

Bike Signal Resource Hub Case Study – City of Nashville, Tennessee

General project information:

- What prompted the use of bicycle signals?
 - The use of bicycle signals began once they received interim approval. As the City started installing more bike lanes **with unique characteristics** such as *contraflow* or *additional buffers*, it wanted to meet the evolving best practice for bikeway design. In many locations, that includes installation of bike signals.
- Where were they used? (Include photos and street view link, if possible before and after.)
 - Bicycle signals are used where appropriate bike lanes are installed. The City is working to place them where there are relatively high bicycle or micromobility trips or where those trips are expected. Nashville has high scooter usage in the bike lanes that are expected to use the bike signals.

Design information:

- Number of intersections
 - There are six intersections with at least one approach signalized. There are also two intersections that are planned to have bicycle signals in the future. The list of intersections with signals is below.



Figure 1. Belmont at Blair. Source: Teresa Neal.

Figure 2. [12th Ave at Demonbreun](#)

Figure 3. [13th Ave at Demonbreun](#)

Figure 4. [14th Ave at Demonbreun](#)



Figure 5. Wedgwood and Rains. *Source: Teresa Neal.*



Figure 6. Wedgwood and Craighead. *Source: Teresa Neal.*

- Detection type used
 - Mostly loops are used. The City is considering radar detection where it is already installed for vehicular detection. The City will do some testing of the radar detection before committing to using it exclusively.
- Type of bike facility and form of separation
 - All the signalized facilities are 4-foot bike lanes with 2-foot buffers. The buffer area has flexible delineation on most of the signalized approaches.
- How are bicycle/vehicle/ped conflicts handled?
 - The city does not provide exclusive phasing for bicycles at this time. Bicycle movements are permitted with the vehicular movement. The City is trying to create a standard approach to bicycle signal installation so they are more systematically installed. Nashville Department of Transportation is working on incorporating something into a revised pedestrian crossing policy (underway).
- Size of bike signal indications (4", 8", 12")?
 - All the bicycle signal heads are 8" and LED.
- Key challenges/obstacles to designing and implementation?
 - Without providing the separate phase for bicycles at the intersection, conflicting movements still exist, so the signal does not always reduce conflicts. Phasing is done to not reduce vehicular green times on the corridor, but the City is considering installing a leading time similar to a leading pedestrian interval (LPI) to give bikes a lead time. The existing installed bicycle signals are not always located at intersections with high volumes of bicycles.

Outcome Information:

- Feedback/outcome comments from public?
 - The City has not received much feedback from the public. City representatives believe this is because an exclusive phase is not provided and the system is still high stress. Currently, bicycle signals do not function to prioritize bicycles. The signals seem to still function the same way with and without the bicycle signals.
- Key successes
 - The Demonbreun corridor, located in the downtown area of Nashville, provides an opportunity to increase the number of bicycle trips if the corridor is designed to limit the amount of bicycle stress. There is also an opportunity on Demonbreun at 14th Avenue to upgrade the bikeway and intersection treatments to decrease the amount of bicycle stress for riders on the corridor.
 - The City is starting to evaluate bicycle signals with intersection improvements on a regular basis and hoping to create a policy that outlines the requirements for bicycle signal installation.
- Any studies or findings on collision history before/after
 - There haven't been any studies done to this point in relation to evaluating the bike signal installation.
- What would you do differently next implementation?
 - Consider loop detection and not moving to radar, as radar may not be as reliable. Some cities have used Wavetronix and Flir for detection, but don't find it as reliable.

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