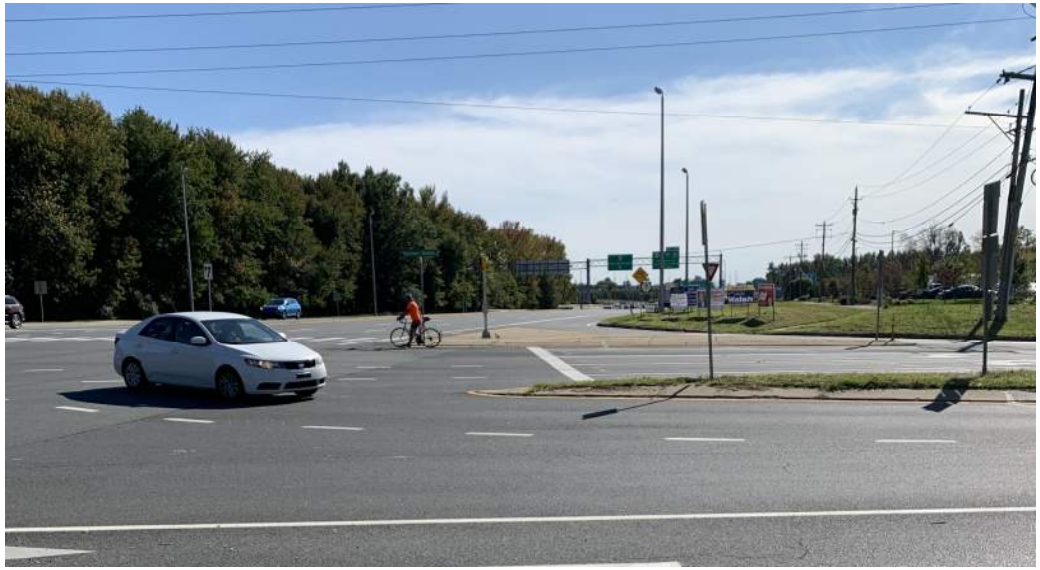
SR 4 Corridor Audit and Lighting Evaluation

December 2021



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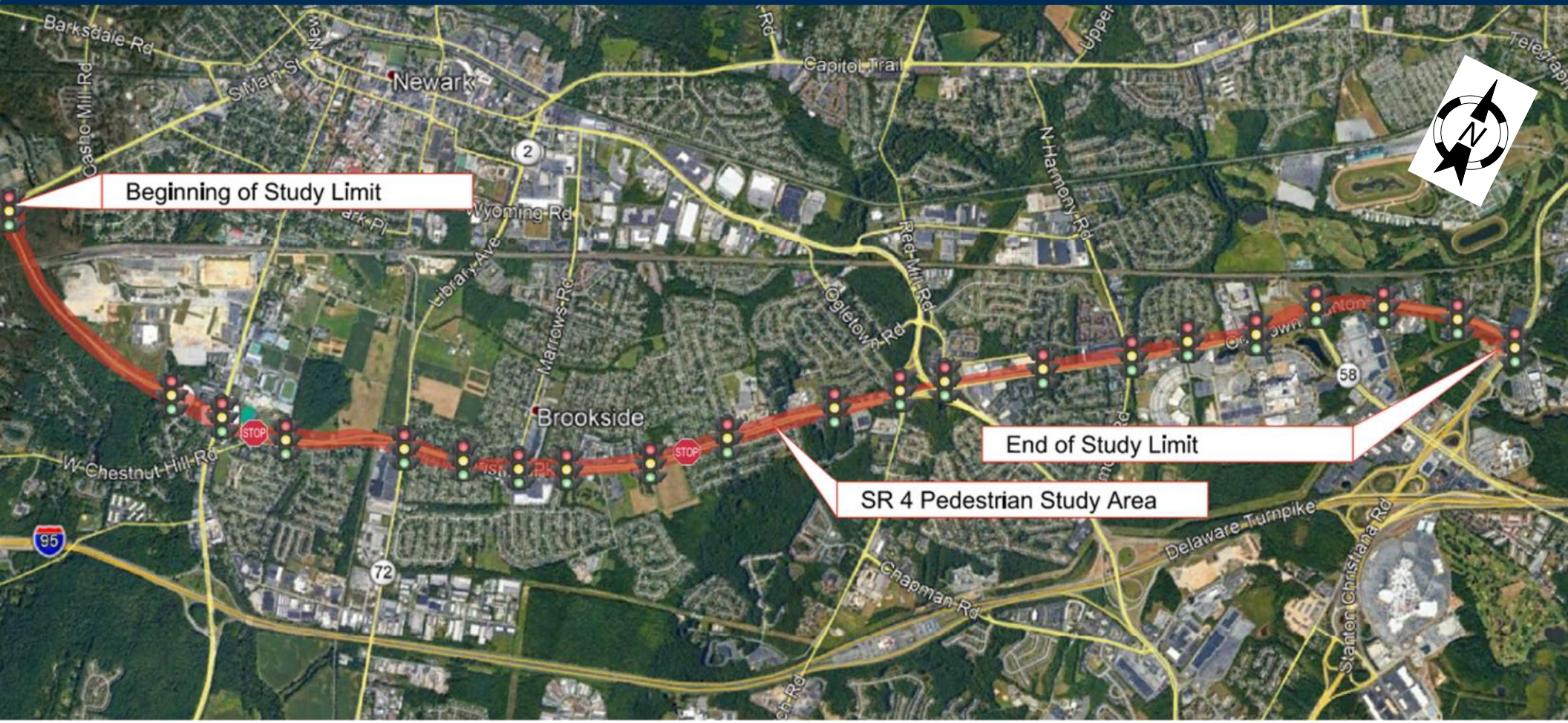
Presentation Outline

- ❑ Background
- ❑ Pedestrian Audit
- ❑ Lighting Evaluation
- ❑ Recommendations
- ❑ Next Steps

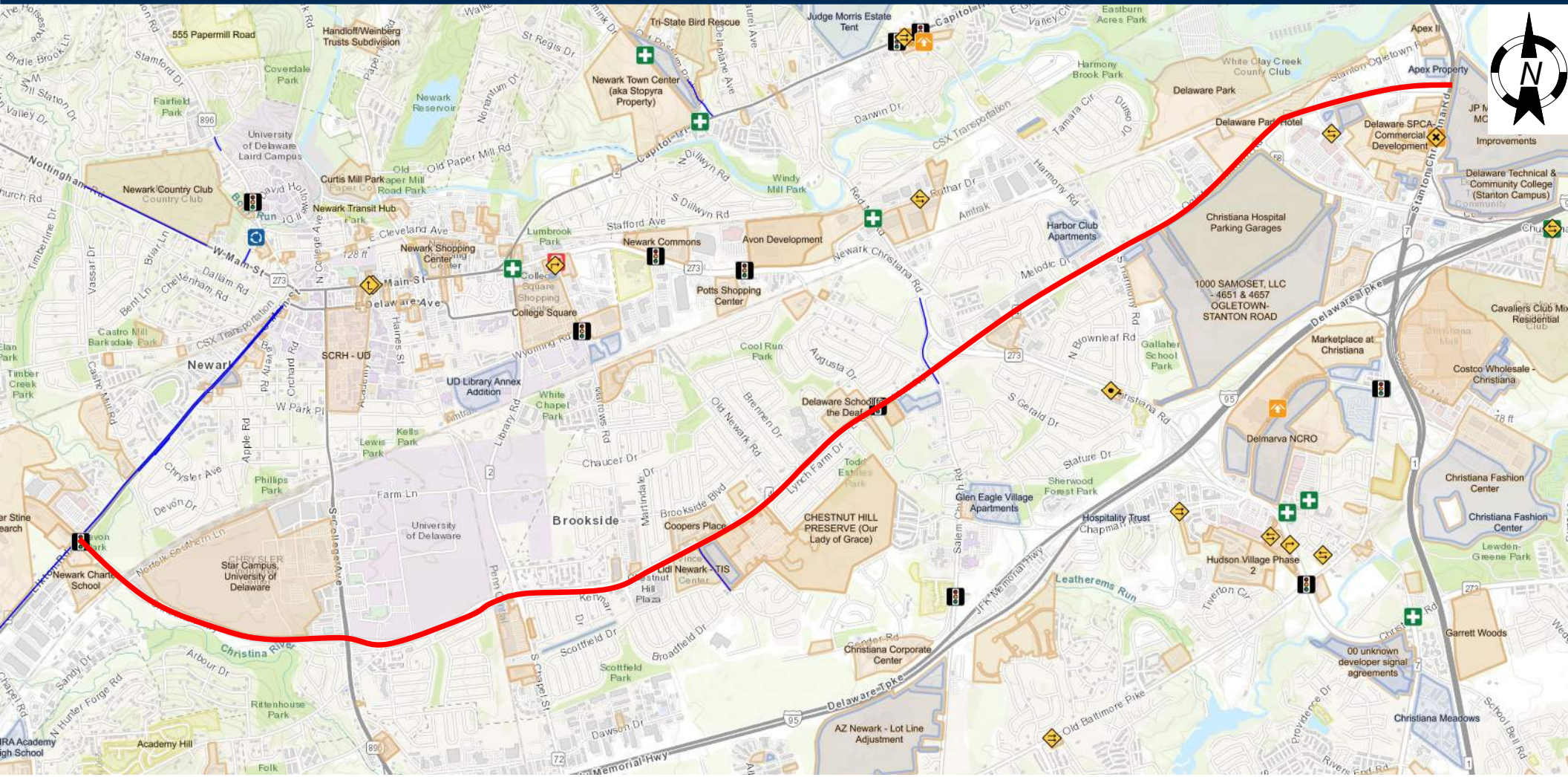
Study Area



Project Study Limits Extend along SR 4 from Elkton Road to SR 7

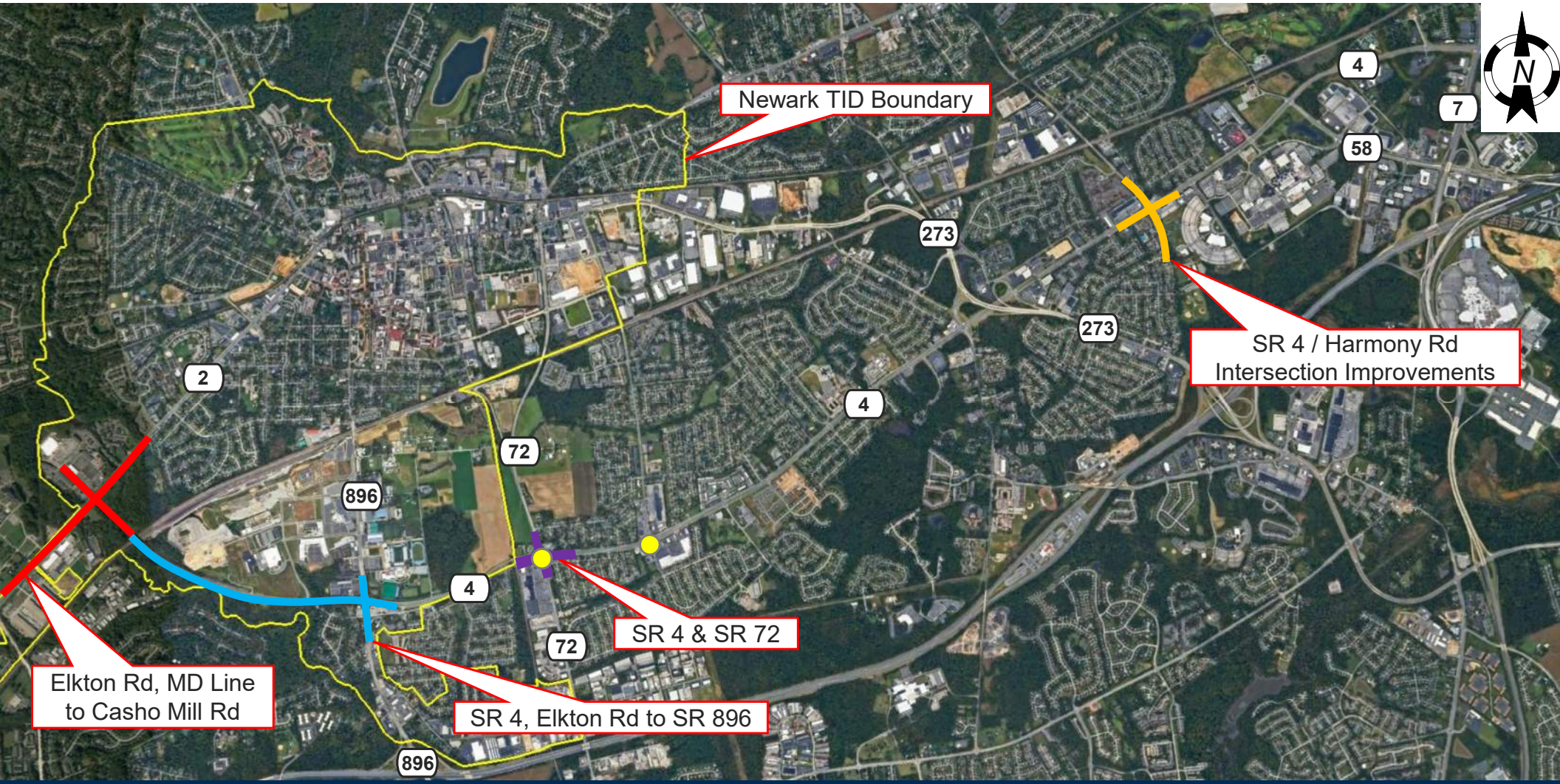
- Approximately 8 miles of roadway
- 21 signalized Intersections
- 2 unsignalized intersections

Planned Development



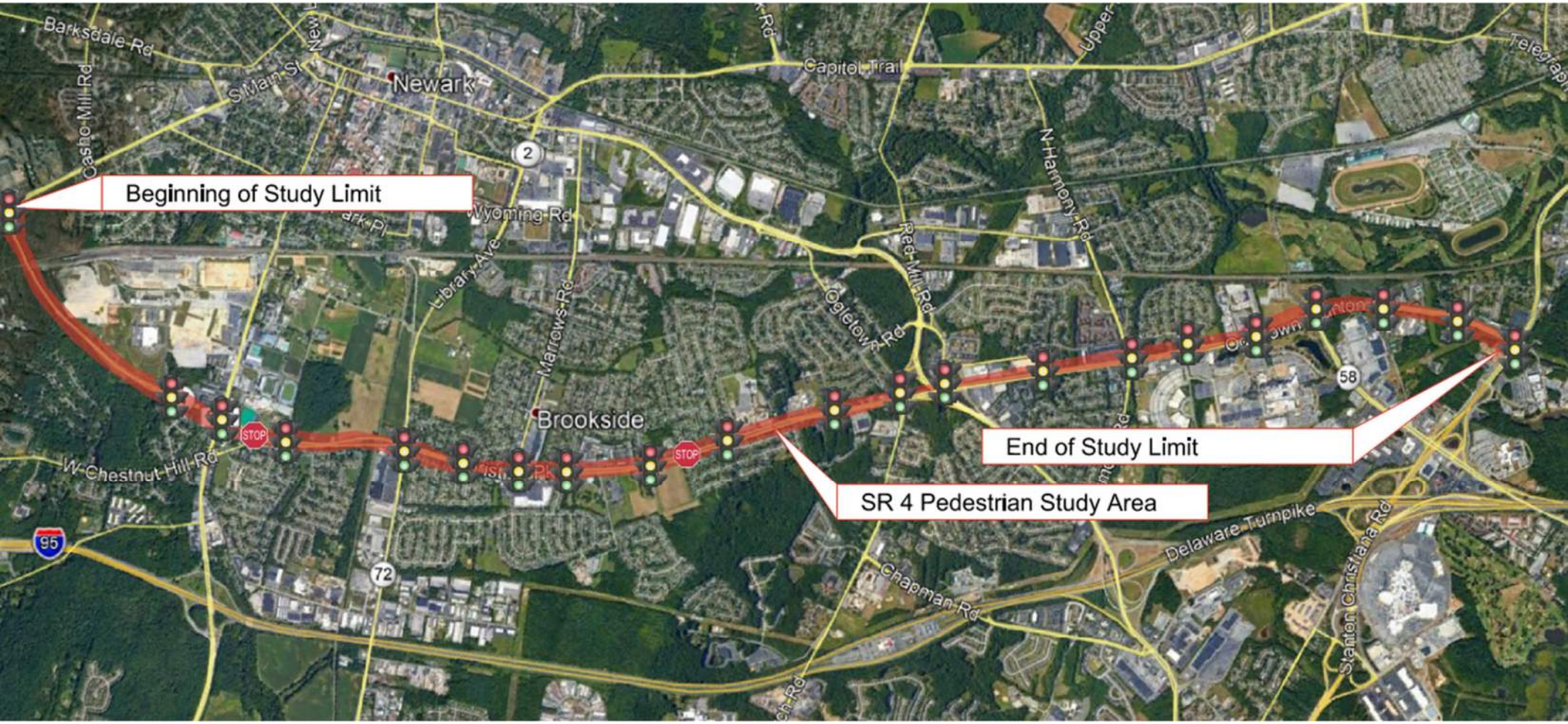
[Planning and Development Coordination Application (PDCA)]

Planned DelDOT Capital Projects



= Intersection Outside of TID Boundary but Included in TID

Study Scope



Purpose:

- Evaluation of pedestrian facilities along the corridor
- Qualitative review of existing lighting coverage along the corridor
- Evaluation of existing lighting to identify locations where lighting improvements/upgrades will be needed

Study Scope

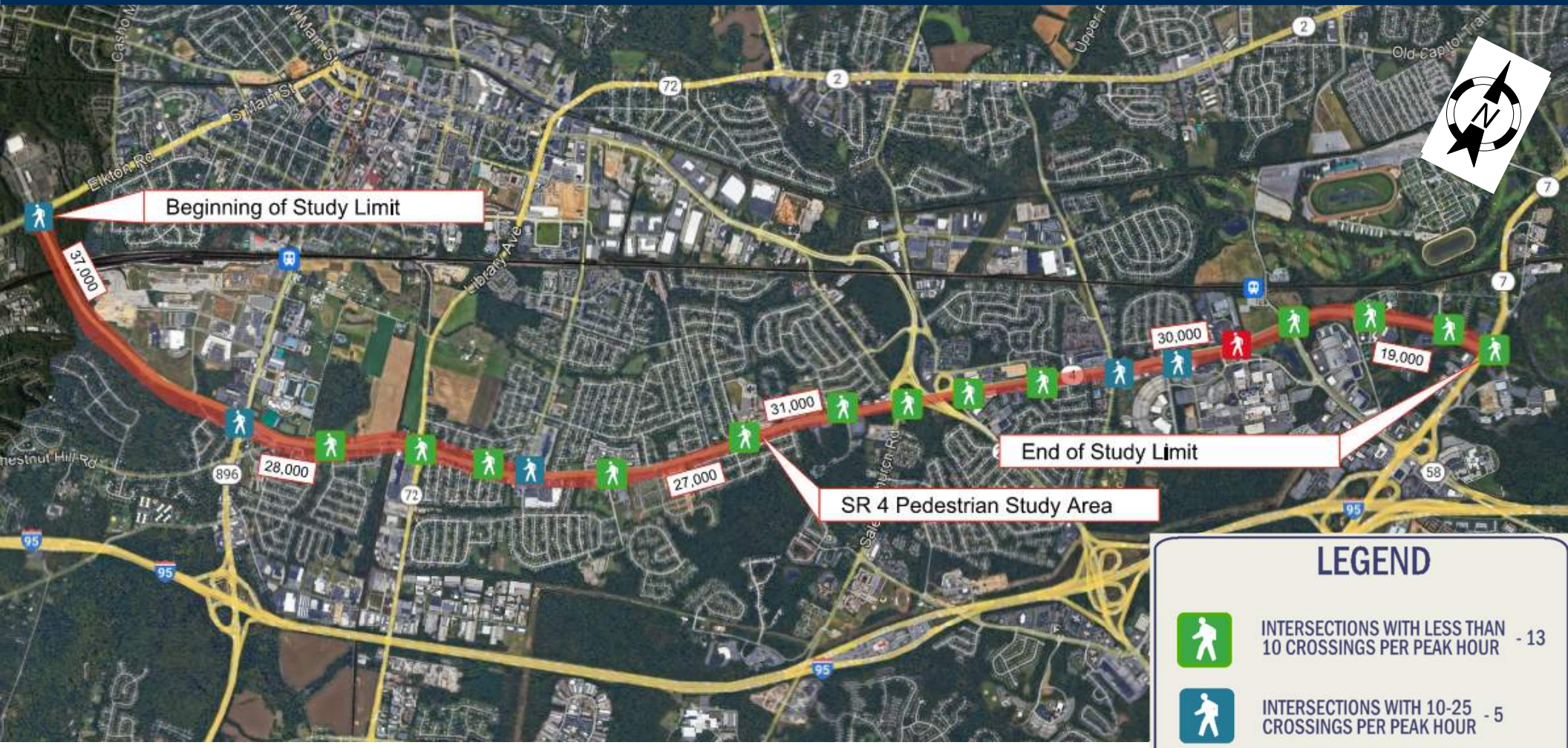
Study Scope:

- Crash evaluation
  - Last 10 years of bicycle and pedestrian crash data
  - Last 3 years of vehicular crash data
- Observed and collected pedestrian, bicycle, and vehicular counts at all study intersections
- Collected DART bus ridership at all stops along the corridor
- Reviewed existing lighting and conducted a lighting warrant evaluation to identify where additional lighting is needed
- Developed list of short-term improvements and potential long-term considerations regarding pedestrian and lighting recommendations

Eastbound SR 4 @ Cedarwood Road

Eastbound SR 4 @ Driveway

Existing Conditions – Vehicles and Pedestrians



Count Data Collected along the Corridor

- Average Annual Daily Traffic (AADT) ranges from 19,000 to 37,000 vehicles per day along the corridor
- Pedestrian crossings exist at 19 intersections

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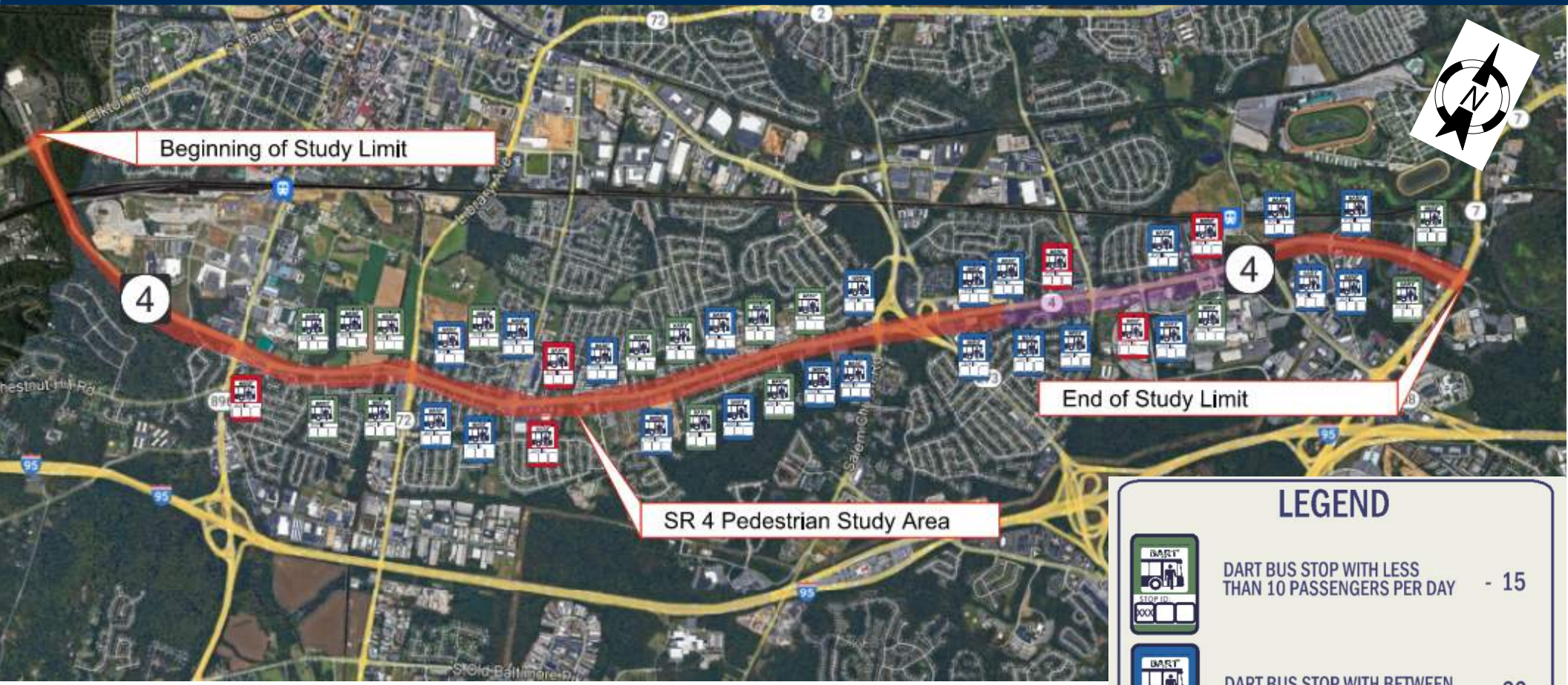
Existing Conditions – Ridership and Speed Limit



Existing Speed Limits and DART Ridership along the Corridor

- Speed limit varies along the corridor between 45 mph and 50 mph
- 43 Dart stops exist along the corridor serving the following routes:
  - Route 5
  - Route 33
  - Route 42
  - Route 46
  - Route 55
  - Route 62
  - Route 302

Existing Conditions – Crash History

Crash History Along the Corridor

- Ten years of pedestrian and bicycle crash data was collected
  - 29 pedestrian crashes occurred
    - 15 crashes occurred during night-time conditions
    - 5 fatalities, various locations along the corridor
  - 16 bicycle crashes occurred
    - 3 crashes occurred during night-time conditions
    - No fatalities
- Ratio of night-time vehicular crashes to daytime crashes using three years of data was also collected

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Data Compilation

LEGEND

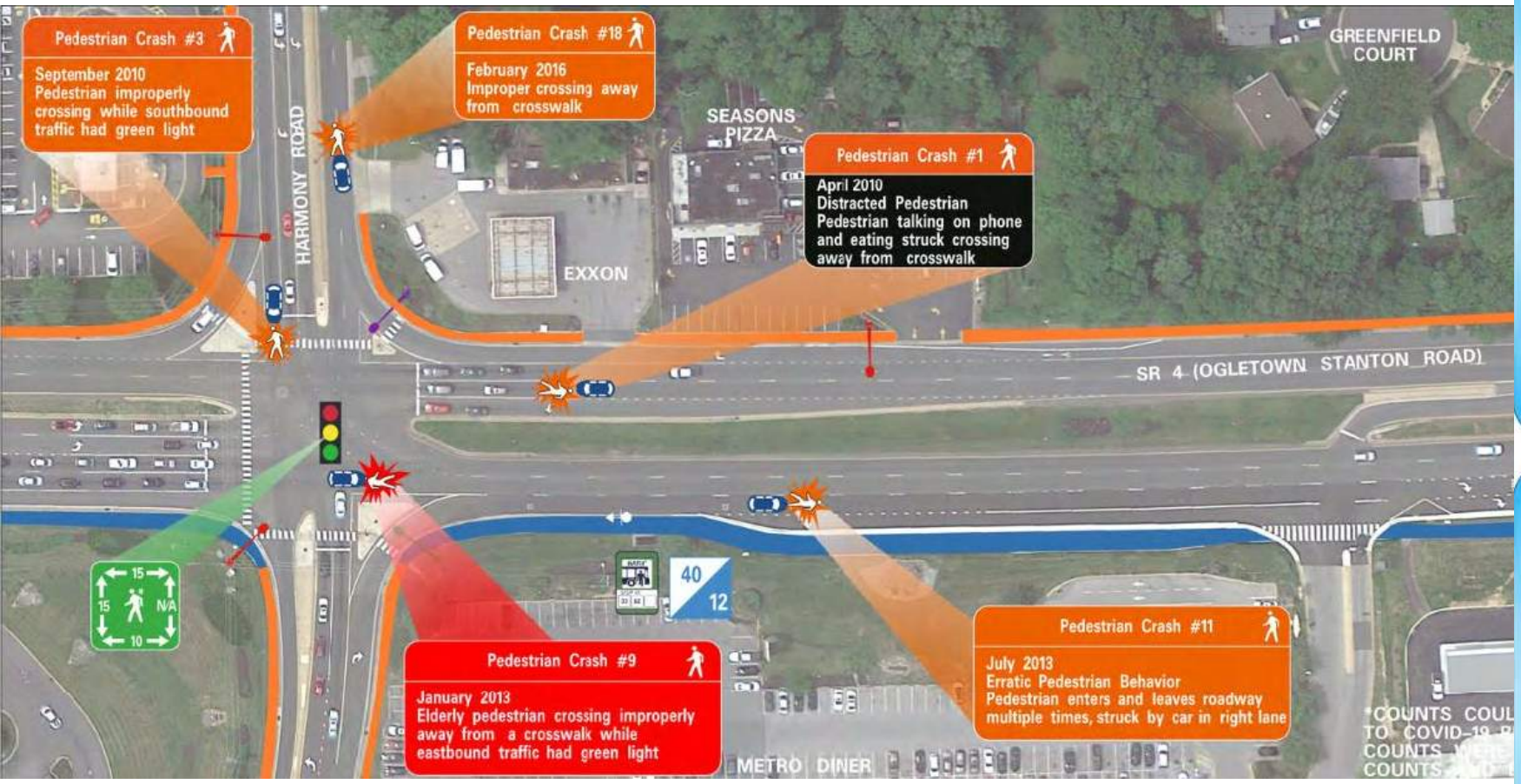
- TRAFFIC SIGNAL
- EXISTING BUS STOP
- BUS BOARD/ALIGHT
- EXISTING STAND ALONE LUMINAIRE
- EXISTING UTILITY POLE LUMINAIRE
- EXISTING SIDEWALK
- EXISTING SHARED USE PATH
- AVERAGE HOURLY PED VOLUME (HIGHEST OF 3 PEAKS)

CRASH TYPES

- PEDESTRIAN NON-INJURY CRASH
- BICYCLE NON-INJURY CRASH
- PEDESTRIAN INJURY CRASH
- BICYCLE INJURY CRASH
- PEDESTRIAN FATAL CRASH
- BICYCLE FATAL CRASH
- DARK — NIGHTTIME CRASH

CRASH STUDY PERIOD:
JANUARY 2010 THROUGH JANUARY 2020

Data Compilation



LEGEND

- TRAFFIC SIGNAL
- EXISTING BUS STOP
- BUS BOARD/ALIGHT (0 / 0)
- EXISTING STAND ALONE LUMINAIRE
- EXISTING UTILITY POLE LUMINAIRE
- EXISTING SIDEWALK
- EXISTING SHARED USE PATH
- AVERAGE HOURLY PED VOLUME (HIGHEST OF 3 PEAKS)

CRASH TYPES

- PEDESTRIAN NON-INJURY CRASH
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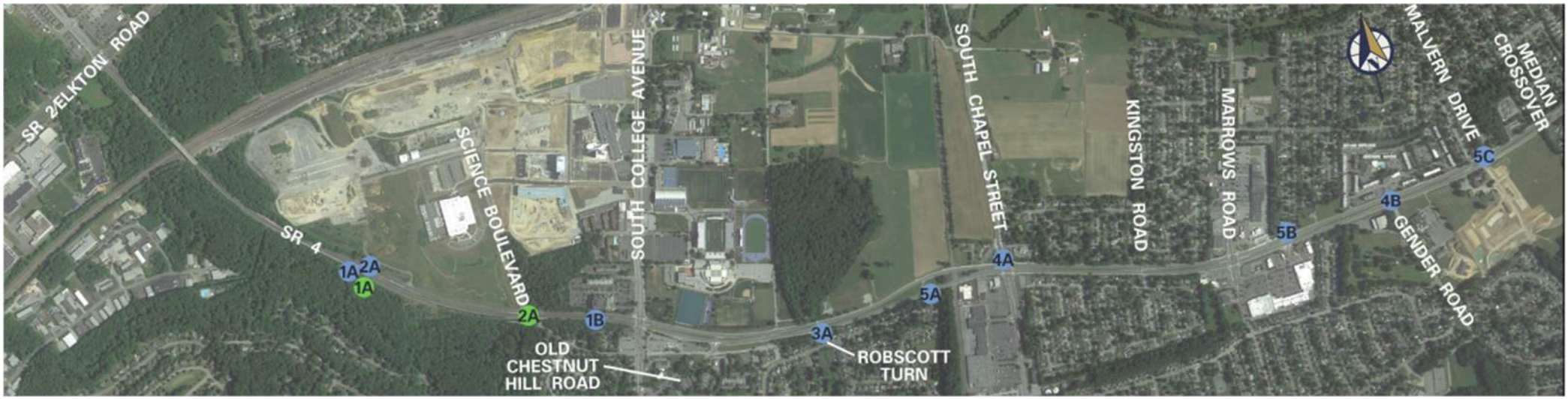
CRASH STUDY PERIOD:
JANUARY 2010 THROUGH JANUARY 2020

Pedestrian Facilities Audit



SHORT–TERM PEDESTRIAN IMPROVEMENTS RECOMMENDATIONS	
RECOMMENDATION	LOCATION(S)
TRIM VEGETATION	1A) SOUTH SIDE OF SR 4 BETWEEN ELKTON ROAD & SCIENCE BOULEVARD 1B) SOUTH SIDE OF SR 4 BETWEEN SCIENCE BOULEVARD & S. COLLEGE AVENUE
CLEAN SIDEWALK FROM DEBRIS & WASHOUT	2A) SOUTH SIDE OF SR 4 BETWEEN ELKTON ROAD & SCIENCE BOULEVARD
FIX PEDESTRIAN SIGNAL HEAD MALFUNCTIONS	3A) SR 4 & ROBOSCOTT TURN SOUTHEAST CORNER FACING WEST
RESTRIPE FADED CROSSWALKS	4A) SR 4 & SR 72 NORTHERLY CROSSWALK (10' WIDE) 4B) SR 4 & GENDER ROAD EASTERLY AND WESTERLY CROSSWALKS (6' WIDE)
PROVIDE CROSSWALKS AT EXISTING PEDESTRIAN RAMPS	5A) SR 4 & ARGYLE ROAD SOUTHERLY CROSSWALK 5B) SR 4 & MARTINDALE DRIVE NORTHERLY CROSSWALK 5C) SR 4 & MALVERN DRIVE NORTHERLY CROSSWALK 5D) SR 4 & TODD LANE SOUTHERLY CROSSWALK

LONG–TERM PEDESTRIAN CONSIDERATIONS	
RE–BUILD DRAINAGE FACILITIES	1A) SOUTH SIDE OF SR 4 BETWEEN ELKTON ROAD & SCIENCE BOULEVARD
PROVIDE CROSSWALKS/ PEDESTRIAN RAMPS	2A) SR 4 & SCIENCE BOULEVARD

Pedestrian Facilities Audited Along SR 4 for Quality and Connectivity

- Condition of ADA ramps, crosswalks, pedestrian signals, sidewalks, and shared use paths reviewed in the field
- Lack of connectivity identified within the pedestrian network
- Identified short-term improvements and potential long-term considerations along the corridor
  - Long-term considerations in this section of roadway will be addressed as part of the *SR 4, Elkton Road to SR 896 Improvement* project (Contract No. T200410301). Project will install ADA-compliant curb ramps and sidewalk along the SR 4 corridor.

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Pedestrian Facilities Audit

SHORT–TERM PEDESTRIAN IMPROVEMENTS RECOMMENDATIONS	
RECOMMENDATION	LOCATION(S)
TRIM VEGETATION	1C) NORTH SIDE OF SR 4 BETWEEN PRIDES CROSSING & HARMONY ROAD
CLEAN SIDEWALK FROM DEBRIS & WASHOUT	2B) NORTH SIDE OF SR 4 BETWEEN PRIDES CROSSING & HARMONY ROAD 2C) SOUTH SIDE OF SR 4 BETWEEN CENTURION DRIVE & SR 7
FIX PEDESTRIAN SIGNAL HEAD MALFUNCTIONS	3B) SR 4 & HARMONY ROAD SOUTHWEST CORNER FACING NORTH
RESTRIPE FADED CROSSWALKS	4C) SR 4 & SAMOSET DRIVE WESTERLY CROSSWALK (10' WIDE)
STRIPE NEW CROSSWALKS	5E) SR 4 & STANLEY PLAZA BOULEVARD SOUTHERLY CROSSWALK 5F) SR 4 & CHESWOLD DRIVE SOUTHERLY CROSSWALK 5G) SR 4 & BROOKBEND DRIVE NORTHERLY CROSSWALK
ADJUST LOCATION OF KEEP RIGHT SIGNS	6) SR 4 & CEDARWOOD BOULEVARD
RELOCATE YIELD BARS TO YIELD CONDITION	7) SR 4 EASTBOUND RIGHT TO SAMOSET DRIVE
PROVIDE CROSSWALKS AT EXISTING PEDESTRIAN RAMPS	8) NORTHERLY APPROACH OF THE SR 4 & AUGUSTA DRIVE INTERSECTION

LONG–TERM PEDESTRIAN CONSIDERATIONS	
RE–BUILD DRAINAGE FACILITIES	1B) SOUTH SIDE OF SR 4 BETWEEN CENTURION DRIVE & SR 7
PROVIDE CROSSWALKS/ PEDESTRIAN RAMPS	2B) SR 4 & SR 58 /CHURCHMANS ROAD
PROVIDE SIDEWALK	3) NORTH SIDE OF SR 4 APPROX. 550' EAST OF CENTURIAN DRIVE
REBUILD PEDESTRIAN FACILITY	4) NORTH SIDE OF SR 4 APPROX. 725' EAST OF AUGUSTA DRIVE TO PROVIDE ADA ACCEPTABLE ACCESS

Note: Items 3 and 4 as part of the Long-Term Considerations would be addressed through various projects along the SR 4 corridor.

Pedestrian Facilities Audited Along SR 4 for Quality and Connectivity

- Condition of ADA ramps, crosswalks, pedestrian signals, sidewalks, and shared use paths reviewed in the field
- Lack of connectivity identified within the pedestrian network
- Identified short-term improvements and potential long-term considerations along the corridor
  - Long-term considerations are being coordinated with WILMAPCO, the Churchmans Crossing Study, and DelDOT Traffic to identify an implementation process

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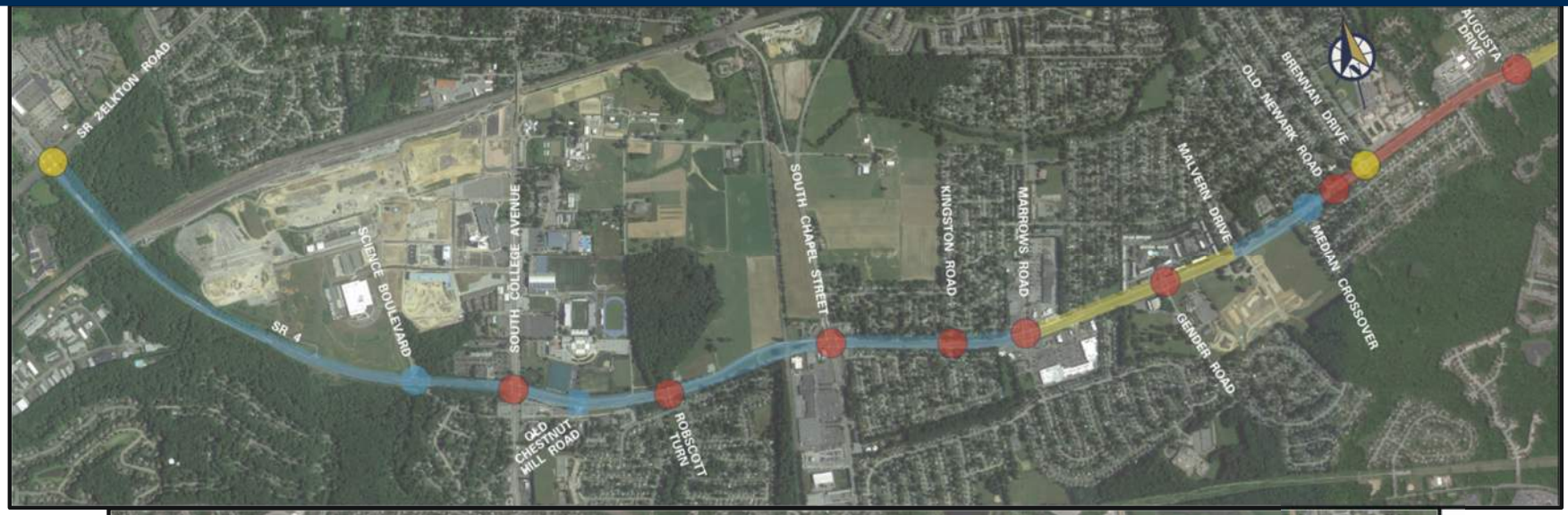
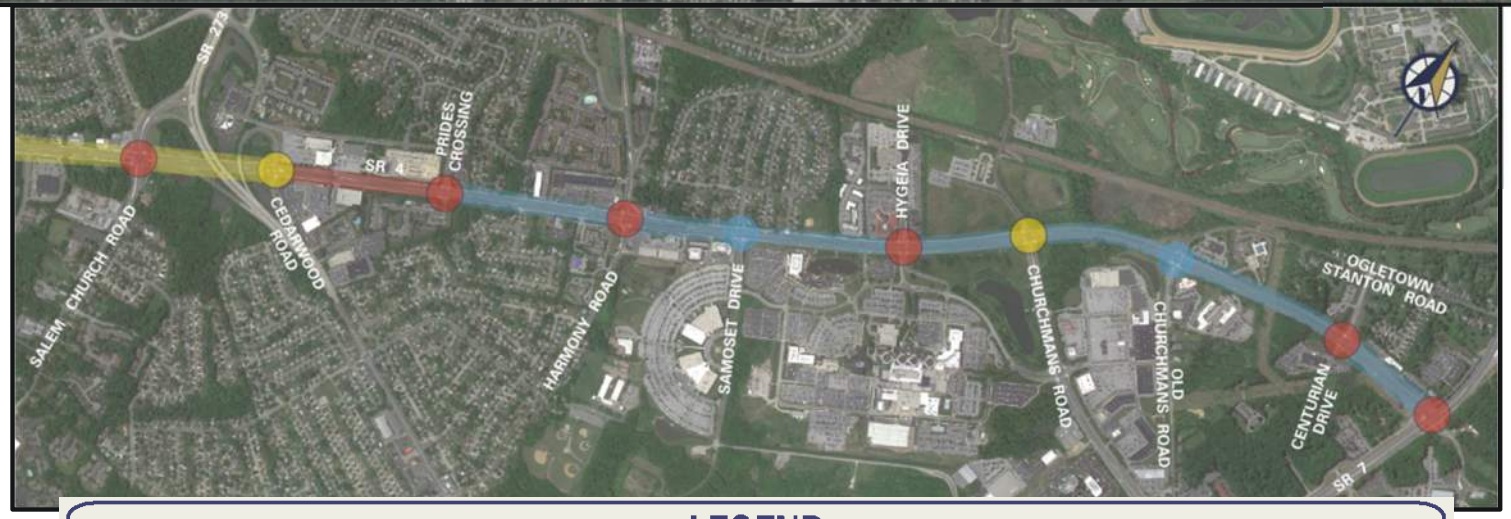
Existing Lighting Along the Corridor





LEGEND

- FULLY LIT INTERSECTION - 4
- PARTIALLY LIT INTERSECTION - 14
- INTERSECTION WITH NO LIGHTING - 5
- FULLY LIT ROADWAY SEGMENT - 4
- PARTIALLY LIT ROADWAY SEGMENT - 3
- ROADWAY SEGMENT WITH NO LIGHTING - 15

Lighting Evaluation

Existing Lighting and Future Lighting Warrants along SR 4

- Qualitative evaluation of existing lighting based on DelDOT's Traffic Lighting Policy to determine if adequate lighting coverage is provided
- 'Form A' evaluations assign a score at each intersection and segment along the corridor based on roadway features to determine if new lighting is warranted


Eastbound SR 4 @ SR 273

- A score of **19 or more**; *"Lighting should be warranted"*
- A score **less than 10**; *"Lighting should not be considered"*
- A score of **10-18**; *"Further Studies should be performed"*


Westbound SR 4 @ SR 273

- 17 Intersections assigned a score of 19 or greater
- Further studies performed at 11 intersections and all 22 roadway segments

Lighting Evaluation - Intersections

Intersection Results - Types of Lighting Recommendations at Study Intersections

SR 4 Intersections	New lighting Recommended	Anticipated Mounting Style
Elkton Road	**No**	**Lighting Exists**
Science Boulevard	**Yes**	**Utility Pole/Standalone**
South College Avenue	**Yes**	**Utility Pole/Standalone**
Old Chestnut Hill Road (unsignalized)	**No**	**N/A**
Cedarwood Road	**Yes**	**Replacing HPS with LED**
SR 7	**Yes**	**Utility Pole/Standalone**

Lighting Exists - No Additional Lighting Recommended	2 Locations
Lighting Exists - Replace HPS with LED Recommended	2 Locations
Lighting Exists - Additional Lighting Recommended	14 Locations
Lighting does not exist - Lighting Recommended	3 Locations
Lighting does not exist - Lighting Not Recommended	2 Locations

Lighting Evaluation - Segments

Segment Results - Types of Lighting Recommendations at Study Roadway Segments

SR 4 Roadway Segment From	To	New lighting Recommended	Anticipated Mounting Style
Science Boulevard	South College Avenue	**Yes**	**Standalone**
South College Avenue	Robscott Turn	**No**	**None**
Kingston Road	Marrows Road	**Yes**	**Utility/Standalone**
Marrows Road	Chestnut Crossing Drive	**Yes**	**Replacing HPS with LED**
Median Crossover	Old Newark Road	**No**	**None**
Old Newark Road	Brennan Drive/Pearson Drive	**Yes**	**Utility/Standalone**

Lighting Exists - Replace HPS with LED Recommended	4 Locations
Lighting Exists - Additional Lighting Recommended	3 Locations
Lighting does not exist - Lighting Recommended	2 Locations
Lighting does not exist - Lighting Not Recommended	13 Locations

Lighting Evaluation – Implementation Efforts

Implementation Efforts

- **Replacing HPS with LED:**
  - Utility Pole Based lighting will require Delmarva Power or City of Newark Coordination
- **New or Adding Additional Lighting:**
  - Existing lighting infrastructure may need to be replaced based on age or condition
  - Power source coordination with Delmarva Power or City of Newark
  - Utility Pole Based lighting will require Delmarva Power or City of Newark Coordination
  - Lighting design and construction

Eastbound SR 4 @ Marrows Road

Eastbound SR 4 Off Ramp @ SR 273

Pedestrian Audit and Lighting Evaluation Recommendations

Short-Term Improvements in Progress

- **Pedestrian Facilities:**
  - Trim vegetation at blocked pedestrian facilities
  - Clear sidewalk of debris/washout where needed
  - Fix pedestrian signal head malfunctions
  - Restripe faded crosswalks
  - Stripe new crosswalks across state-maintained accesses to developments (all accesses appear to include ADA-compliant pedestrian ramps; however, compliance should be confirmed)
- **Lighting:**
  - Restoring any luminaires along the corridor that are currently not functioning
  - Replace all High-Pressure Sodium (HPS) fixtures with Light-Emitting Diode (LED) fixtures


Eastbound SR 4 @ Science Blvd


Westbound SR 4 @ Cheswold Blvd


Westbound SR 4 @ Prides Crossing

Pedestrian Audit and Lighting Evaluation Recommendations

Next Steps to be Considered

- **Pedestrian Facilities:**
  - Consider adding projects to the future Transportation Improvement Program (TIP) and Capital Transportation Program (CTP) to address the following Long-term Pedestrian Considerations identified by the audit:
    - Provide adequate drainage facilities in flood-prone areas.
    - Provide pedestrian ramps, crosswalks or sidewalk at locations of disconnections
      - Note: Would be addressed through various projects along SR 4
    - Re-build pedestrian facilities where needed
      - Note: Would be addressed through various projects along SR 4
    - In addition to pedestrian facilities, as part of future projects, such as Capital Transportation, Pavement and Rehabilitation, Pedestrian Access Routes, Traffic Engineering, etc., installation of additional bicycle improvements such as pavement markings and signage can be implemented along the SR 4 corridor.


Westbound SR 4 @ Churchmans Road


Eastbound SR 4 @ SR 7

Pedestrian Audit and Lighting Evaluation Recommendations

Next Steps to be Considered

- **Lighting:**
  - Re-design or install lighting at all intersections where lighting is warranted and is not existing or does not meet standards
    - New lighting recommended at 3 intersections
    - Additional lighting recommended at 14 intersections where some lighting already exists
    - New lighting recommended along 2 segments
    - Additional lighting recommended along 3 segments where some lighting already exists
  - Photometric analysis have been completed and approved by DelDOT at locations that have existing lighting and locations where lighting is proposed to be installed or upgraded along the corridor
  - Conceptual designs to identify mounting style of lighting and develop costs for lighting construction


Westbound SR 4 @ Churchmans Road


SR 4 @ JP Morgan & Chase

Thank You!

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