

# Missed Opportunities

## DelDOT Lessons Learned Workshop

March 7, 2022



# *Excellence in Transportation.*

## **Every Trip.**

We strive to make every trip taken in Delaware safe, reliable and convenient for people and commerce.

## **Every Mode.**

We provide safe choices for travelers in Delaware to access roads, rails, buses, airways, waterways, bike trails, and walking paths.

## **Every Dollar.**

We seek the best value for every dollar spent for the benefit of all.

## **Everyone.**

We engage our customers and employees with respect and courtesy as we deliver our services.





# Agenda

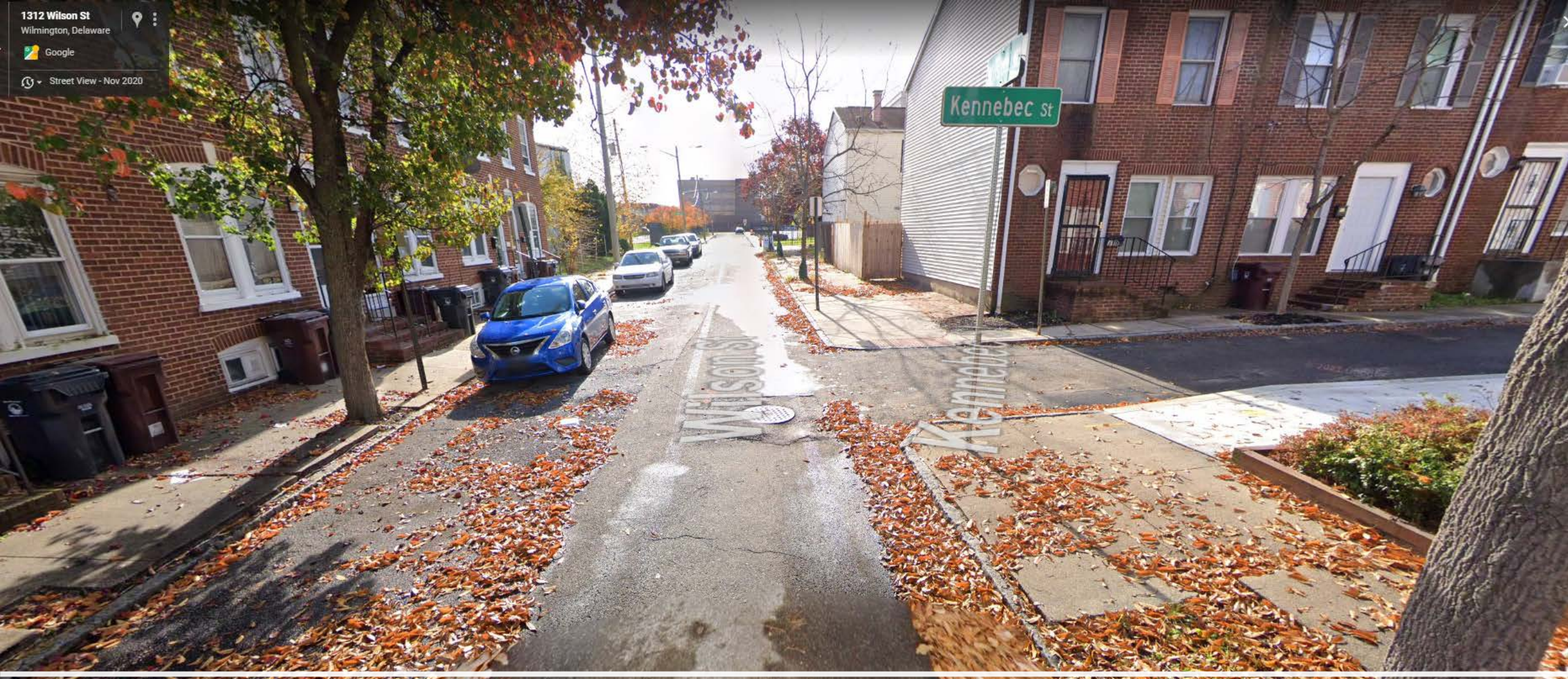
- Missed Opportunities
    - Scoping
    - Design
    - Construction
-



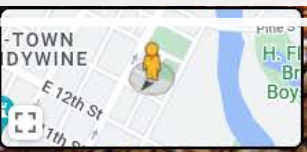
# Scoping - Pedestrian Connectivity

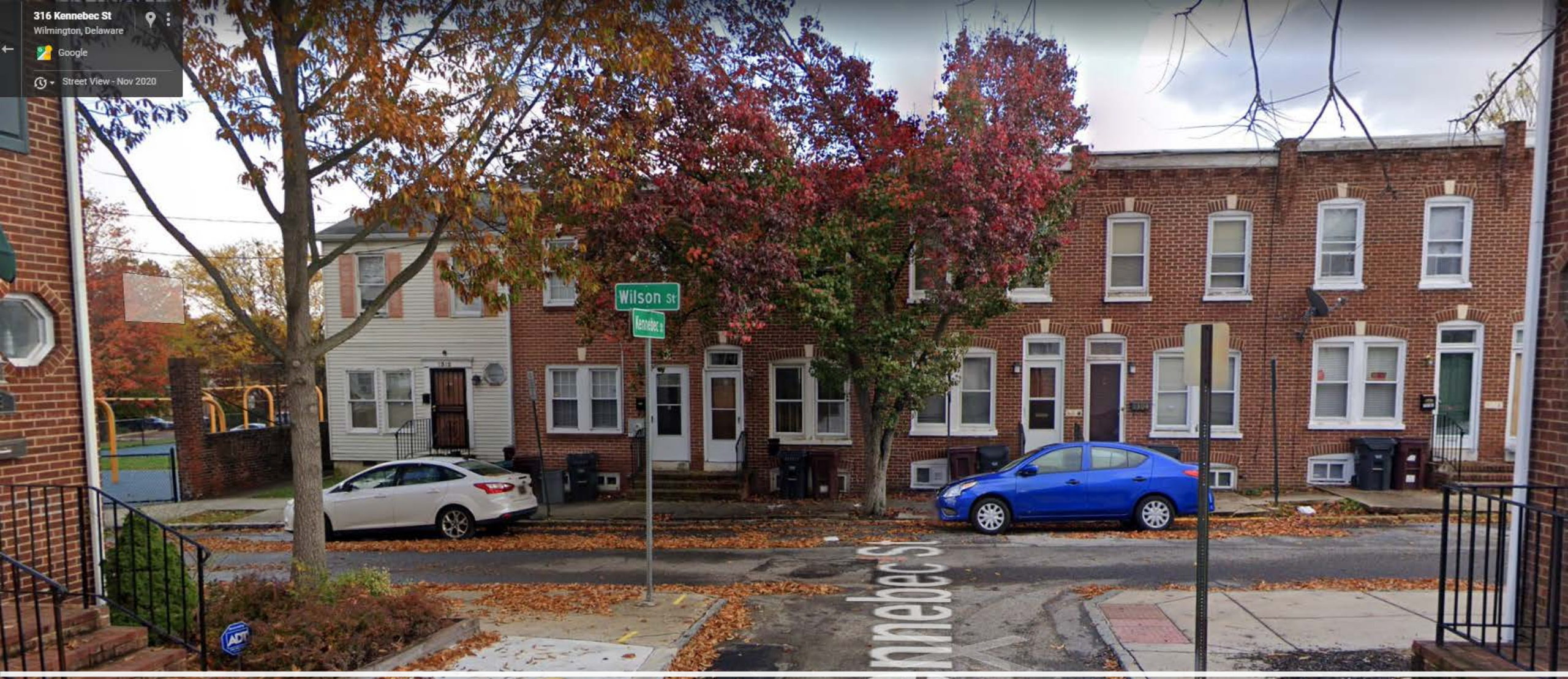
**Every Trip • Every Mode • Every Dollar • Everyone**



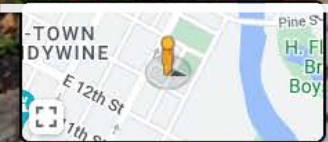


# Pedestrian Connectivity





# Pedestrian Connectivity

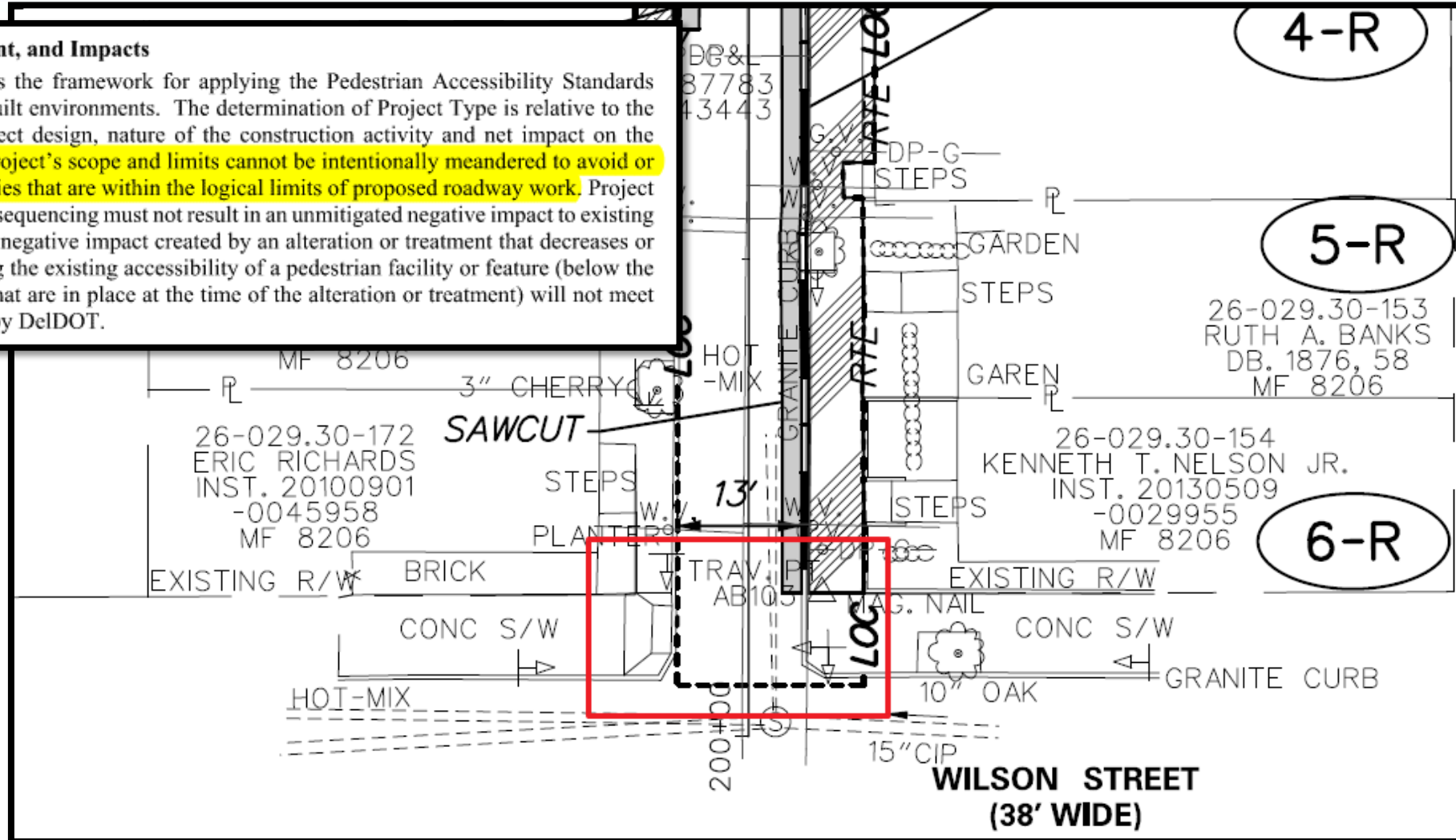




# Scoping - Pedestrian Connectivity

## 2.1 Project Scope, Intent, and Impacts

The Project Type provides the framework for applying the Pedestrian Accessibility Standards (PAS) to the design and built environments. The determination of Project Type is relative to the primary intent of the project design, nature of the construction activity and net impact on the pedestrian network. **The project's scope and limits cannot be intentionally meandered to avoid or skip over pedestrian facilities that are within the logical limits of proposed roadway work.** Project activities and construction sequencing must not result in an unmitigated negative impact to existing pedestrian accessibility. A negative impact created by an alteration or treatment that decreases or has the effect of decreasing the existing accessibility of a pedestrian facility or feature (below the established requirements that are in place at the time of the alteration or treatment) will not meet the Standards established by DelDOT.





# Scoping - Pedestrian Connectivity

**Every Trip • Every Mode • Every Dollar • Everyone**





## DelDOT ADA Inventory & Assessment App

This application contains data that portrays the pedestrian facility inventory and ADA assessment of these facilities located in the DelDOT right of way as of December 2011 for Kent and Sussex counties and June 2012 for New Castle County. Facilities under construction, constructed or repaired from September 2011 through June 2012 and later in the respective counties are not represented within this data. Information Materials can be made available in an alternative format by emailing the DelDOT ADA Title II/Section 504 Coordinator at [Thomas.Nickel@delaware.gov](mailto:Thomas.Nickel@delaware.gov) or by calling: (302) 760-2048.

An aerial photograph of a road intersection and surrounding area. Overlaid on the map are several colored lines (red, blue, purple) representing pedestrian routes. Various icons are placed along these routes, including red triangles, blue circles, and blue squares with a person icon. A red circle highlights a specific red triangle icon on a red line. In the top right corner, there is a search bar with the text 'Find address or place' and a magnifying glass icon. Below the search bar is a small inset map showing the current location within a larger geographic context, with the word 'Topographic' below it. On the left side of the map, there are three vertical icons: a plus sign, a minus sign, and a house icon. The text 'Pedestrian Connectivity' is overlaid at the bottom of the image in a large, bold, black font.

# Pedestrian Connectivity



# Scoping – Pedestrian Accessibility (LOC)

**Every Trip • Every Mode • Every Dollar • Everyone**





# Scoping – Pedestrian Accessibility (LOC)

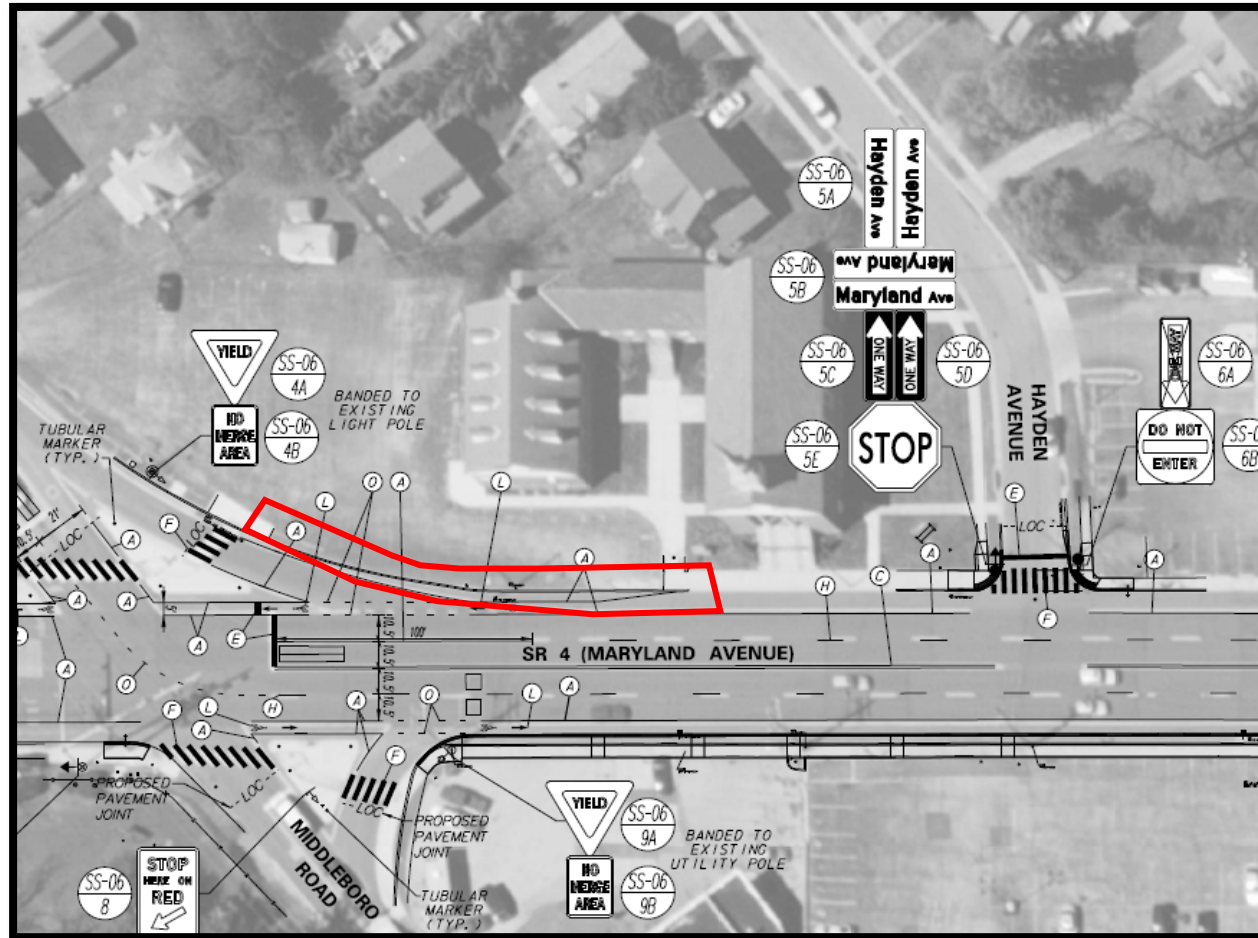
Every Trip • Every Mode • Every Dollar • Everyone

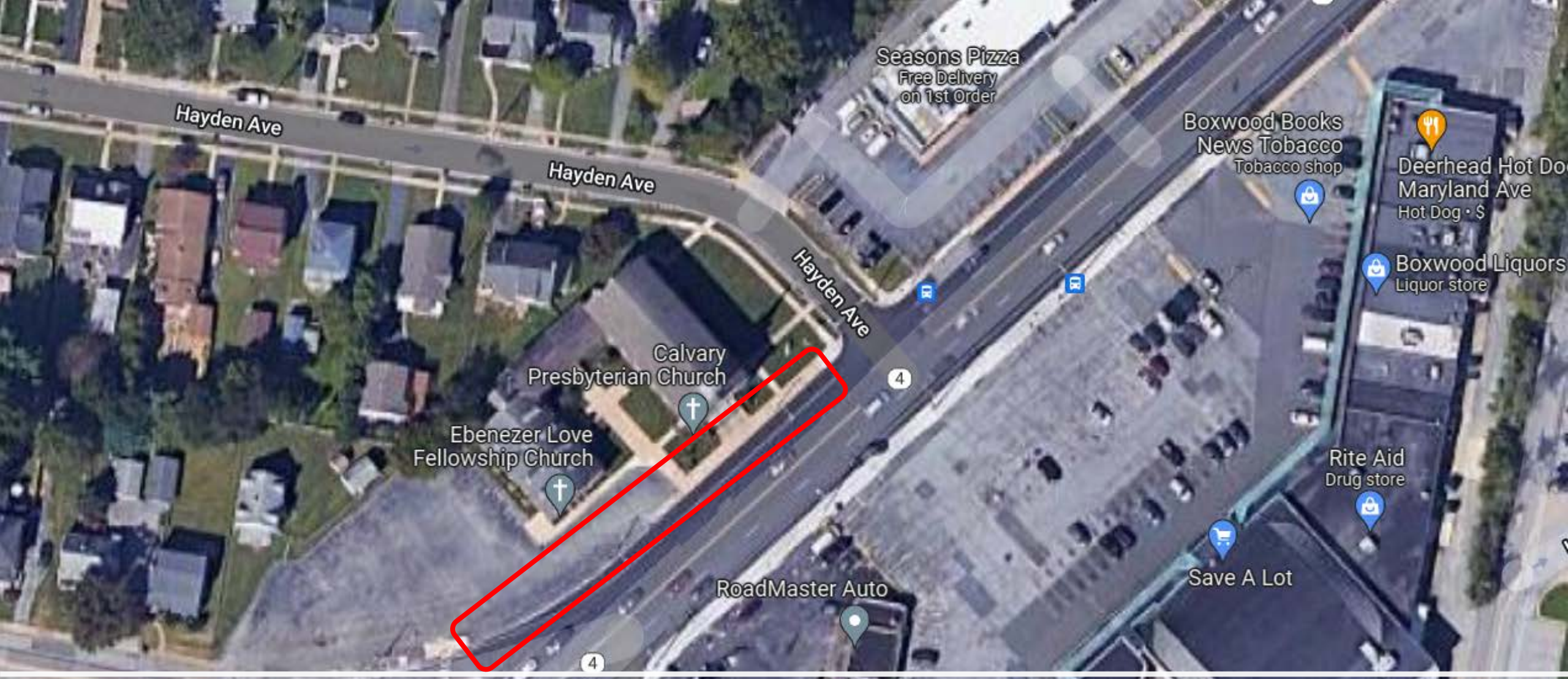




# Scoping – Pedestrian Connectivity (LOC)

Every Trip • Every Mode • Every Dollar • Everyone





## Pedestrian Connectivity





**Pedestrian Connectivity**



# Pedestrian Connectivity



# Scoping – Pedestrian Accessibility (LOC)







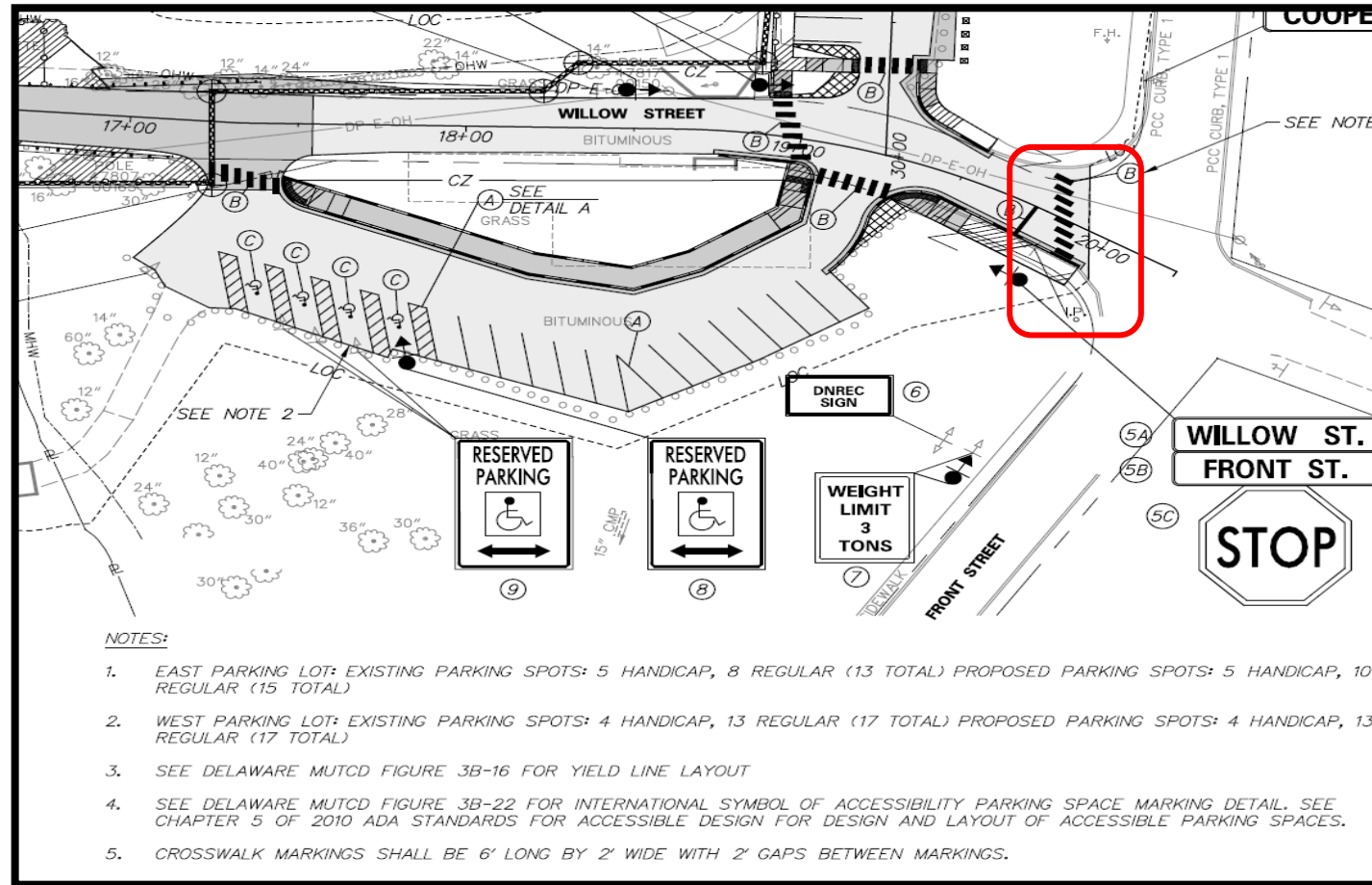
### 2.2.2 Alteration Projects

Alteration projects include activities such as reconstruction, rehabilitation, resurfacing, widening and projects of similar scale and effect. Maintenance activities that do not affect the usability of the facility are not considered alteration projects. Pavement overlays that involve milling an existing road, and then overlaying the road with material, regardless of whether it exceeds the height of the road before milling, falls within the definition of “alteration” because it is a change to the road surface that affects or could affect the usability of the pedestrian route. These project types are required to add new compliant or replace existing non-compliant curb ramps at locations where an existing prepared surface intended for pedestrian use crosses a curb. Below are the specific work activities that are recognized as alterations by the US Department of Justice and the US Department of Transportation:



# Scoping – Pedestrian Accessibility (LOC)

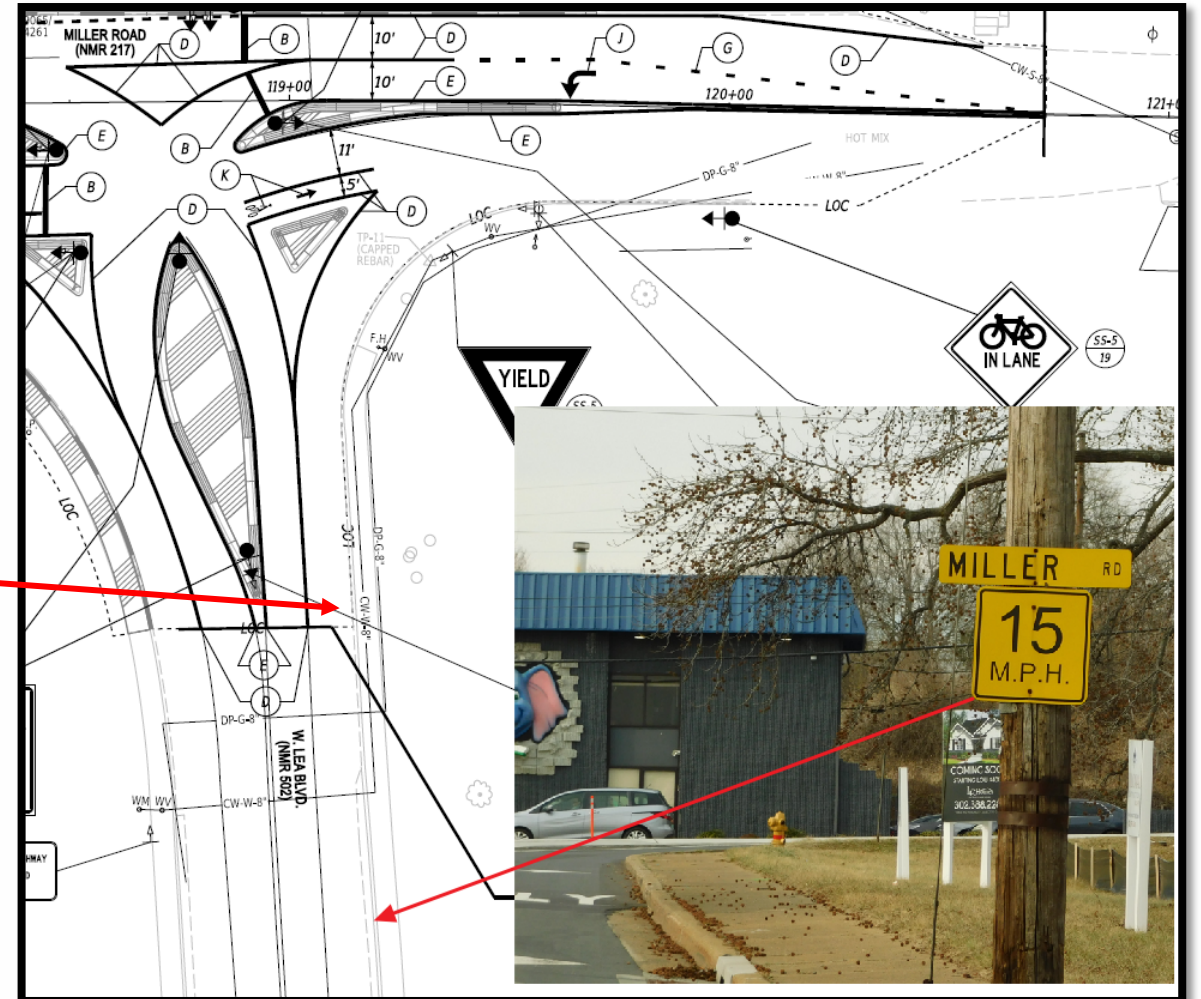
Every Trip • Every Mode • Every Dollar • Everyone





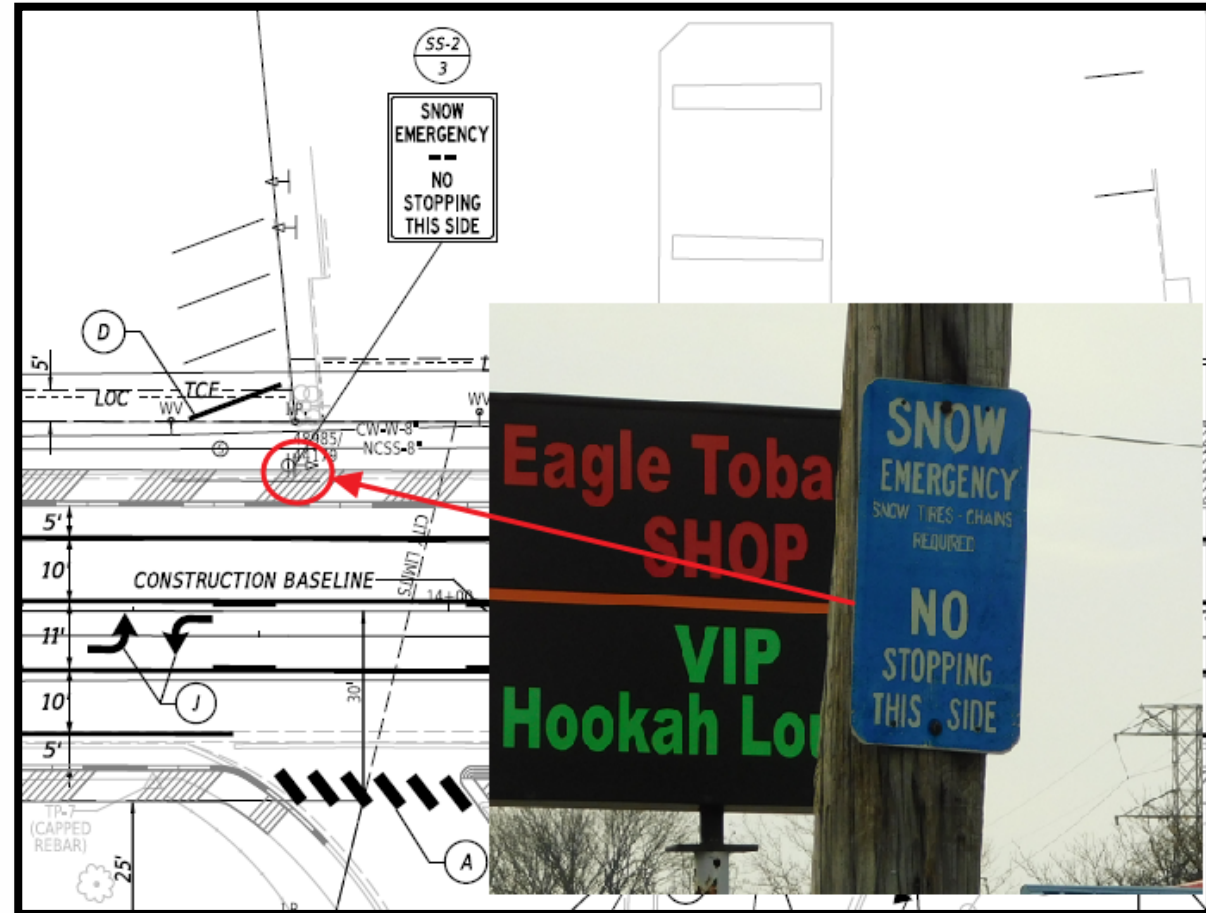
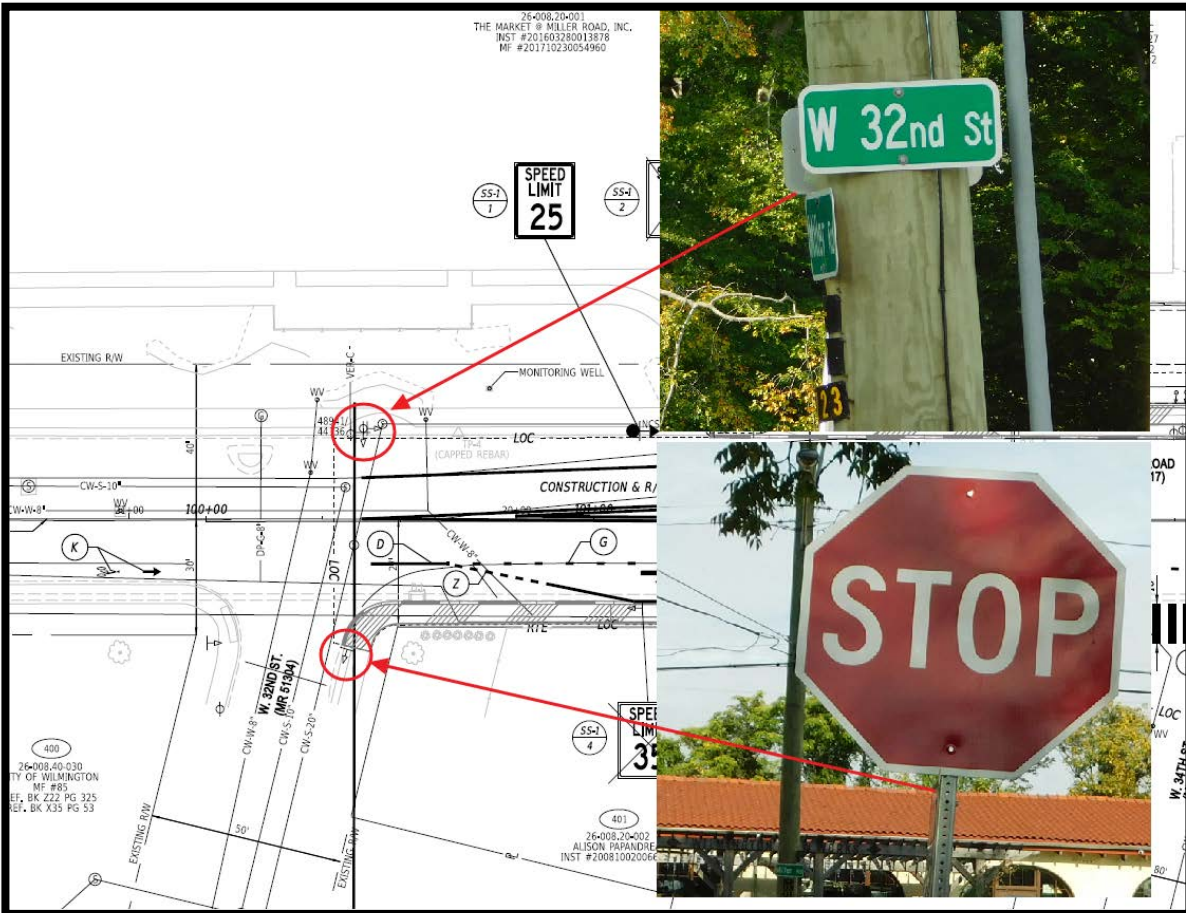
# Scoping – Existing Signage

- Sign evaluations during scoping
  - Physical condition and hardware
  - Retro-reflectivity
  - Coloration
  - Sign size
    - Font size
  - L.O.C. capture all?



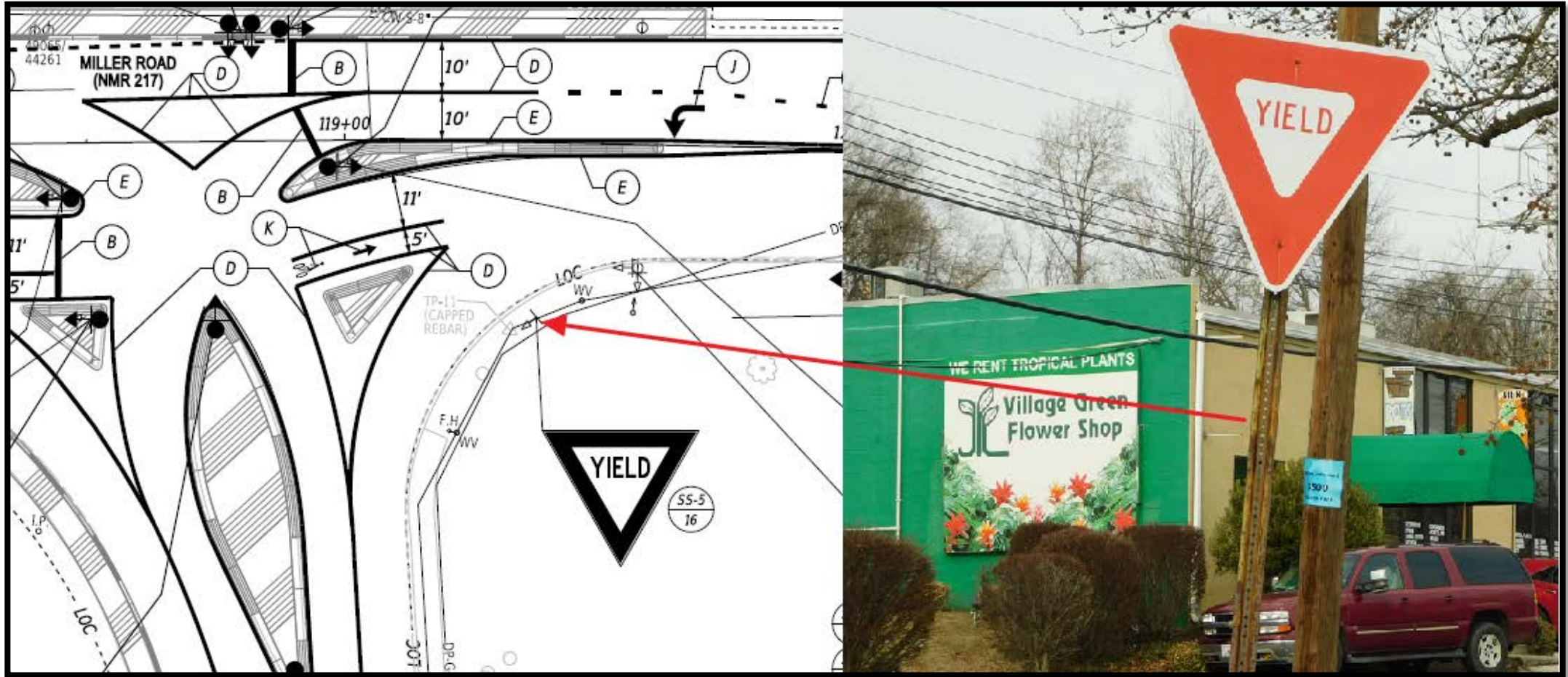


# Scoping – Existing Signage





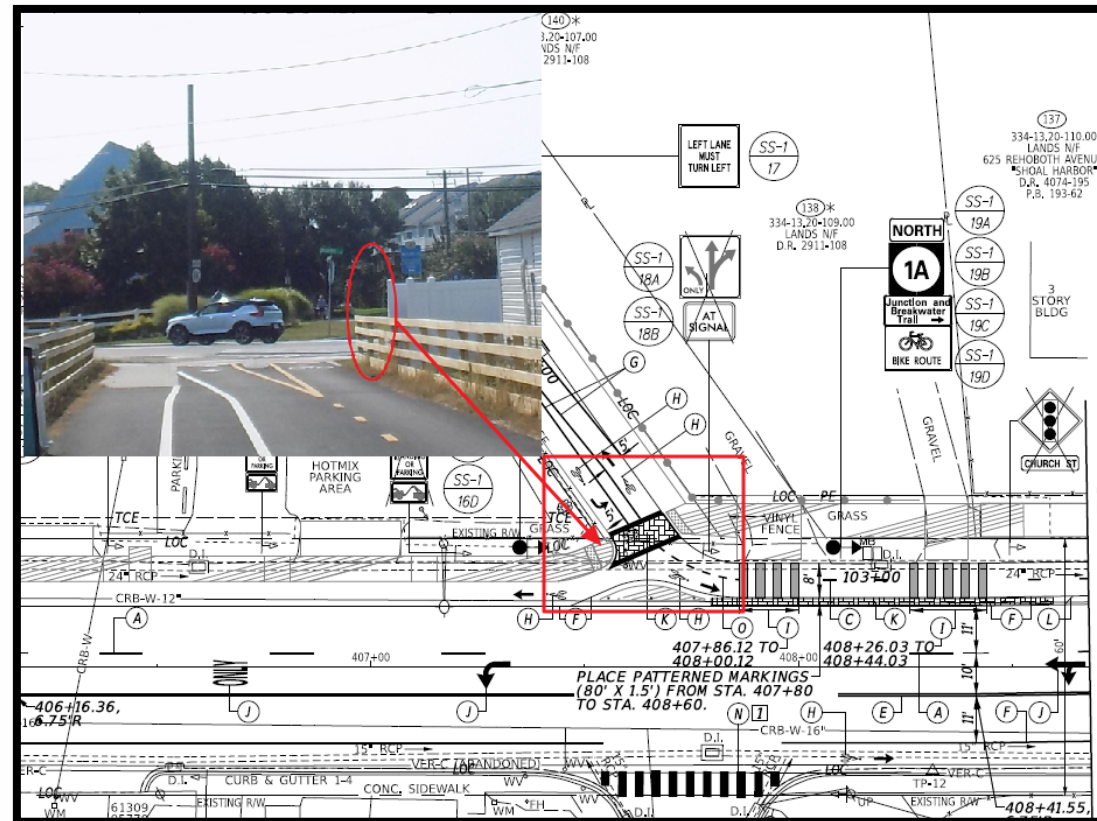
# Scoping – Existing Signage





# Scoping – Proposed Signage

- Does proposed signage consider all-users?
  - Privacy fence creates blind bicycle/pedestrian intersection
    - Stop sign should have been proposed and has been recommended





# Design – L.O.C?

- Proposed curbing did not match previous limit
  - Location already subject to inundation due to topography

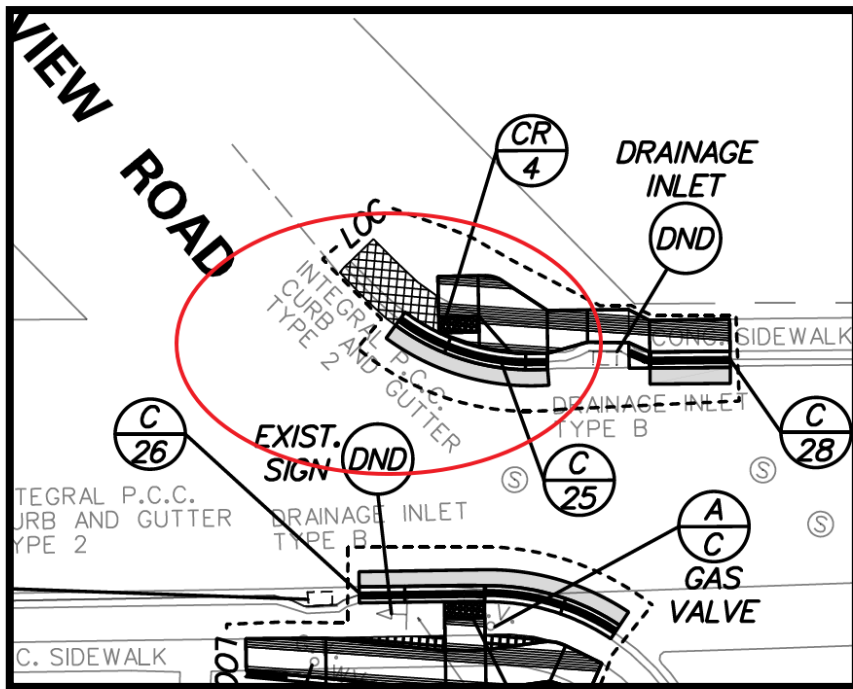
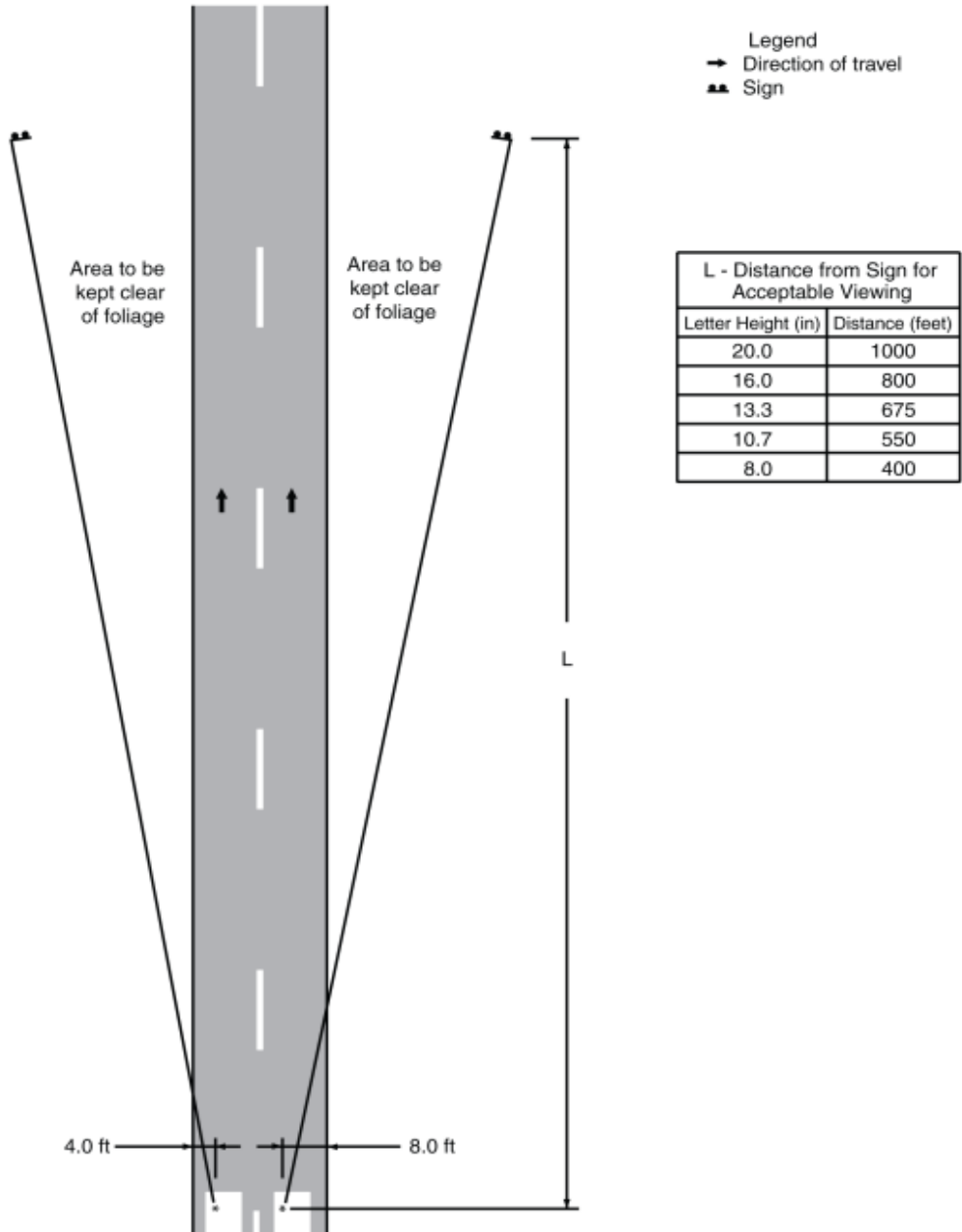


Figure 2A-5. Examples of Clearing Foliage for Sign Installation  
(Delaware Revision)



# /Sign Obstructions

## • Every Dollar • Everyone



### 201.3.2 Trees and Roadside Amenities Designated to Remain.

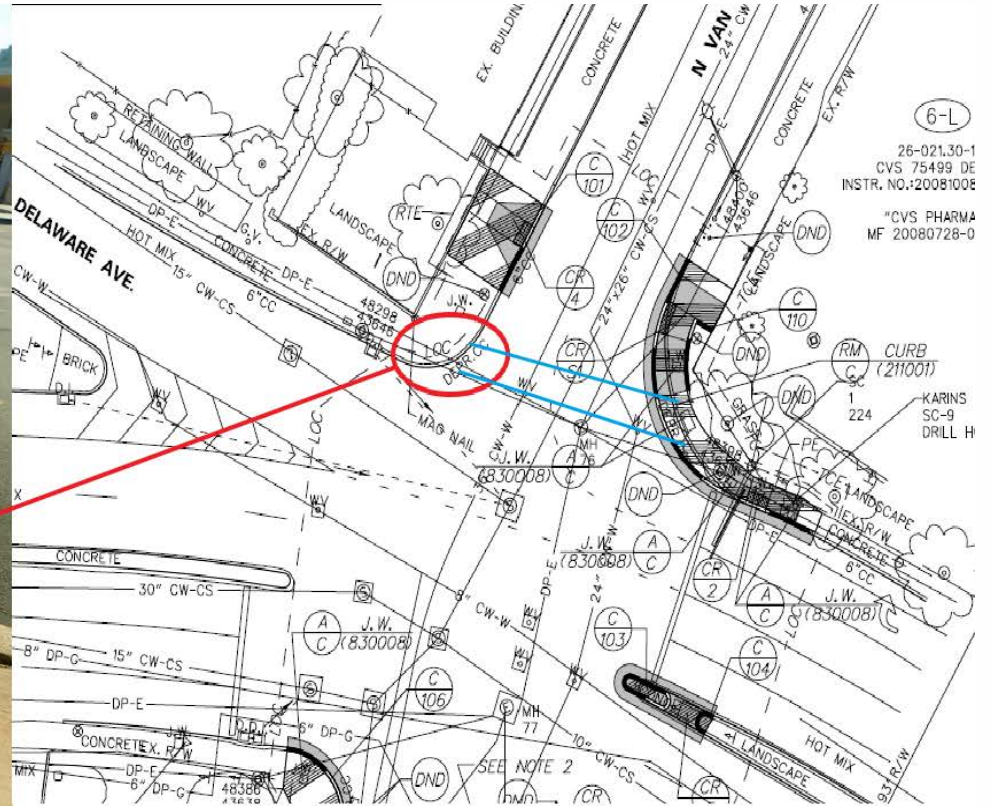
- A. Protect items designated to remain.
- B. Place a temporary construction fence to protect trees designated to remain. Place the fence at the drip line of the trees.
- C. Engage a certified tree surgeon to evaluate trees damaged by the clearing and grubbing operations. Repair or replace the trees as recommended by the tree surgeon.
- D. Prune tree branches overhanging the roadbed to maintain a vertical clearance height of 20 feet above the roadway.
- E. Prune trees or shrubs overhanging the pedestrian path to achieve a vertical clearance height of 10 feet above and 2 feet adjacent to the sidewalk, trail, or shared-use path on either side.
- F. Prune trees and shrubs overhanging the utility limits within the right of way and easement limits of construction. Remove obstructions at the edges of the utility limits and the easement limits from the ground up in a vertical plane until no trees or shrubs cross the utility and easement limit lines at any point.
- G. Perform all required pruning in accordance with ANSI A300.





# Design – L.O.C?

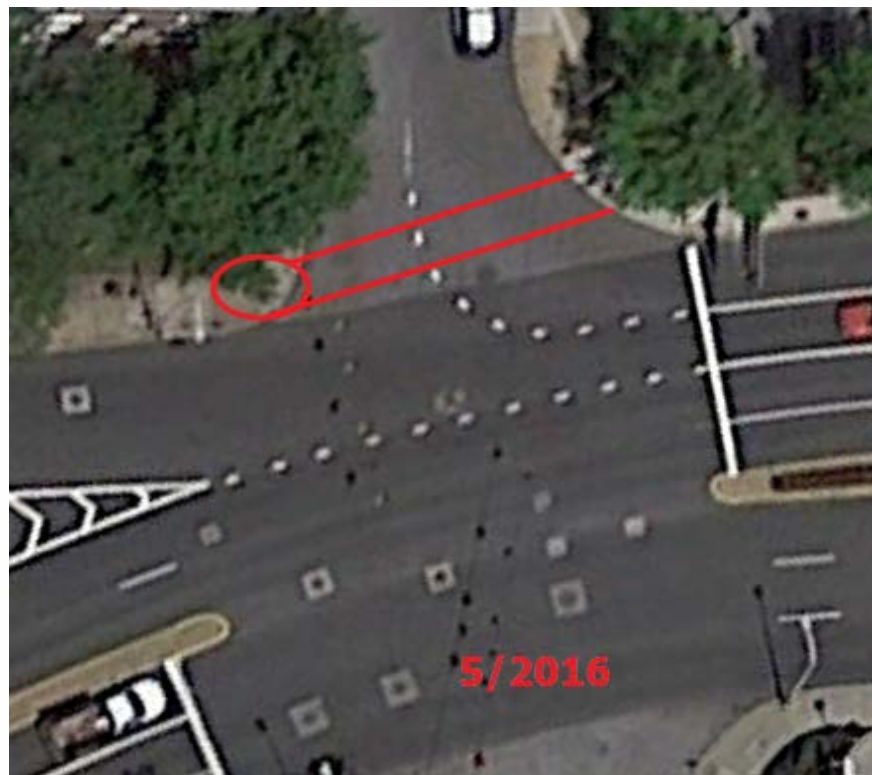
- Depressed CC (curb-cut) shown on Plans
  - Crosswalk realigned and pre-existing curb ramp left in-place





# Design – L.O.C?

- Depressed curb opening been in place through three different projects since 2016





# Design – Consistency of Improvements

- There was another location on the project where guardrail was improved

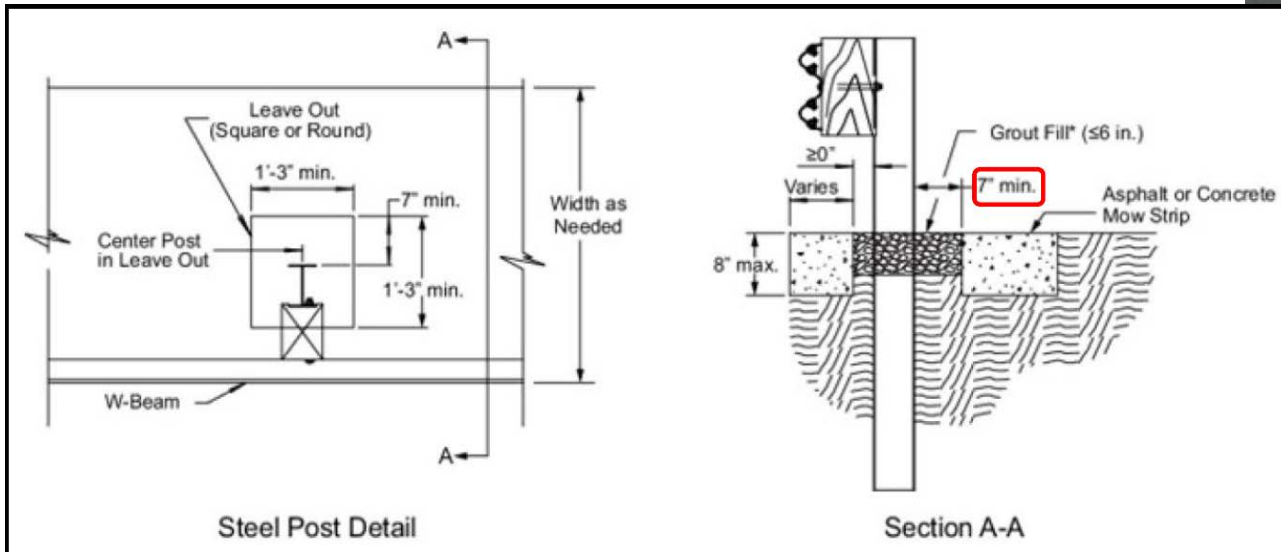




# Design – Eng. Judgement and Communication

- Technically there should not be concrete directly behind the guardrail posts (per RDG)
  - A decision was made to remain
    - Based off of crash data
      - No history of crashes
  - How do we prevent reoccurrence?
    - Communicate with designer

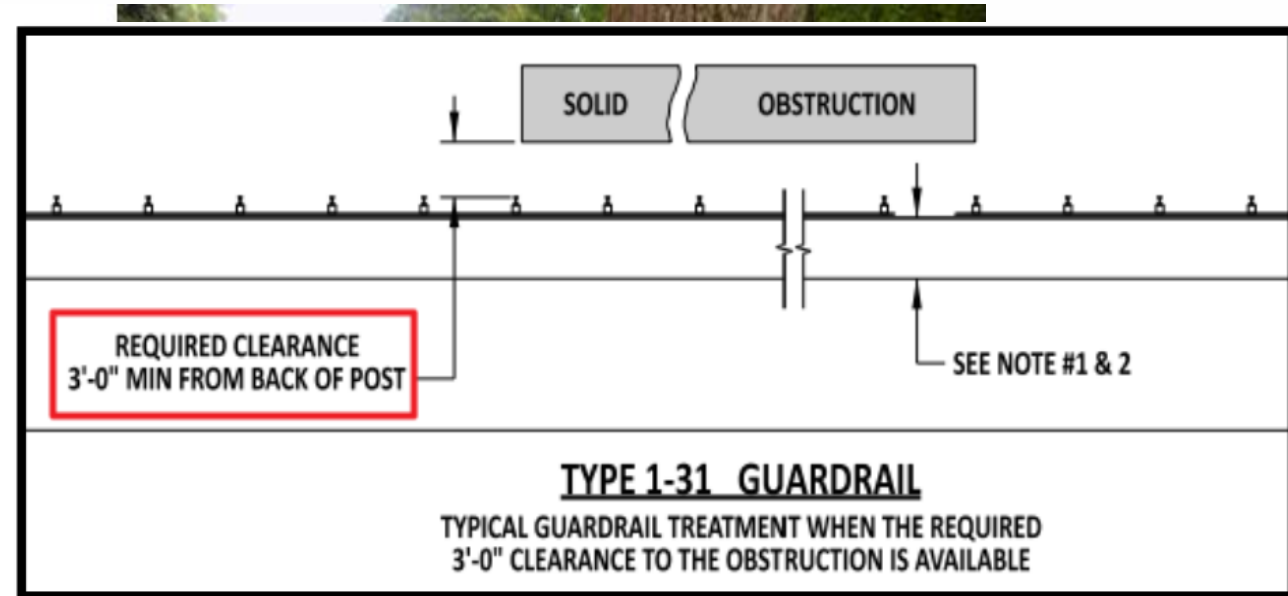
Strong post W-beam guardrail posts in mow strips face similar problems as posts in rock formations. Details for installation of strong post W-beam guardrail posts in rock have also been developed, which differ from that in rock formations. The critical feature of the mow strip installation is the portion of the mow strip around the post omitted for the post rotation, also known as the "leave-out". The leave-out's critical measurement is from the back of the post to the edge of the mow strip and should be a minimum of 175 mm [7 in.], as shown in the details in [Figures 5-52\(a\)](#) and [5-52\(b\)](#). Leave-outs can be filled with low-strength grout, a two-part polyethylene foam or other material that has a compressive strength of 0.85 MPa [120 psi] or less. During an impact, the leave-out material allows for some degree of post rotation by deforming or crushing prior to generating sufficient force to cause post failure. Failure of the sacrificial leave-out backfill material also minimizes damage to the surrounding mow strip. Some states backfill with a coarse aggregate material and seal the surface with an asphaltic sealer material. High tension cable barrier posts do not need a leave-out in the mow strip.





# Design – Replace in Kind or Address?

- Guardrail should have appropriate clearance to obstructions



Snapshot taken from the 2017 Standard Details, [Standard No. B-1 \(2017\)](#)



# Common ADA Deficiencies

- Vertical Surface discontinuities
  - Pavement elevations
  - Expansion materials
- Vertical clearance
  - Vegetation
  - Utilities
  - Signs

## 3.1.5.2 Vertical Surface Discontinuities

### Standard:

01 Where changes in level are permitted in ground surfaces, they shall comply with [Section 3.1.5.2. \(303.1\)](#)

### Advisory:

02 The allowance for vertical surface discontinuities is for occasional expansion joints and objects such as utility covers, vault frames, and gratings that cannot be located outside the pedestrian access route. (Advisory R302.7.2)

## 3.4.3 Vertical Clearance

### Standard:

01 **Vertical clearance shall be 6'-8" high minimum.** Guardrails or other barriers shall be provided where the vertical clearance is less than 6'-8" high. The leading edge of such guardrail or barrier shall be located 2'-3" maximum above the finish floor or ground. (307.4)

### Guidance:

02 The vertical clearance to obstructions for shared use paths should be 10'-0".

### Option:

03 The vertical clearance to obstructions for shared use paths may be limited to 8'-0" in constrained areas.

### Advisory:

04 Section 201 of the Standard Specifications requires that trees or shrubs adjacent to and above the pedestrian access route are pruned "to achieve a vertical clearance of 10'-0" above and 2'-0" adjacent to the sidewalk, trail, or shared-use path on either side."



# Vertical Surface Discontinuities - Pavement

Every Trip • Every Mode • Every Dollar • Everyone

## 3.1.5.2.1 Vertical

### Standard:

- 01 Changes in level of 0'-0.25" high maximum shall be permitted to be vertical. (303.2)

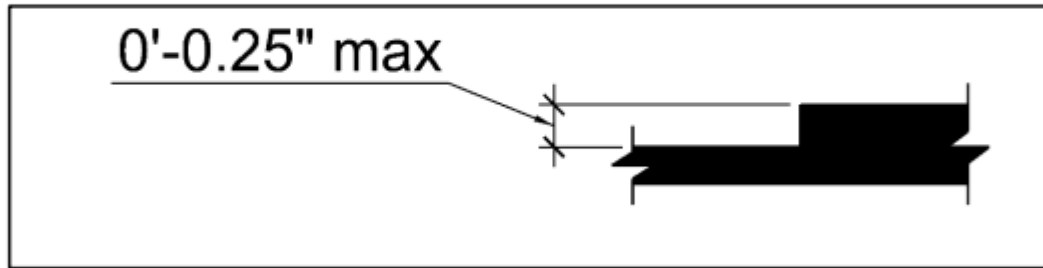


Figure 3.1.5.2.1 Vertical Change in Level (303.2)



## 3.1.5.2.2 Beveled

### Standard:

- 01 Vertical surface discontinuities between 0'-0.25" and 0'-0.50" shall be beveled with a slope not steeper than 50 percent. The bevel shall be applied across the entire vertical surface discontinuity (R302.7.2)

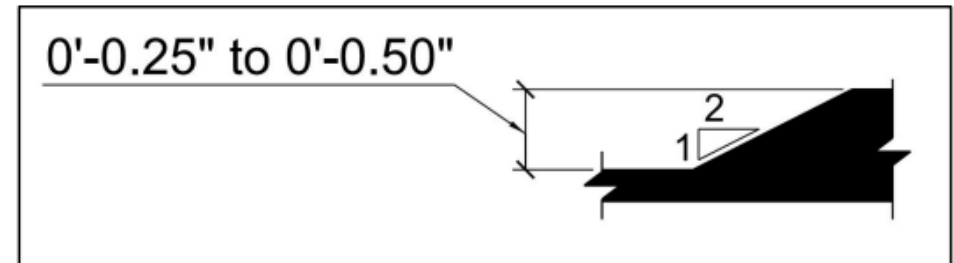


Figure 3.1.5.2.2 Beveled Change in Level (R302.7.2)





# Vertical Surface Discontinuities - Pavement

**Every Trip • Every Mode • Every Dollar • Everyone**







# Vertical Surface Discontinuities - Expansion

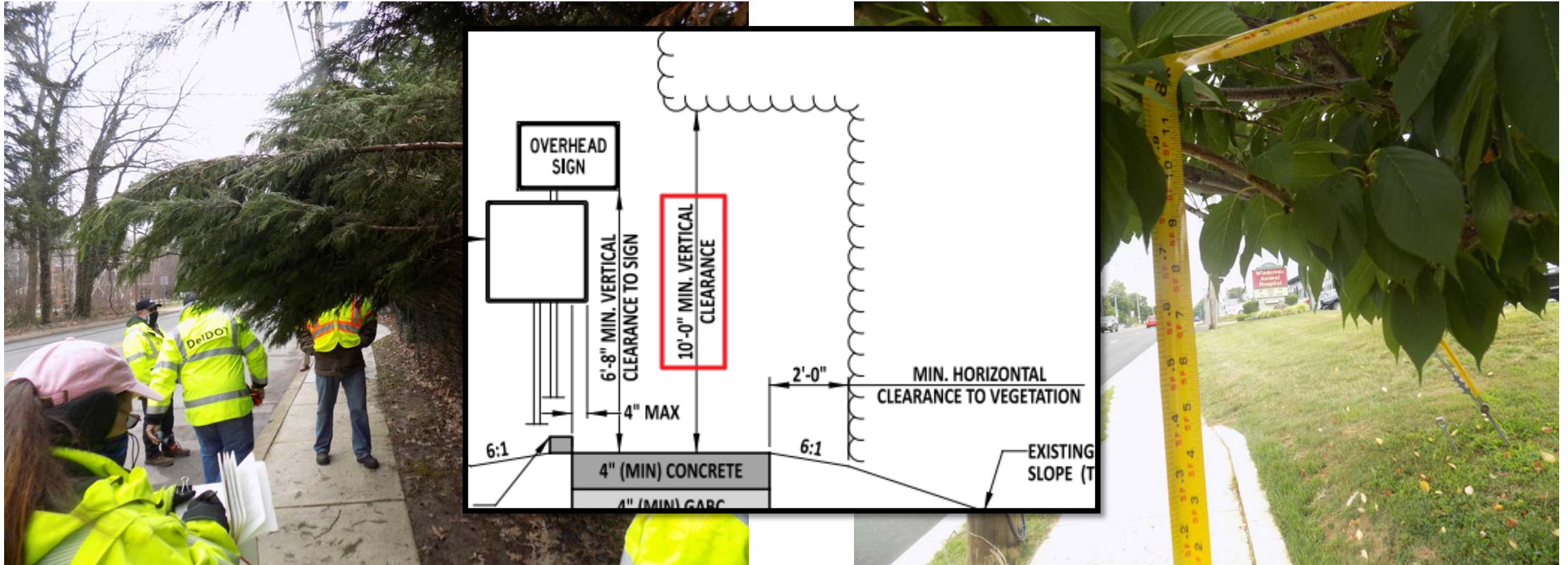
**Every Trip • Every Mode • Every Dollar • Everyone**





# Vertical Clearance - Vegetation

Every Trip • Every Mode • Every Dollar • Everyone





# Pedestrian Signal Head Obstructions

**Every Trip • Every Mode • Every Dollar • Everyone**





# Common Construction Deficiencies

- Signs
  - Color
  - Breakaway assembly
- Tubular markers/flexible delineators
  - Color
    - Marker
    - Retroreflective sheeting



# Sign Coloration

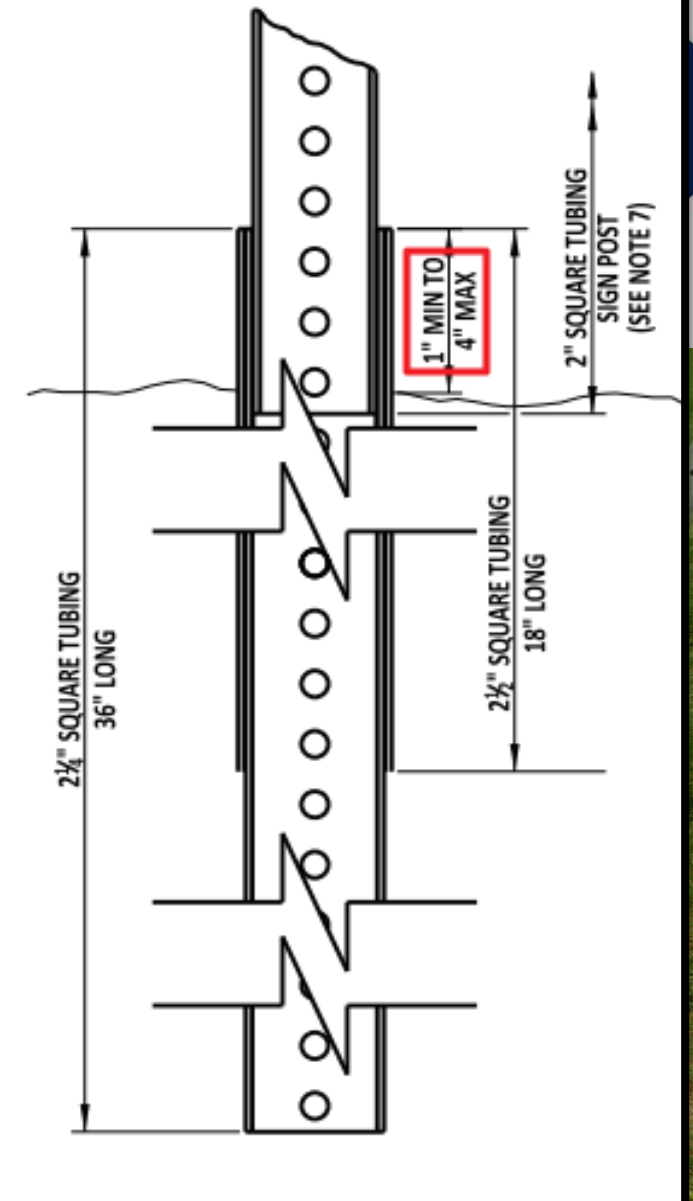
**Every Trip • Every Mode • Every Dollar • Everyone**





# Sign Installations

Every Trip • Every Mode • Every Doll



**BREAK-AWAY ASSEMBLY  
SECTION VIEW**



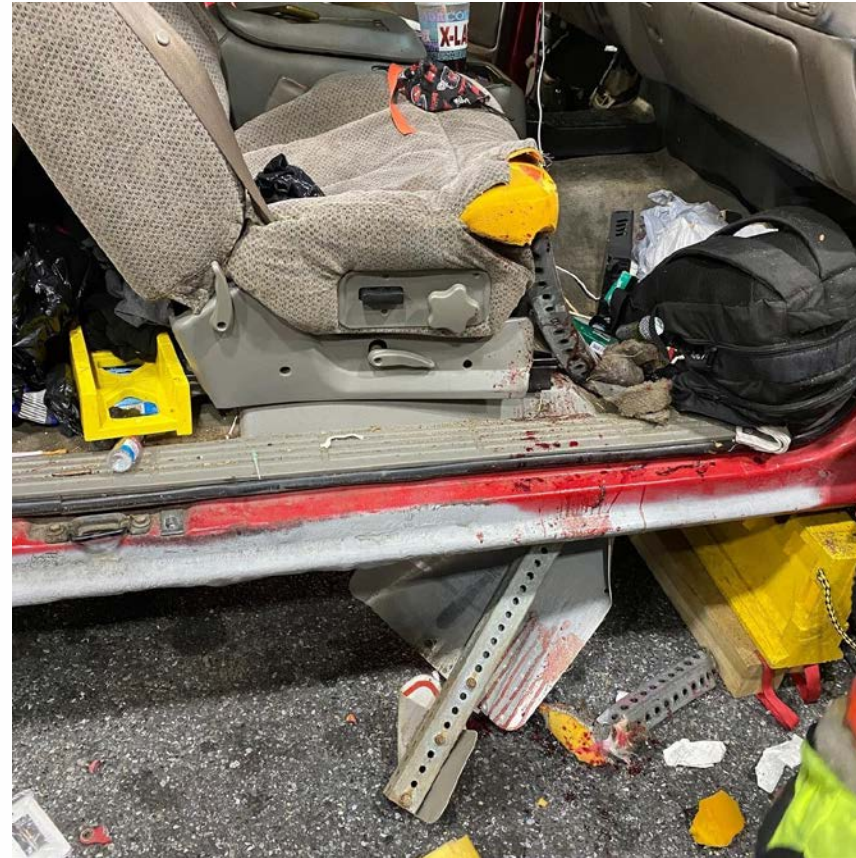
# Sign Installations

**Every Trip • Every Mode • Every Dollar • Everyone**

*Dover firefighters work to free person impaled by street sign in vehicle*

WDEL, Aug 26, 2021

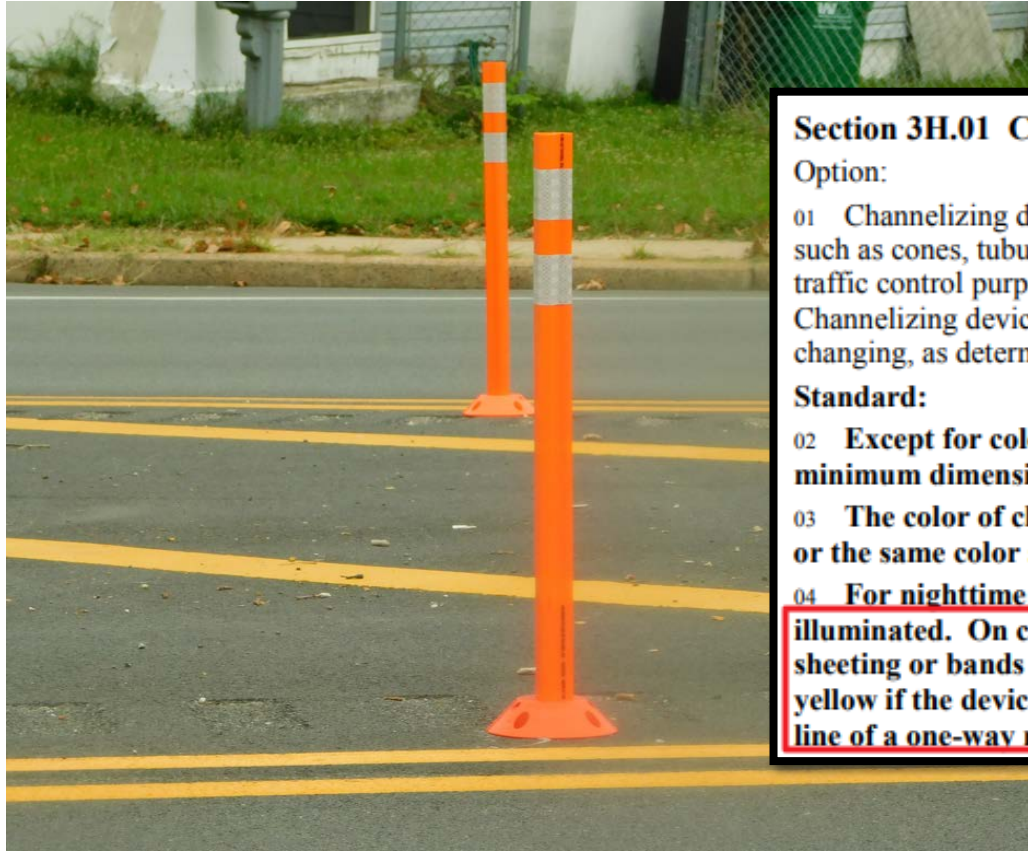
- Sign stubs require proper embedment to perform properly
- Snagging hazard
- Sign may pull from ground versus yielding





# Retroreflective sheeting coloration

Every Trip • Every Mode • Every Dollar • Everyone



## Section 3H.01 Channelizing Devices

### Option:

01 Channelizing devices, as described in Sections 6F.63 through 6F.73, and 6F.75, and as shown in Figure 6F-7, such as cones, tubular markers, vertical panels, drums, lane separators, and raised islands, may be used for general traffic control purposes such as adding emphasis to reversible lane delineation, channelizing lines, or islands. Channelizing devices may also be used along a center line to preclude turns or along lane lines to preclude lane changing, as determined by engineering judgment.

### Standard:

- 02 Except for color, the design of channelizing devices, including but not limited to retroreflectivity, minimum dimensions, and mounting height, shall comply with the provisions of Chapter 6F.
- 03 The color of channelizing devices used outside of temporary traffic control zones shall be either orange or the same color as the pavement marking that they supplement, or for which they are substituted.
- 04 For nighttime use, channelizing devices shall be retroreflective (as described in Part 6) or internally illuminated. On channelizing devices used outside of temporary traffic control zones, retroreflective sheeting or bands shall be white if the devices separate traffic flows in the same direction and shall be yellow if the devices separate traffic flows in the opposite direction or are placed along the left-hand edge line of a one-way roadway or ramp.



# Thank You!

## **Mark Luszczyk**

Deputy Director (Design)  
Division of Transportation Solutions  
Mark.Luszczyk@delaware.gov

## **Don Weber**

Deputy Director (Operations)  
Division of Transportation Solutions  
Don.Weber@delaware.gov

