



DEPARTMENT OF PUBLIC WORKS
Engineering Division – Traffic Section
2625 E. Glendale Avenue
Appleton, WI 54911
TEL (920) 832-5580
FAX (920) 832-5570

To: Municipal Services Committee
From: Michael Hardy, Assistant City Traffic Engineer
Date: July 20, 2022
Re: APS Evaluation – Meade St / Wisconsin Av Traffic Signal
Follow Up to a One-Year Trial Period

This is a summary and recommendation of the one-year test of Accessible Pedestrian Signals (APS) at the Meade St / Wisconsin Av intersection. The city deployed this APS system on May 5, 2021. The citizen requesting the APS at this location provided feedback throughout the process.

Background

APS systems provide information to pedestrians in non-visual formats, such as audible tones, speech messages, and/or vibrating tones. The factors that make crossing at a signalized location difficult for pedestrians who have visual disabilities include increasingly quiet cars, right turn on red (masks the beginning of the through phase), continuous right-turn movements, complex signal operations, and wide streets. Furthermore, low traffic volumes can make it difficult for pedestrians who have visual disabilities to discern signal phase changes. The primary technique that pedestrians who have visual disabilities use to cross streets at signalized locations is to initiate their crossing when they hear the traffic in front of them stop and the traffic alongside them begins to move, which often corresponds to the onset of the green interval. The existing environment is often not sufficient to provide the information that pedestrians who have visual disabilities need to cross a roadway at a signalized location.

The citizen requesting the APS at this intersection, who is legally blind, had experienced APS elsewhere in the United States. While this is not the first contact to the city about APS, it was the first formal request for deployment. The requesting citizen, who lives near Wisconsin Av, west of Drew St, frequently travels to businesses and restaurants at the Meade St/Wisconsin Av intersection. This is also a location used to access a Valley Transit bus route. The requesting citizen feels the environment at this intersection is too complicated to cross confidently.

The City of Appleton is aware of APS deployments elsewhere in Wisconsin in the cities of Waukesha, Madison, and De Pere, with Menasha also implementing one this year.

Guidance

The current edition of the Federal Manual on Uniform Traffic Control Devices (MUTCD) provides guidance and standards on pedestrian control features at traffic signals, including APS. It has guided technologies and application of APS throughout the United States. The US Access Board's *Draft Public Rights-of-Way Accessibility Guidelines* (Draft PROWAG) also provides additional guidance on APS implementation.

The MUTCD guidance states that an engineering review should be conducted to decide if APS should be deployed, considering the following:

- Potential demand for accessible pedestrian signals
- A request for accessible pedestrian signals
- Traffic volumes during times when pedestrians might be present, including periods of low traffic

- volumes or high right-turn-on-red volumes
- The complexity of traffic signal phasing (such as split phases, protected turn phases, leading pedestrian intervals, and exclusive pedestrian phases)
- The complexity of intersection geometry

Our engineering review, based on the requesting citizen's formal request for APS at the Meade St/Wisconsin Av intersection, determined it was suitable for test deployment. The requesting citizen is a frequent user of this moderately busy traffic signal (over 20,000 vehicles per day), with left turn phases on all approaches and a high volume of right turns on red (NB and SB especially).

Implementation

The APS deployment involved the purchase and installation of eight new push buttons with audible capabilities and a programmable logic controller in the cabinet. We chose the *Polara iNS iNavigator* 2-wire system, which had a material cost of \$6,600. This brand is supported by a vendor we frequently contract with for service and maintenance of our traffic signals technologies. The installation required some new wiring in our cabinet, but no rewire from the cabinets to the new buttons on the poles. City Electricians performed the installation with vendor oversight.

The programmed settings were developed in collaboration with MUTCD and the requesting citizen. The implemented settings have four general features: 1) a locate tone, 2) a button push confirmation, 3) a *Walk* confirmation, and 4) a *Don't Walk* ("ping pong" sound) confirmation. The volume of each is set to actively adapt to ambient sound of traffic. The confirmation messages are only played when the button is activated, even if the *Walk* is recalled each cycle of the traffic signal. The locate tone is the only continuous sound.

There is also an open-source application (*PedApp*) users can install on a smart device with Bluetooth technology for real-time interaction with the Polara iNS system. The app will recognize the system within the Bluetooth proximity and provide additional feedback throughout the crossing experience.

Observations and Feedback

The system has been operating well with no maintenance calls. The only requested adjustment to the settings was to increase the volume when traffic noise was high. There was flexibility to do that at this intersection since there is no residential land use in the vicinity.

The requesting citizen was very pleased with the APS and the operational settings. The audio feedback throughout the crossing process was very helpful to feeling confident navigating the intersection, especially with only having the ability to visually observe traffic up to ten feet in front. A few more locations were suggested based on the preferred walking routes, but the citizen understands there is a significant cost to implement.

Favorable feedback and a general request for more APS locations was also received from a rehabilitation specialist with the Wisconsin Office of the Blind and Visually Impaired. It was noted they now travel to this intersection to educate their clients and experience the APS.

Summary & Recommendation

The requesting citizen was very cooperative and appreciative of this APS implementation, working with the city to develop the optimal settings. The visually impaired community was also supportive of this implementation and certainly hopes there will be more installations elsewhere in Appleton.

We feel an APS at this location made sense as the traffic environment is supported by the MUTCD and the requesting citizen is a frequent user of this intersection to access businesses and Valley Transit.

The APS system has been operating very well, providing many programable features appealing to the requesting citizen and requiring little to no maintenance so far. Ambient volume of APS if deployed in residential environment is a potential concern we are aware of, and would need to be cognizant of with any future installations.

We recommend the following guidelines be followed in relation to APS systems:

1. The existing APS system at Meade St/Wisconsin Av would remain in place indefinitely.
2. Future requests from the public for new APS installations at existing traffic signals would be reviewed by the Traffic Engineer based on MUTCD guidelines. If recommended by the Traffic Engineer and subsequently approved by the Municipal Services Committee, the APS project in question would be considered as a part of future budget deliberations. If denied, the requestor would be able to appeal the decision to the Municipal Services Committee.
3. In the case of new traffic signal installations or traffic signal reconstruction projects, APS systems would be considered as a part of the project design process. The ultimate inclusion or exclusion of APS systems in these cases will be determined by the Municipal Services Committee as a part of the normal design approval process.