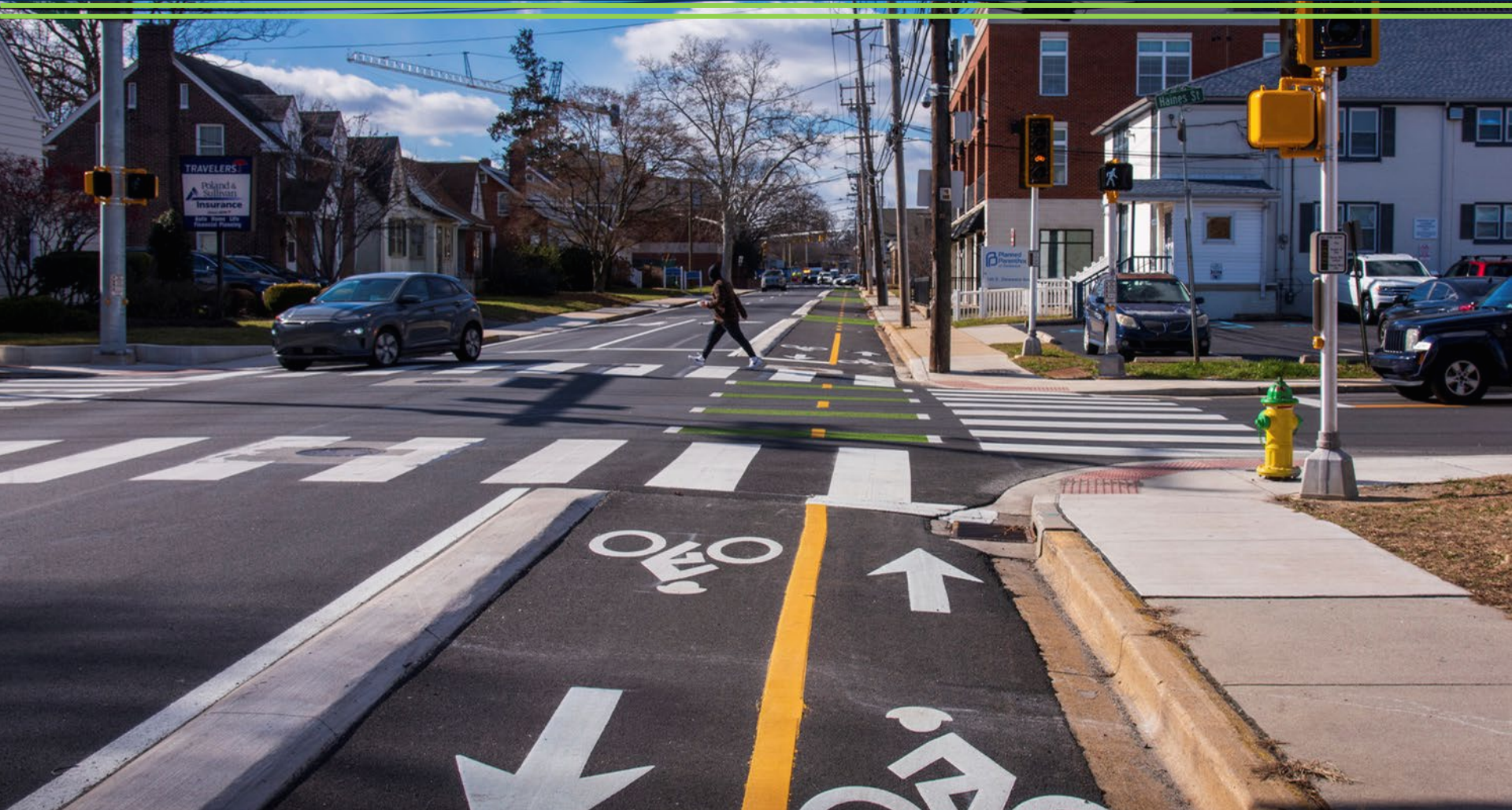


Delaware Avenue Bikeway

What Happens When a Restriping Project Escalates Into A Major Capital Project



Presented at NYSAMPO Conference
May 10, 2023



Today's Presenters



**Angie Hernandez,
AICP**

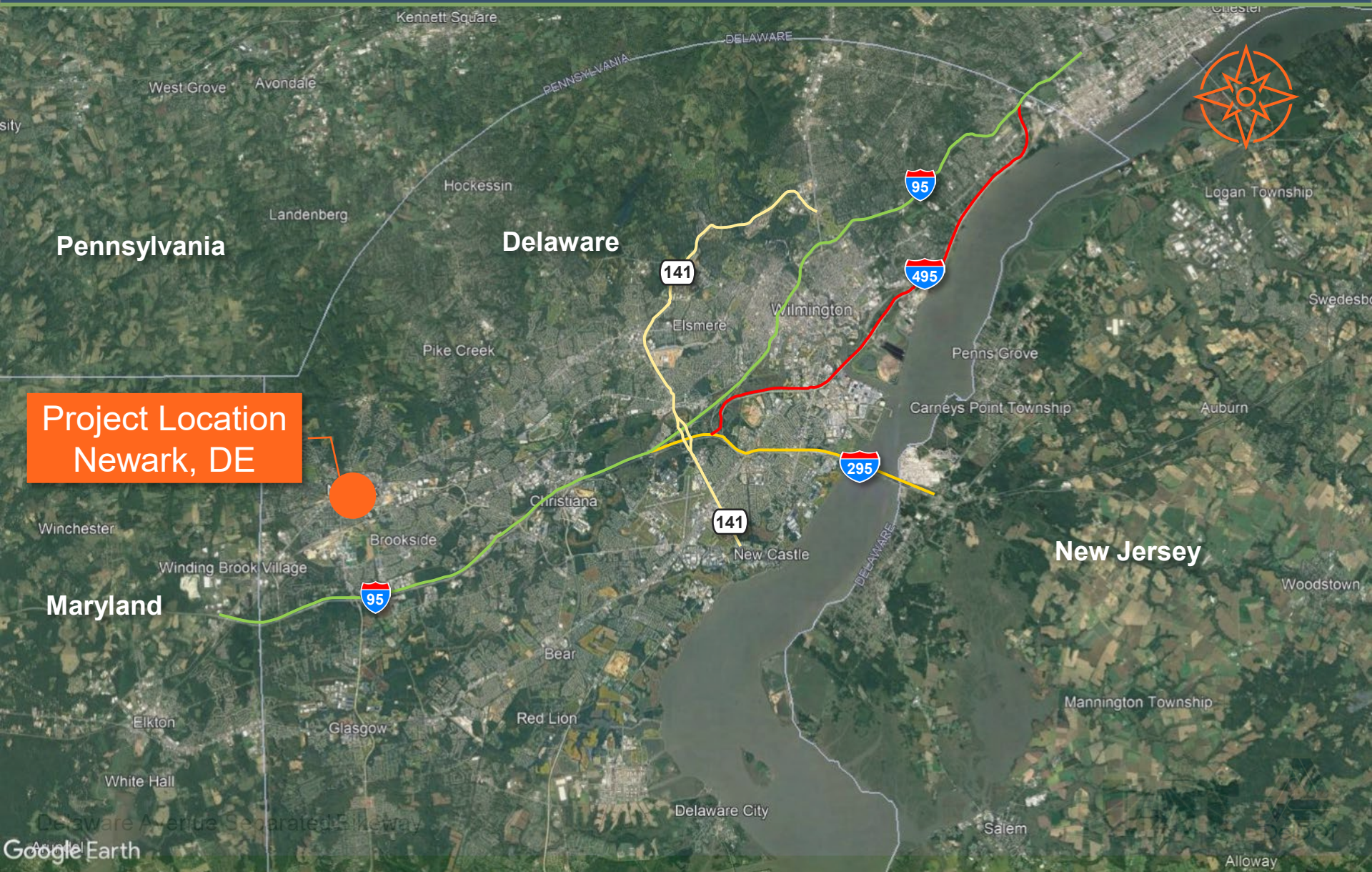
Transportation
Planning Manager



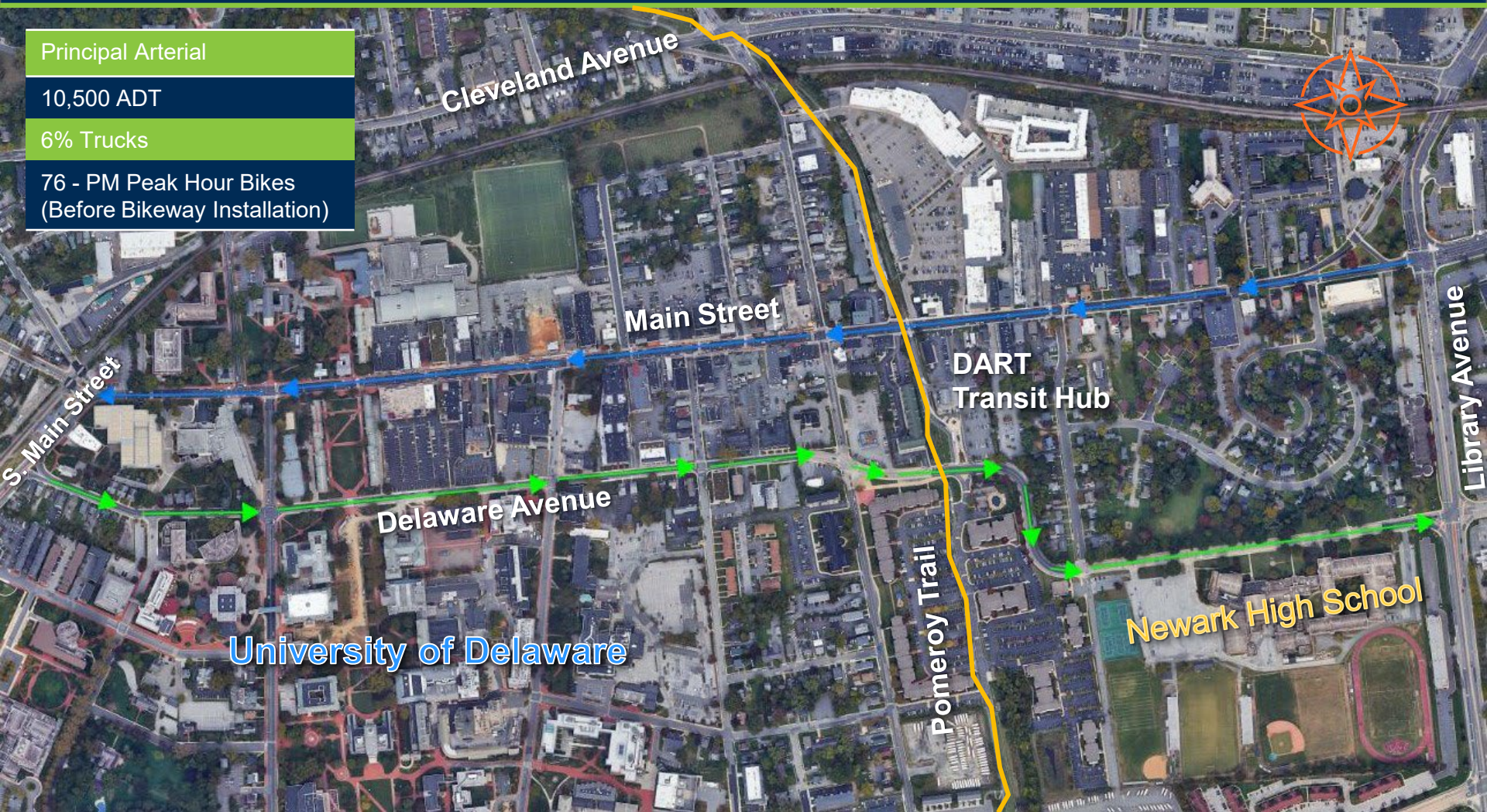
**Joanne Arellano,
PE, PTOE, PTP**

Traffic Engineering
Manager

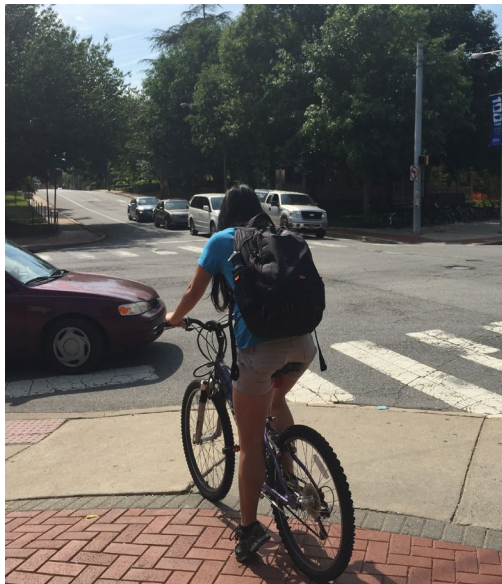
Project Location



Project Location



Lots of Bicycle and Pedestrian Use, ALSO BIG TRUCKS!



Coordination is Key!



Project Purpose and Goals:

1. Provide a designated and predictable two-way bicycle route on one-way street.
2. Reduce bicycle level of stress for on-street bicycle use.
3. Improve pedestrian facilities to be ADA compliant.
4. Rehabilitate and replace deteriorated pavement.
5. Engage public in project decisions and process.

Pop-Up Public Demonstration



- “Move the cycle track to the left side”
- “It’s wide enough”



Delaware Avenue Separated Bikeway

Planning Study – Initial Alternatives Identified

Low Impact Alternative

- Constructable without modifying curb to curb width

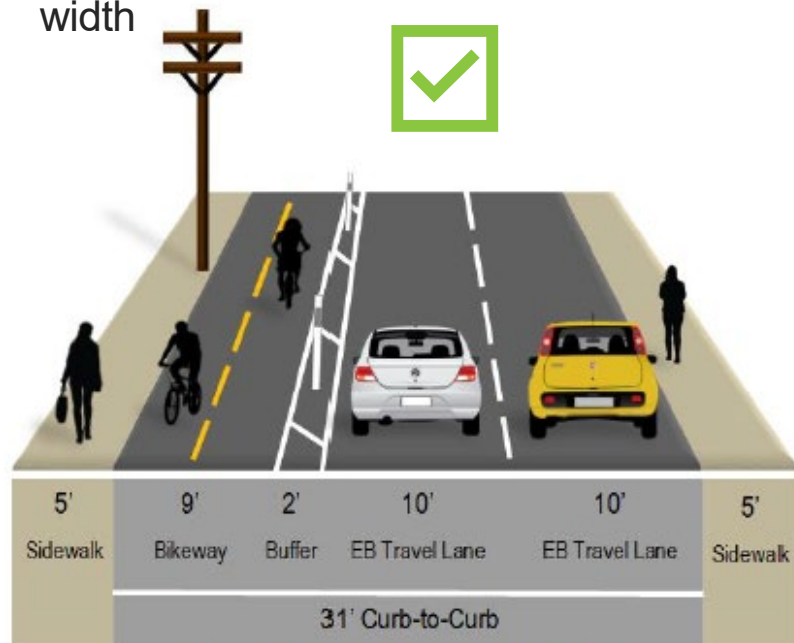


Figure 5: Section 1 – Low Impact Alternative
Delaware Avenue: Orchard Road to S. College Avenue

Ideal Alternative

- Wider more protected facility

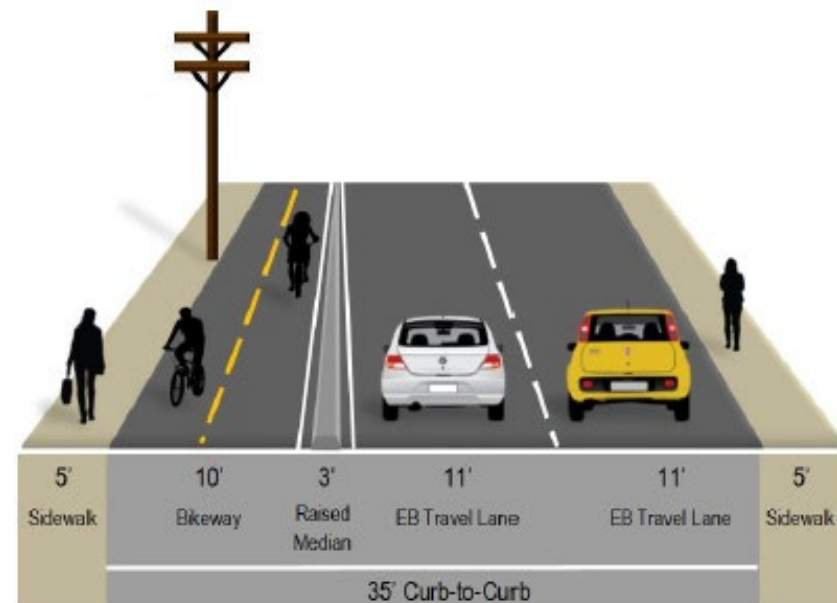


Figure 8: Section 1 – Ideal Alternative
Delaware Avenue: Orchard Road to S. College Avenue

* FHWA Separated Bike Lane Design Guide was published when we were looking at alternatives.

Concept Development – Advancing the Design

New Information Uncovered:

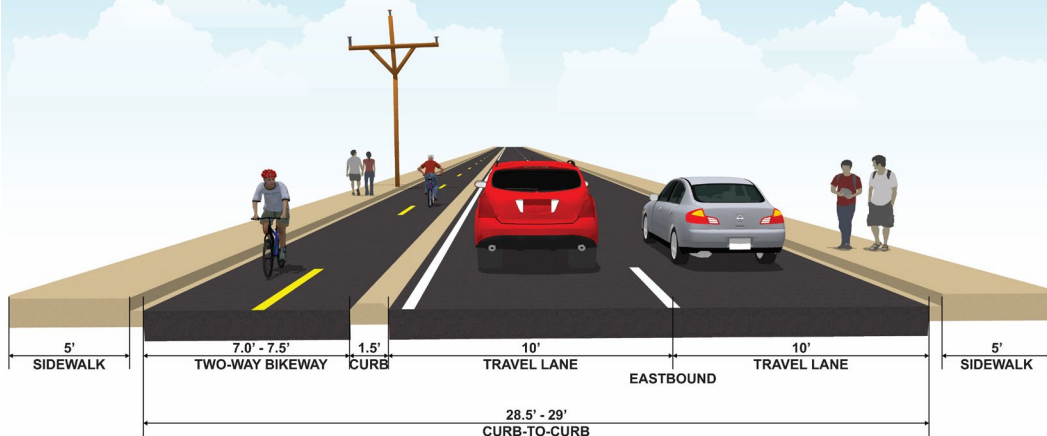
- Traffic Study
 - Solidified need for bicycle signals
 - Bicycle signals under experimental FHWA approvals would cause traffic congestion and intersection failures
- Case Studies of Comparable Projects
 - Flashing yellow “permissive” bicycle signals
- Dutch Cycling Ambassadors
 - Vertical concrete buffers / raised bike lanes



Project Design – Two General Sections

Section 2 - South College Avenue to South Chapel Street

Pavement Mill & Overlay

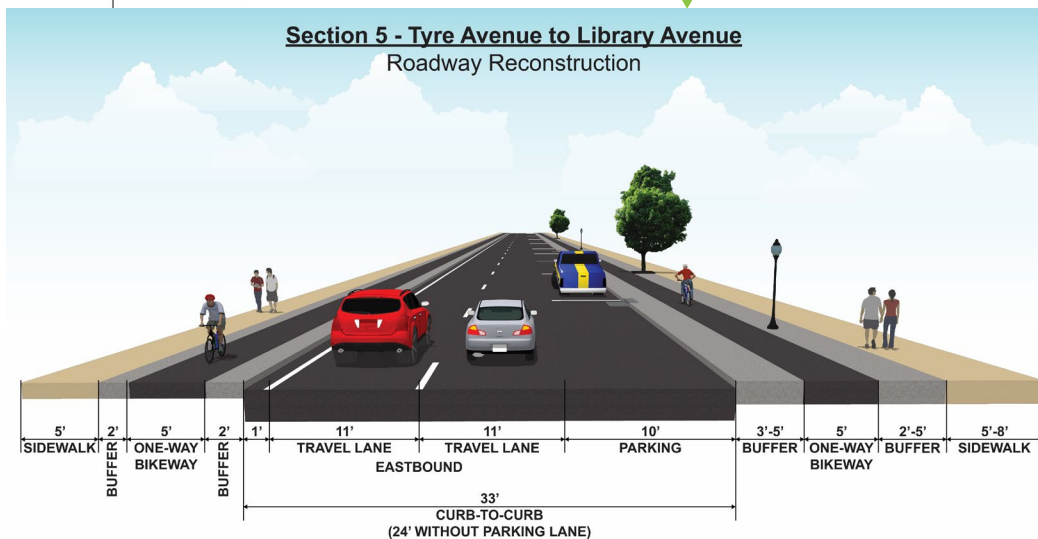


Two-way separated

Two one-way bike lanes

Section 5 - Tyre Avenue to Library Avenue

Roadway Reconstruction



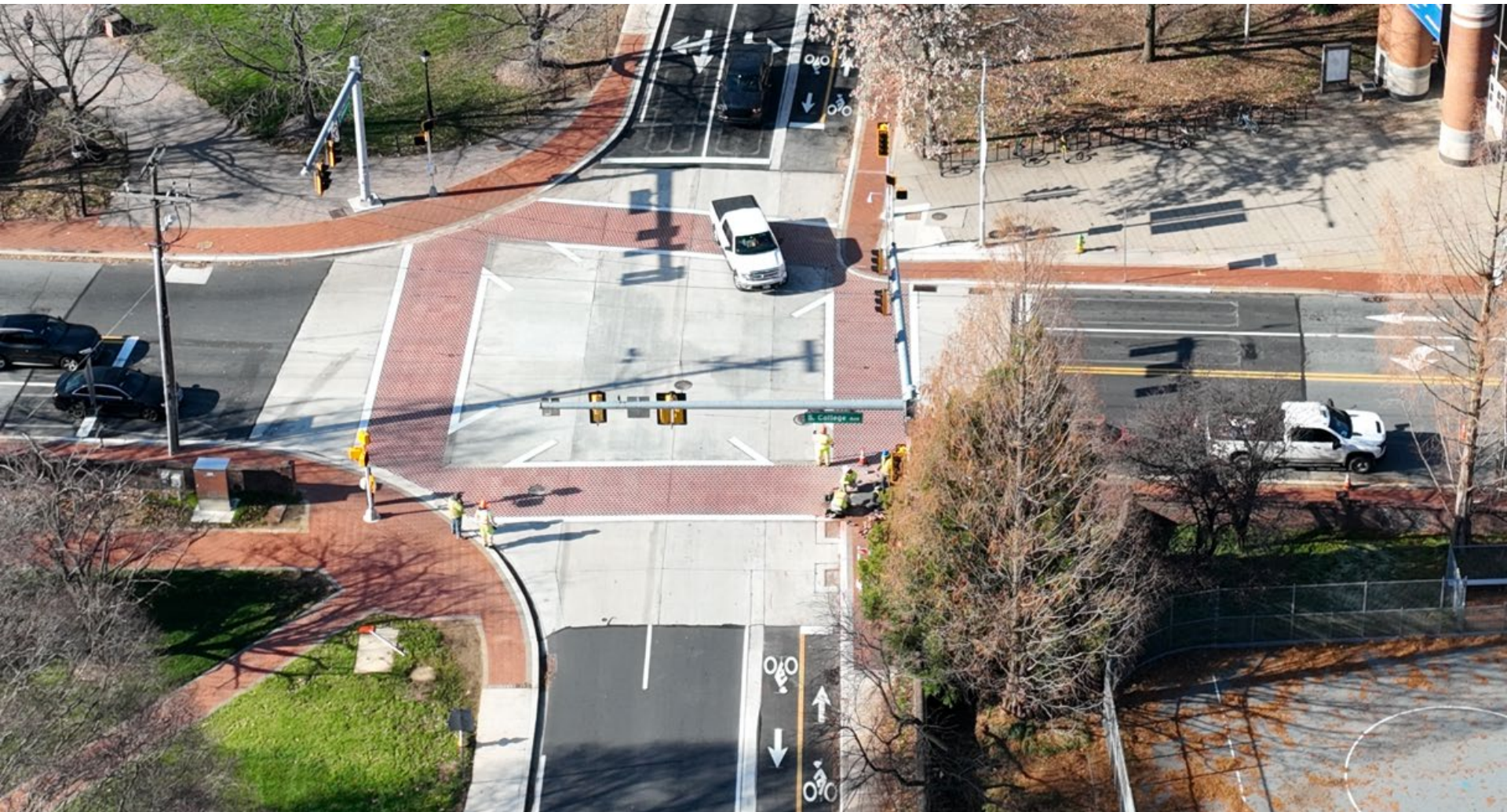
A First for the First State – Raised and Concrete Protected Bike Lanes



A First for the First State – Floating Bus Island



A First for the First State – Raised Intersection with Scramble



Delaware Avenue Separated Bikeway

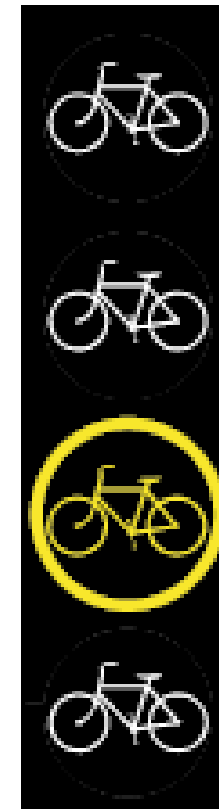
A First for the First State – Honeycomb Buffer



A First for the First State – Permissive Bicycle Signals



FHWA Experimentation

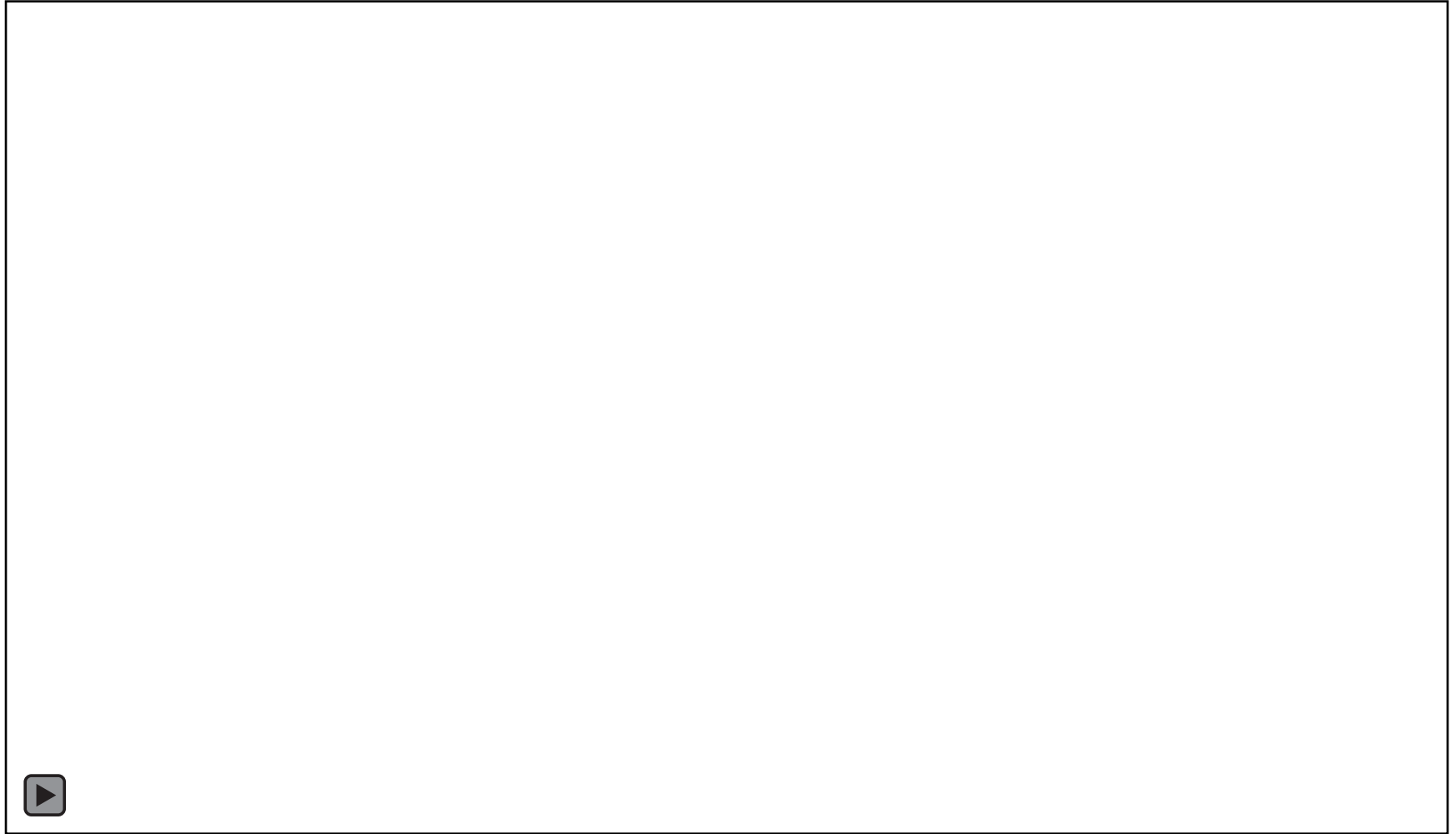


Flashing
Yellow

Permissive Bicycle Signals - Operations



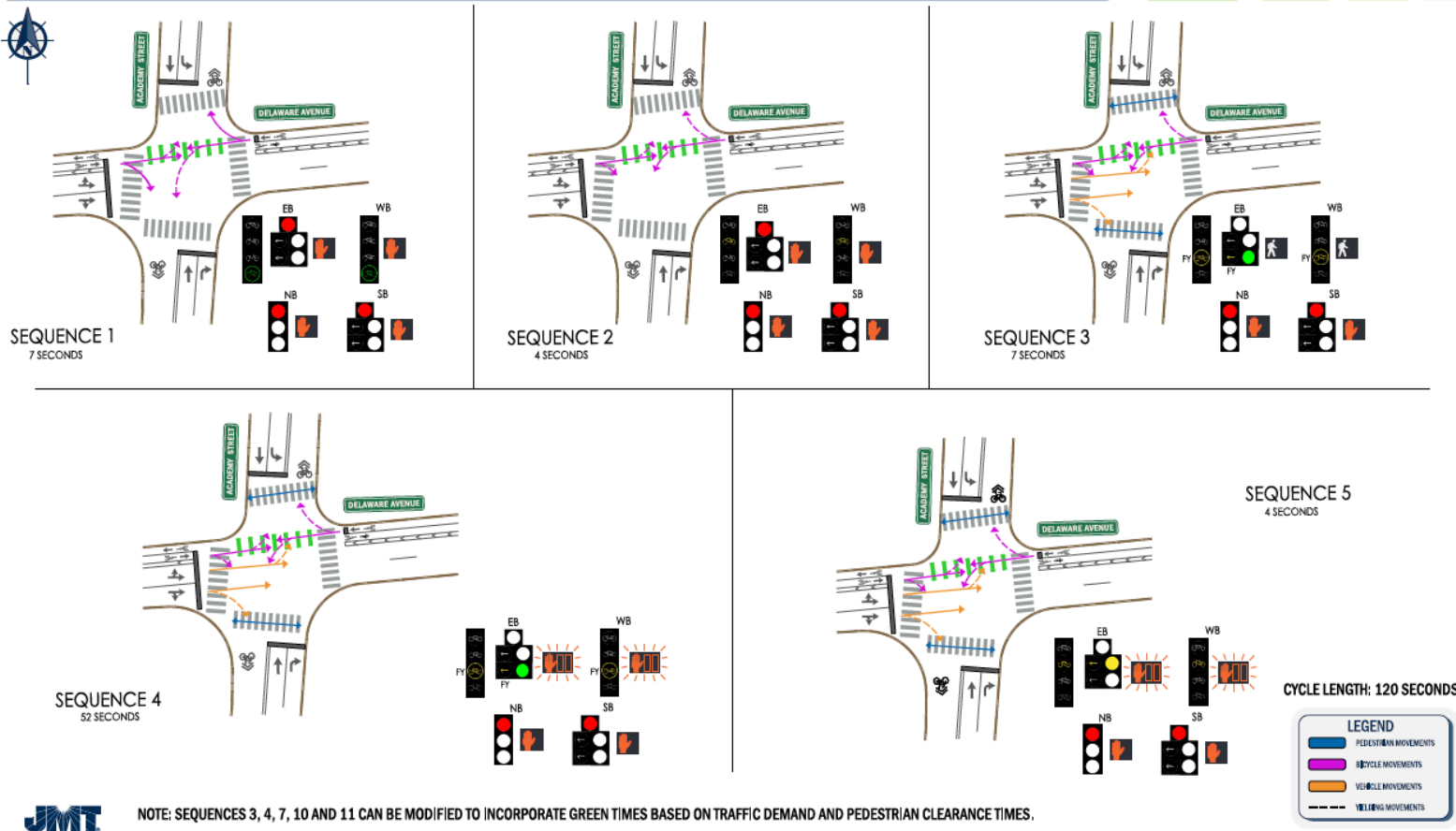
Bicycle Signal Operation – Traffic Analysis



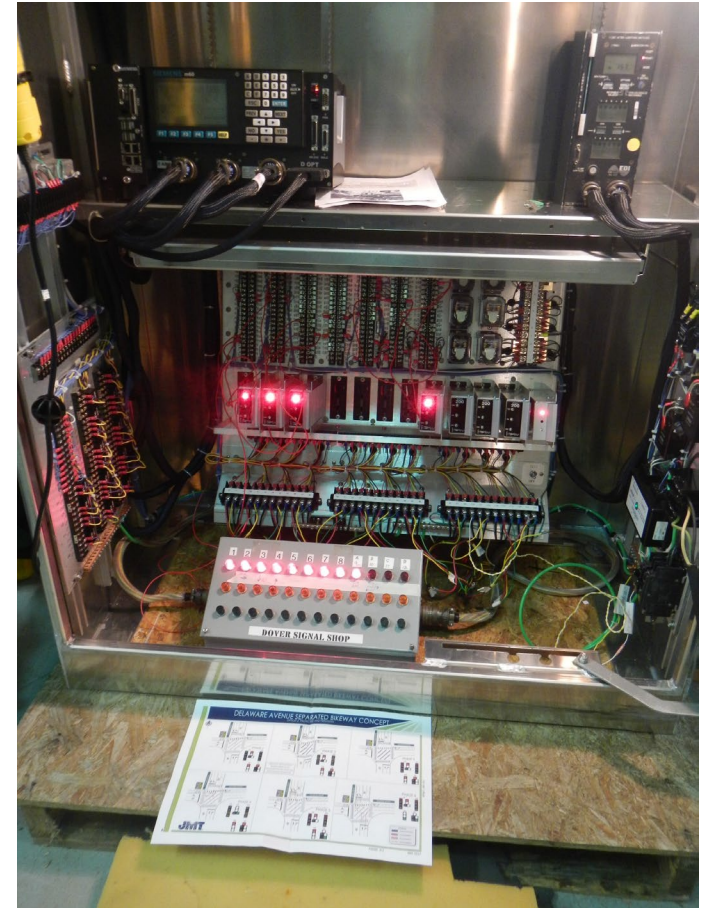
Bicycle Signal Operation – Phasing Sequence

DELAWARE AVENUE SEPARATED BIKEWAY CONCEPT

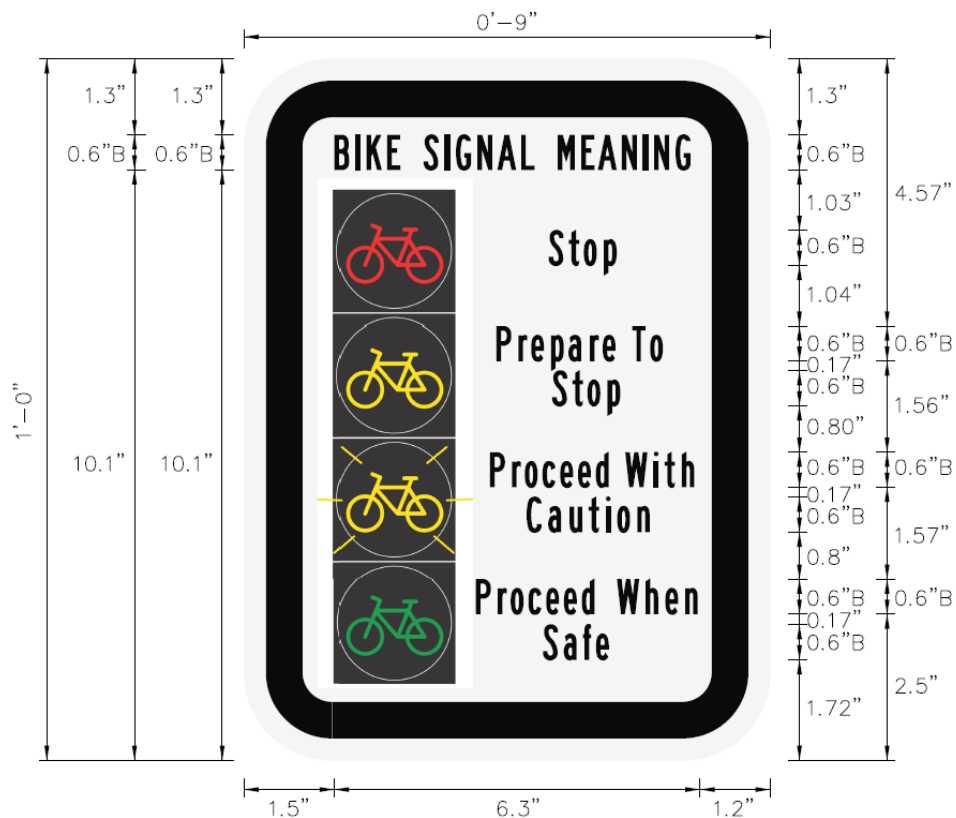
DELAWARE AVENUE/ACADEMY STREET - WEEKDAY PM PEAK DRAFT SIGNAL TIMINGS



Traffic Signal Controller Cabinet Testing



Bike Signal Signage



R10-3J-DE5





Delaware Department
of Transportation

CONTACT US:

delawareaveseparatedbikeways@delaware.gov

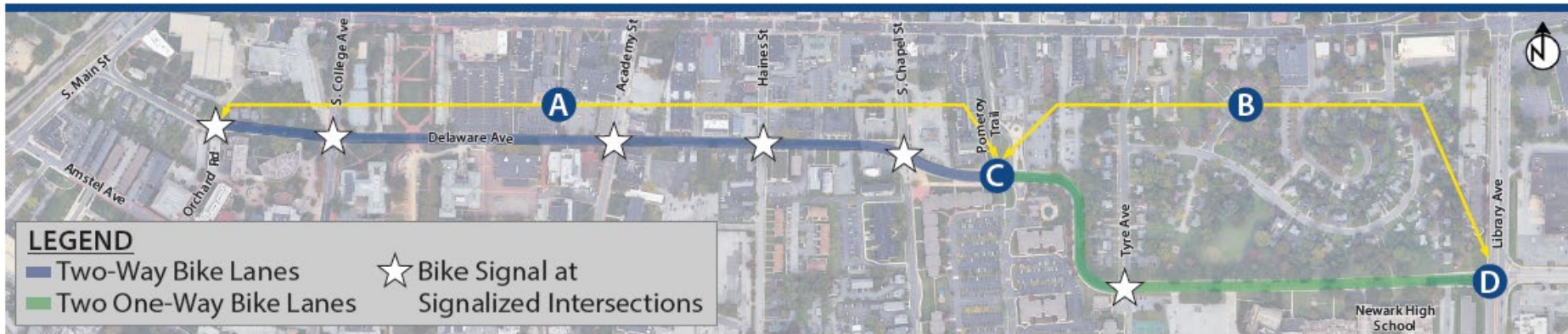
REPORT AN ISSUE:
Contact DelDOT TMC
302-659-4600
TMC1@delaware.gov



Delaware Avenue

SEPARATED BIKEWAYS

www.delawareaveseparatedbikeway.com



LEGEND

Two-Way Bike Lanes

Two One-Way Bike Lanes

★ Bike Signal at
Signalized Intersections



HOW TO USE BIKE LANE CROSSING



Bikes use
green
crosswalk
to
continue.

HOW TO USE BIKE BOX

When signal is red and cars have come to a complete stop, bikes may position themselves in front of vehicles to enter intersection ahead of cars.



BIKE SIGNAL MEANING



Steady Red: Stop

Steady Yellow: Prepare to stop

Flashing Yellow: Proceed with caution, turning bikes yield to vehicles and pedestrians

Steady Green: Proceed when safe

Ongoing Monitoring and Evaluation

Purpose:

1. Ensure signal equipment is operating correctly
2. Monitor safety and success of experimental signals
3. Report to FHWA to demonstrate success of experiment for permanence

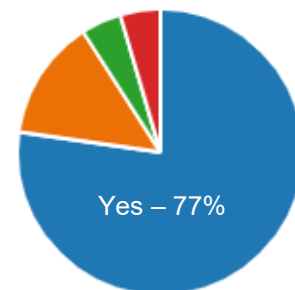
Process:

- “After Study” Data Collection
 - Intersection observations
 - Camera observation periods
- Crash data review
- Public experience opinion survey
- Bikeway Usage Traffic Counts



Public Experience Opinion Survey

Do you find the flashing yellow bicycle signal indications helpful?



Bikeway Usage Traffic Counts 11/17/2022 13 Hour Count Period	Bike	Skateboard	Scooter	Rollerskating	Total
	165	65	8	2	240

Thank You!

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