Bicycle Pedestrian Safety Commission
AGENDA
March 20, 2023, 5:30 P.M.

In-person and virtual hybrid meeting
Council Chambers, Room #115
Online link:
https://bloomington.zoom.us/j/89131043033?pwd=amZ5VzhSSnliZE5KUFpCZUR2WlVYQT09
Meeting ID: 891 3104 3033
Passcode: 937370
Dial in: +1 301 715 8592

Meeting Agenda:

1. Attendance
2. Approval of Minutes - January 9, 2023
3. Election of Officers – Chair, Vice Chair, Secretary
4. New Business
    a. 2023 Traffic Calming and Greenways Program
        i. Staff-Led Projects
        ii. Resident-Led Projects and Deadlines
    b. 7-Line Project Update & All-Way Stop Control Installation – Andrew Cibor
    c. Micro-Mobility Recommendations for 2023 and Beyond – Hank Duncan
5. Old Business
6. Reports from Commissioners
7. Public Comment
8. Adjourn

Public Comment:
The Bicycle Pedestrian Safety Commission (BPSC) welcomes public comment at meetings for both items being discussed as part of the topic and new items that are not on the meeting's agenda. Members of the public wishing to comment on specific agenda items may have the opportunity to do so once the presentation has concluded and the BPSC Members have had an opportunity to ask initial questions. At that time, the BPSC Chair may ask if there are members of the public who wish to comment, or commenters may ask to be recognized. Members of the public wishing to comment on items not on listed on the agenda, but related to BPSC business will have the opportunity to do so during the meeting's designated public comment period. To ensure equal access to comment, BPSC chair may establish a time limit for each public comment.

Auxiliary aids for people with disabilities are available upon request with adequate notice. Please call 812-349-3429 or e-mail human.rights@bloomington.in.gov.

Minutes
Bicycle Pedestrian Safety Commission

Monday, January 9, 2023

Meeting Agenda:

1. Attendance:

Commissioners: Paul Ash, Ann Edmonds, Zach Huneck, Jaclyn Ray, Mitch Rice
Staff: Steve Cotter, Hank Duncan, Ryan Robling
Public: Bill Coulter, Greg Alexander, Eric Ost, Christine, Milne Computer, Ron Brown, Mark Stosberg.

2. Approval of Minutes of Meeting: November 14, 2022

Paul moved to approve: Zach seconded. All voted to approve

3. New Business

a. 2023 Priorities

Hank noted the dates for 2023 meetings. No July and no December meetings.
Hank wants to know our priorities.
Paul wanted to know the status of the Hawthorne Greenway.
Mitch noted that it is already low stress except for the crossing at Hillside.
Hank says the Hawthorne project is on hold waiting for the Council to discuss their proposed amendments.
Jaclyn and Mitch presented their ideas in emails.
Ann suggested that we review the projects for staff led traffic calming.
Zach wondered what happened to the bike-to-work day. He thinks it went on hold because of the pandemic.
Mitch noted that it was in conjunction with the IU bike programs, and we should reach out to Anna Dragovich.
Hank wanted to know how BPSC has been involved in this.
Jaclyn also brought up the bike light and helmet evenings when they were given away.
Mitch noted that there used to be a bike street fair.
Paul noted that when there have been ribbon cuttings there have been rides associated with it. Paul noted there will be a project for the Allen Street Greenway, and he would like an event associated with it. He said trucks go through the greenway despite the no trucks signs.

Jaclyn says that the three big priorities for her are to indicate who can ride on MUPs, better signage and a center line to encourage people to keep right except to pass. Parks and Rec may add a center stripe on the B-line. She would like safety improvements at intersections. She is also concerned about the Hopewell site and its connection to the B-line.
Paul is bringing up the issue of the Duke reliability project; removing trees will affect the B-line. He is concerned about the towers that will be on the B-line.
Jaclyn wants to continue the center line across the pavers on the B-line. She wants us to follow the Hopewell project and to participate in the decision making process.
Paul says there is a current meeting on the demolition issues.
Mitch mentioned Switchyard should have signs indicating it's a plaza, not a through street, so that people will slow down. Steve Cotter mentioned that it's still a trail at the plaza.
Mitch is concerned about safe access to schools. He is especially concerned about access to University Elementary. The bus service to schools has been bad and we need to make it easier for kids to walk or ride to school safely.
Ann noted that in the past we have discussed pedestrian access to Summit.
Mitch has been especially concerned about access on 10th Street.
Hank noted that 10th Street is a state-maintained street. The state has a project in 2023 and 2024 to widen the intersection with Pete Ellis. He says there is a phase 3 which will address the area further east to Russell Road. There will be a MUP.
Paul says the MUP will be on the north because of historic preservation on the south side at Hinkle Garton. The state is acquiring the right of way.
Jaclyn would like separation of pedestrians and bikes on MUPs.
Hank noted that there is a link on the INDOT site to express concerns about the 10th Street project. He will share that link.
https://indottscc.service-now.com/csm
Steve said that the Duke project will go up Rogers then head up the B-line. The B-line will need to be closed while work is being done. He says Bloomington has grown and Duke wants to reduce the amount of time power is out. Parks and Rec is working on building a trail going west; they are trying to coordinate with Duke and the county to get a path. Jaclyn wants to know whether there will be

enough space to separate cyclists and pedestrians. Steve doesn't think that will be possible. She thinks that will help in keeping people to the right. Steve noted that there is a high turnover rate in our community, and that it takes time for newcomers to learn. He says there will be additional signage motivated by the rise in use of electric bikes. Parks manages multi-use trails; other departments manage multi-use paths.

Mitch explained the difference in classification between bicycles and motorcycles.

Steve has looked at other city rules regarding electric bikes. He says that some ban motorized vehicles entirely on multi-use trails and paths.

Zach asked whether there were any other concerns.

Hank mentioned that the amendment the council is considering has been changed. The change from 30% to 51% approval for resident led projects has been dropped. There is still an amendment requiring that Council will need to give final approval.

Jaclyn thinks that council members should be involved early rather than later. She doesn't think approval at the end is appropriate. The change for council approval applies to both council and staff projects.

Commissioners asked what would happen if the council didn't approve. Ann noted that would only happen if the neighbors didn't want the project, and that hasn't been an issue until Elm Heights didn't want traffic calming. Other neighborhoods proposed projects.

b. Traffic Calming and Greenways Program Amendment (see discussion above)

c. Staff-Led Traffic Calming and Greenways Program (see discussion above)

4. **Old Business**
5. **Reports from Commissioners:** Mitch wanted to know what he could do about safety concerns, and he was advised to submit ureports.

6. Public Comment

Greg Alexander said that he thinks that giving Council veto power would be a disaster. There's no such veto power over car projects.

Mark Stosberg is opposed to rolling back the current process. He thinks that having a political override after an objective evaluation would be harmful to equity.

Eric Ost commented on percentage approval and council approval. He said that the Council reduced the percent from 51% to 30%, after the staff originally proposed the 51% figure. He doesn't understand the references to the difficulty in getting participation. He also wanted to speak to the idea that Elm Heights is opposed and doesn't want safe streets. The resident-led and greenway areas are already on safe streets based on the speed of the traffic. There is no data indicating that the streets are not safe. The issue is with the process. He thinks greater involvement of neighbors and users should be heard. He thinks it is important to measure safety. Council approves other safety issues such as stop signs. He thinks this is similar.

Bill Coulter is not opposed to traffic calming and bike paths. He says that the Maxwell Street resident led project was happening at the same time as a people were concerned about the Sheridan and Maxwell intersection. He says that it was noted that people are concerned about crossing Third and Maxwell but that the city is proposing a redundant bike path instead of addressing concerns.

7. Adjourn

CITY OF BLOOMINGTON

TRAFFIC/BPSC **Case #:** TC-23-01
STAFF REPORT **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.

Memo

TO: Office of the Mayor

FROM: Planning and Transportation Department
With Information from the Economic and Sustainable Development Department

Date: Friday, March 10, 2023

RE: City of Bloomington Micro-Mobility Recommendations

Executive Summary

Since shared e-scooters first came to Bloomington in 2018, residents benefitted from a new convenient mode of transportation. With that came lower transportation costs, quicker commutes, and environmental benefits.

There are, however, two main drawbacks that have arisen due to the prevalence of e-scooters:

1. Rider and pedestrian safety, and
2. Parking and pedestrian accessibility

Regarding rider and pedestrian safety, pedestrian-friendly policies such as leading pedestrian intervals, protected intersections, and no-right-on-red intersections help prioritize vulnerable street users and increase safety for everyone. These larger policies, combined with short-term solutions such as recurring educational rider quizzes, collaborative protocols for highly attended events, and an increased amount of sit-down vehicles should result in a more seamless experience for both riders and non-riders in Bloomington.

To aid pedestrian accessibility due to improperly parked scooters, staff recommends implementing designated scooter parking corrals in high-use areas, geofencing appropriate parking areas, and enforcing vehicle fleet caps based on ride volume.

City staff collaborated significantly with Indiana University to craft these recommendations and discussed the feasibility of implementation with the operators. To adequately carry out the recommendations, staff recommends extending current licenses with pro rata fees through July 31, 2023 and enforce new licensing documentation with all changes effective August 1, 2023.

Rider and Pedestrian Safety

2023 Recommendations	Details	Reasoning
Implement Pre-Ride Educational Quizzes	Operators will require riders to take semi-annual quizzes surrounding safe riding habits and rules of the road.	These quizzes are an efficient way to ensure that all riders understand the rules of the road, safe riding habits, and appropriate parking locations.

Adjust Hours of Operation	Stand-up scooters: April – October: Operations restricted from 11:00pm-5:00am November-March: Operations restricted from 8:00pm-5:00am E-bikes and sit-down scooters: Operational 24/7	As a compromise between both Indiana University (IU) and the City on how to best reduce late-night crashes involving shared micro vehicles, allow residents to access all modes of transportation, and create one standard policy within Bloomington, e-bikes and sit-down scooters will be operational 24 hours per day while stand-up scooters will be restricted during late hours.
Enforce a Minimum Number of Sit-Down Vehicles in Each Fleet	At least 25% of each operator's fleet must consist of e-bikes or sit-down scooters. If at least 50% of an operator's fleet consists of sit-down vehicles, the City will reduce operator fees from 15 cents per ride to 10 cents per ride for the entire fleet.	To make accessible transportation available 24 hours per day, the City and IU jointly agreed to impose a minimum required amount of sit-down vehicles available to the public.
Operator Helmet Certification	All helmets given out by operators must be authentically to code as defined by the U.S. Consumer Product Safety Commission	If operators choose to give away safety equipment, it should at least meet these safety standards.

PARKING AND PEDESTRIAN ACCESSIBILITY

2023 Recommendations	Details	Reasoning
Create Designated Parking Corrals	On-street scooter parking corrals in high-use areas will supplement existing bicycle racks and allow operators to stage their vehicles in and users to end their rides at locations designated for scooters.	Many cities with dockless e-scooter programs have already implemented corrals, which have reduced the amount of improperly parked scooters.[i] To maximize effectiveness, staff recommends installing a high frequency of corrals in high-use areas.
Geofence End-of-Ride Areas and/or Incentivize Appropriate Parking	Operators will be required to geofence corrals and bike racks as the only appropriate areas to end a ride or provide financial incentives for users who end rides in these areas.	Both strategies have improved parking behavior in other markets, and with various operator preferences, allowing operators to choose between the two will allow the City to see which strategy works best in Bloomington.
Enforce Vehicle Fleet Caps	Fleets will be capped at a maximum of 400 vehicles per operator. If the weekly average of trips per day per vehicle surpasses 2.0, fleet size may increase.	With all vendors operating at an annual average of one ride per vehicle per day or less, there is room to decrease the number of vehicles on the street without significantly affecting transportation accessibility for riders. All fleet increase proposals will need to be approved by the Board of Public Works.
Fine Operators for Improperly Parked Vehicles	Once the City and operators take measures to promote appropriate parking, operators with vehicles outside the designated parking area may be	As per the current e-scooter ordinance, the City may enforce fines upon operators with improperly parked vehicles. After parking corrals are installed and geofencing technology is implemented, all operator-owned vehicles should begin and end each trip within the designated areas. By continuing the current

	fined.	Department of Public Works temporary labor program, designated City employees and contractors have authority to fine operators for improperly parked vehicles.
Create Special Event Protocols for Major Events	Operators will each submit protocols for highly attended events to seamlessly provide accessible and safe transportation.	Because 41% of e-scooter trips would have otherwise been taken in a car,[ii] encouraging patrons to use sustainable modes of transportation would relieve motor vehicle congestion and reduce the amount of carbon dioxide emitted.[iii] IU plans to geofence the athletic complex area, which will necessitate plans on how to allow micro-mobile users to attend sporting events.

LONG-TERM RECOMMENDATIONS

To promote walking, cycling, and scooter riding alike, City staff recommends the following general practices long-term.

Recommendations	Details	Reasoning
Implement Leading Pedestrian Intervals	The City will consider changing high pedestrian-use signalized intersections to coincide with 3-5 second leading pedestrian intervals.	This practice has shown to reduce pedestrian-vehicle crashes by over 58% at treated intersections.[iv] Additionally, because 67% of scooter and bicycle collisions occur at intersections, this implementation should significantly reduce the number of pedestrian, cyclist, and scooter rider collisions at signalized intersections.[v]
Build Protected Intersections	For upcoming infrastructure projects, the City should construct protected intersections to prioritize the safety of vulnerable street users.	Intersections are by far the most frequent points of conflict between pedestrians, cyclists, scooter riders, and motor vehicles.[vi] Protected intersections give these street users spatial priority and decrease crashes with motor vehicles.
Expand no-right- on-red Intersections	The City should analyze more signalized intersections to implement no-right-turn-on-red rules to motor vehicles.	60% of crashes involving e-scooters and motor vehicles occur on the right side of the motorist.[vii] No-right-turn-on-red intersections create safer street crossings for all vulnerable street users.
Construct Physical Scooter Racks	As a next step to designated scooter parking corrals, the City should begin installing physical racks within these spaces.	Physical racks minimize fallen scooters, which is the main cause of accessibility and pedestrian conflicts.
Implement Universal Charging Stations	If micro electric vehicle ridership continues to rise, the City will consider installing charging stations to promote these modes of transportation.	In 2019 alone, over 136 million e-scooter and e-bike trips were made in the US, of which over 400,000 occurred in Bloomington. Additionally, e-bikes are the fastest growing mode of transportation and even outpaced electric car sales in 2021.[viii]

INDIANA UNIVERSITY RECOMMENDATIONS

Recommendations	Details
Reduce Speed Limits	IU staff prefers 10 mile per hour speed limits campus-wide for stand-up scooters.
Geofence Athletics Complex	The entire athletic complex will be fenced from any shared micro-mobile vehicle activity.

[i] *2019 E-Scooter Findings Report*, City of Portland, Oregon, 2019. https://www.portland.gov/sites/default/files/2020-09/appendix-b-e-scooter-parking-solutions.pdf.

[ii] "Scooter Survey Report." Survey. *City of Bloomington*. March 2019. Accessed 5 Jan. 2023.

[iii] Browne, Kerry, et al. "Zing E-Scooters to Reduce Carbon Emissions Attributable to the Transportation Sector in Santa Monica." *UCLA Institute of Transportation Studies*, 8 May 2020.

[iv] Fayish, Aaron C., and Frank Gross. "Safety Effectiveness of Leading Pedestrian Intervals Evaluated by a before-after Study with Comparison Groups." *Transportation Research Record: Journal of the Transportation Research Board,* vol. 2198 no. 1, 1 Jan. 2010 pp. 15-22., https://doi.org/10.3141/2198-03.

[v] Shah, Nitesh R., et al. "Comparison of Motor Vehicle-Involved e-Scooter and Bicycle Crashes Using Standardized Crash Typology." *Journal of Safety Research, vol. 77, June 2021, pp. 217-228., https://doiorg/10.1016/j.jsr.2021.03.005.*

[vi] Ibid.

[vii] *2019 E-Scooter Findings Report*, City of Portland, Oregon, 2019. https://www.portland.gov/sites/default/files/2020-09/appendix-b-e-scooter-parking-solutions.pdf.

[viii] Hurford, Molly. *New Research Shows that e-Bikes are Outpacing Car Sales in the US. Bicycling,* 3 Nov. 2022