Bike Signal Resource Hub Case Study – Montgomery County, Maryland

General project information:

- *What prompted the use of bicycle signals?*
  - Installation of a new cycle track
  - Split phase, so no left-turn conflict
  - Red arrows prohibit RT conflict, and only buses can turn right on a lagging right turn arrow phase.
- *Where are they used? (Include photos and street view link, if possible before and after.)*
  - 2nd Ave/Wayne Ave at Colesville Rd in Silver Spring
    - First installation in Maryland
    - On a state road, only used bike signal at one location as a test case
    - On recall for peds/bikes
    - Installed September 2019

Design information:

- *Number of intersections*
  - One intersection has bike signals (2nd Ave/Wayne Ave at Colesville Rd in Silver Spring).
  - All others on the corridor are signed as bike use ped signal since there is no space for separating right turn phases. Left turns across the bikeway are mostly restricted to "on green arrow" only.
  - If FHWA releases more flexible guidance for permissive movements across the bikeway with bike signals, a future project would likely include bike signals at more locations.
- *Detection type used*
  - On recall for peds and bikes, but includes detection for future use (video)
- *Type of bike facility and form of separation*
  - Concrete wheel stops with striping and flexible posts (if done today it would be a concrete median instead)
  - Two-way cycle track application
- *How are bicycle/vehicle/ped conflicts handled?*
  - Split phase
- *Size of bike signal indications (4", 8", 12")?*
  - Two heads for each approach, one nearside and one far side
  - All 12" heads (the County doesn't have any 8" or 4" so for stocking consistent pars)
- *Key challenges/obstacles to designing and implementation?*
  - Ongoing Purple Line construction has caused the bus-only right turn to be temporary; ultimately, it will be an exclusive bike phase with no turning movement conflicts without split phasing at the traffic signal.
  - Bike signal terminates early to make sure bikes can clear the intersection.
  - 8 seconds of bike yellow, although future installations will likely use all-red instead

Outcome Information:

- *Feedback/outcome comments from public?*
    - Have not had any issues
    - It's a big intersection, compliance has not been an issue
- *Key successes*
    - N/A
- *Any studies or findings on collision history before/after*
    - N/A
- *What would you do differently next implementation?*
    - Concrete medians for the buffer

Bike Signal Resource Hub Case Study – Montgomery County, Maryland

General project information:

- *What prompted the use of bicycle signals?*
    - Two-way cycle track crossing adjacent to pedestrian crossing
- *Where were they used? (Include photos and street view link, if possible before and after.)*
    - Bethesda Ave at Wisconsin Ave (Downtown Bethesda)
        - Officially opened October 2022

Design information:

- *Number of intersections*
    - Two bike signals
- *Detection type used*
    - On recall for peds and bikes, but includes detection for future use (video)
- *Type of bike facility and form of separation*
    - Two-way cycle track application
- *How are bicycle/vehicle/ped conflicts handled?*
    - Bike phase will terminate before ped phase to keep turning conflicts from occurring
- *Size of bike signal indications (4", 8", 12")?*
    - Two heads for each approach, one nearside and one far side
    - All 12" heads (the County doesn't have any 8" or 4" so for stocking consistent parts)
- *Key challenges/obstacles to designing and implementation?*
    - Future trail connection will open Capital Crescent Trail extension to Silver Spring which will make this an important connection

Outcome Information:

- *Feedback/outcome comments from public?*
    - No concerns from the public, and it will be better utilized with the future trail connection
- *Key successes*
    - N/A
- *Any studies or findings on collision history before/after*
    - N/A
- *What would you do differently next implementation?*
    - N/A

Bike Signal Resource Hub Case Study – Montgomery County, Maryland

General project information:

- *What prompted the use of bicycle signals?*
  - Two-way cycle track crossing adjacent to pedestrian crossings
  - Diagonal bike crossing required separate phase
- *Where were they used (include photos and street view link, if possible before and after)*
  - Bethesda at Woodmont (Downtown Bethesda)
    - Officially opened October 2022

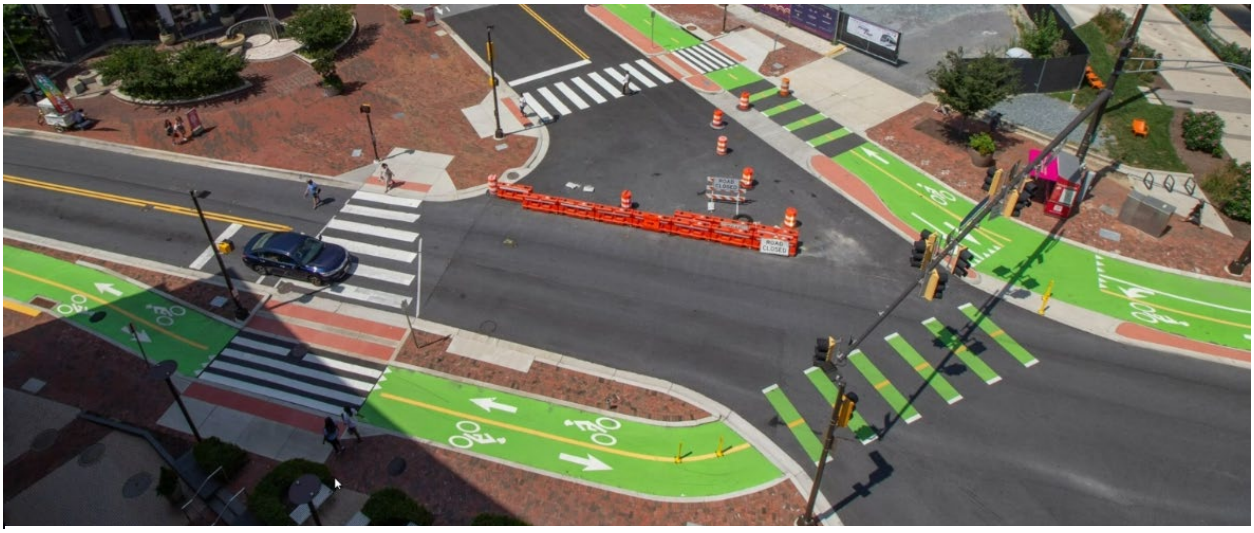

Figure 1. Bethesda at Woodmont, Downtown Bethesda. *Source: Matt Johnson*.

Design information:

- *Number of intersections*
  - One intersection with two bike crossings (both signalized with bike signals): SW-NE (diagonal) and NE-SE (parallel to Woodmont Ave & east leg crosswalk)
- *Detection type used*
  - On recall for peds and bikes, but includes detection for future use (video)
- *Type of bike facility and form of separation*
  - Two-way cycle track application
  - Raised concrete medians
  - MMA is used for areas not driven on
- *How are bicycle/vehicle/ped conflicts handled?*
  - 3-phase signal
    - First N/S on Woodmont (All ped signals and bikes are red allowing turning movements for vehicles)
    - Then E/W (All ped signals and bikes are red allowing turning movements for vehicles)

        - Then, all peds WALK, all Bikes Green
        - Bikes have shark's teeth markings to yield to peds
- *Size of bike signal indications (4", 8", 12")?*
    - Two heads for each approach, one nearside and one far side
    - All 12" heads (the County doesn't have any 8" or 4" so for stocking consistent parts)
- *Key challenges/obstacles to designing and implementation?*
    - Water main pole conflicts made it challenging to place poles out in the road medians
    - 3-phase signal

Outcome Information:

- *Feedback/outcome comments from public?*
    - N/A
- *Key successes*
    - No issues with bike yielding to peds around crosswalks, though some pedestrians queue for the crosswalk by standing in the bike lane. This is likely mostly due to the newness of the facility.
- *Any studies or findings on collision history before/after*
    - N/A
- *What would you do differently next implementation?*
    - Trying to get APS into the median refuges for all approaches

Bike Signal Resource Hub Case Study – Montgomery County, MD

General project information:

- *What prompted the use of bicycle signals?*
    - The need to make clear that cyclists need to stop on red, even though they are separated from vehicles
- *Where were they used? (Include photos and street view link, if possible before and after.)*
    - Marriot Headquarters midblock (Bethesda)
        - Opened April 2022

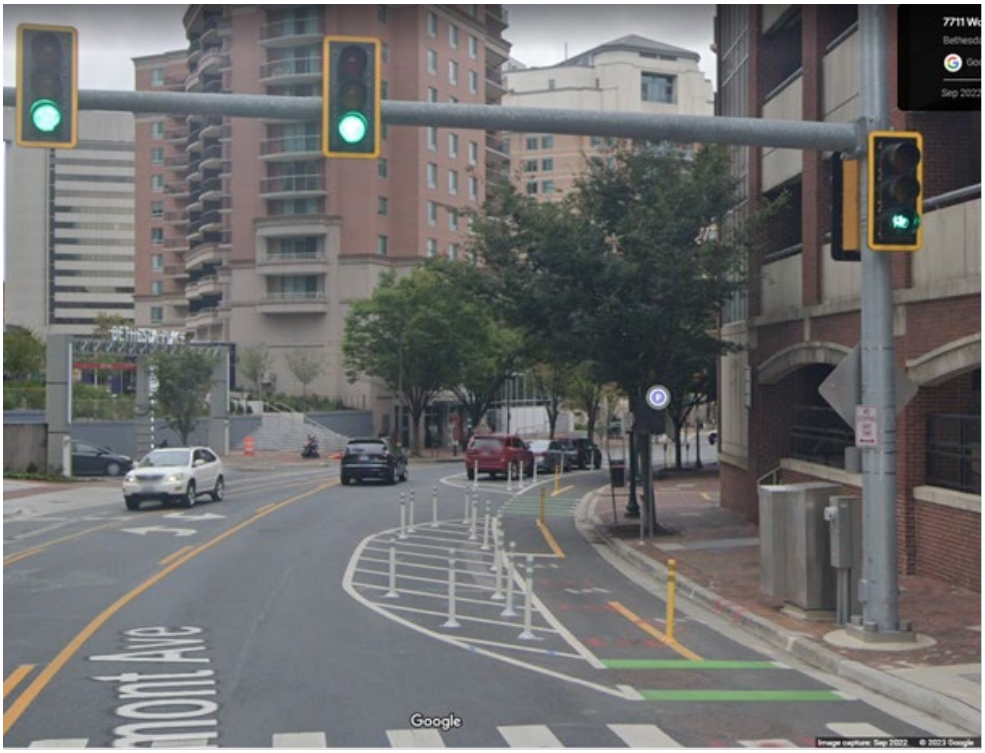

Figure 2. Woodmont Avenue, Bethesda, MD. *Source: Google Street View Imagery: (9/2022, Copyright 2023.)*

Design information:

- *Number of intersections*
    - One bike signal
- *Detection type used*
    - Rests in green for vehicles and bikes on mainline (no ped control for mainline peds), hot response changes it to red when peds activate the crossing by pushing button
- *Type of bike facility and form of separation*
    - Two-way cycle track application
    - Striping/posts
    - MMA is used for areas not driven on

- *How are bicycle/vehicle/ped conflicts handled?*
    - Bikes & cars stop when peds go
- *Size of bike signal indications (4", 8", 12")?*
    - One head for each approach, one nearside and one far side
    - All 12" heads (the County doesn't have any 8" or 4" so for stocking consistent pars)
- *Key challenges/obstacles to designing and implementation?*
    - Was originally installed as green ball, changed to bike signals to reinforce that bikes need to stop for peds

Outcome Information:

- *Feedback/outcome comments from public?*
    - No issues so far
- *Key successes*
    - Provided additional clarity to bikes to better protect the pedestrian movement at this busy crossing
- *Any studies or findings on collision history before/after*
    - N/A
- *What would you do differently next implementation?*
    - Lower bike heads. This was a conversion, so the heads were mounted higher.

Contact:

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