Recommend the Best Public Transit Option and Street Design for West Fond du Lac Avenue





Jesse Doiron, Claire Enders, Evan Hoier, and Kirtis Orendorff UP 810

December 12th, 2023

To: Carl Glasemeyer, Transportation Policy Analyst, 1000 Friends of Wisconsin Phone: 816-668-1052 Email: carl@1kfriends.org CC: Professor Robert Schneider, Associate Professor of Urban Planning & Department Co-Chair, UWM RE: Recommend the Best Public Transit Option and Street Design for West Fond du Lac Avenue (WI 145)

Dear Carl,

Our team would like to thank you for the opportunity to collaborate with 1,000 Friends of Wisconsin to help generate alternatives to address the safety and livelihood of the Fond du Lac Avenue corridor. While we acknowledge that there is no single solution to increase capacity and decrease traffic crash injuries and deaths, we are confident that these proposed alternatives are a strong starting point for addressing the issues that plague this corridor.

Our preferred alternative is to redesign all intersections along Fond du Lac Avenue to decrease conflict points, slow traffic, and efficiently utilize the public right-of-way. These proposed redesigns focus on creating roundabouts at major intersections to facilitate safer and more efficient traffic flow while reducing the amount of space dedicated to personal vehicles. If implemented, we anticipate that redesigned intersections that slow traffic and improve pedestrian/bicycle infrastructure will decrease traffic crash deaths by 90%.

Other alternatives investigated include upgrading the Blue Line bus route into a BRT "Lite" system, an expansion of The Hop as an elevated light rail system, and traffic lane redesigns to include more bicycle and pedestrian infrastructure. While these other alternatives are ambitious, they do not provide enough benefit on their own to be our preferred alternative. While redesigning intersections on this corridor does not address straightaway speeds in between intersections, our team believes the proposed redesigns will most significantly reduce traffic crashes in the shortest amount of time.

On behalf of our team, we would like to thank you again for this opportunity to work with 1,000 Friends of Wisconsin to address such a massive issue that our community faces. Please contact our team if you have any further questions about our research, analysis, and recommendations.

Sincerely,

Jesse Doiron, Claire Enders, Evan Hoier, and Kirtis Orendorff University of Wisconsin-Milwaukee, Master of Urban Planning Students

EXECUTIVE SUMMARY

Problem

West Fond du Lac Avenue is the deadliest street in Milwaukee, experiencing 27 deaths from vehicle crashes between 2017 and 2022. The corridor is a state connecting highway, thus tasked with the conflicting purposes of moving many people while serving as a vibrant neighborhood hub. Much of the corridor is part of Milwaukee's High Injury Network for motor vehicle occupants, pedestrians, and bicyclists, creating an uncomfortable roadway experience that prohibits the foot traffic necessary for a thriving commercial corridor. Exacerbating poor conditions is the lack of investment in transportation projects on Milwaukee's Northwest side.

Criteria

- <u>Effectiveness</u>: The proposed alternative must increase accommodations for pedestrian, bicycle, and transit users while increasing the capacity of the roadway to move all users in line with projected demand by 2033.
- <u>Equity</u>: The preferred alternative must target the deadliest intersections on Fond du Lac Avenue and reduce traffic fatalities on the corridor by 70% by the year 2033.
- <u>Cost</u>: The preferred alternative must cost less than \$300 million to fully implement.
- <u>Political Feasibility</u>: The preferred alternative must be in alignment with community goals and interests, including comprehensive plans, BIDs, community development organizations along the corridor, and WisDOT.

Alternatives

- 1. <u>Redesigned Intersections:</u> Address the disproportionate number of crashes at intersections by redesigning all intersections along Fond du Lac Avenue for enhanced safety and efficiency, with roundabouts at the deadliest intersections.
- <u>Elevated Hop Extension</u>: Connect an elevated light rail to the proposed Bronzeville Hop expansion to add transit ridership capacity without impacting the existing roadway. Seven stations are proposed at major intersections, approximately ¾ mile apart.
- 3. <u>BRT "Lite"</u>: Eliminate secondary traffic lanes in each direction of Fond du Lac Avenue to make room for shared bus and bike lanes, curb extensions, and increased curb radii. Add or move stops for the MCTS Blue Line to dense, mixed-use areas to increase ridership.
- 4. <u>Pedestrian and Bicycle Traffic Calming:</u> Reduce travel lanes to one in each direction and add parking-protected raised bike lanes, curb extensions, and raised crosswalks to slow traffic, prevent reckless driving, and increase pedestrian and cyclist comfort and safety.

Recommendation

We recommend implementing the Redesigned Intersections, as intersections present the most conflict points in a roadway. Roundabouts reduce crash fatalities by 90%, reduce delays by 33%, and create space for pedestrian and bicycle accommodations. This alternative is estimated to cost \$65 million, well below the cost per user of major highway construction while benefiting a wider variety of users. Significant safety benefits and opportunities for placemaking will likely be accepted by community organizations. WisDOT's history of constructing roundabouts on state highways indicates state support.

PROBLEM STATEMENT

West Fond du Lac Avenue is the deadliest street in Milwaukee, experiencing 27 deaths from vehicle crashes between 2017 and 2022.¹ On May 15th, 2023 six people died from crashes on West Fond du Lac Avenue and six others were hospitalized, just in one day.² The majority of crashes occur where West Fond du Lac Avenue intersects with other major roadways, including 38 crashes at the intersection of North 51st Boulevard and 81 crashes where Fond du Lac intersects with Center Street and 27th Street. West Fond du Lac is a state connecting highway that is often tasked with performing two conflicting functions, moving many people as quickly and efficiently as possible, and serving as a neighborhood hub or "main street" that connects residents to the businesses and services that they rely on. These competing functions and a lack of investment in transportation infrastructure in this section of Milwaukee have created deadly conditions that inhibit the community's potential. 1000 Friends of Wisconsin, a non-profit advocacy group, seeks a new vision for Fond du Lac Avenue that will make the corridor safe and enjoyable for all road users.

Milwaukee and the surrounding area have recently received billions of dollars in major transportation infrastructure improvements including \$1.5 billion on the Zoo Interchange³, \$550 million on I-43 from Milwaukee to the North⁴, and a proposed \$1.2 billion to rebuild I-94 running east west through Milwaukee⁵. Notably missing, geographically, from this list of projects is the Northwest side of the city, contributing to the deteriorating conditions experienced on West Fond du Lac Avenue. In 2022, the state spent \$13.7 million on resurfacing the freeway that leads onto West Fond du Lac Avenue, but investments were not made further southeast in the corridor. Portions of the corridor have been rebuilt as recently as 2016. However, a redesign that considers current traffic patterns and multimodal uses has not been considered in recent history, reenforcing past design mistakes that do not align with the characteristics and needs of the neighborhood. Residents of Fond du Lac Avenue are more likely to use public transit than other areas of Milwaukee. 10-20% of residents commute by bus⁶ and 20-40% of households

¹ Jordan, B. (2022, December 7). The two deadliest streets in Milwaukee County intersect on Milwaukee's north side. TMJ4. <u>https://www.tmj4.com/news/project-drive-safer/the-two-deadliest-streets-in-milwaukee-county-intersect-on-milwaukees-north-side</u>

² Bentley, D. (2023, May 17). These 14 Milwaukee intersections have seen the most car crashes in a year. Milwaukee Journal Sentinel. <u>https://www.jsonline.com/story/news/2023/05/17/14-milwaukee-intersections-with-mostcar-accidents-a-year/70225504007/</u>

³ Dixon, J. (2023, September 30). Milwaukee Zoo Interchange Reconstruction. GRAEF. <u>https://graef-usa.com/milwaukee-zoo-interchange-reconstruction/#:~:text=major%20roadways%20include%3A%20WIS%20100,Plank%20Road%2C%20and%20GI enview%20Avenue.&text=Interchange%20construction%20project%20is%20%241.5%20billion.</u>

⁴ WisDOT (2022, February 7). Governor Evers approves I-43 North-South project to begin. <u>https://wisconsindot.gov/Pages/about-wisdot/newsroom/news-rel/020722-se-i43-north-south</u>

⁵ Jannene, J. (2021, December 10). Transportation: Interstate 94 project cost much higher than original estimate. Urban Milwaukee. <u>https://urbanmilwaukee.com/2021/12/10/transportation-interstate-94-project-cost-much-higher-than-original-estimate/</u>

⁶ American Community Survey. Census Tract Data, Five-Year Estimates, 2017-2021.

don't have a car⁶. The roadway has been designed to move large numbers of cars but previously has not considered the pedestrian or transit user, leading to the current unsafe conditions.

This lack of investment and cohesion between roadway design and potential users has not only created unsafe conditions for roadway users but has also created undesirable conditions for economic activity in the area. The corridor faces a stigma of being unsafe or undesirable that is reinforced by constant headlines of crash deaths on the street. West Fond du Lac Avenue already has a high amount of pedestrian activity⁷; however, large portions of the corridor are part of Milwaukee's High Injury Network for motor vehicle occupants, pedestrians, and bicyclists⁸. This limits the economic benefits that large numbers of pedestrians typically generate in a commercial corridor⁹ and prevents additional pedestrians from engaging in the space¹⁰. The City of Milwaukee has adopted a Complete Streets law that mandates all street reconstruction in the area to accommodate all road users, not just personal automobiles. This might conflict with the priorities of WisDOT, which officially owns the highway. Further complicating redesign efforts is the lack of consistent design standards for this roadway. Different sections might require different design treatments, leading to increased costs and varying levels of user reeducation as they learn to interact with a new space.

⁷ City of Milwaukee, Department of Public Works. Milwaukee Pedestrian Plan,

https://city.milwaukee.gov/dpw/infrastructure/multimodal/Milwaukee-Pedestrian-Plan, 2019. ⁸ City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis, <u>https://www.milwaukee.gov/MKECrashAnalysisReport2022.pdf January 2023</u>.

⁹ Westaby, Katherine A. (July 2019). "Walkability Means Better Business" https://economicdevelopment.extension.wisc.edu/files/2022/01/DE0719.pdf

¹⁰ Schneider, R., Schmitz, A., Schinkowsky, H. Milwaukee Safe & Healthy Streets Surveys: Full Report, https://city.milwaukee.gov/ImageLibrary/Groups/cityDPW/pavement/FullReportMilwaukeeSafeHealthyStreets Surveys.pdf, September 2021.

CRITERIA

<u>Effectiveness</u>: The proposed alternative must increase accommodations for pedestrian, bicycle, and transit users while increasing the capacity of the roadway to move all users in line with projected demand by 2033.

Rationale: Large portions of this corridor are part of the High Injury Network for automobile passengers, pedestrians, and bicyclists. Many residents along the corridor travel by means other than personal vehicles. Thus, better accommodating multiple modes of transportation will increase the roadway's capacity to move people while still serving its current users. Projections were calculated by referencing the impact implementing multimodal accommodations had on other roadways¹¹. In a report for the University of Minnesota, the authors find that expanding transit service promotes modal shift and generates significant increases in ridership¹². These projections constrained our capacity estimates to align them more accurately with actual usage.

<u>Equity</u>: The preferred alternative must target the deadliest intersections on Fond du Lac Avenue and reduce traffic fatalities on the corridor by 70% by the year 2033.

Rationale: To make Milwaukee more geographically equitable in terms of safety, it is important to target its deadliest intersections. This includes along Fond du Lac Avenue, as determined by the High Injury Network. Focusing on reducing fatalities along this corridor will also result in the reduction of severe injuries and overall crashes. Because Fond du Lac Avenue is one of Milwaukee's most dangerous streets and one of the most diverse areas of the city, directing attention to solving this issue will help bring this artery up to the safety standard other privileged communities enjoy. The 70% benchmark was determined to align with the Vision Zero goal of reducing traffic crash fatalities to zero by 2037, or 7% per year.

Cost: The preferred alternative must cost less than \$300 million to fully implement.

Rationale: It is imperative that local multi-modal projects receive the same level of investment as other car-oriented transportation projects in Wisconsin. Based on current budget projections of the I-94 expansion at the Stadium Interchange as well as AADT data from the Fond du Lac Avenue corridor, we wish to allocate \$300 million to our project¹³.

<u>Political Feasibility</u>: The preferred alternative must be in alignment with the goals and interests of the community along Fond du Lac Avenue. These include comprehensive plans, BIDs, community development organizations, and WisDOT.

¹¹ See Appendix A for projection calculations.

¹² "Exploring Strategies for Promoting Modal Shifts to Transitways." Exploring Strategies for Promoting Modal Shifts to Transitways | Center for Transportation Studies, <u>www.cts.umn.edu/research/project/exploring-strategies-for-promoting-modal-shifts-to-transitways</u>. Accessed 9 Dec. 2023.

¹³ See Appendix B for cost criteria breakdown.

Rationale: The preferred alternative must meet the needs of the residents and businesses that utilize Fond du Lac Avenue and are most impacted by the road's safety. Alignment with comprehensive plans ensures that the preferred alternative reflects the long-term vision for the corridor, while acceptance by local BIDs and community organizations indicates acceptance by the surrounding community. WisDOT's support is imperative due to Fond du Lac's status as a state highway.

ALTERNATIVES

Alternative 1: Redesigning Intersections to Increase Safety and Efficiency for All Users

This alternative proposes redesigning every intersection along Fond du Lac Avenue to prioritize safety, efficiency, and neighborhood well-being. The redesign proposes dramatic reconfigurations of the deadliest intersections and more basic enhancements to others with the goal of improving efficiency for all roadway users. Roundabouts would be implemented on Fond du Lac where it intersects multiple streets at once including W. Hampton Ave, W. Capitol Drive, W. Burleigh Street, W. Center Street, and W. North Ave.

Excessive automobile speed in this corridor contributes to its unsafe and inefficient characteristics. A recent speed analysis of the intersection at Burleigh found that 68% of vehicles drove above the speed limit with 19% exceeding 40 mph, at least 10 miles above the posted speed limit.¹⁴ The faster a vehicle travels, the more likely that vehicle is to be involved in a crash and the more severe the crash outcome.¹⁵ Roundabouts will reduce speeds in the corridor by creating a built environment that forces drivers to slow down and be more aware of their environment. The typical posted speed for a roundabout in Wisconsin is 15-20 mph¹⁶, a much safer speed for all users.

Roundabouts are also safer than intersections, where most crashes in Milwaukee occur.¹⁷ They eliminate opportunities for right-angle, head-on, and left-turn collisions, the deadliest for drivers.¹⁸¹⁹ WisDOT data shows that intersections controlled by roundabouts reduce fatal crashes by 90%, injury crashes by 75% and overall crashes by 35%.¹⁸ Implementing roundabouts at Fond du Lac, Burleigh and 35th would help prevent the 110 crashes that occurred at that intersection in 2022. The number of fatal crashes at intersections of Fond du Lac Avenue would be reduced from around 19 since 2017 to about 2, saving 17 lives²⁰.

Roundabouts will increase the efficiency of the roadway, allowing more users to move through it while giving transit the ability to make more frequent and reliable trips. Multiple studies have estimated that roundabouts reduce delays at intersections by 33%-89% depending on the

¹⁴ Amsden, M. City of Milwaukee, Department of Public Works. Fond du Lac and Burleigh Speed Study. September 2023.

¹⁵ SWOV Institute for Road Safety Research. (April 2012). <u>https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa1304/Resources3/08 - The Relation Between Speed</u> <u>and Crashes.pdf</u>

¹⁶ Wisconsin Department of Transportation. (n.d.). How roundabouts work. <u>https://wisconsindot.gov/Pages/safety/safety-eng/roundabouts/works.aspx</u>

¹⁷ City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis.

https://www.milwaukee.gov/MKECrashAnalysisReport2022.pdf January 2023. See also Appendix C.

¹⁸ Wisconsin Department of Transportation (n.d.-b). Safe use of roundabouts reduces crashes, improves traffic flow. <u>WisDOT Law of the Month: Safe Use of Roundabouts</u>.

¹⁹US Department of Transportation (September 2010). Crash Factors in Intersection-Related Crashes: An ON-Scene Perspective. <u>NHTSA Crashes at Locations</u>.

²⁰ Calculated by multiplying total deaths on Fond du Lac by % of crashes that occur at intersections.

specific characteristics of the intersection. A more efficient roadway paired with other transit enhancements along the corridor, such as transit signal priority, would further optimize the roadway to serve all users instead of just personal vehicles.

Proposed roundabouts will typically create unused right-of-way that can be repurposed for enhanced transit, bicyclist, or pedestrian accommodations²¹. The space in the center of the roundabouts can be utilized to meet other community goals including stormwater management, enhanced tree canopy, and the creation/promotion of a community identity. One example could be a new roundabout at Fond du Lac and Burleigh that houses greenspace for stormwater management and encircles a statue of a phoenix, emblematic of the rebirth being experienced by the surrounding community highlighted by Sherman Phoenix.

The cost of this alternative would be approximately \$65 million. WisDOT estimates that an expensive roundabout costs \$3 million, therefore the cost of 5 roundabouts is \$15 million. A similar roadway on Milwaukee's south side, W. National Avenue, is about half of the length of this segment of W. Fond du Lac Avenue and is being reconstructed at an estimated cost of \$20 to \$25 million²². It stands to reason that reconstructing the rest of W. Fond du Lac Avenue should cost around \$50 million, in addition to the roundabouts.

Alternative 2: Hop, Skip, and a Jump: An Elevated Expansion Line for The Hop

This alternative proposes an expansion of The Hop to extend along Fond du Lac at an elevated grade. An elevated rail expansion allows for the addition of public transit options to the corridor while keeping intact West Fond du Lac Avenue's current designation as a state highway and freight corridor. This increases the capacity of the corridor while mitigating the need to redirect traffic through residential streets and provides residents an additional alternative to personal automobile trips. The Hop has seen one expansion since completion, with further expansions proposed into the Deer District, Walker's Point, and Bronzeville²³. This alternative is inspired by renderings for the Aurora Street, Seattle, Washington proposed elevated light rail expansion²⁴, as well as the Lynnwood expansion project of The Link light rail network in Seattle²⁵.

Currently, The Hop serves as a transit mode with huge potential for the City of Milwaukee. The Hop has seen almost 2 million riders, over 2000 riders per day on average, from completion in November 2018 to April of 2023²⁶. While larger in scope than current implementations of The

²¹ Appendix D and Appendix E for roundabout redesign proposals.

²² West National Avenue. (n.d.).

https://city.milwaukee.gov/dpw/infrastructure/supportforbusiness/projectsummaries/West-National-Avenue

²³ Polcyn, B. (2023, June 8). \$353M Milwaukee streetcar expansion planned; funding "a challenge." FOX6 News Milwaukee | Wisconsin & Local Milwaukee News WITI. <u>https://www.fox6now.com/news/milwaukee-streetcar-expansion-funding-challenge</u>

²⁴ See Appendix F for Aurora Street renderings.

²⁵ Lynnwood Link Extension | Project map and summary | Sound Transit. (n.d.). https://www.soundtransit.org/system-expansion/lynnwood-link-extension

²⁶ LaFountain, J. (n.d.). The Hop MKE | Milwaukee Streetcar. <u>https://thehopmke.com/expansion/</u>

Hop, the proposed Lynnwood Extension Project will connect to Seattle's existing streetcar network with an elevated spur. This extension will serve as our guide for possible implementations of an elevated expansion of The Hop²⁷.

Our proposed Hop expansion would be the largest expansion yet, as the additional 5 miles of track would also need to connect to the proposed Bronzeville expansion. Seven stations would be built, with spacing around three-quarters of a mile for each station²⁸. The stations would be placed over intersections to reduce street crossings for riders of this extension, lowering pedestrian-traffic conflict zones and reducing the likelihood of pedestrian crashes²⁹. With the addition of a convenient and frequent mode of transit along this corridor, we believe that this expansion will create a mode shift of travelers along this corridor from automobile to public transportation.

Our elevated Hop expansion would cost an estimated \$1.7 billion to complete, based on budget projections from the Lynnwood Link expansion and other comparable light rail projects³⁰. One challenge with this proposal is the reliance on other Hop expansions to be completed, as it connects to the proposed Bronzeville Hop expansion. Another challenge is the crossing of the 30th Street Corridor, as Fond du Lac Drive drops under an elevated railway crossing³¹. This rail crossing would need either a signalized railway crossing, a further elevated section of track to go above the freight rail line, or a diversion to the north to avoid extreme elevation changes.

Alternative 3: Bus Rapid Transit "Lite"

This alternative proposes implementing built environment changes coupled with a revamping of MCTS's Blue Line to effectively make it a Bus Rapid Transit (BRT) "Lite" transit opportunity. This focus is important for allowing public transit to replace private individual vehicles and become the primary method of transportation on this corridor. Improvements to the built environment will help reduce the danger posed by vehicles to pedestrians and cyclists and make Fond du Lac Avenue a more accessible and attractive place to shop, work, live, and relax.

Improvements to the built environment would include curb extensions, increased curb radii, installation of dedicated shared bus and bike lanes, and others as deemed appropriate. The secondary traffic lane in each direction of Fond du Lac Avenue will be eliminated to make room for these changes. Because Fond du Lac Avenue is such a large area to cover with improvements, these built environment installations should be concentrated in areas of commercial or employment importance so that walkability and accessibility in the immediate area is improved to a high degree. This policy is commonly known as a "road diet". According to A Comprehensive Study of Road Diet Implementation in the US and Abroad by Johns Hopkins

²⁷ Chan, Kenneth (Sept 4, 2019). Seattle begins construction on \$2.9-billion, 8.5-mile grade-separated LRT <u>https://dailyhive.com/seattle/seattle-lynnwood-link-extension-construction</u>

²⁸ See Appendix G for proposed station locations.

²⁹ See Appendix H for proposed station designs.

³⁰ See Appendix I for projected budget breakdown.

³¹ See Appendix J for site context for the 30th Street Corridor Crossing.

University³², after implementation of a road diet "the fatal/incapacitating crash rate was reduced by 33%, sideswipe crash rate by 90%, angle crash and left turn crash rate by 64%, pedestrian crashes by 62%, and bicycle crashes by 47%".

Revamping the MCTS Blue Line to upgrade it to a BRT "Lite" system would ensure that the use of public transportation on Fond du Lac Avenue remains safe, reliable, and efficient. According to a Johns Hopkins study which created a meta-analysis of literature on the subject, while probably somewhat overestimated, models of BRT implementation in affected areas and traffic safety found a decrease of 14-60% of traffic fatalities³³. Additionally, adding bus stops in areas that have a greater mix of land use or are of a more intense commercial, institutional, or recreational use could yield more efficient transit patterns for Fond du Lac Avenue. Writing in Bus Rapid Transit Service Design Guidelines, the National Association of City Transportation Officials states "land use policies that encourage denser mixed-use developments built to a pedestrian scale are much more likely to generate transit ridership than dispersed communities that are designed around the personal car"³⁴. Consequently, centering new or moved stops in areas where there is a high intensity and general mix of land uses is crucial to achieving the best possible outcomes for the upgraded Blue Line. See Appendix K for intersections identified for new or relocated bus stations.

These intersections represent a clear mix of land uses with more intense commercial operations near them. This is especially true for intersections that provide more basic services like grocery, food, retail establishments, and other common amenities. This provides a great opportunity for the upgraded Blue Line to capitalize on their intensity of use. Subsequently, stronger residential development in these areas could further emphasize the accessibility and overall livability of neighborhoods along this corridor.

Alternative 4: Traffic Calming via Bicycle and Pedestrian Prioritization

This alternative proposes using enhanced bicycle and pedestrian accommodations as traffic calming measures. Modeled after Milwaukee's recent redesign of Walnut Street, protected bike lanes, curb extensions, and high visibility raised crosswalks will increase cyclist and pedestrian safety by narrowing the road to slow traffic and prevent unsafe passing behavior. These pedestrian accommodations will encourage foot traffic that will benefit the businesses along this corridor.

Vehicle speed is a primary factor in Fond du Lac Avenue's inclusion in the High Injury Network. The recent speed study at the intersection of Burleigh and Fond du Lac found that over two-

³² Vecino-Ortiz, Andres I, and Adnan A Hyder. "Road Safety Effects of Bus Rapid Transit (BRT) Systems: A Call for Evidence." Journal of Urban Health : Bulletin of the New York Academy of Medicine, U.S. National Library of Medicine, Oct. 2015, <u>www.ncbi.nlm.nih.gov/pmc/articles/PMC4608935/</u>.

³³ Boyle, Patrick, et al. "A Comprehensive Study of a Road Diet Implementation in the US and Abroad." SCIRP, Scientific Research Publishing, 9 Aug. 2023, <u>www.scirp.org/journal/paperinformation?paperid=127799</u>.

³⁴ Ink, Social. "BRT: Bus Rapid Transit Service Design Guidelines." National Association of City Transportation Officials, 22 July 2015, nacto.org/references/vta-transit-2/.

thirds of vehicles speed through this intersection.¹⁴ The highest recorded speed was 63 mph, over double the posted speed limit of 30 mph.¹⁴ The built environment changes proposed in this alternative will slow traffic to safe speeds to ensure the safety of all users.

This alternative proposes the following changes to the public right-of-way.³⁵ Travel lanes will be reduced to one 12-foot lane in each direction to provide space for separated bike lanes while still accommodating buses and freight trucks. Parking-protected raised bike lanes will increase cyclist safety and maintain parking for businesses. Bollards or curbs will separate bike lanes where the road narrows. Sidewalk-level bike lanes will enhance visibility, safety, and cyclist comfort. Green paint will increase visibility and clearly demarcate cyclist paths. New bike lanes will provide connections to the city's existing and planned bike network³⁶. To promote biking as a viable mode choice, bicycle parking will be provided throughout the corridor. Bublr stations, currently absent throughout the northwest side of the city, will be installed at major hubs such as Sherman Phoenix and near bus stops to allow convenient multimodal transfers. Existing high-frequency bus service will be maintained. Floating bus stops at larger intersections, such as Capitol, will prevent conflicts between bikes and buses by allowing bike lanes to pass between the bus stop and the sidewalk. Allowing buses to stop in-lane also reduces bus and car conflicts.

Intersections will be redesigned to shorten crossing distances and increase pedestrian visibility through curb extensions and high-visibility crosswalks. Elevated crosswalks will be installed at dangerous vehicle-pedestrian conflict points, such as key intersections and Sherman Phoenix, to increase pedestrian visibility and slow traffic. Bike boxes or two-stage turn queue boxes at intersections prioritize cyclists and make cyclist movements clear to all road users. Additional improvements will include landscaping throughout the corridor and upgraded bus stops with shelters and increased lighting. Right-turn slip lanes, such as the one at 17th and Fond du Lac, will be closed to slow traffic and reclaim space for pedestrians, keeping bike slip lanes open where appropriate³⁷.

By shifting road user prioritization, this alternative aims to encourage a modal shift that will reduce car traffic and congestion, allow buses to move more efficiently, and increase safety. The proposed redesign accommodates 17,919 roadway users per hour,³⁸ sufficiently meeting current demand. Similar roadway changes in other cities have decreased injuries for all users, increased comfort, and strengthened the local economy.³⁹ This alternative will be most effective if paired with a public education campaign about how to use new infrastructure. Construction would be conducted by WisDOT with maintenance done by the City of Milwaukee. Estimated to cost around \$69 million,⁴⁰ the proposed redesign is a worthwhile investment in a part of the city that has long been neglected.

³⁵ See Appendix L for proposed cross sections.

³⁶ Milwaukee Department of Public Works (n.d.). "Milwaukee Bike Maps". <u>https://city.milwaukee.gov/dpw/infrastruture/multimodal/maps</u>

³⁷ See Appendix N for full list of slip lanes to be closed.

³⁸ See Appendix P for capacity and roadway user calculations.

³⁹ See Appendix Q for a list of case studies highlighting benefits.

⁴⁰ See Appendix R for cost calculations.

EVALUATION

Alternative 1 – Intersection Redesign

<u>Effectiveness</u>: *Pass.* Roundabouts reduce delays at intersections by at least 33% according to conservative estimates. This increase in efficiency benefits all vehicles, including transit, and creates available space for pedestrian and bicycle accommodations to be implemented, further increasing capacity and easily accommodating projected demand.

<u>Equity:</u> *Pass.* Roundabouts and elevated crosswalks increase safety for all users by decreasing traffic speeds, thus mitigating the risk for the deadliest crash scenarios. WisDOT estimates that roundabouts reduce crash fatalities by 90%, crashes with an injury by 70%, and all crashes by 35%. The 90% fatality reduction estimate exceeds our criterion of 70% on the way to Vision Zero.

<u>Cost:</u> *Pass.* The \$65 million cost is well below the cost per user of major highway construction while benefitting a wider variety of users²⁰.

<u>Political Feasibility:</u> *Pass.* We anticipate that WisDOT will accept this alternative as it does not decrease the capacity of the roadway, allows for the continued movement of freight along the corridor and WisDOT has already built 267 roundabouts on state highways⁴¹. Community stakeholders will welcome the dramatic safety improvements and the ability to take advantage of other transportation and placemaking opportunities.

Alternative 2 – Elevated Hop Expansion

<u>Effectiveness</u>: *Pass.* This alternative will not decrease the average daily users below 33,000 because it does not significantly change the existing roadway and expands the public transit modes available along the corridor.

<u>Equity:</u> *Fail.* This alternative does not affect the current traffic patterns and does not do enough to reduce traffic fatalities Users of this new elevated railway would be able to avoid pedestrian/automobile conflict points.

<u>Cost:</u> *Fail.* We estimate our Hop expansion will cost 1.7 billion, well above our \$300 million budget³⁰.

<u>Political Feasibility:</u> *Fail.* This alternative does not integrate itself with local community plans and initiatives. Further, feasible implementation relies upon the completion of other proposed expansions to The Hop.

⁴¹ Sentinel, J. (2023, September 12). Wisconsin has more roundabouts than any other state. That's a good thing, experts say. Milwaukee Journal Sentinel. <u>WI has the most Roundabouts of any State</u>

Alternative 3 – BRT Lite

<u>Effectiveness</u>: *Pass.* We are confident that there will be no negative effects on either traffic volume or the carrying capacity of the roadway. A study from the University of Utah⁴² examined an implemented BRT Lite system compared to traffic volumes along the Provo-Orem corridor and concluded that traffic volumes on the BRT alignment is 7.38% lower than previously recorded. Meanwhile, transit ridership in the Provo-Orem corridor increased by almost 123%, indicating that a large portion of the reduction in traffic volume, measured in vehicles per day, can be attributed to increases in transit ridership.

<u>Equity</u>: *Fail.* With the estimations for traffic fatality reduction at 50% with the implementation of a Bus Rapid Transit line, we can reasonably claim that the implementation of this alternative will greatly contribute to ending the cycle of traffic injuries and fatalities along the Fond du Lac Avenue corridor. However, due to construction timelines and the fact that BRT would be a singular event and not an incremental or continual change, we cannot confirm that BRT Lite would meet the 70% reduction by 2033.

<u>Cost:</u> *Pass.* According to cost estimates provided by the presenters from MCTS, the East/West BRT cost MCTS \$6 million for 9 miles of development and the North/South BRT will cost \$8 million for 18 miles of development. Based on an average of \$550,000 per mile from these estimates, we can conclude that a BRT Lite expansion of the Blue Line would cost \$2.31 million for a line from North Avenue to Hampton Avenue and \$3.1 million for a line from North Avenue to Silver Spring Drive. This is well within the \$300 million budget set forth in the cost criterion.

<u>Political Feasibility:</u> *Fail.* Because this project would be funded through WisDOT, there is very little evidence that the agency would relinquish travel lanes for private automobiles to create more public transit. For the East/West BRT, federal highways were converted for BRT. Fond du Lac Avenue is a state highway and thus subject to WisDOT's more stringent policies regarding state highway use for transportation modes other than private automobiles, so we cannot say with certainty that WisDOT will welcome change of this magnitude to a freight roadway.

Alternative 4 – Bike/Ped Prioritization

<u>Effectiveness:</u> *Fail.* Although this alternative increases roadway capacity and mode choice by adding bicycle accommodations, improving pedestrian accommodations, and maintaining bus and private vehicle access, we do not anticipate that the full capacity will be utilized based on projected bicycle and pedestrian counts.⁴³ We estimate that the proposed redesign can accommodate 17,919 users per hour. However, this would require significant mode shifts to biking and walking.

www.sciencedirect.com/science/article/abs/pii/S0967070X23003268#abs0010.

⁴² Junsik Kim, et al. "Impact of 'Light' Bus Rapid Transit (BRT-Light) on Traffic and Emissions in a Travel Corridor." *Transport Policy*, Pergamon, 2 Dec. 2023,

⁴³ See Appendix P for traffic volume projections.

<u>Equity:</u> *Fail.* We anticipate that the proposed redesign will lead to a 40% reduction in fatalities (see Appendix S). Despite applying traffic calming measures throughout the entire corridor, with additional safety enhancements at the most dangerous intersections, this alternative does not achieve our goal of reducing traffic fatalities by 70% by 2033.

<u>Cost:</u> *Pass.* This alternative costs \$68,343,335 total, well within the \$300 million budget. See Appendix R for cost calculations.

<u>Political Feasibility:</u> *Fail.* This alternative does not align with SEWRPC's Vision 2050 plan, which identifies Fond du Lac as a BRT corridor. WisDOT endorsement is not guaranteed, as it would be dependent upon local support.⁴⁴ However, this alternative is in line with local area plans⁴⁴ and the City of Milwaukee's Safe Routes to Transit project on Burleigh Street,⁴⁵ which focuses on increasing pedestrian safety along the roadway to facilitate public transit use. It also reflects desires expressed by community organizations representatives to see traffic calming measures along the corridor.⁴⁶

⁴⁴ See Appendix T for political feasibility reasoning and summary of area plans.

⁴⁵ City of Milwaukee. (n.d.). Safe routes to transit. <u>https://city.milwaukee.gov/Safe-Routes-to-Transit</u>

⁴⁶ In-person presentations. Stacia Thompson (Sherman Phoenix), Maricha Harris (Dominican Center), Elizabeth Brown (Amani United). November-December, 2023.

EVALUATION MATRIX

	Effectiveness	Equity	Cost	Political
				Feasibility
	Increases modes	Targets high risk	Less than	
	and meets	intersections;	\$300,000,000	Accepted by
	projected ROW	70% reduction	total to	stakeholders,
	demand by 2033	in fatalities by	implement	aligns with
		2033		comp plans
Alternative 1	Pass	Pass	Pass	Pass
	Roundabouts	Roundabouts	Total cost	History of
	improve	reduce fatalities	\$65,000,000	WisDOT building
	efficiency by at	by 90%		roundabouts on
Intersection	least 33% and			State Highways;
Redesign	redesign allows			reclaimed ROW
	for Bike/Ped			can meet
	accommodations			community
				needs
Alternative 2	Pass	Fail	Fail	Fail
	Increases Fond	Does not	\$1.7 Billion	Not integrated
	du Lac Ave's	significantly	projected	into any
Hon Extension	capacity for	improve	budget	neighborhood
HOP EXtension	passengers, no	intersections or		plan
	impact on	reduce traffic		
	vehicles	deaths		
Alternative 3	Pass	Fail	Pass	Fail
	No negative	Only a 50%	\$2.31 million or	With WisDOT
BBT Lito	impact on	reduction and is	\$3.1 million	jurisdiction, not
DRT LILE	roadway capacity	a one-time	depending on	likely to be
		event	miles added	approved
Alternative 4	Fail	Fail	Pass	Fail
	Increases	Reduce fatalities	Costs	Not in line with
Bike/Ped	capacity, but not	by 40%	\$68,757,335	SEWRPC Vision
Priority	anticipated to be			2050
	fully utilized			

RECOMMENDATION

Upon evaluating the proposed alternatives against the criteria, our preferred alternative is to redesign the most dangerous intersections along Fond du Lac Avenue as roundabouts and apply additional traffic calming measures at other pedestrian-vehicle conflict points²¹. While this alternative does not specifically address providing new transit options, we determined that addressing the structural deficiencies of these intersections is critical to any future transit improvements along this corridor. Incorporating roundabouts at these intersections will greatly reduce speeds and therefore have a dramatic impact on improving the safety of the entire corridor. Roundabouts will also make the roadway more efficient, allowing for current transit options to operate with greater frequency and reliability without additional cost. This alternative can be implemented for around \$65 million dollars for both the roundabouts and a reconstruction of the entire roadway, bringing it well under our proposed budget. Additionally, roundabouts free up large portions of the existing right-of-way that can be rededicated to multimodal improvements and placemaking opportunities. This satisfies the needs of the communities along the corridor who already engage in pedestrian activity and have expressed a desire for reinvestment along this often-ignored corridor. Increasing safety and efficiency are top priorities among all the stakeholders who provided information for this analysis. This alternative goes the farthest at meeting both of those goals. Investment in this bold vision for urban intersection design will be a foundational catalyst that reverses the wrongs of the past and allows this corridor to realize its potential.

MONITORING

To best ensure that our preferred alternative meets the criteria laid out in this report, we recommend that 1000 Friends of Wisconsin partners with the Milwaukee County Sheriff's Office, Data You Can Use, Milwaukee County Transit System and WisDOT. Through these partnerships, we can gain meaningful insight into how well these improvements are working from access to intricate crash and transportation data systems. During the early planning phases of the project, as much data as possible should be collected to form a baseline of control for measurement. Data collected could include monitoring the number of traffic collisions, how many of those collisions were fatal, and how many involved pedestrians or bicyclists. With this baseline, we can gain a better understanding of just how much of a difference this alternative has on keeping Fond Du Lac Avenue safe and moving people more efficiently along the corridor.

APPENDIX

	Projection annual rate of change after	Current Daily Counts	Year 1	Year 2	Year 3	Year 4	Year 5
Car Projection	0%	33000	33000	33000	33000	33000	33000
Transit Projection	23%	2568	3159	3885	4779	5878	7230
Pedestrian Projection	50%	105	158	236	354	532	797
Bicycle Projection	75%	3	5	9	16	28	49
Total amount of users		35,676	36,321	37,131	38,149	39,438	41,076
https://pdxscholar.library	.pdx.edu/cengin_fa	c/144/					
47							

Appendix A – Effectiveness Criteria: Projected future roadway usage

Appendix B – Cost Criteria: Breakdown

	Average Annual Daily	Cost per Automobile	Total Project Cost
	Traffic (AADT) Count	User	
194 Stadium	158,000	\$ 7,600.00	\$ 1,200,000,000.00
Expansion			
Fond du Lac	33,000	\$ 7,600.00	\$ 250,800,000.00
Project			

-I94 Expansion: \$1.2 billion⁴⁸/158,000 AADT⁴⁹ = \$7,600/automobile user on I94

-\$7,600/user X 33,000 AADT along Fond du Lac Ave⁵⁰ = \$250,800,000 total Fond du Lac Ave project budget

-Round to \$300 million for inflation/buffer costs/uncounted non-automobile users

Appendix C – Alternative 1: Total Crashes that result in death or severe injury and where the	ıey
occur	

-		Dr	iver		Ped			Bike				Total Crashes				
	Total # of crashes	%of total Crashes	% K+A	K+A #	Total # of crashes	%of total Crashes	<mark>% К</mark> +А	K+A #	Total # of crashes	%of total Crashes	% K+A	K+A #	Total #	% of total	% K + A	# K + A
Location Type	153,916	100	0.83%	1277.503	4101	100	0.1658	679.9458	1422	100	6.68	9498.96	159,439	100%	7%	11456.41
Intersection	98918	64.3	0.75%	741.885	3003	73.2	0.1399	420.1197	1168	82.1	6.76	7895.68	103,089	65%	9%	9057.685
Midblock	54998	35.7	0.97%	533.4806	1098	26.8	0.2368	260.0064	254	17.9	6.3	1600.2	56,350	35%	4%	2393.687

⁴⁷ Monsere, C. (n.d.). Lessons from the Green Lanes: Evaluating Protected Bike Lanes in the U.S. PDXScholar. https://pdxscholar.library.pdx.edu/cengin fac/144/

⁴⁸ Sentinel, J. (2022, November 11). Wisconsin DOT has redone the Milwaukee west I-94 study. Plans remain to widen it from 6 to 8 lanes. Milwaukee Journal Sentinel. <u>WisDOT I-94 Study</u>.

 ⁴⁹ Wisconsin Department of Transportation (November 2021). "I-94 East-West Corridor Project Purpose and Need Summary". <u>https://wisconsindot.gov/Documents/projects/by-region/se/94ew-study/2021/purpose-need.pdf</u>
 ⁵⁰ Wisconsin Department of Transportation (n.d.). "WisDOT Traffic Counts"

https://wisdot.maps.arcgis.com/apps/webappviewer/index.html?id=2e12a4f051de4ea9bc865ec6393731f8

Appendix D – Alternative 1: Intersection of Fond du Lac, Burleigh, and N 35th Current:



Appendix E - Alternative 1: Intersection of Fond du Lac and Hampton **Current:**



Proposed:



Appendix F – Alternative 2: Aurora Street Expansion Context Photo⁵¹



Appendix G – Alternative 2: Proposed Station Map



⁵¹ Trumm, D. (2019, August 28). Seattle Subway Promotes Aurora Avenue Light Rail with New Renderings - The Urbanist. The Urbanist - Examining urban policy to improve cities and quality of life. https://www.theurbanist.org/2019/08/27/aurora-line-renderings/

Appendix H – Alternative 2: Station Locations Zoomed In

(White – Stations, Blue – Entrance Stairs) -Walnut



-North Ave

-Center Street



-Burleigh Street



-Capitol Drive



-Hampton Avenue



Appendix I – Alternative 2: Estimated Cost Breakdown

Estimated total project cost: \$1.7 Billion.

Lynnwood Link's \$3.3 billion budget breakdown:

8.5 miles of new track, expanded storage facilities, acquisition of 34 new railway cars, 4 new stations. Lynnwood Link elevated station: \$145 million/station⁵².

Our proposal includes:

5 miles of new track (\$80 million/mile, \$400 million total⁵³⁵³), 7 new stations (\$145 million/station, \$1 Billion total⁵²), New vehicles (Streetcar original contract: 4 streetcars for 18.6 million⁵⁴), Expansion to the current railway storage facilities, Potential sidewalk/roadway improvements and repairs.

⁵² SoundTransit System Expansion Committee. (June 10, 2021). Lynnwood Link Extension Project Update. https://www.soundtransit.org/st_sharepoint/download/sites/PRDA/FinalRecords/2021/Presentation -Lynnwood Link Extension Update 06-10-2021.pdf, Slide 23

⁵³ Light-Rail Transit (LRT). (2016, August 1). Transportation Policy Research. https://policy.tti.tamu.edu/strategy/light-rail-transit/

⁵⁴ Vantuono, W. C. (2018, February 1). Brookville streetcars for Milwaukee - Railway Age. Railway Age. https://www.railwayage.com/passenger/light-rail/brookville-streetcars-for-milwaukee/



Appendix J – Alternative 2: 30th Street Corridor Crossing (source: Google Maps)











Appendix L – Alternative 4: Cross Sections

All travel lanes are intended for shared use with both private vehicles and buses.







Appendix M – Alternative 4: Precedent Photos



Raised, separated cycle tracks. Image Source: NACTO Urban Bikeway Design Guide



Two-stage left turn queue box in Ottawa. Image Source: NACTO Urban Bikeway Design Guide



Floating bus stop in Seattle. Image Source: NACTO Urban Bikeway Design Guide

Appendix N – Alternative 4: Right-Turn Slip-Lanes to Be Closed

Fond du Lac FDL and 17th Street Fond du Lac and Sherman Fond du Lac and 60th Fond du Lac and Hampton

Reference photos on next page.



Image of a bike-only slip lane in Alexandria Virginia. Image Source: Google Maps



Closed slip lanes could be converted to plazas with plants and benches, such as the one at the intersection of Fond du Lac Avenue, North Avenue, and 21st Street. Image Source: Google Maps

Appendix O - Alternative 4: Bublr Station Map⁵⁵

This map of existing and proposed bike share stations shows the lack of stations on the northwest side of the city and along most of Fond du Lac Avenue.



Proposal for 5 additional stations w/ 10 regular bikes and 2 e-bikes per station: North, Center, Locust, Burleigh, Keefe

⁵⁵ Bublr Bikes. (n.d.). <u>https://city.milwaukee.gov/dpw/infrastructure/multimodal/Shared-Mobility/Bublr-Bike-Share</u>

Appendix P – Alternative 4: Capacity and Roadway User Calculations

This figure shows that vehicle capacity decreases as speed increases. Thus, we can predict that traffic calming measures that slow traffic speed will result in more efficient traffic flows. The graph indicates that if vehicles travel at Fond du Lac's posted speed limit of 30mph, 700 vehicles per hour can be moved through each lane, or 1,400 for two lanes.⁵⁶ NACTO's Transit Street Design Guide states that mixed traffic with frequent buses ranges from 1,000-2,800 per hour, indicating that 1,400 vehicles per hour is a safe estimate.⁵⁷ Adding the 19 passengers per bus hour served by the MCTS Blue Line bus (Ochoa, J., MCTS, 2023), we reach 1,419 users per hour.



Vehicles Per Hour Per Lane

Accommodation	Capacity / Hour
Travel lane (private vehicle, bus)	1,419
Bike lane	7,500
Sidewalk	9,000
Total:	17,919

This estimation shows that this model can achieve the highest AADT of 33,000 in under 2 hours. Numbers come from the NACTO Transit Design Guide.

Projected bicycle and pedestrian demand is not expected to reach this capacity, as shown in Appendix A. Based on current pedestrian and bicycle counts, demand is expected to only reach 797 pedestrians and 49 bicyclists five years after implementation. See Appendix A.

⁵⁶ Babadjanov, A. (2018, January 27). The supply and demand of street space - the urbanist. The Urbanist -Examining urban policy to improve cities and quality of life. <u>https://www.theurbanist.org/2016/05/26/the-supply-and-demand-of-street-space/</u>

⁵⁷ Designing to Move People | National Association of City Transportation Officials. (2016, May 17). National Association of City Transportation Officials. <u>https://nacto.org/publication/transit-street-design-guide/introduction/why/designing-move-people/</u>

Appendix Q – Alternative 4: Case Studies Regarding Benefits of Bike Infrastructure

Protected Bike Lane – Chicago⁵⁸

- 49% of respondents felt motorist behavior improved on Kinzie Street post-installation
- Bicycle counts during morning rush hour increased 55% post-construction
- Little to no effect on automobile traffic and travel times

Protected bike lanes in NYC⁵⁹

- Injury crashes for all road users (drivers, pedestrians, cyclists), typically drop by 40% and by more than 50% in some locations
- Cycling more than doubled but number of fatal cycling crashes and serious injuries decreased

Economic benefits of bike infrastructure

- On Salt Lake City's Broadway, retail sales increased by 8.8% after replacing parking with protected bike lanes (Salt Lake City DOT)
- After installing a protected bike lane on 9th Avenue in New York City, local businesses experienced a 49% increase in retail sales (NYC DOT)

Raised Crosswalks in Cambridge, MA⁶⁰

motorists yielding to pedestrians increased from 10% to 55%

Appendix R - Alternative 4: Cost Calculation

Cost per Bublr station with 10 bikes = \$55,467West Allis is spending \$499,200 for 9 stations and 90 bikes: 499,200 / 9 = $55,467^{61}$

5 stations with 10 bikes each = \$277,335 (55,467*5)

Cost per e-bike = \$2,000 (average price according to REI⁶²)

2 e-bikes at 5 stations = \$20,000 (2,000*2*5)

277,335 + 20,000 = 297,335

Total cost for 5 stations with 10 bikes and 2 e-bikes at each = \$297,335

⁵⁸ Chicago Department of Transportation. (September 2011). Initial Findings: Kinzie Street Protected Bike Lane. <u>https://www.chicago.gov/content/dam/city/depts/cdot/bicycling/publications/Kinzie Initial Findings.pdf</u>

⁵⁹ City of New York Office of the Mayor (March 21, 2011). *Memo on Bike Lane Implementation*. <u>https://www.nyc.gov/html/om/pdf/bike_lanes_memo.pdf</u>

⁶⁰ <u>https://pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=y</u>

⁶¹ City of West Allis (n.d.) Bike Share in West Allis – FAQs <u>https://www.westalliswi.gov/DocumentCenter/View/7118/Bike-Share-in-West-Allis-FAQs?bidId=</u>
⁶² How much do electric bikes cost2 (2022, December 28) PEL https://www.roj.com/loarn/orport.advice/cost

⁶² How much do electric bikes cost? (2022, December 28). REI. <u>https://www.rei.com/learn/expert-advice/cost-electric-bikes.html</u>

The 0.6 mile reconstruction of Walnut Street cost \$8.1 million.⁶³ Based on this cost, the 5-mile stretch of Fond du Lac Avenue would cost about \$68 million. (8,100,000/6)*10 = 13,500,000 per mile 13,500,000*5 = 67,500,000 for the 5-mile corridor Round up to 68,000,000 to factor in landscaping

A standard bus shelter costs about \$10,000, according to Jesus Ochoa of MCTS. There are 46 bus stops along the corridor. Adding a new shelter at each stop will cost an estimated \$460,000.

Cost in Dollars					
Roadway reconstruction	68,000,000				
Bus shelters	460,000				
Bublr stations	297,335				
Total:	68,757,335				

Appendix S - Alternative 4: Equity Calculations

Safety Benefits by Improvement^{64 65}:

Protected bike lanes: 40% reduction in injuries for all users Raised crosswalks: 55% reduction in pedestrian crashes High visibility crosswalks: 40% reduction in pedestrian crashes Speed reduction (from 40 to 30 mph): 40% reduction in pedestrian fatality risk

Based on these figures, we are assuming a 40% reduction in traffic fatalities from the proposed redesign⁶⁶.

https://city.milwaukee.gov/dpw/infrastructure/supportforbusiness/projectsummaries/West-Walnut-Street

⁶⁴ City of New York Office of the Mayor (March 21, 2011). *Memo on Bike Lane Implementation*. <u>https://www.nyc.gov/html/om/pdf/bike_lanes_memo.pdf</u>

<u>fatalities/#:~:text=In%202022%2C%2023%20pedestrians%20were,fatalities%20since%20at%20least%202010</u>. ⁶⁶ Crosswalk visibility enhancements. (n.d.). FHWA. <u>https://highways.dot.gov/safety/proven-safety-</u>

⁶³ West Walnut Street. (n.d.).

⁶⁵ McGinnis, M. (2023, February 22). Learning from Milwaukee's Record-High Pedestrian Fatalities - Wisconsin Bike Fed. Wisconsin Bike Fed. <u>https://wisconsinbikefed.org/advocacy/safety/learning-from-milwaukees-record-high-pedestrian-</u>

Crosswalk visibility enhancements. (n.d.). FHWA. <u>https://highways.dot.gov/safety/prover</u> <u>countermeasures/crosswalk-visibility-enhancements</u>

Appendix T – Alternative 4: Political Feasibility





Although WisDOT does not typically reduce lanes on state highways, the National Avenue project shows that there is precedent for WisDOT to support lane reductions to allow bicycle and pedestrian infrastructure if there is strong local support. Therefore, WisDOT support for the proposed redesign would be dependent on the level of vocal local support.

Fond du Lac and North Area Plan (Although the roadway capacity would be increased for all users, we do not anticipate that the full capacity will be utilized based on current bicycle and pedestrian counts.

Fond du Lac and North Area Plan⁶⁷ – Areas of Agreement with Alternative 4

- Curb extensions, pedestrian lighting, bike parking, transit waiting areas, on-street parking
- Maximize pedestrian space as proportion of overall ROW, allow for sidewalk expansion into curb lane where appropriate
- Narrow streets and repurpose excess ROW for pedestrian amenities.
- Repurpose extra travel lanes for other uses such as wider sidewalks, landscaping, and improved bike facilities

⁶⁷ Milwaukee Department of City Development (November 2021), Milwaukee Comprehensive Plan – Fond du Lac and North. <u>https://city.milwaukee.gov/ImageLibrary/Groups/cityDCD/Fondy-and-North1222021REDUCED.pdf</u>

- Retrofit streets with traffic calming measures intended to reduce speed of motor vehicles
- Implement geometric design changes to slow traffic and increase pedestrian safety
- Prioritize reducing vehicle speed over congestion mitigation

West Side Area Plan⁶⁸ – Areas of Agreement with Alternative 4

- Rethink and redesign major arterials to be context-sensitive surrounding neighborhoods, business districts and adjacent land use
- Create a public ROW that includes space for pedestrians, bicycles, automobiles, and mass transit on major arterials.
- Design cross sections and dedicate ROW for mass transit, automobiles, bicycles and pedestrians
- Phase out uses that are solely automobile-oriented and do not provide pedestrian connections to the surrounding neighborhoods
- Make triangles in the public ROW created by three-way street crossing, landscape features that identify and enhance the appearance of the West Side

Near North Side Area Plan⁶⁹ – Areas of Agreement with Alternative 4

- Improve major thoroughfares as complete streets
- Improve streetscaping and calm traffic on major thoroughfares to increase "retailability" and improve safety for area residents
- Make walking safe, attractive, easy, and convenient
- Include traffic calming elements to increase the safety and security of pedestrians and bicyclists
- Where appropriate, improve the public ROW to include space for pedestrians, bicycles, and mass transit
- Prioritize the movement of people rather than individual vehicles

⁶⁸ Milwaukee Department of City Development (November 2021), Milwaukee Comprehensive Plan – West Side <u>https://city.milwaukee.gov/ImageLibrary/Groups/cityDCD/planning/plans/West/plan/WestPlan.pdf</u>

⁶⁹ Milwaukee Department of City Development (November 2021), Milwaukee Comprehensive Plan – Near North <u>https://city.milwaukee.gov/ImageLibrary/Groups/cityDCD/planning/plans/NearNorth/pdfs/NearNorthPlan-w-CTC.pdf</u>