



**TRAFFIC/BPSC
STAFF REPORT**

Case #: TC-23-01
Date: March 22, 2023

FROM: Andrew Cibor, PE, PTOE, Engineering Department

REQUEST: 7-Line Project Update and All-Way Stop Control Installation

Location: 7th Street (B-Line Trail to Woodlawn)

Description and Purpose:

The 7-Line project was one of seven Bicentennial Bond projects proposed by Mayor John Hamilton and approved by the City Council in 2018. The project was also identified as a Phase 1 priority project in the Transportation Plan adopted by City Council in 2019. The project was envisioned to provide a protected east-west bicycle lane and improved transit corridor to connect the B-Line, downtown, Indiana University campus, and eastside neighborhoods. In August 2020, City Council unanimously approved Ordinance 20-14 with parking and stop sign changes associated with the project. These changes were also supported by the city's Parking, Traffic, and Bicycle & Pedestrian Safety Commissions. Project construction was completed in late 2021. This report provides a brief update on the overall project after one full year of operation and makes recommendations for updates to the corridor.

Early Trends:

Bicycle Traffic – Based on data from a permanent bicycle counter on 7th Street adjacent to the Indiana University (IU) campus where the two-way protected bicycle lane replaced standard bicycle lanes, bicycle/scooter use has increased 26%. Additionally, a January 2019 (pre-project) peak period (7-9AM and 4-6PM) traffic count was compared with a February 2023 (post-project) traffic count in the block between Dunn Street and Grant Street to assess bicycle traffic change in a block that previously did not have bicycle lanes. While these counts are less robust than the permanent counter because weather and other variables need to be considered, the data shows that bicycle/scooter use in this area of the corridor increased 259%.

Transit Metrics – Quantitative data to compare pre-project and post-project transit travel times, ridership, etc. is not available. Bloomington Transit (BT) has been upgrading technology to better measure these items going forward and has been working to modify their routes, manage changes in travel patterns, etc. Specifically as a part of this project some bus stops were consolidated to assist with travel times, and efficiency along the corridor is assumed to have improved as a result of stop sign removal, removal of on-street parking, and construction of bus stop islands that do not require buses to exit the travel lane. When the street first reopened after construction, BT and IU Campus Bus noted some concern with the width of the road and some turning movements. Minor project modifications were implemented at some intersections to address many of those concerns. Additionally, BT has been actively working to enhance driver training in various road conditions found throughout the city.

Pedestrian Activity – Staff has heard some concern about the level of comfort for pedestrians crossing 7th Street where stop signs were removed within the 7-Line project limits; however, the limited pedestrian data available at this time indicates more pedestrians are crossing the street, corridor-wide reported pedestrian crashes have decreased, and accessibility has been improved (the project constructed 59 accessible curb ramps and removed numerous sidewalk trip hazards).

Motor Vehicle Traffic – Traffic counts on 7th Street have increased by 11% to 27% in the area between Walnut Street and Indiana Avenue since the installation of the protected bike lane and removal of stop signs. The measured average speed in this area is 27mph with an eighty-fifth percentile speed of nearly 32mph. The measured speeds are higher than desired (the speed limit is 25mph) and suggest the majority of drivers are comfortable driving in 10' wide travel lanes. The data indicates no significant change in traffic volumes on 7th Street in the vicinity of Morton Street and a decrease in traffic volumes on some of the intersecting streets where all-way stop control was removed (e.g., Morton Street traffic decreased 5% and Dunn Street traffic decreased 15%). Some drivers have driven into the bicycle lanes, either intentionally to illegally park/load or mistakenly due to confusion. Flexible delineator posts were installed at the entrance to the bicycle lanes at key intersections, and the incidence of this behavior has decreased significantly (the flexible posts were removed over the winter to facilitate snow removal, but will be reinstalled in the spring).

Parking Impact – The majority of on-street parking was removed from 7th Street within the 7-Line project area. As a part of the project, 44 parking spaces were added nearby on Dunn Street. 2019 data showed 35% utilization of parking spaces on 7th Street based on revenue potential (equivalent to 42 parking spaces). Multiple underutilized parking garages nearby the project were also identified during the project planning and development phases. Post-project parking data comparisons are limited given the majority of on-street parking on 7th Street in the project area was removed. Accessible parking spaces that were previously located on 7th Street were relocated on adjacent streets as necessary to maintain ADA compliance.

Crash Data - It is desirable to use multiple years of crash data to make robust evaluations. However, using one year of post-project crash data (2022 calendar year) for this corridor indicates a trend of increased crashes at the intersections where all-way stop control was removed, and a decrease in crashes at mid-block locations and at other intersections where intersection control did not change. This crash trend is further analyzed in the following section.

Enhancement Alternative:

The data and observations available to date indicate that while the protected bicycle lanes are generally operating as intended, the five intersections where all-way stop control was removed (7th Street at Morton Street, Washington Street, Lincoln Street, Grant Street, and Dunn Street) would benefit from modifications. The crash data for these intersections indicates that nearly all reported crashes were a result of drivers on the side street failing to yield to drivers on 7th Street. In many of these crash reports, the driver on the side street told the reporting police officer that they mistakenly thought the intersection had all-way stop control. At these intersections during the 2022 calendar year, there were also two reported crashes involving drivers failing to yield to users of the protected bicycle lane (one scooter at Dunn Street and one bicycle at Washington Street) and one reported crash involving a scooter failing to yield to a driver (southbound scooter on Morton Street). There were no reported crashes involving pedestrians.

Each of these five intersections has visible stop bars on the pavement and a stop sign with a “cross traffic does not stop” plaque. The one-way intersecting streets (Washington Street, Lincoln Street, and Dunn Street) have these signs located both on the left and right side of the road where it intersects with 7th Street. Additional signs and markings are not expected to be beneficial for clarifying the existing stop control at these intersections.

Installation of all-way stop control was evaluated at these intersections as an option to address the observed crash patterns. The Indiana Manual on Uniform Traffic Control Devices (MUTCD) includes specific criteria that should be followed for all-way stop installations. There are multiple reasons that stop signs are only recommended if they meet the MUTCD guidelines:

- Stop signs that do not meet recommended criteria are frequently violated (have low compliance rates). Drivers might come to a full stop initially, but over time they may begin rolling through the stop or even completely ignoring it because they rarely see what they believe to be a reason to stop. This behavior is problematic at the intersection with the all-way stop (for example, a pedestrian crossing the street thinks that traffic will stop at the stop sign, but a driver approaching the stop sign is used to simply slowing down and doesn't notice the pedestrian) and also at other intersections (as drivers lose respect for stop signs in general). There are multiple existing all-way stop intersections in town for which the City regularly receives complaints and safety concerns about drivers who do not stop (*In the context of 7th Street it is likely that many users, particularly people on bicycle or scooter who do not want to lose momentum, will not come to a full stop.*)
- Studies show that stop signs are not an effective tool for reducing speeds. Stop signs generally reduce speeds near the location where they are installed, but do not reduce speeds along the rest of a corridor. In fact, studies show that drivers tend to increase their speed between stop signs. Numerous references, including documents from the Institute of Transportation Engineers (ITE) and the National Association of City Transportation Officials (NACTO), explicitly recommend against using stop signs as a tool for speed reduction. (*If all-way stop control is reinstalled on 7th Street, then the corridor would have stop signs or traffic signals at every block between the B-Line and Indiana Avenue. Speeds on the corridor would likely decrease because the majority of the street would be in close proximity to a stop sign.*)
- Unwarranted stop signs are not conducive to efficient traffic flow for vehicles (including bicycles, cars, and transit), particularly on collector or arterial streets. Stop signs at every single block make a corridor less convenient for vehicular travel. (*Stop control was modified on 7th Street with the explicit goal to “improve east/west connectivity and efficiency for bicyclists and transit users.”*)

MUTCD guidance for all-way stop installations states that intersections should meet one of the following:

- As an interim measure while awaiting installation of traffic signals.
- Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop.
- Minimum volume thresholds.
- Where no single criterion is satisfied, but the location meets a combination of the crash and volume criteria to at least 80% of values.

The following table summarizes these criteria for each subject intersection.

Intersection Cross Street	Interim measure for traffic signal installation?	≥ 5 reported crashes susceptible to correction by all-way stop?	Meets minimum volume threshold?	Meets a combination of thresholds to at least 80% of values?
Morton St	No	No (3)*	No	No
Washington St	No	Yes (5)*	No	N/A
Lincoln St	No	Yes (5)*	No	N/A
Grant St	No	No (4)	No	No
Dunn St	No	Yes (12)	Yes**	N/A

*This criteria uses a rolling 12-month period. For intersections that did not have at least 5 crashes during the 2022 year of crash data (1/1/2022 through 12/31/2022), a subsequent evaluation was performed to search for a higher 12-month period using data available to date (e.g. 2/1/2022 through 1/31/2023). The Morton, Washington, and Lincoln intersections yielded an increase with this evaluation. When looking only at 2022 data, Morton had 2 crashes, Washington had 4 crashes, and Lincoln had 4 crashes.

**The Dunn Street intersection did not meet the minimum volume criteria based on pre-project data, but does meet the criteria using post-project data.

The MUTCD also allows the following optional criteria to be considered as a part of an engineering study regarding all-way stop control:

- The need to control left-turn conflicts (*Not applicable, but stop control may be beneficial for controlling motor vehicle turns across the protected bike lane.*)
- The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes (*Pedestrian use is generally high due to proximity to both downtown and Indiana University campus.*)
- Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop (*Visibility is limited in some locations. Adequate visibility is available if drivers pull forward after stopping, but this action can generate conflict with the pedestrian crosswalks.*)
- An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection (*This consideration is typically applied in fully residential areas, but does have some relevance for 7th Street.*)

The Dunn Street, Washington Street, and Lincoln Street intersections each meet at least one MUTCD criteria for all-way stop control installation. The Grant Street and Morton Street intersections do not meet the primary criteria, but they are close to meeting the crash data criteria and, if unchanged, it is possible that they would fully meet this criteria in a future 12-month period. The Morton Street intersection is currently the furthest from meeting the primary criteria, but anecdotal observations indicate that this intersection potentially experiences the highest level of driver confusion and has the potential for more crashes. The MUTCD's optional criteria provide further support for installation of all-way stop control at each of these intersections.

It is worth noting that the majority of crashes are a result of motor vehicle drivers failing to yield to other motor vehicles, but the improvement option of implementing all-way stop control would have the most negative impact to efficiency for transit and bicycle/scooter traffic. The crashes involving motor vehicles are primarily right angle collisions. While the majority of crashes have not involved any injury, this crash type has potential to create serious injuries. Additionally, the

implementation of all-way stop control can also reduce the potential for crashes involving users of the protected bicycle lanes (there have been some reported crashes involving people on bicycle/scooter, and observations indicate that some bicycle/scooter users must rapidly brake to avoid conflict with turning motor vehicles that failed to properly yield).

Title 15 Changes:

In order for all-way stop control to be implemented, Section 15.12.010, Schedule B “Multi-Stop Intersections” would need to be edited with the following changes.

Section 15.12.010, entitled “Stop intersections,” shall be amended by deleting the following from Schedule A Stop Intersections:

Traffic on	Shall Stop for Traffic on
Morton Street	Seventh Street
Washington Street	Seventh Street
Lincoln Street	Seventh Street
Grant Street	Seventh Street
Dunn Street	Seventh Street

Section 15.12.010, entitled “Stop intersections,” shall be amended by adding the following to Schedule B Multi-Stop Intersections:

Seventh Street & Morton Street	4-Way
Seventh Street & Washington Street	3-Way
Seventh Street & Lincoln Street	3-Way
Seventh Street & Grant Street	4-Way
Seventh Street & Dunn Street	3-Way

Recommendation:

This project has been successful for improving east-west accessibility and mobility for all modes of transportation. All-way stop control implementation is expected to result in an additional positive metric through a reduction of reported crashes along the corridor. Staff recommends that a Title 15 amendment be forwarded to City Council with a positive recommendation to reinstall all-way stop control at the five locations listed above. While the data is more compelling for some of these intersections than others, staff believe that all-way stop control installation is appropriate at all five locations. Implementing this operational change at all five intersections at the same time, as opposed to using an incremental approach, is expected to improve user ability to adapt to the change.