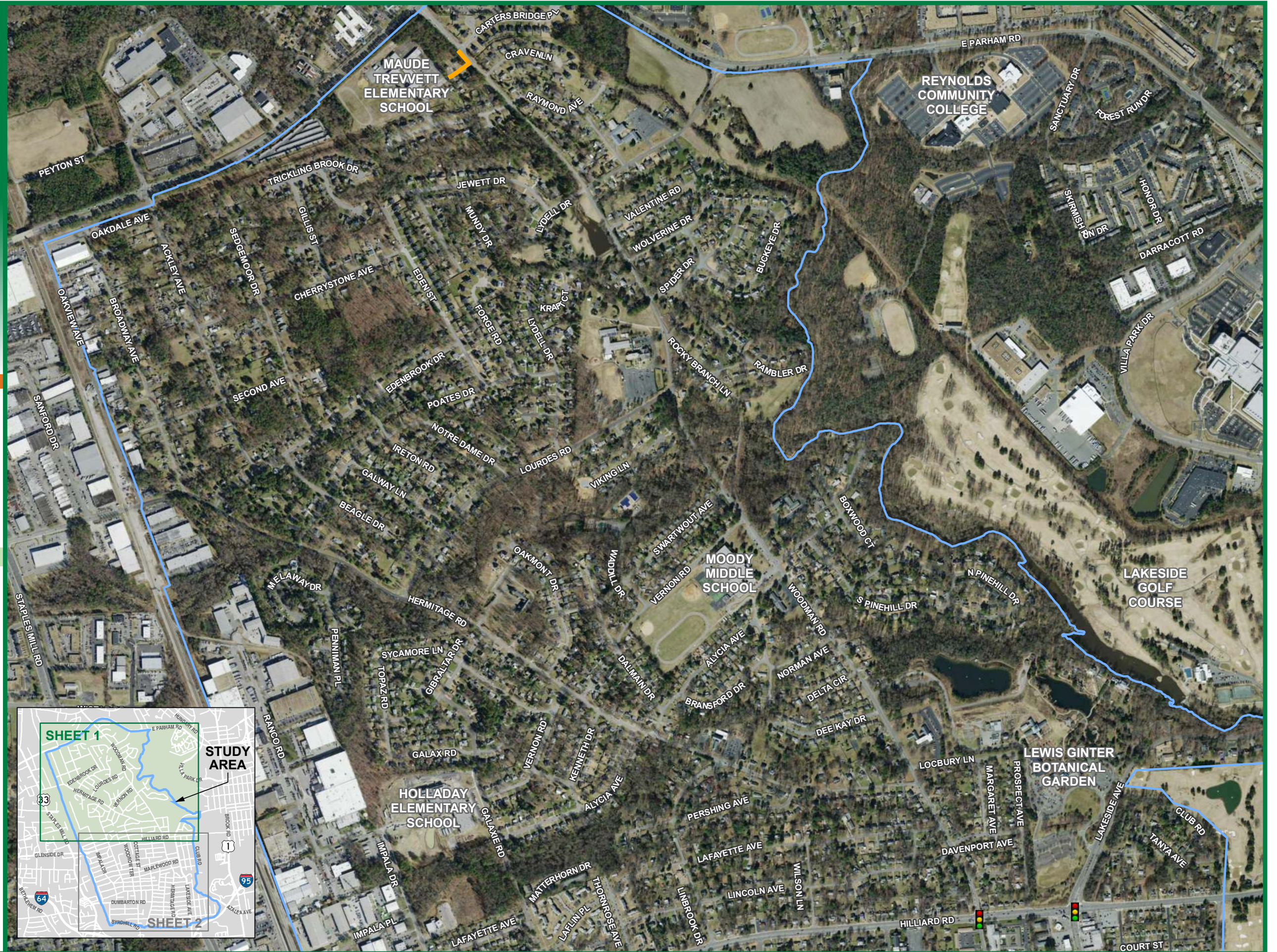


Existing Traffic Signal

Study Area

ONGOING PROJECTS

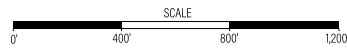
Maude Trevvett Elementary Sidewalk Connection



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Figure 1: Ongoing and Recently Completed Projects

*Lakeside Area
Mobility and Safety
Improvements Study*
Henrico County, VA



Existing Traffic Signal

Study Area

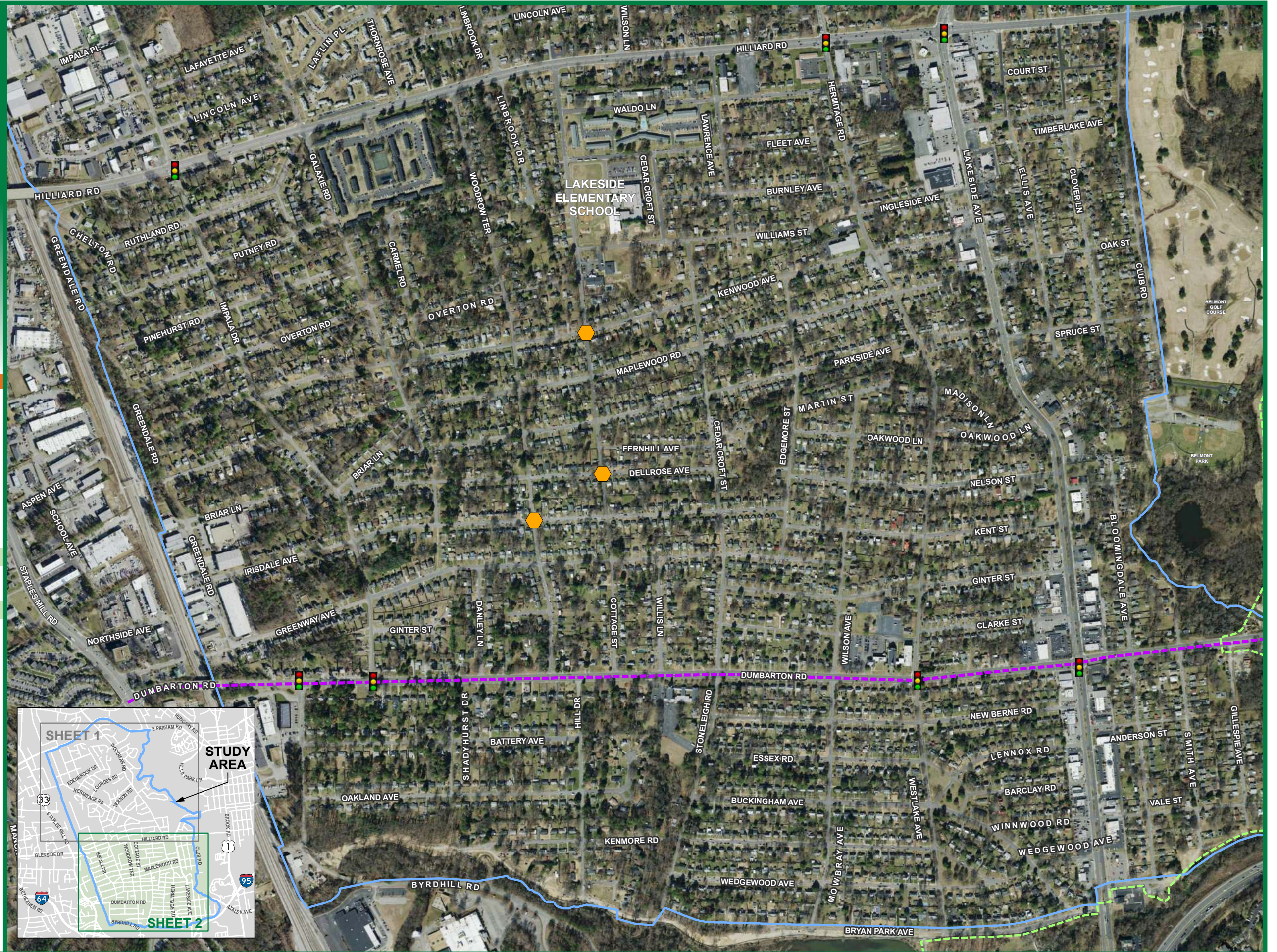
RECENTLY COMPLETED PROJECTS

Stop Sign Reconfiguration

ONGOING PROJECTS

Dumbarton Rd Safety and
Mobility Improvements

Fall Line Trail

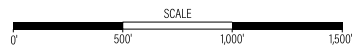


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Figure 2: Short-Term Improvements

Lakeside Area Mobility and Safety Improvements Study

Henrico County, VA



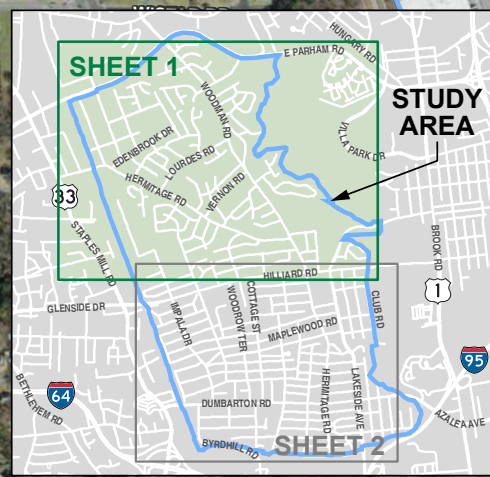
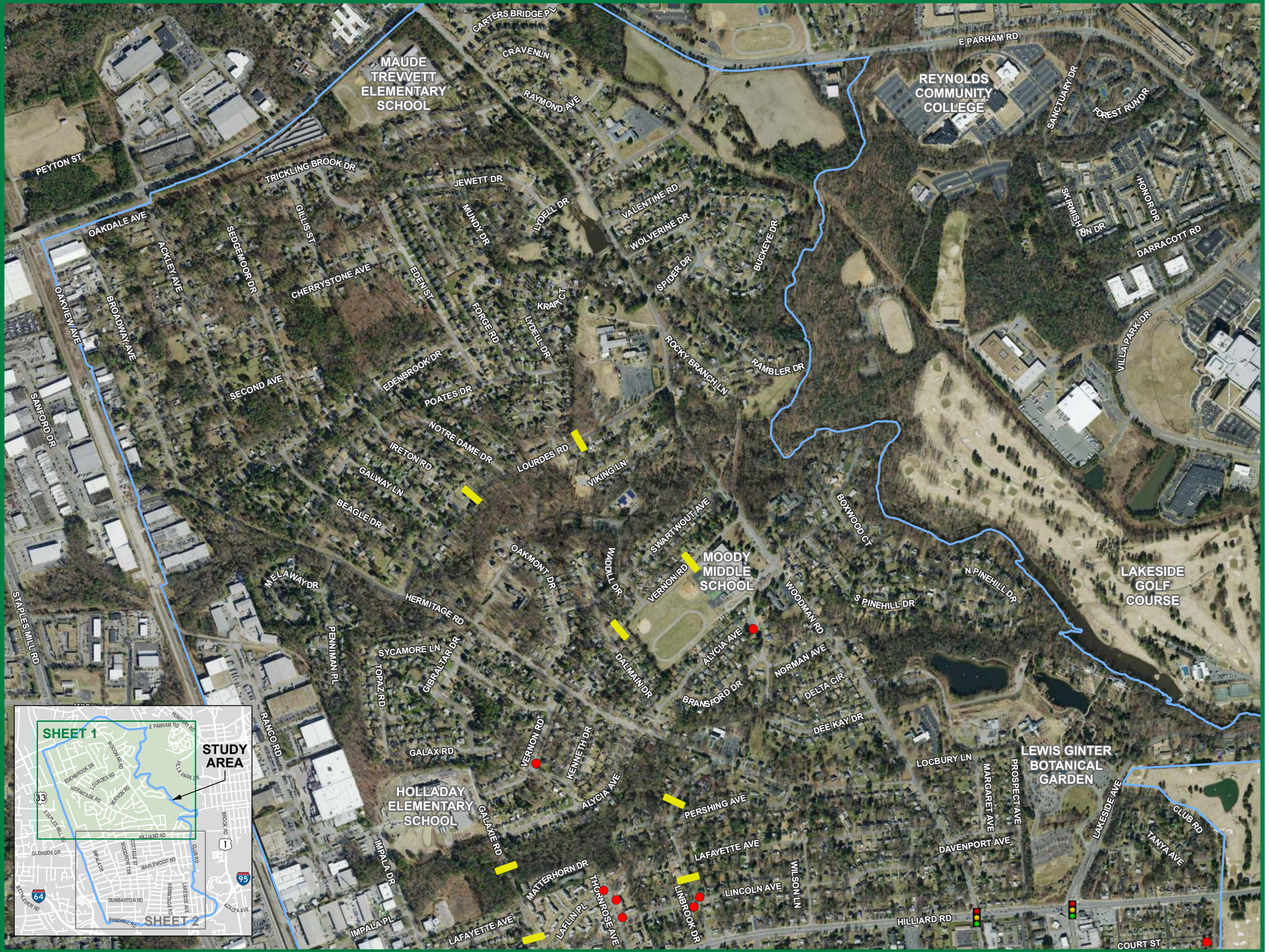
Existing Traffic Signal

Study Area

SHORT-TERM IMPROVEMENTS

Install Speed Humps

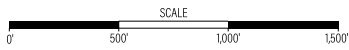
Replace Yield with Stop Sign



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Figure 3: Mid-Term/ Long-Term Improvements

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Improvements Study*
Henrico County, VA



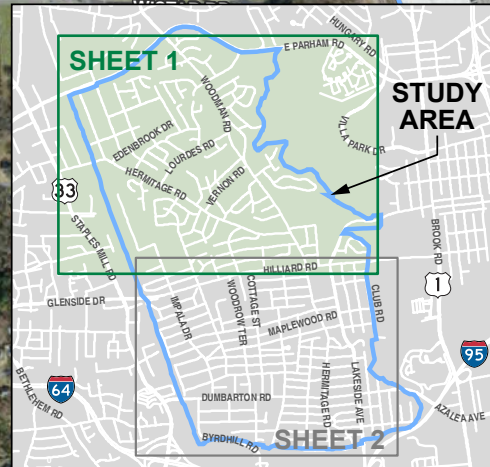
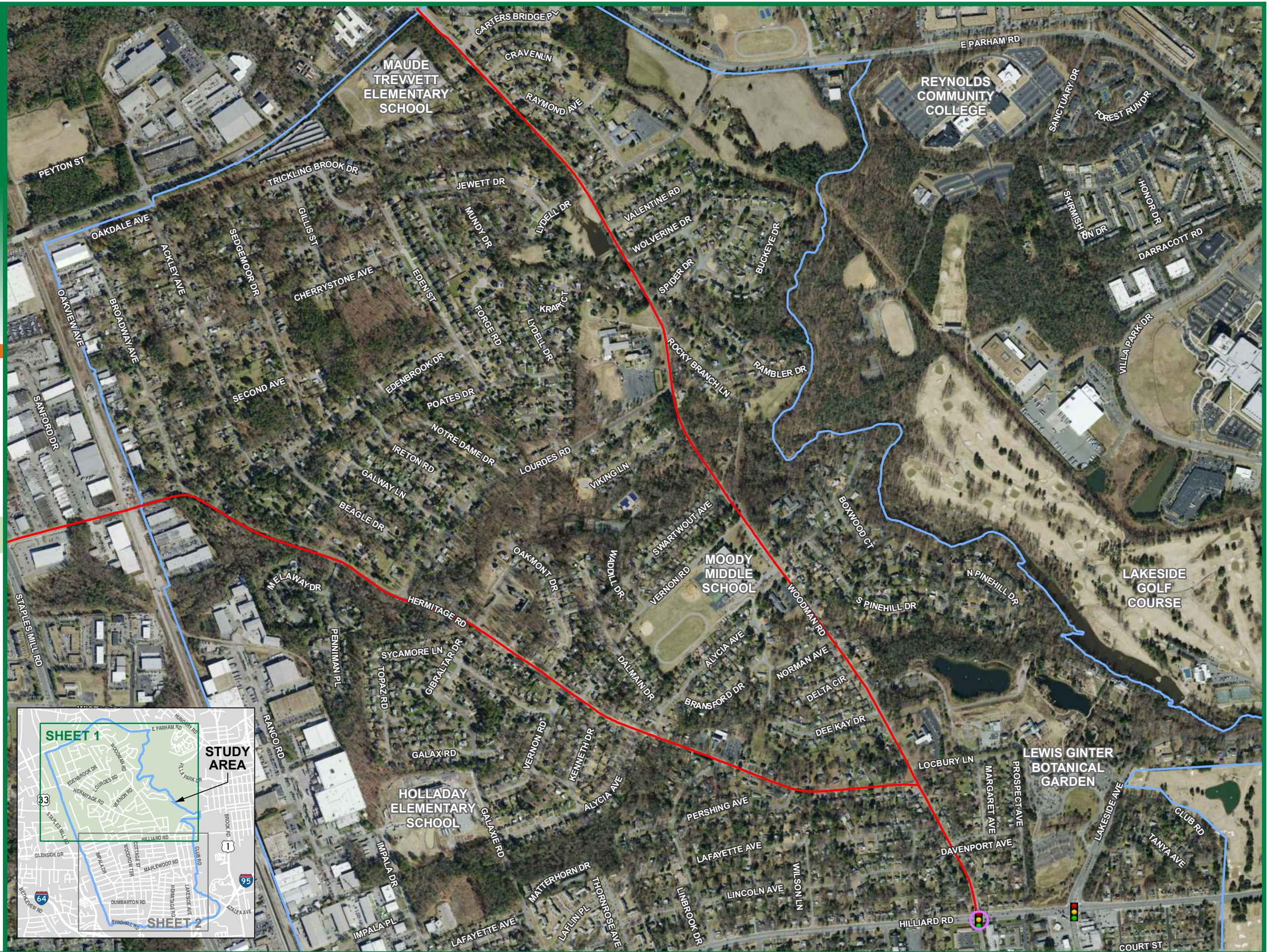
Existing Traffic Signal

Study Area

MID-TERM/LONG-TERM IMPROVEMENTS

Priority Sidewalk and
Traffic Calming Segment

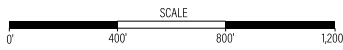
Install Signalized Pedestrian
Crossings in Collaboration
with VDOT



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Figure 3: Mid-Term/ Long-Term Improvements

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Henrico County, VA



Existing Traffic Signal

Study Area

MID-TERM/LONG-TERM IMPROVEMENTS

Priority Sidewalk and
Traffic Calming Segment

Install Signalized Pedestrian
Crossings in Collaboration
with VDOT

