



Iowa Transportation Conference
September 25, 2025

KM1

Madison East-West Bus Rapid Transit

Jeff Held, P.E., PTOE, Strand Associates, Inc.®



Agenda

- City of Madison Metro Area Overview
- City of Madison Transit History
- Defining BRT Corridor Guideway and Stations
- Traffic Analysis of Selected Guideway
- Madison BRT Updates



Slide 2

KM1 Updated conference title, date, and logo. Confirm everything is correct.

Mack, Katie, 2025-09-17T16:17:30.650

JH1 0 Yup. Also added Iowa DOT and FHWA logos.

Held, Jeff, 2025-09-19T00:39:51.086

Slide 3

KM1 Removed citation. We have purchased the professional photos so we do not need to cite them in the presentation.

Mack, Katie, 2025-09-17T16:23:03.891

JH1 0 Roger that.

Held, Jeff, 2025-09-19T00:46:14.961

KM2 Removed orphan

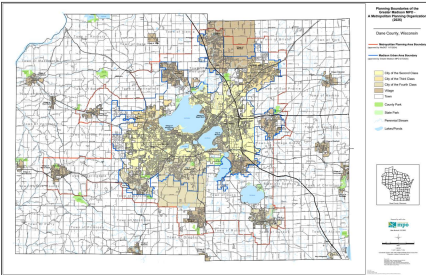
Mack, Katie, 2025-09-17T16:23:31.850

JH2 0 ?? OK.

Held, Jeff, 2025-09-19T00:46:24.398

City of Madison Metro Area Overview


- Dane County, WI
 - 2020 population of 561,504
 - The second most populous county in WI (Milwaukee County)
 - Fastest growing county in WI
- Greater Madison MPO



Source: Greater Madison MPO

City of Madison Metro Area Overview, Continued

- Madison Metro Area
 - 400 square mile planning area
 - Unique geography
- Plans for a freeway through the Isthmus scuttled in the 1960s

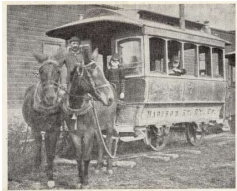



State Capitol

Source: Google Earth Pro

City of Madison Transit History

- Mule-drawn bus – 1884
 - Ran for 8 years
 - Lost 4 cents on every passenger
 - King Street required an extra mule (~5% grade)

Source: Wisconsin Historical Society, image ID: 128021

Source: Google Earth Pro

Streetcar System Fueled Madison's Expansion

- First electric streetcar – 1892 to 1935
- 1,899 to 3,000 riders per day
- Photo ~1910



Source: Photo: Westborough

Source: Wisconsin Historical Society, image ID: 5488

Buses Replace Streetcars – 1934/1935



Source: Wisconsin Historical Society, image ID: 6351

We Lean Into the Automobile Law Park Parking Lot – 1958

- Commuter parking and one-way streets
- After several more decades we begin to understand the limitations of cars
- As a community we had to acknowledge the need for enhanced transit and build support



Source: Wisconsin Historical Society, image ID: 5808

Previous Mass Transit Studies Built the Foundation

- 1992 – Madison Light Rail Study
- 2007 – Madison Streetcar Preliminary Feasibility Study
- 2008 – Transport 2020 (Light Rail)
- 2013 – Madison Transit Corridor Study



Support Achieved by Building the Economic Case for Transit

- IndyGO – Indianapolis, IN: \$1.2 Billion
- Heathline – Cleveland, OH: \$9.0 Billion



IndyGO, Indianapolis



Heathline, Cleveland



Circumstances Aligned to Move Forward with BRT



Madison elected a mayor who actually rode the bus



New presidential administration provided opportunity for funding



Madison was ready (in project development)



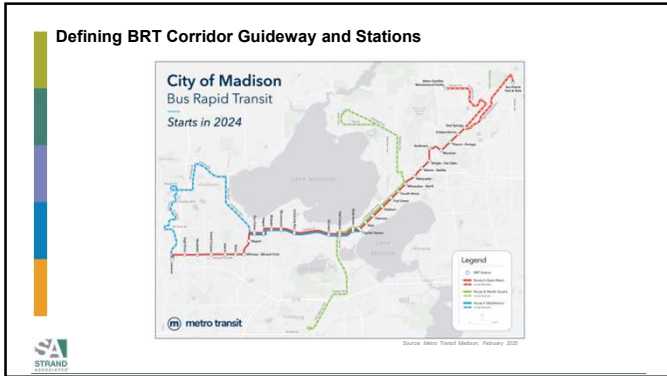
Creative local match options



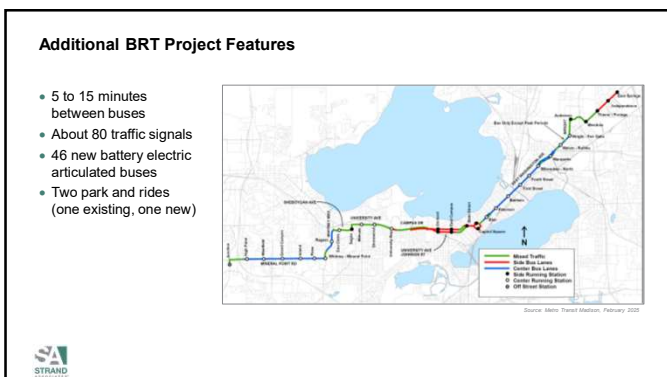
Slide 12

KM1 Updated font to arial
Mack, Katie, 2025-09-17T16:25:35.505

JH1 0 Good deal.
Held, Jeff, 2025-09-19T00:48:20.851







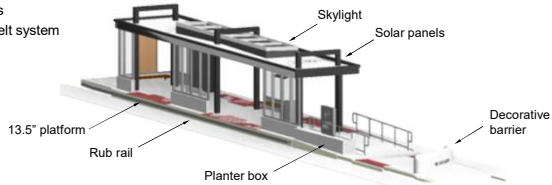
New Flyer 60' Excelsior Charge Electric Bus



Source: Metro Transit Media, February 2025

Typical Station

- Ticket vending machines
- Real-time bus arrival information
- Heat
- Cameras
- Snow melt system



Courtesy of AECOM, Inc., February 2025

Completed Station



Slide 18

KM1 Centered the image and removed the source
Mack, Katie, 2025-09-17T16:26:57.339

JH1 0 Love it.
Held, Jeff, 2025-09-19T00:48:53.664

- 



The map illustrates the proposed bus rapid transit system in Minneapolis, showing routes along major corridors. The legend indicates:

- Mixed Traffic (Green line)
- Side Bus Lanes (Blue line)
- Center Bus Lanes (Red line)
- Side Running Station (Green circle)
- Center Running Station (Red circle)
- Off Street Station (Black circle)

 Key locations and stations marked include:

- University Ave:** Running from the University Ave/25th St intersection south to the University Ave/23rd St intersection.
- Campbell Ave:** Running from the University Ave/23rd St intersection south to the University Ave/21st St intersection.
- Hennepin Ave:** Running from the University Ave/21st St intersection south to the University Ave/19th St intersection.
- Other locations:** University Ave/25th St, University Ave/23rd St, University Ave/21st St, University Ave/19th St, University Ave/17th St, University Ave/15th St, University Ave/13th St, University Ave/11th St, University Ave/9th St, University Ave/7th St, University Ave/5th St, University Ave/3rd St, University Ave/1st St, University Ave/2nd St, University Ave/4th St, University Ave/6th St, University Ave/8th St, University Ave/10th St, University Ave/12th St, University Ave/14th St, University Ave/16th St, University Ave/18th St, University Ave/20th St, University Ave/22nd St, University Ave/24th St, University Ave/26th St, University Ave/28th St, University Ave/30th St, University Ave/32nd St, University Ave/34th St, University Ave/36th St, University Ave/38th St, University Ave/40th St, University Ave/42nd St, University Ave/44th St, University Ave/46th St, University Ave/48th St, University Ave/50th St, University Ave/52nd St, University Ave/54th St, University Ave/56th St, University Ave/58th St, University Ave/60th St, University Ave/62nd St, University Ave/64th St, University Ave/66th St, University Ave/68th St, University Ave/70th St, University Ave/72nd St, University Ave/74th St, University Ave/76th St, University Ave/78th St, University Ave/80th St, University Ave/82nd St, University Ave/84th St, University Ave/86th St, University Ave/88th St, University Ave/90th St, University Ave/92nd St, University Ave/94th St, University Ave/96th St, University Ave/98th St, University Ave/100th St.

[illegible]

Slide 21

KM1 Moved image out of the margin

Mack, Katie, 2025-09-17T16:27:46.516

JH1 0 Copy.

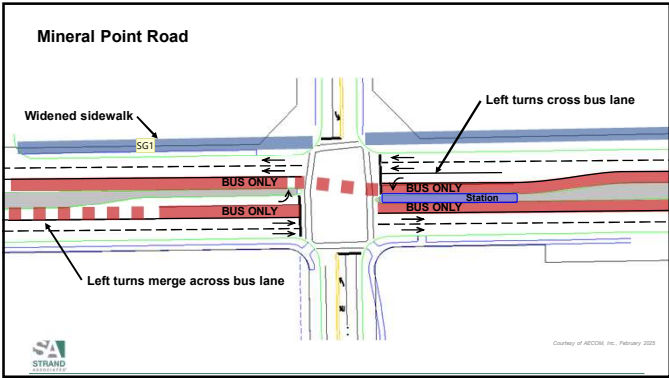
Held, Jeff, 2025-09-19T00:49:42.179

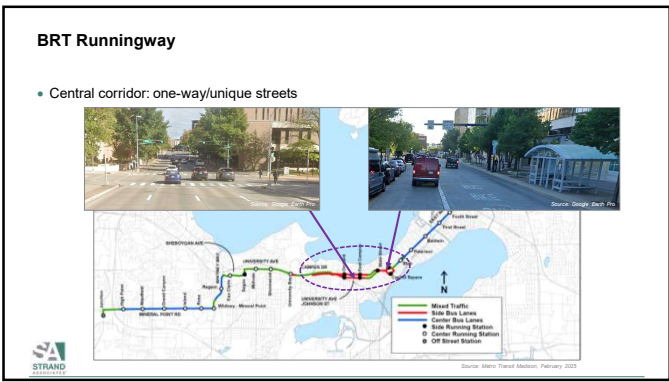
SG2 Consider Strand Orange or something that will pop a little more over the dark purple on this and following slides with purple

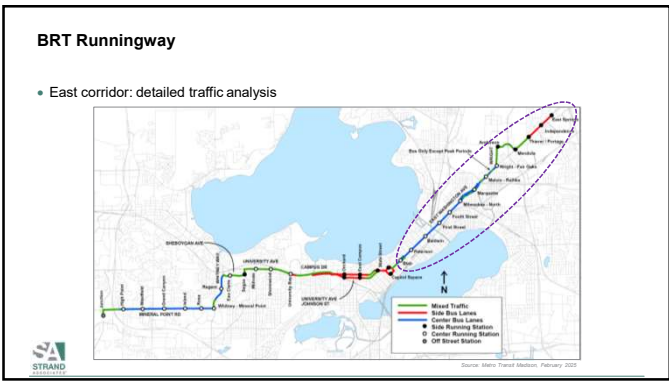
Glossner, Stephanie, 2025-09-18T21:11:41.194

JH2 0 Negative. The purple stays. 😊

Held, Jeff, 2025-09-19T00:49:59.289







Slide 22

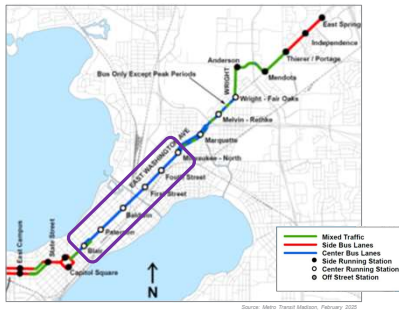
SG1 Changed arrows to have same arrow heads as other slides!

Glossner, Stephanie, 2025-09-18T21:13:30.634

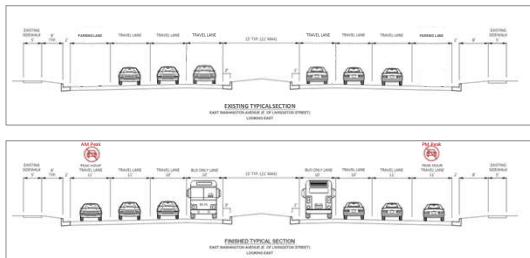
JH1 0 Noted.

Held, Jeff, 2025-09-19T00:50:16.476

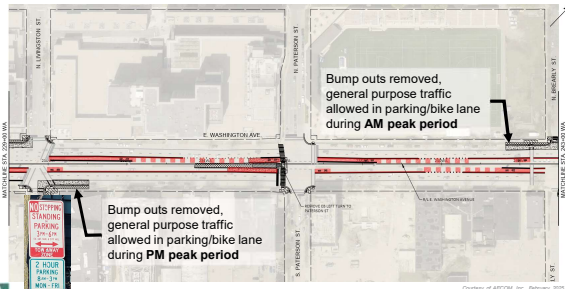
Section 1: Center Running with Peak Direction Parking Restrictions



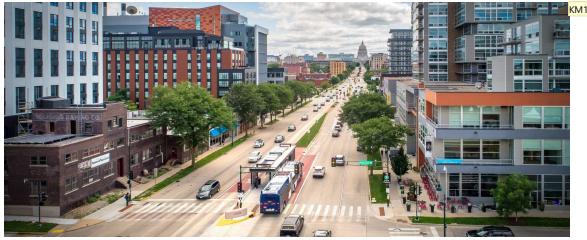
Section 1: Center Running with Peak Direction Parking Restrictions



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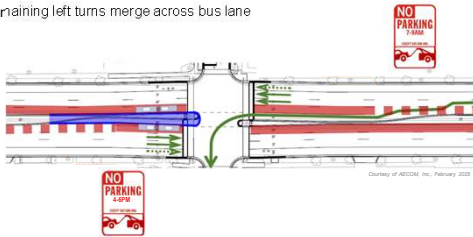


Section 1: Center Running – 24-hr Bus Lanes



Section 1: Center Running – Left-Turn Removals

- Some left turns removed for stations
- Most remaining left turns merge across bus lane



Section 1: Center Running – Left-Turn Removals



Slide 28

KM1 Removed citation
Mack, Katie, 2025-09-17T16:28:56.238

JH1 0 Golden. These are some really nice looking photos!
Held, Jeff, 2025-09-19T00:50:58.258

Section 1: Operations with Left-Turn Restrictions

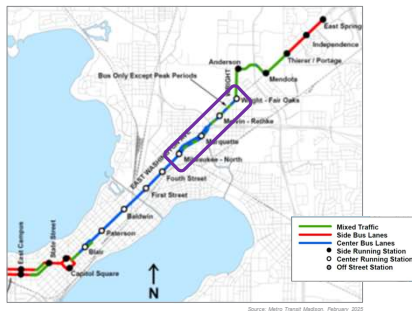
- Left-turns that receive additional traffic experience higher delay, but none operate with $v/c > 1.0$
- WBL at Marquette Street drops just into LOS F during PM peak but v/c is 0.86 and SimTraffic does not suggest operations or queuing are a concern for westbound US 151/ East Washington Avenue Traffic

Time Period	Operations	Base Conditions	With BRT
AM Peak Hour	Ingersoll Street	LOS A	LOS B
	Eastbound Left		
	First Street	LOS E	LOS E
	Eastbound Left	LOS E	LOS E
	First Street	LOS A	LOS E
	Westbound Left	LOS A	LOS E
Noon Hour	Marquette Street	LOS A	LOS D
	Westbound Left	LOS D	LOS E
	Wright Street	LOS D	LOS E
	Eastbound Left	LOS A	LOS A
	First Street	LOS E	LOS E
	Eastbound Left	LOS A	LOS E
PM Peak Hour	First Street	LOS A	LOS E
	Westbound Left	LOS A	LOS A
	Marquette Street	LOS D	LOS E
	Westbound Left	LOS D	LOS E
	Ingersoll Street	LOS A	LOS A
	Eastbound Left	LOS D	LOS E
PM Peak Hour	First Street	LOS D	LOS E
	Westbound Left	LOS D	LOS E
	Marquette Street	LOS D	LOS F
	Westbound Left	LOS D	LOS F
	Wright Street	LOS D	LOS E
	Eastbound Left	LOS D	LOS E

Table 2.01-2 2024 Intersections Receiving Additional Left-Turn Traffic Turn Traffic Operations Comparison

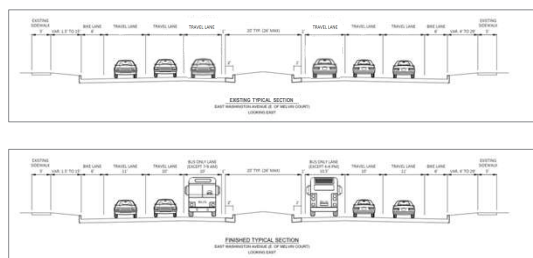
Courtesy of ARCDOT, Inc., February 2025

Section 2: Combination of Center Running and Mixed Traffic



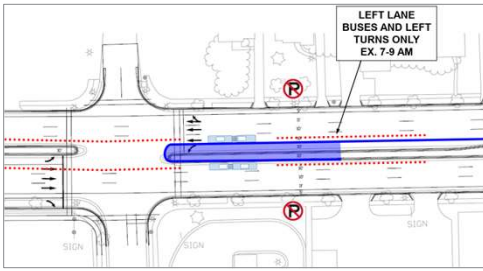
Source: Metro Transit Medium, February 2025

Section 2: Combination of Center Running and Mixed Traffic



Courtesy of ARCDOT, Inc., February 2025

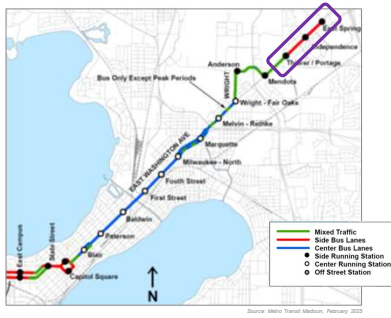
Section 2: Combination of Center Running and Mixed Traffic



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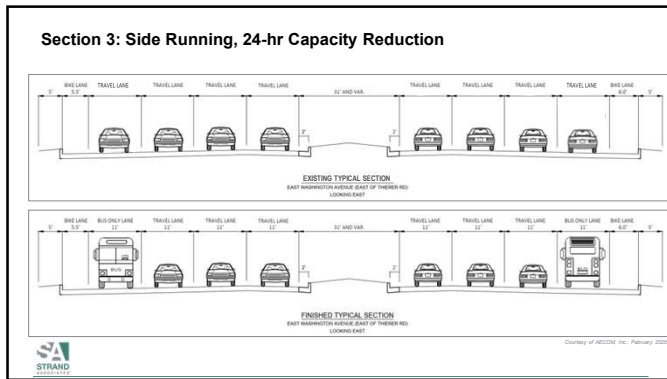
Section 3: Side Running, 24-hr Capacity Reduction



Slide 35

KM1 Removed citation, all photos taken by SAI do not need to be cited.
Appreciate you taking the photo though!
Mack, Katie, 2025-09-18T21:45:58.811

JH1 0 Got it, thanks! I risked life and limb for the sake of Strand, just
sayin'...
Held, Jeff, 2025-09-19T00:52:23.961



Section 3: Side Running, 24-hr Capacity Reduction

- Key Intersections: Mendota Street, Portage Road, East Springs
- No LOS F movements and overall LOS B or better for all peaks

KM1

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Madison BRT Updates

- Early ridership – November and December 2024:
 - 18% increase on Rapid Route A since BRT project completed
 - 10% increase across network since Metro's route redesign

RAPID ROUTE A		SYSTEMWIDE	
2023	2024	2023	2024
147,077	164,611	954,427	1,014,013*
112,266	142,680	738,922	843,985*
	↑ 18%		↑ 10%

TOTAL 2024 RIDERSHIP IN NOVEMBER & DECEMBER UP 24% SINCE 2022

*UNOFFICIAL APC DATA, PENDING CERTIFICATION

Source: Metro Transit Station, February 2025

STRAND CONSULTING

Slide 38

KM1 Removed colon and citation
Mack, Katie, 2025-09-18T21:46:39.114

JH1 0 Lovely.
Held, Jeff, 2025-09-19T00:53:32.866

Ridership

- April 2025 Ridership
 - Pre-pandemic ridership surpassed for first time
 - All transit ridership in U.S. at 79% of pre-pandemic levels
 - 1.3 million rides in April highest since 2015

Metro Transit ridership in April surpasses pre-pandemic numbers for first time

The agency experienced a sharp decline in ridership during the pandemic

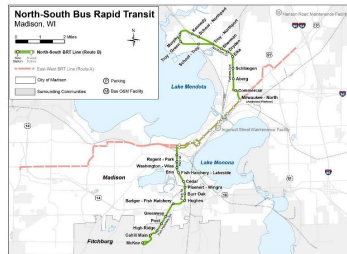
BY LIAM BERAN MAY 12, 2025 4:00 PM

Source: Metro Transit



Next Steps

- North-South BRT (Rapid Route B)
 - Locally preferred alternative approved
 - Preliminary design
 - Environmental review process



Source: Metro Transit Madison, February 2020



Thank You!

- See Metro's website for additional information on Madison's BRT:
 - <https://www.cityofmadison.com/metro/routes-schedules/bus-rapid-transit/>
- Jeff Held, P.E., PTOE, Strand Associates, Inc.®
 - jeff.held@strand.com
 - 608-251-4843
- Questions?



Source: © iStockphoto - iStockphoto.com



Slide 42

KM1 Updated to hyperlink
Mack, Katie, 2025-09-17T16:32:17.071

JH1 0 Cool, thanks!
Held, Jeff, 2025-09-19T00:53:54.695



EXTRA SLIDES



By Attending This Session, You Will Be Able To:

- Summarize the City of Madison's enhanced transit history and the East-West Bus Rapid Transit (BRT) project's purpose and need
- Explain the complex planning, outreach, design, and coordination required for the City of Madison to deliver a project of this magnitude
- Describe the basics of a bus rapid transit project, including bus-only lanes, enhanced amenities, and improved boarding efficiencies, as well as design challenges and opportunities specific to the East-West BRT project
- Comprehend the traffic analysis scope and outcomes and how that relates to the constructed BRT running way
- Encourage the use of specific technologies, design strategies, and funding opportunities to prioritize transit to meet community transportation needs



Support Achieved by Building the Economic Case for Transit

- Number of \$100,000 underground parking spaces needed per 100 jobs
 - Bus – 0
 - Auto – 100



East-West BRT Funding Stack

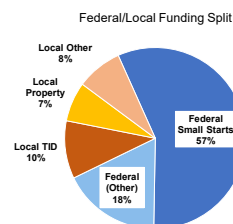
Source	Amount	From SCC Final Workbook	Costs Attributed	Federal/	All	Local Funds*
			No Source of Funds	Local Match	Federal Funds	
Small Starts	Federal 110,000,000	Federal 5302 Small Starts	\$151,230,772.00	711/289	\$ 110,000,000	\$ 40,630,772
Formula	Federal 21,182,545	Federal 5307 Urbanized Area Formula Program	\$ 16,513,178.00	80/20	\$ 13,210,542	\$ 3,302,636
5339 JN	Federal 4,630,500	Federal 5337 State of Good Repair Grants Program	\$ 3,298,426.00	80/20	\$ 2,638,740	\$ 691,886
Reserve Act Funds	Federal 7,000,000	Federal 5339(a) Buses and Bus Facilities Formula Program	\$ 6,696,580.00	80/20	\$ 5,357,264	\$ 1,339,317
Federal Grants (Earmark, 2020)	Federal 1,272,522	Federal 5339(b) Buses and Bus Facilities Competitive Prog	\$ 7,030,000.00	60/40	\$ 4,818,120	\$ 2,385,440
State Funds (2020)	Other 749,022	CARBS - Federal 5307 Urbanized Area Formula Program	\$ 6,000,000.00	100/0	\$ 6,000,000	\$ -
Sun Prairie	Other 700,000	CRMSA - Federal 5307 Urbanized Area Formula Program	\$ 1,000,000.00	100/0	\$ 1,000,000	\$ -
Revenues Applied (2020)	Local 3,500,000	Federal 5314 National Research Program	\$ 1,247,762.00	50/50	\$ 623,881	\$ 623,881
GF GO Borrowing (2020)	Local 3,500,000	Federal 5339 Alternatives Analysis Program	\$ 1,297,282.00	50/50	\$ 648,641	\$ 648,641
GF GO Borrowing (2021)	Local 2,000,000					
GF GO Borrowing (2022)	Local 6,025,965		\$ 194,250,000.00		\$ 144,685,627	\$ 49,564,373
Junction Rd Lot	In-Kind 1,000,000					
Brayton Lot	In-Kind 12,670,000					
TID 46 Cash - 2022	TIF 10,000,000					
TID 46 Borrowing - 2022	TIF 10,000,000					
Debt Service Payments	Other 1,454,386					
Total	194,250,000					
2023 Capital Budget Addition - GO	10,000,000	Management Reserve for RR improvements				

75% Federal



Innovative Funding

- 75% federally funded
- Includes routes A, B, and F buses
- Local match components
 - City-owned Junction Road and Brayton Lot property value
 - TID #36 UW-Madison Research Park



Station and Shelter Design



Construction



Section 1: Center Running – At-Grade Railroad Crossing



Unique Design Elements – Battery-Electric Buses

- Challenge: Maintaining battery life throughout the day



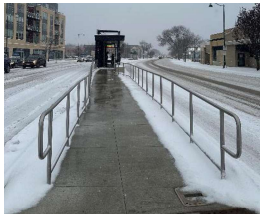
Unique Design Elements – Battery-Electric Buses

- Solution: Five on-route ABB chargers for the 60' articulated battery electric buses (BEBs)



Unique Design Elements – Operational Needs

- Challenge: Space for operator facilities, vehicle charging infrastructure, and ability for riders living outside the route to connect to BRT



Unique Design Elements – Operational Needs

- Solution: Overhead chargers, operator restroom, bike shelter, and 87-space park and ride to connect to BRT



Unique Design Elements – Bike Infrastructure

- Challenge: Designing for pedestrians and bicyclists



Unique Design Elements – Bike Infrastructure

- Solution: Protected intersection elements added to Mineral Point Road-Whitney Way intersection



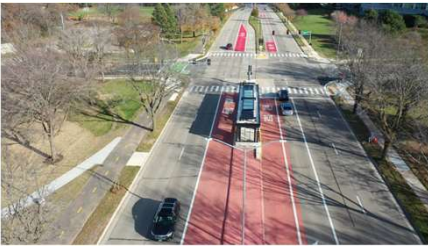
Unique Design Elements – Bicycle Network

- Challenge: Limited right of way width to distribute between various interests



Unique Design Elements – Bicycle Network

- Solution: Off-street or parallel bike accommodations



Unique Design Elements – Signals

- Challenge: Uncommon vehicular movements/lane designations at signalized intersections



Unique Design Elements – Signals

- Solution: Special phasing for bus movements (Junction Road example)