FIX AT SIX:

A SUSTAINABLE ALTERNATIVE TO EXPANDING I-94 IN MILWAUKEE

1000 Friends of Wisconsin | ACLU of Wisconsin | Midwest Environmental Advocates
Sierra Club-Wisconsin Chapter | Wisconsin Environment | WISPIRG

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Executive Summary

THE CHALLENGE

The segment of Milwaukee's I-94 East-West highway between the Marquette and Zoo interchanges is a deteriorated, 3.5-mile long, 60-year old stretch of legacy highway. The road should be repurposed, redesigned, and rebuilt to perform a new role in advancing the transportation, economic, environmental, and social goals of the 21st century.

The case against expansion is stronger than ever. The expansion of I-94 and the construction of enormous interchanges will increase vehicle miles traveled, increase greenhouse gas emissions, promote sprawl development, and damage the social and economic fabric of the neighborhoods it traverses. The Wisconsin Department of Transportation's (WisDOT) traffic projections don't make sense in the context of today's changing commuting patterns. Nationwide, the evidence shows that highway expansion only makes congestion worse. In fact, many cities are rethinking their existing highways. An alternative approach can make things better for all greater Milwaukee area residents.

WHAT SHOULD THE I-94 PROJECT LOOK LIKE?

A sustainable, equitable alternative to the expansion proposal should meet three tests: it should promote racial equity, it should confront climate change, and it should be demonstrably feasible. The Transit/Rehab Alternative, also referred to as Fix at Six, proposed here meets these criteria.

This alternative will:

- Repurpose, redesign, and rebuild I-94's roadway to meet 21st century needs.
- Build a modern rapid transit system to improve mobility in the East-West Corridor.
- Promote thriving, walkable/bikeable neighborhoods in the East-West Corridor.

We recommend the Transit/Rehab Alternative, which opens the way to a new collaborative, community-based vision for the East-West Corridor. The concept will include the following elements:

1. Repair the road's pavement and bridges as needed, but minimize new pavement and keep the current six lanes. WisDOT's Final Environmental Impact Statement (FEIS) discusses the pavement deficiencies and makes a strong case that full replacement is needed.[1] The new pavement should be designed using the latest and best techniques for minimizing carbon footprint, managing stormwater, maximizing safety, and sustaining a long life.

2. Add a new bus rapid transit (BRT) line along National and Greenfield avenues. The East-West Corridor is full of opportunities for adding transit. This second line, augmented by future north-south lines, would improve the throughput of people in the corridor while reducing vehicle miles traveled (VMT) and air emissions. To further environmental justice goals, support should be given to the new north-south BRT route along 27th Street as proposed by the MPO.

3. Promote thriving, walkable/bikeable neighborhoods in the East-West Corridor by building bicycle infrastructure near the corridor as listed in the 2010 Milwaukee Bicycle Master Plan. This includes on bridges crossing the Menomonee Valley, and turning Wisconsin Highway 175 (Stadium Freeway) into a bicycle and pedestrian friendly boulevard that connects communities. The goal is to create safer streets that address traffic-related deaths by fixing dangerous arterials near the I-94 corridor.

4. Explore future opportunities to maximize sustainable alternatives including additional north-south BRT routes, commuter rail, and better housing and zoning practices including Transit-Oriented Development (TOD).

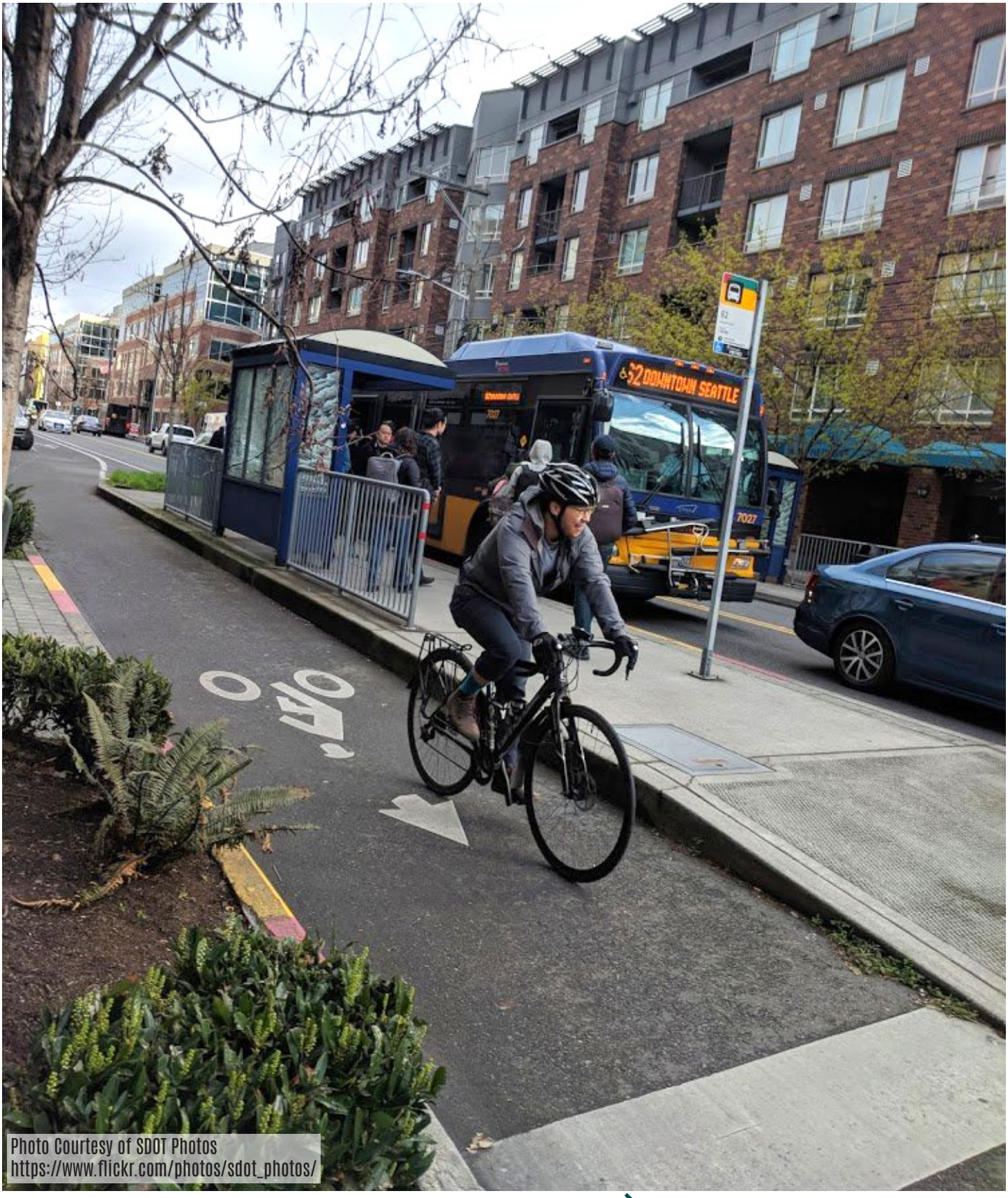


Photo Courtesy of SDOT Photos
https://www.flickr.com/photos/sdot_photos/

We recommend a context-sensitive re-imagining of the I-94 East-West Corridor. This includes repairing the road's existing pavement and bridges, building a new bus rapid transit (BRT) line along National and Greenfield Avenues, developing new walking and bicycle infrastructure, and turning Wisconsin Highway 175 (Stadium Freeway) into a bicycle and pedestrian-friendly boulevard.

Transit/Rehab Elements

There are four main elements that make the Transit/Rehab alternative a feasible, equitable, and sustainable choice:

1. REPURPOSE, REDESIGN, AND REBUILD THE EXISTING ROADWAY TO MEET 21ST CENTURY NEEDS.

The existing legacy highway should be rebuilt but not expanded. This rehab will reduce regional greenhouse gas emissions, remediate past harmful effects on racial equity, restore wetlands and open space, minimize stormwater runoff, and revitalize neighborhoods. Recommendations which are likely to emerge from a reoriented planning process include:

- Replace the pavement and repair the bridges.
- Fix safety hotspots.
- Downsize interchanges and ramps.
- Accommodate more transit.
- Develop a corridor management plan using the best transportation systems management and operations techniques.
- Develop a comprehensive stormwater management plan.
- Reroute I-94 onto I-894 to reduce travel through downtown.

2. BUILD A MODERN RAPID TRANSIT SYSTEM TO IMPROVE MOBILITY IN THE EAST-WEST CORRIDOR.

A new bus rapid transit system will provide high-quality rapid transit in the corridor. The proposed Transit/Rehab alternative includes the Wisconsin Avenue line, which is currently under construction, and proposes another line mostly following National and Greenfield Avenues. Stations on the National/Greenfield line can be determined at a later date, but good candidates include: Wisconsin Center, Milwaukee Intermodal, Harley-Davidson Museum, Potawatomi Bingo Casino, Cesar Chavez, Clarke Square, Silver City, West Milwaukee, Zablocki VA Center, Liberty Heights, West Allis Tech Center, State Fair, Lafayette Park, Rosehill, and Greenfield Gardens. Future north-south connections along 27th street will tie the system together.

Local bus service will still be the workhorse of public transportation in the corridor. The Milwaukee County Transit System is now implementing its MCTS NEXT plan, which will reorganize the bus network to increase the number and length of high frequency routes while advancing racial equity.

3. PROMOTE THRIVING, WALKABLE/BIKEABLE NEIGHBORHOODS IN THE EAST-WEST CORRIDOR.

Improving transportation in the corridor includes improving “access” - how people can get to the places they need to go. A major question for the corridor and its surrounding neighborhoods is: can someone get to the places they need to go within a 15-minute walk or bike ride?

Cycling is growing rapidly as a transportation choice and is an important part of neighborhood mobility. Milwaukee and other communities in the corridor should build out their bicycle plans. They should also build protected bike lanes – the current best practice for bicycle facilities – including on bridges crossing the Menomonee Valley. Cyclists should be able to access the transit system efficiently.

Converting Wisconsin Highway 175 (Stadium Freeway) into a bicycle and pedestrian friendly boulevard would also help to restore "missing links" that will better connect the street grid around I-94 with upgraded signals, better sidewalks, and more intensive transit. Converting this freeway to a boulevard opens up opportunities to reconnect the community and address equity concerns, while also incorporating better stormwater management, enhancing pedestrian connections to the surrounding neighborhoods, and promoting business development.

As an environmental justice issue, highway and urban designers should meaningfully collaborate with community members in the surrounding neighborhoods. The goal should be to upgrade this street and explore other critical roads in the East-West Corridor including Wisconsin Avenue, Bluemound Road, Canal Street, National Avenue, and Greenfield Avenue.

4. EXPLORE FUTURE OPPORTUNITIES TO MAXIMIZE SUSTAINABLE ALTERNATIVES FOR THE REGION

A commuter rail line serving Milwaukee's western suburbs can provide a clean, modern, effective, climate-friendly alternative to automobile commuting on I-94. Development of the line will benefit from investments already planned by WisDOT and Amtrak. Stations in the East-West Corridor could include Milwaukee Intermodal, Brewers Stadium, Miller Valley, Wauwatosa, Mayfair Road, and Elm Grove, with service continuing on to Waukesha, Oconomowoc, and Madison.

Transit Oriented Development – planned, mixed-use development around transit stations – benefits both neighborhood development and transit usage. The City of Milwaukee has done Transit Oriented Development planning studies for future streetcar extensions and similar studies should be done for BRT lines. Brief case studies for possible station area studies are given in the appendix for Concordia (Wisconsin at 27th Street), Silver City, West Milwaukee, and West Allis Tech Center. Better housing and zoning practices should be developed, in collaboration with surrounding neighborhoods to achieve the best possible transportation and land use outcomes.

Photo Courtesy of Google Street View

Expanding I-94 will not reduce congestion, but will perpetuate a status quo that has hurt transit service and made walking and biking more dangerous. By turning Wisconsin Highway 175 (Stadium Freeway), seen above, into a bicycle and pedestrian-friendly boulevard, WisDOT and the City of Milwaukee can better connect surrounding neighborhoods while reducing emissions.

Why Expansion is not the Right Choice!

Expanding the segment of I-94 between the Zoo and Marquette interchanges by adding new travel lanes and constructing enormous interchanges would promote increased vehicle miles traveled, increase greenhouse gas emissions, promote sprawl development by encouraging longer trip lengths, increase polluted runoff to area waterways, and damage the social and economic fabric of the neighborhoods it traverses.

The Purpose and Need narrative in the Final Environmental Impact Statement (FEIS) for the proposed expansion project includes some reasonable "purpose" statements: maintain a key link in the regional transportation system, improve safety, and replace deteriorating pavement.

However, the real catalyst for the project as it has emerged from the process so far is the purpose statement *"Accommodate existing and future traffic volumes at an acceptable level of service."*[2] The project is, in fact, scaled to match a predicted ever-growing tide of peak hour automobile traffic and to keep the speeds of those automobiles up as much as possible.

The prediction of 0.2% to 0.5% annual increase in traffic volume on I-94 well into the future[3] clearly makes no sense for the times in which we live. The pandemic has led to major changes in working and commuting patterns, and many of these changes are likely to persist. A recent study by University of Chicago economists, based on extensive survey research, predicts that "*American workers will supply about 20% of full workdays from home in the post-pandemic economy, four times the pre-COVID level."*[4]

A recent survey of Milwaukee-area employers found a similar trend, with two-thirds anticipating that employees *"will have increased flexibility in their work arrangements including remote work"* in the future and more than half saying that employees *"will frequently work remotely or work under a remote/ in-office hybrid model."*[5]

In addition to reducing total commuting hours, these changes are predicted to "flatten the curve" of peak-hour commuting, which is typically the main impetus for highway expansions.[6]

Aside from this baseline prediction, three flawed conclusions stand out in the FEIS' discussions of future traffic:

1. **WisDOT dismisses increases in VMT as *"not relevant to projects such as the I-94 East-West Corridor study*** *because VMT provides aggregate state or county trends that are not applicable to location-specific traffic forecasts."*[7]

2. **WisDOT dismisses induced travel as *"not expected to substantially increase"*** due to the proposed expansion, even though many national studies suggest otherwise.[8]

3. **Since WisDOT believes induced demand will not occur, the project will have minimal increases in greenhouse gas emissions.** WisDOT argues that no project-level GHG analysis is required, because *"the available analysis tools are not sensitive to meaningful project level differences among alternatives."*[9]

However, more important than raising specific criticisms about the treatment of traffic and congestion in the FEIS is recognizing the fundamental flaw in the thinking that it represents: **expanding highways does not solve congestion problems.**

A recent study of highway expansion and congestion in metro areas throughout the country by the advocacy group Transportation for America concluded:

> *"Our main national strategy for addressing congestion is failing to produce results. Put simply, our investments aren't working. With our growth in highway lane-miles significantly outpacing population growth, you would expect us to at least be keeping pace with congestion in the nation's urban regions, if not reducing it. We aren't…In fact, congestion has grown significantly faster than population.[10]"*

Even *"places that added new road capacity most aggressively did not consistently see slower growth in delay—and in some cases, saw much higher growth in delay."*[11] The report concludes that attacking congestion requires a much more systemic approach, including promoting better land use and reducing the number and lengths of trips.

Fortunately, the old dogma that more lane-miles are a good idea is being widely challenged. A recent article in Governing magazine asks:

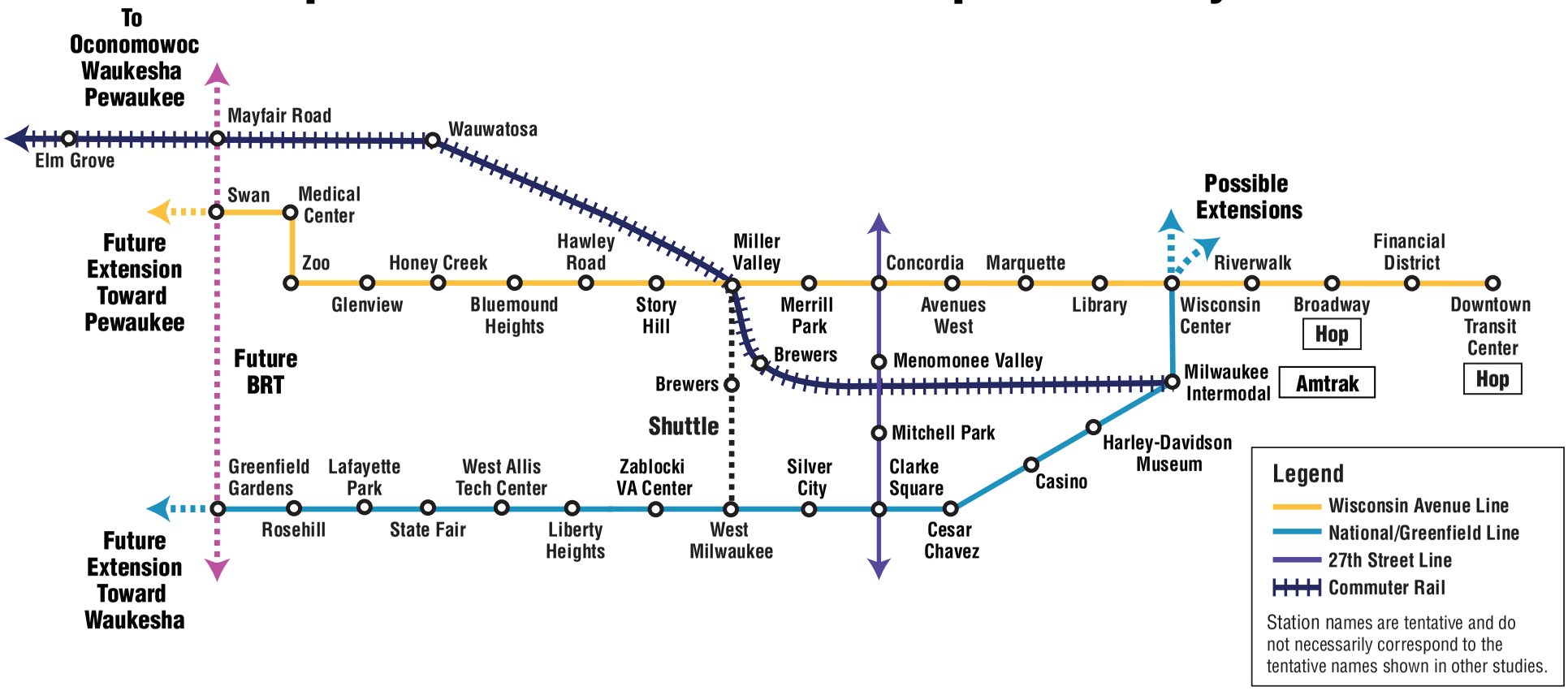
> *"It's clear that adding lanes to urban expressways or building new ones doesn't reduce congestion. Sometimes it makes things worse. So why do we keep doing it?"*[12]

And a recent story in the New York Times noted that:

> *"As midcentury highways reach the end of their life spans, cities across the country are having to choose whether to rebuild or reconsider them."*[13]

All these negative effects of highway expansion can be avoided – and corridor and community mobility supported – through adopting the sustainable Transit/Rehab alternative proposed here. Furthermore, the Transit/Rehab option anticipates incorporating many of the same improvements included in the "Six-Lane Modernization Option" laid out in the original FEIS, which **even WisDOT concedes fixes most of the infrastructure, safety, and operational problems it identifies on the roadway.**

Proposed Milwaukee East-West Rapid Transit System



Why is the Transit/Rehab Alternative Superior to Expansion?

We believe that a sustainable alternative to the expansion proposal should meet three tests: it should **promote racial equity**, it should **confront climate change**, and it should be **demonstrably feasible**.

RACIAL EQUITY

The tide of support for the pursuit of racial justice that has swept the nation after the death of George Floyd has inevitably engulfed the world of transportation planning. The history of old highway projects that destroyed African American neighborhoods, such as I-43 in north Milwaukee, has been revisited. Some of these older projects, such as the Claiborne Expressway that tore apart the Treme neighborhood in New Orleans, have been targeted for teardown.

New highway projects that would cause similar damage today, such as the expansion of I-45 in Houston, have been – at least for now – stopped. Remediation for past damage is being pursued, as with the project to place a cap on I-94 in St. Paul to reconnect the predominantly African American Rondo community. Additionally, the Biden Administration has adopted a goal of requiring that 40% of the benefits of infrastructure projects go to disadvantaged communities.

It is beyond the scope of this paper to discuss the racial equity impacts of expanding I-94, a topic that is being addressed elsewhere. What we should do, however, is note that the alternative proposed here will advance the cause of racial equity by:

- Using transit investment to leverage economic development in the neighborhoods.
- Providing improved access to jobs via transit.
- Improving walking and biking options in the neighborhoods.
- Providing transportation choices for people without access to cars.
- Improving public health by reducing pollution along the highway.

CLIMATE CHANGE

Climate change is an existential threat which requires our full attention. The transportation sector must play a vital role in combating climate change in this country because it generates about 28% of all greenhouse gas emissions. The proposed expansion of I-94 in the East-West Corridor would be a disaster for the effort to fight climate change, promoting increased vehicle miles traveled, propping up an automobile-reliant economy and society, encouraging sprawl development, and consuming a billion dollars of resources that could otherwise be used to support high-quality transit serving liveable neighborhoods.

Our proposed alternative, by contrast, would put in place a suite of infrastructure and policy initiatives that would reduce VMT and support cleaner travel options, including rapid transit, local transit, and active transportation.

FEASIBILITY

The alternative proposed here offers a transformative future for transportation in Milwaukee's East-West Corridor. But to be implemented, an alternative must be more than transformative – it must be feasible.

All of the infrastructure and policy proposals outlined in this paper are based on existing and available technology and statutes, although open to exploiting emerging opportunities.

Funding, of course, is always an important consideration for transportation initiatives. It is important to underscore that funding for all these proposals is available under existing federal programs. And the future promises more resources for transit, active transportation, and community-based programs and, hopefully, fewer resources for highway expansion. For instance, the federal discretionary transportation RAISE program – formerly known as TIGER and BUILD – now prioritizes *"projects that can demonstrate improvements to racial equity, reduce impacts of climate change and create good-paying jobs."*[14]

Replace the road's existing pavement and repair its bridges as needed, but keep the corridor at six lanes. WisDOT needs to honestly evaluate the Transit/Rehab Option as a feasible alternative by accounting for the impacts on surrounding neighborhoods and environmental justice populations. *Photo Courtesy of 1000 Friends of Wisconsin*

Conclusion: Build the Transit/Rehab Alternative

The segment of Milwaukee's I-94 East-West highway between the Marquette and Zoo interchanges is a deteriorated, 3.5-mile long, 60-year old stretch of legacy highway. The road should be repurposed, redesigned, and rebuilt to perform a new role in advancing the transportation, economic, environmental, and social goals of the 21st century.

The road should be scaled to fit into a sustainable metropolitan transportation system and to advance long-term mobility and accessibility goals. The next phase of the road's life should be planned to **reduce regional greenhouse gas emissions**, not just to minimize their increase. It should be designed to **remediate the harsh effects of its original construction on racial inequity**. Its footprint should be redrawn to **restore wetlands and green space**, to **protect water and air quality**, and to **revitalize neighborhoods** damaged by its original construction.

We recommend the following steps to advance the Transit/Rehab Option:

1. ***Ensure that the Supplemental Environmental Impact Statement:***
    - Includes a Purpose and Need statement that incorporates climate change, racial equity, and other key issues omitted in the FEIS.
    - Addresses the gaps in the FEIS traffic analysis identified in this paper.
    - Honestly evaluates the Transit/Rehab Option as a feasible alternative by accounting for the impacts on surrounding neighborhoods and environmental justice populations.

2. ***Initiate planning studies*** for the National/Greenfield BRT line, BRT/Hop linkages, accelerated bicycle and pedestrian projects, Transit Oriented Development (TOD) opportunities, and I-94 community visioning.

3. ***Pursue federal discretionary funding.***

ABOUT THE AUTHOR

Mark Stout is an independent transportation consultant. His consulting practice addresses a wide range of transportation policy issues, including climate change, transportation and land use, and state and federal funding challenges. His clients include state transportation departments, national and state nonprofit and advocacy groups, and metropolitan planning organizations. His work is supported by a network of specialists in such disciplines as traffic engineering, safety engineering, air quality, aviation planning, transit planning, bridge design, and historic preservation. His work in Wisconsin has included reports prepared for WISPIRG addressing the previous effort to expand I-94 in Milwaukee.

Dr. Stout previously served more than 25 years with the New Jersey Department of Transportation. As Assistant Commissioner for Planning and Development he was responsible for the divisions of planning, capital programming, project development, local aid, freight services, aeronautics, and environmental resources, and for managing relations with the state's three metropolitan planning organizations. He has also served as a legislative assistant in the U.S. Congress.

Dr. Stout maintains a Smart Transportation blog on his website at *mlstoutconsulting.com*.

While BRT will be the backbone of the East-West transit corridor, local bus service will continue to be the workhorse of public transportation. *Photo Courtesy of David Loken.*

Appendix: Project Specifics

TRANSIT ELEMENTS

Bus Rapid Transit (BRT)

The Wisconsin Avenue BRT line, which is currently under construction, should be the first leg of a high-quality rapid transit system in the East-West Corridor that will support healthy communities and provide a clean and efficient mobility option connecting people to where they want to go.

The new BRT line has been awarded a $40.9 million grant from the Federal Transit Administration, enabling the Milwaukee County Transit System to move forward with construction in 2021[15] (recently topped off with another $2.1 million grant).[16] It is gratifying to note that the planned system follows the general alignment recommended by us for the Wisconsin Avenue corridor in a 2014 paper, "The Rehab/Transit Option: A Better Solution for Milwaukee's East-West Corridor," (and roughly follows earlier plans as well).

Bus rapid transit is a good choice for the corridor. As the Federal Transit Administration defines it:

> *"Bus Rapid Transit (BRT) is a high-quality bus-based transit system that delivers fast and efficient service that may include dedicated lanes, busways, traffic signal priority, off-board fare collection, elevated platforms and enhanced stations.[17]"*

The five "basic features" of a bus rapid transit system, according to the Institute for Transportation and Development Policy (ITDP), the leading authority on the subject, are:

1. Dedicated right-of-way – Buses in a BRT system should be separated from mixed traffic to the extent possible.
2. Busway alignment – Center-of-the-roadway alignments are better than curbside alignments.
3. Off-board fare collection – Paying on the bus causes delays.
4. Intersection treatments – Prevent turning movements across buses at intersections where possible. Give buses traffic signal priority.
5. Platform-level boarding – This speeds boarding while also facilitating riders with disabilities, wheelchairs, strollers, etc.[18]

The ITDP BRT Guide rates existing and planned U.S. systems according to how well they meet these standards. Only one system, the Albuquerque ART, rates as "Gold," while Cleveland's HealthLine and Hartford's CTFastrak rate as "Silver."[19] Five systems are rated as "Bronze," including Richmond's The Pulse, which is the most similar to Milwaukee's planned system.[20]

Richmond's system began operations in 2018. It is 7.6 miles long with 14 stations (compared to Milwaukee's 9.0 miles and 17 stations). It has a combination of center-running right-of-way, curbside bus lanes, and mixed traffic segments (Milwaukee's will use a combination of mixed traffic segments and dedicated right-side travel lanes). Both feature an alignment that connects downtown, major medical centers, a university area, civic buildings, and urban and suburban neighborhoods. Both provide (or will provide) 10-minute service in peak hours and 15- to 30-minute service off-peak. Both also launched (or will launch) in coordination with a system-wide bus network redesign.

Given the similarities, it is encouraging that the ITDP case study, while noting the many hurdles that had to be overcome to plan, build, and implement the Richmond system, rates it as a success story:

> *"GRTC [the local transit agency] and their local, state, and federal partners succeeded in bringing a high-quality BRT corridor, the region's first rapid transit service, to the Greater Richmond Area. Outreach staff who repeatedly canvassed the corridor and engaged community advocates were essential to building a coalition of project supporters. GRTC and the City of Richmond addressed local concerns about parking impacts with a block-by-block parking management plan. Today, the Pulse is exceeding ridership forecasts in part because it eliminates common causes of delay, and provides a high-quality passenger experience. It remains to be seen to what extent GRTC, the City of Richmond, and the region can build upon the success of the Pulse and expand frequent transit service into underserved neighborhoods."*[21]

The Wisconsin Avenue line, as presently designed, can form the first leg of a fully-functioning, successful East-West rapid transit system that can meet the needs of the 21st century. But more needs to be done.

We recommend three next steps:

1. **Complete the Wisconsin Avenue BRT** using a robust partnership to achieve the highest-quality system.
2. **Plan and build the second leg of the East-West BRT transit corridor along National Avenue and Greenfield Avenue**, to be followed by North-South connections on 27th Street.
3. **Extract full value from the new transit network using a collaborative planning** process to provide significant social and economic benefits to the communities in the corridor.

As suggested by the ITDP rating system discussed above, bus rapid transit systems consist of many design elements – alignment, right-of-way exclusivity, etc. – that can be put together in various packages. And the nature of that combination determines the overall effectiveness (gold, silver, bronze, etc.) of the system.

When it comes to designing a BRT system, the devil is very definitely in the details. **That is why planners, transit advocates, advocacy groups, and neighborhood leaders must form a robust partnership to refine and pursue the best choices.**

Transportation professionals know that any major project generates opposition coming from various sources and for various reasons. In the case of BRT projects, the issues usually relate to parking and lane usage. Street space, including parking space, is valuable and its use can be hotly contested. Proprietors of abutting businesses are often very concerned about how changes in traffic flow and on-street parking will affect them. Continuing, intensive, fine-grained community involvement is critical to moving forward.

The following issues should be considered:

1. Dedicated lanes are much better than mixed traffic. Dedicating lanes, whether fully protected or just striped, means taking over general purpose travel lanes or reducing parking.
2. Left turns at intersections slow buses down and should be minimized. Motorists sometimes object to any restrictions on their ability to make turns.
3. Station design must be attractive enough for businesses and residents to consider them beneficial to the neighborhood.
4. The project must include street design as well as busway design. That means that pedestrian and bicycle facilities, pavement markings, trees, and street furniture must combine to create an overall pleasant and harmonious impact.
5. Above all, the BRT must be operated at frequencies (10-minute intervals, now planned for at least peak periods, is best) that make the service convenient enough to attract riders and effectively serve the needs of the neighborhoods. Any relaxation of this standard would be a critical error.

While pursuing effective implementation of the Wisconsin Avenue BRT, planners and activists should at the same time begin planning for the second leg of the East-West system, south of the Menomonee River Valley.

Building the second leg, which would follow generally the alignment of National Avenue and Greenfield Avenue and which would link to key points on the Wisconsin Avenue line, is essential to providing a fully effective alternative to I-94 for connecting people in the corridor to jobs and other important destinations.

The National/Greenfield line proposed here is based largely on the proposal laid out by the author in the 2014 paper "The Rehab/Transit Option: A Better Solution for Milwaukee's East-West Corridor." Although that paper did not select a preferred technology (BRT, light rail, or streetcar), it is well-suited for BRT. It is also advisable to use a consistent technology (in this case BRT) for the whole rapid transit network. Sharing technology and branding will benefit both the operator and the user. The proposed route alignment is also generally congruent with Corridor 4 of the 8 rapid transit corridors recommended in the MPO long-range plan.[22]

A station-by-station description of the proposed route will provide a good introduction to the proposed National/Greenfield line.

Wisconsin Center (N. 4th and W. Wisconsin)
This station forms the eastern terminus, for planning purposes, of the proposed National/Greenfield line, which would interchange here with the Wisconsin Avenue BRT line. The Wisconsin Center is the state's flagship convention center and is currently planning a major expansion, which will bring exhibit space to 300,000 square feet and support 2,300 full-time jobs.[23] Future extensions can be planned to the north and east.

Milwaukee Intermodal (N. 5th and W. St. Paul)
Milwaukee Intermodal Station provides service for Amtrak and intercity and local buses. The currently proposed increase in Amtrak service in the region – together with the bus rapid transit and commuter rail service proposed in this paper – would make Milwaukee Intermodal a true transportation hub and a real engine for downtown development.

Harley-Davidson Museum (S. 6th and W. Canal)
The museum is one of the city's prime tourist attractions, located in an area with good transit-oriented redevelopment potential.

Potawatomi Casino (S. 16th and W. Canal)
The Potawatomi Hotel and Casino is "Wisconsin's number one tourist destination" according to Visit Milwaukee.[24] The complex had more than 2,000 employees prior to the pandemic and at the time of this writing is gradually reopening and rehiring.[25]

Cesar Chavez (S. 16th and W. National)
This station would serve the Cesar Chavez commercial district, the heart of the city's Latinx community.

Clarke Square (S. Layton Boulevard and W. National)
This station would serve the adjacent, diverse Clarke Square neighborhood. This will be an interchange station with the proposed 27th Street North-South BRT line.

Silver City (S. 35th and W. National)
Silver City is a lively, diverse, redeveloping neighborhood but this intersection needs to be reworked to improve pedestrian safety. This area will be discussed further in the Transit Oriented Development section of this report.

West Milwaukee (W. National at Brewers Boulevard)
This station would serve the adjacent Komatsu redevelopment site, area retail outlets, and residences. It could also serve as a site for a connector to American Family Field and to the Wisconsin Avenue line. This area will be discussed further in the Transit Oriented Development section of this report.

Zablocki VA Center (W. National near the VA main entrance)
The VA center is one of Milwaukee's major employers, drawing thousands of visitors each year.

Liberty Heights (S. 60th and W. National)
A station in this general area would serve surrounding residential neighborhoods.

West Allis Tech Center (S. 70th and W. National)
The former Allis-Chalmers site is a redevelopment area with various employers, as well as the Milwaukee Area Technical College. Downtown West Allis is nearby. This area will be discussed further in the Transit Oriented Development section of this report.

State Fair (W. Greenfield in the vicinity of the main entrance)
The State Fair Park is home to the Wisconsin State Fair, the Wisconsin Expo Center, the Milwaukee Mile Speedway, and the Pettit National Ice Center.

Lafayette Park (S. 92d and W. Greenfield)
This station would serve local neighborhoods.

Rosehill (S. 101st and W. Greenfield)
This station could host a park-and-ride facility serving I-41.

Greenfield Gardens (S. 108th and W. Greenfield)
This station serves as the likely terminus of Phase One of the National/Greenfield line. It would also serve as terminus of the North-South line following along 108th Street as proposed in the MPO long-range plan.

This station serves as the likely terminus of Phase One of the National/Greenfield line. It would also serve as terminus of the North-South line following along 108th Street as proposed in the MPO long-range plan.

The termini described here for the East-West National/Greenfield line (Wisconsin Center in the east and 108th Street in the west) are selected for initial planning purposes. In fact, the line could be extended to the east, running along the same route as the Wisconsin Avenue line, or to the north. And it should when feasible be extended to the west, toward Waukesha, as recommended by the MPO.[26]

To prepare for the future, we recommend that the "West National Avenue Replacement" study now being undertaken by the city of Milwaukee[27] be broadened to include planning for incorporating future BRT lanes and stations.

The two parallel BRT routes discussed here will provide fast, high-quality transit service on the East-West Corridor. The mobility provided by these routes will be magnified by providing North-South connectors. The critical connector is probably the 27th Street route, as proposed by the MPO.[28] This corridor, currently served by the MCTS Purple Line, is already under study for upgrading to BRT status.[29] Plans should also be made for a connector or shuttle service to American Family Field from the Miller Valley station on the Wisconsin line and the West Milwaukee station on the National/Greenfield line.

Planning, designing, and building a BRT network does not necessarily prohibit the application of future technology in those corridors. At some point, conversion into light rail or tram technology can be considered.

A station-by-station description of the proposed route will provide a good introduction to the proposed National/Greenfield line.

Local Bus

While BRT will be the backbone of the East-West transit corridor – with commuter rail serving longer-range, suburban traffic – local bus service will continue to be the workhorse of public transportation. The Milwaukee County Transit System is currently implementing a comprehensive redesign of the system, focusing on increasing the number and length of "high frequency" routes. The redesign – branded as MCTS NEXT – is also intended "*to advance racial equity by increasing access for people of color to employment, education, healthcare, grocery stores, and other essential destinations.*"[30] The program is being implemented in phases, and has already shown early signs of success, with ridership reported to be up by 14% after the first phase was implemented in April 2021.[31]

The BRT, commuter rail, and local bus networks should also be integrated with Milwaukee's streetcar, The Hop. At a minimum the BRT and streetcar should have coordinated stations where their routes cross. The streetcar has been planned to be – at least in its initial phases – primarily a downtown circulator.

However, future extensions have been sketched out, including some that would follow in part the proposed alignment of the East-West lines. If the proposed BRT system is fully built out, the streetcar could be kept as a downtown circulator, connecting at key nodes such as the Milwaukee Intermodal station. Alternatively, the East-West lines could be built originally with lower-cost bus rapid transit technology, interfacing with the streetcar at key nodes, but upgraded over time into high-level streetcar service, perhaps something like the Strasbourg Tram in France.

Commuter rail

While BRT and local bus routes can serve as the backbone of the East-West transit system, a commuter rail line serving Milwaukee's western suburbs can provide a clean, modern, efficient, climate-friendly alternative to automobile commuting on I-94.

The current national push for significant new investment in passenger rail infrastructure – including the prospect of new Amtrak service from Milwaukee to Madison to Minnesota – provides an opportunity for thinking about commuter rail in that corridor.

Commuter rail (sometimes called regional rail) is a key component of a successful metropolitan transportation system. Most older cities in this country – including Milwaukee – had extensive commuter lines operated by private railroads in the first half of the 20th century. Most of these cities – not including Milwaukee – established public authorities to operate commuter lines after the private railroads stopped passenger service. And new commuter rail systems have sprung up in recent years in cities as diverse as Miami, Salt Lake City, and Albuquerque.

Why is commuter rail so valued by a diverse range of cities? Commuter rail is the perfect solution for bringing large numbers of commuters from outlying suburbs into metro central business districts. It consumes only a fraction of the physical footprint required for highways. The energy consumed and greenhouse gases emitted are much smaller than for highways. The air quality, water runoff, noise and other impacts to the neighborhoods it passes through are also much smaller.

Commuter rail is also much more flexible than highways and can be adapted to changing circumstances.

Is there more passenger demand than current service can handle? ***Add a train or two.***

Are major suburban activity centers generating demand for travel throughout the day? ***Add mid-day trains.***

Are people beginning to use trains to move from one part of the metro area to another? ***Plan the development of a full regional rail system, now common in Europe.***

This flexibility stands in stark contrast to the river of highway concrete that may burden the landscape for decades, regardless of all the dramatic changes going on around it.

The renewed federal emphasis on support for passenger rail may offer a major opportunity for Milwaukee. Amtrak's vision for expanded service that may be made possible by new national investment in infrastructure includes increased service on the existing Milwaukee to Twin Cities route as well as new service from Milwaukee to Madison, Eau Claire, and Green Bay.[32] Wisconsin DOT is already partnering with Amtrak, Minnesota, Illinois, and other partners to invest $53 million in the Twin Cities-Milwaukee-Chicago (TCMC) project to upgrade track on the route.[33]

The existing Milwaukee to Twin Cities route and the potential new route to Madison are of critical importance to Milwaukee's East-West Corridor as they also form the route for potential new commuter rail service from Milwaukee Intermodal to Oconomowoc, Waukesha, and Madison. Although Amtrak may not actually operate commuter rail service on this alignment, it could open the way to such service by investing in physical improvements to the route, building new stations, and reaching new agreements with the freight railroads that own the rails.

Although of course the final routing and selection of station stops would be a product of further detailed study, the likely stations (as identified by the MPO's VISION 2050 plan)[34] are:

- Milwaukee Intermodal
- Brewer's Stadium (called Miller Park in the MPO plan)
- Miller Valley
- Wauwatosa (called Tosa Village in the MPO plan)
- Mayfair Road
- Elm Grove
- Brookfield
- CTH F
- Pewaukee
- Hartland
- Oconomowoc

With a branch from CTH F to stations at:

- I-94
- Waukesha

Planning should also begin for commuter rail service to Madison.

The proposed commuter rail service will be far cleaner than highway commuting, even though in the near future it will most likely be powered by diesel locomotives. Further into the future we should anticipate that more and more commuter service in this country will be electrified – or perhaps powered by hydrogen fuel cell technology – providing even greater environmental benefits.

WALKING AND BIKING ELEMENTS

When we talk about improving transportation in the East-West Corridor, we need to talk about more than concrete and steel. We need to talk about people and neighborhoods. About where people want to go and how we can get them there safely and efficiently. And about how neighborhoods are laid out to make meeting those needs easier.

One way of talking about this issue is the concept of the "15 minute neighborhood." Can someone get to most of the places they need to get to in a 15 minute walk? Or a 15 minute bike ride? A trip to the corner store to buy a quart of milk is cheaper, better for personal health, better for neighborhood health, and better for the environment than driving to the strip mall to buy a quart of milk. And, of course, many people living in the East-West Corridor don't own a car – or they own one but don't want to drive it every day.

Transportation planners sometimes talk about this concept as "access," in contrast to "mobility." What's the difference and why is it important?

"Mobility" is a way of talking about how we move people through physical space to get to places they want to be. "Access" is a way of talking about how easy it is to get to those places. A focus on mobility tends to lead to discussions of infrastructure, traffic congestion, and speed. A focus on access tends to lead to discussions of land use and walkability.

Transit planner Jarrett Walker talks about "access" in terms of freedom:

> *"Access is your ability to go places so that you can do things… Whoever you are, and wherever you are, there's an area you could get to in an amount of time that's available in your day. That limit defines a wall around your life. Outside that wall are places you can't work, places you can't shop, schools you can't attend, clubs you can't belong do, people you can't hang out with, and a whole world of things you can't do…Access is a combined impact of land use planning and transport planning. We can expand your access by moving your wall outward (transport) or by putting more useful stuff inside your current wall (land use).*[35]

Based on this thinking, transportation planners should strive to improve both access within neighborhoods and mobility to places beyond the neighborhood. In this paper we have argued that the foundation for improving medium to long range mobility should be the bus rapid transit system. This is more sustainable, more equitable, more resilient, and more economical by far than laying more urban highway pavement. The BRT system can also be used to promote access within neighborhoods. A well-planned BRT line, linked to robust comprehensive neighborhood plans, can significantly widen the freedom Jarrett Walker talks about. The best tool for making that linkage is Transit Oriented Development.

Transit Oriented Development

Transit Oriented Development (TOD), as defined by the Federal Transit Administration, includes:

> *"…A mix of commercial, residential, office and entertainment centered around or located near a transit station. Dense, walkable, mixed-use development near transit attracts people and adds to vibrant, connected communities. Successful TOD depends on access and density around the transit station. Convenient access to transit fosters development, while density encourages people to use the transit system. Focusing growth around transit stations capitalizes on public investments in transit and provides many benefits, including:*
>
> - *Increased ridership and associated revenue gains for transit systems.*
> - *Incorporation of public and private sector engagement and investment.*
> - *Revitalization of neighborhoods.*
> - *A larger supply of affordable housing.*
> - *Economic returns to surrounding landowners and businesses.*
> - *Congestion relief and associated environmental benefits.*
> - *Improved safety for pedestrians and cyclists through non-motorized infrastructure.*[36]*"*

There are many examples of successful TOD projects around the country and around the world. Some are mainly driven by market-rate finance; some require public investment. All depend on careful planning and zoning, preferably resulting from a robust collaboration between municipal officials, the transit agency, and the community.

Although most TOD programs are associated with high-capacity rail (subways, commuter railroads, light rail), other transit modes can yield significant benefits. The city of Milwaukee has, in fact, produced two excellent TOD plans related to projected extensions of The Hop streetcar, one for the Walker's Point area south of downtown and one for the MLK Boulevard/Bronzeville area north of downtown.

The Walker's Point plan[37] aims to set out a *"comprehensive vision for how transit oriented development can support development efforts for the Walker's Point and Harbor District area and an implementation strategy to make that vision a reality."*[38] The plan is based on *"a growing realization that equity needs to be at the foundation of planning for Transit Oriented Development"* and therefore the plan development process *"included candid conversations about who may benefit from new development and redevelopment, what can be done to minimize and mitigate any potentially negative effects to current residents, and to find those opportunities to move forward the community's vision for the neighborhood."*[39] The plan development process aimed at achieving *"community informed planning"* based on a *"robust outreach strategy."*[40] The plan is also explicitly linked to the pertinent neighborhood comprehensive plans.

The result is a plan that can be used:

- As a "road map" for neighborhood equitable growth.
- As a guide for how development should align with transit investment.
- As a framework for investment decisions, zoning code updates and practical implementation strategies.
- By the community as a touchstone and point of reference to assess emerging proposals and focus resources for community driven investments.
- By the City of Milwaukee to coordinate public and private investment and to steer private sector proposals.
- By the private sector to understand the range and types of development that are designed in each neighborhood.[41]

The contents of the plan include detailed demographic, land use, and zoning analysis and descriptions of proposed corridors and connectors, designated focus areas, and street design concepts. If fully implemented, the plan would yield 3,000 – 3,800 new housing units, 35 – 45 new storefronts, and space for 6,000 to 7,500 jobs.[42]

We strongly recommend that the city of Milwaukee undertake a similar TOD study for the Wisconsin Avenue East-West BRT and for all future BRT routes. These studies will promote the maximum benefit from the BRT for economic development, equity, and sustainable land use.

As stated above, TOD plans and programs have traditionally been adopted for high capacity rail systems. Can a TOD study be done for BRT? This exact question has been addressed in detail by Robert Cervero, one of the leading scholars on transit and land use.[43] In his paper on the subject, he set out to probe "*the opportunities and challenges of leveraging transit-oriented development (TOD) through BRT investments.*"[44] His conclusion, after a survey of BRT systems around the world:

> *"BRT [systems] should be conceived [of] as more than mobility investments. They also present unprecedented opportunities for restructuring urban and regional growth in more sustainable formats. BRT can serve as a backbone for guiding growth in a more compact, mixed-use urban form—one that not only promotes transit riding and less driving, but also curbs sprawl and the significant costs associated with it.*[45]"

Denver has a citywide master plan for Transit Oriented Development, which has previously concentrated on light rail stations. However, with BRT having been chosen as the Locally Preferred Alternative in the Colfax Avenue corridor, the city has expanded the plan to include BRT. The "Colfax Avenue BRT TOD Continuum Analysis" uses a variety of metrics (market readiness, development readiness, and transit oriented characteristics) to rank the 18 proposed BRT stations on the "TOD continuum analysis" to guide future planning and investment.[46]

Federal funding is available for this type of project. In the St. Petersburg, Florida, area, the Pinellas Suncoast Transit Authority has been awarded a federal grant to study TOD on its 10-mile, 32 station Central Avenue BRT.[47] And closer to home, Madison, Wisconsin has recently received a $290,000 grant for a TOD study for its planned 15.5-mile BRT.[48]

We cannot attempt here to anticipate what a future BRT TOD study of Milwaukee's East-West corridor would contain. However, it may be beneficial to illustrate the TOD possibilities at a selection of future (potential) BRT stations.

Concordia

This planned station on the Wisconsin Avenue East-West BRT line lies at the heart of the Near West Side, one of Milwaukee's low-income neighborhoods. The north-south 27th Street is the "main street" of the area and has been the subject of many planning studies, most recently the "North 27th Street Corridor Strategy."[49] That document identifies the intersection of Wisconsin Avenue and 27th Street as a "priority site" for redevelopment.[50] In addition to serving the Wisconsin Avenue line, the intersection could be home to a station on the prospective North-South 27th street line, thus serving as a major hub on the city's transit system. The area has benefited from the attention of a strong non-profit leadership in the Near West Side Neighbors, which is promoting redevelopment. The intersection has also gotten personal attention from Governor Evers, who had included $163.6 million in his budget for construction of a new state office building which would house up to 1,000 state employees.[51] All of these factors suggest the need for detailed Transit Oriented Development planning to ensure the best possible outcomes both for the transit system and redevelopment of the neighborhood.

Silver City

Our proposed station at West National and 35th Street would serve Silver City, a lively, redeveloping neighborhood. Silver City is a relatively cosmopolitan area, with a good concentration of restaurants and bars. The 2009 Near South Side Area Plan labeled Silver City *"an emerging local and destination retail corridor that provides goods and services for local residents"* and recommended promoting "*the identity of Silver City as a diverse mix of locally owned businesses that provide International goods and services with an Asian emphasis*."[52]

Silver City (Cont.)
The neighborhood is supported by a strong nonprofit, VIA, which has a glowing description of the area:

> *"Located just minutes from the Menomonee Valley, I-94, downtown Milwaukee, and amenities such as the Hank Aaron State Trail, the Urban Ecology Center/Menomonee Valley branch, Three Bridges Park, Miller Park, and the Mitchell Park Domes, Silver City is one of Milwaukee's most diverse and exciting neighborhoods, blending historic architecture with exciting and new retail and international dining opportunities. It is said that one could dine all over the world without leaving the neighborhood's boundaries."*[53]

Silver City could both provide a destination for BRT users seeking employment and entertainment opportunities and also serve local residents seeking access to jobs elsewhere. TOD planning for the area should include some density increases around the station area. Additional residential over retail development would be well suited here.

West Milwaukee
The Village of West Milwaukee – faced with the loss of Komatsu Mining, a major employer relocating to another site in Milwaukee – is proposing a large-scale redevelopment plan for the area. The plan includes extending the street grid into the Komatsu site and developing it with a variety of housing types, offices, shops, hotels, a new park with a view of American Family Field, and coffee shops or entertainment venues with outdoor activities along the Hank Aaron Trail.[54]

Our proposed BRT station at that site (West National and Brewers Boulevard) could support the redevelopment, including by drawing developer interest. TOD planning in the area should focus on ensuring that the Komatsu redevelopment is walkable and transit-supportive, with reasonable density. It should also include improving walkability and connectivity in the current retail sprawl in the southeast quadrant of the intersection and planning appropriate development in the current parking field in the northwest quadrant. Future plans should include shrinking the

pavement footprint in the intersection and its approaches. There are many opportunities to convert this part of Wisconsin Highway 175 (Stadium Freeway) into a more pedestrian and bicycle-friendly boulevard.

West Allis Tech Center

Our proposed station at Greenfield Avenue in the vicinity of South 70th Street can serve as a powerful focus for redevelopment here. This area of West Allis has evolved from a center of heavy industry (Allis-Chalmers), to a declining brownfield, to a revitalizing mixed-use community. Its industrial background can be seen in such enterprises as Toshiba America Energy Systems and Blast Cleaning Technologies (which moved to the area in 2018). And its campus of the Milwaukee Area Technical College looks to the future of industry. The Summit Place development is a classic "adaptive reuse" enterprise, using an old redbrick industrial building to house 2,500 employees in a wide variety of offices. Within recent years, the area has attracted an increasing residential population, often with a younger demographic, in such facilities as The West Living, a 177-unit luxury apartment complex. The West Allis Farmers Market, along with the Towne Center Shopping Center, provide a solid retail base. And coming soon is a major redevelopment, Allis Yards, a 23-acre project that will include a hotel, offices, housing, and retail, highlighted by timbered structures.[55] The BRT station can help to pull these threads together to support a real neighborhood, with walkability, employment opportunities and excellent access to transit.

Although in this report we have concentrated on TOD opportunities on the proposed BRT network, there will also be opportunities at commuter rail stations. Komatsu Mining has already seen the potential of TOD and is planning to incorporate a commuter rail station on the proposed KRM rail line into its waterfront development.[56]

Cycling and Walking

Good access within neighborhoods is also promoted by good pedestrian and bicycle planning. Growing awareness of the need to reduce dependence on automobiles to promote sustainability and fight climate change – magnified by pandemic-induced lifestyle changes – has propelled walking and biking from the periphery to the center of urban transportation planning.

Cities around the world have seen an explosion in pedestrian and bicycle traffic, often with the strong support of local elected officials. Even in U.S. Cities like Houston and Los Angeles, there have been huge increases in cycling.[57] In Paris, a combination of reactions to the pandemic, transit strikes, and concern for the climate supported an upsurge in pedestrian and bike traffic. The city administration, noted for its commitment to sustainability, supported the trend with a dramatic increase in bike lanes together with subsidies and other public policy.[58] Closer to home, Milwaukee shared in the bike boom, with bike shops unable to fill customer demand.[59]

Recent studies confirm that walking and cycling is beneficial for individual health as well as the health of the environment. The Global Health Institute at the University of Wisconsin-Madison, after reviewing the data, concluded:

> *"It is clear that increasing active transportation, and in particular cycling, will bring about significant health benefits through increased physical activity, reduced air pollution, and increased resistance to communicable disease. Achieving these benefits will require significant investment to improve the extent to which the built environment of U.S. Cities fosters physically active forms of transportation over personal car travel."*[60]

Improving conditions for walking and bicycling is an equity issue also. Provided their community has nearby useful destinations, people without access to cars can use sidewalks and bicycles to get too many of the places they want to go. Despite the preconception that many might have of cycling as a middle-class practice, studies show that all income levels cycle. And in fact the highest rates of cycling for commuting to work are found at lower income levels.[61]

The pandemic has underscored the importance of active transportation for low-income communities. While middle-class use of bike sharing plummeted as more people worked from home, lower-income people continued to need and use shared bikes. In Philadelphia:

> *"After the public transit operator limited bus and subway service in parts of the city, [bikeshare operator] Indego was often the only available form of transportation. Bike stations in low-income neighborhoods were especially busy near parks, as residents sought a socially distant way to exercise or unwind."*[62]

A robust network of walking and bicycle facilities should be an integral part of improving mobility in the East-West Corridor.

We recommend taking the following steps:

1. Build out the 2010 Milwaukee Bicycle Master Plan.[63] That plan lays out a comprehensive network of routes where improved bike treatments are appropriate. Other regional bike plans in the corridor (such as West Allis[64]) should also be fully implemented.
2. Milwaukee (along with other communities in the corridor) should update its active transportation plan to include more protected bike lanes (PBLs). These are bike lanes with physical separation (curbs, parked cars, etc.) between bicycle traffic and vehicular traffic and are today's best practice for bicycle infrastructure. Protected bike lanes (also called cycle tracks) are far safer than bike lanes delineated by paint alone. They encourage families, children, and less adventurous riders in general to use them. The District of Columbia, which has installed 94 miles of bike lanes in the past 20 years, has now begun an ambitious program of installing protected bike lanes. A total of 16.6 miles of "PBL" are now in place, with plans to build 20 more miles in the next three years.[65]
3. Transit planners and bicycle planners should work together to ensure that cyclists can reach and use the transit system safely. This should include working to make the BRT corridors as walking and bike accessible as possible.[66]
4. Special attention should be given to providing facilities for pedestrians and cyclists to safely enter and cross the Menomonee Valley from the neighborhoods bordering it. The roadway overpasses across the valley should be redesigned to provide protected bike lanes.

Housing and zoning

Achieving the best possible outcomes from the transportation/land use connection in transit corridors requires careful attention to housing and zoning policy. Although it is beyond the scope of this paper to make detailed recommendations in this area, in general policymakers should strive toward somewhat higher densities around transit stations. Four or five-story buildings with retail ground floors and residential or office uses located on the higher stories is usually best. Legalizing accessory dwelling units is also helpful. This sort of "gentle density" is readily accepted by the public in most cases. Design standards and form-based codes improve the quality and acceptability of new buildings. Care should be given to ensure a wide variety of housing types, including affordable and "middle" housing. Because new transit with good Transit Oriented Development increases property values, care should also be given to provide protection against replacement for current residents of the neighborhood.

ROADWAY ELEMENTS

We recommend a new collaborative, community-based planning process to build a new vision for mobility and access in the East-West Corridor. A new concept for I-94 should emerge from that process. It is likely that concept will include the following elements:

1. Replace the road's pavement and repair its bridges as needed. The FEIS discusses the pavement deficiencies and makes a strong case that full replacement is needed.[67] The new pavement should be designed using the latest and best techniques for minimizing carbon footprint, maximizing safety, and sustaining a long life.

2. Safety hotspots should be addressed and corrective measures should be implemented based on intensive, focused studies. This is not the same as correcting "design deficiencies" as the FEIS suggests, which is often really just about increasing speeds. Instead the safety hotspots should be addressed with context sensitive design that minimizes impacts on the surrounding neighborhoods and promotes pedestrian and cyclists' safety were necessary.

3. Ramps and interchanges should be analyzed to look for opportunities for downsizing. Downsizing Route 175 to an at-grade boulevard, for instance, could help to tame traffic in the corridor, rebuild and reconnect the neighborhoods it now passes through, increase wetlands and open space, protect water and air quality, and provide redevelopment and recreational opportunities. A good model could be Tampa, Florida, which is pursuing a project to replace the existing high-speed ramps connecting I-275 to its downtown with a lower speed boulevard.[68] Planning should also be undertaken for the eventual replacement of I-794 in downtown Milwaukee with an at-grade boulevard, which would promote redevelopment on the southern portion of downtown while helping to calm traffic on I-94.[69] While modest efforts have been made to remediate some of the damage caused by the highway (most recently the construction of pickle ball courts under the structure),[70] healing the urban fabric will ultimately require major downsizing.

4. The road should be studied for opportunities for adding transit (especially commuter buses) and managed lanes, perhaps similar to what is now planned for Madison. These steps would improve the throughput of people in the corridor while reducing VMT.

5. The entire corridor should be studied for development of a comprehensive corridor management scheme using the latest in traffic systems management and operations (TSMO) techniques.[71]

6. A comprehensive drainage plan should be developed to reduce the area of paved surfaces and provide appropriate swales and "green infrastructure" to manage stormwater. A recent study of predicted rainfall and flooding in Wisconsin has concluded that *"extreme rainfall depths are projected to increase for all…periods and greenhouse gas scenarios"* and recommends that infrastructure planning incorporate higher levels of resilience.[72]

7. The Federal Highway Administration should be approached to consider renumbering the highway. "I-94" should be reassigned to what is currently I-894, so that long-distance traffic is encouraged to use the route rather than going through the center of Milwaukee. The current I-94 highway section would then be renumbered as a "spur" route, possibly extending I-794.

These techniques would preserve I-94 for some time into the future as a redesigned and repurposed but more sustainable and still useful transportation asset.

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71. See, for instance, Integrated Corridor Management (ICM) Program: Major Achievements, Key Findings, and Outlook, Federal Highway Administration, 2019, retrieved from https://ops.fhwa.dot.gov/publications/fhwahop19016/fhwahop19016.pdf

72. Wright, Daniel, David Lorenz, and Zhe Li, “Updating Present and Future Rainfall Statistics for Resilient Infrastructure Design, Management, and Planning,” University of Wisconsin-Madison, 2021, 1.