

*Madison Area Transportation Planning Board – An MPO*

# Madison Transit Corridor Study

A Project of the Capital Region Sustainable  
Communities Partnership

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## **Universe of Alternatives Initial Review**

8/14/2012

Prepared by the  
SRF Consulting Group Team

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## Introduction

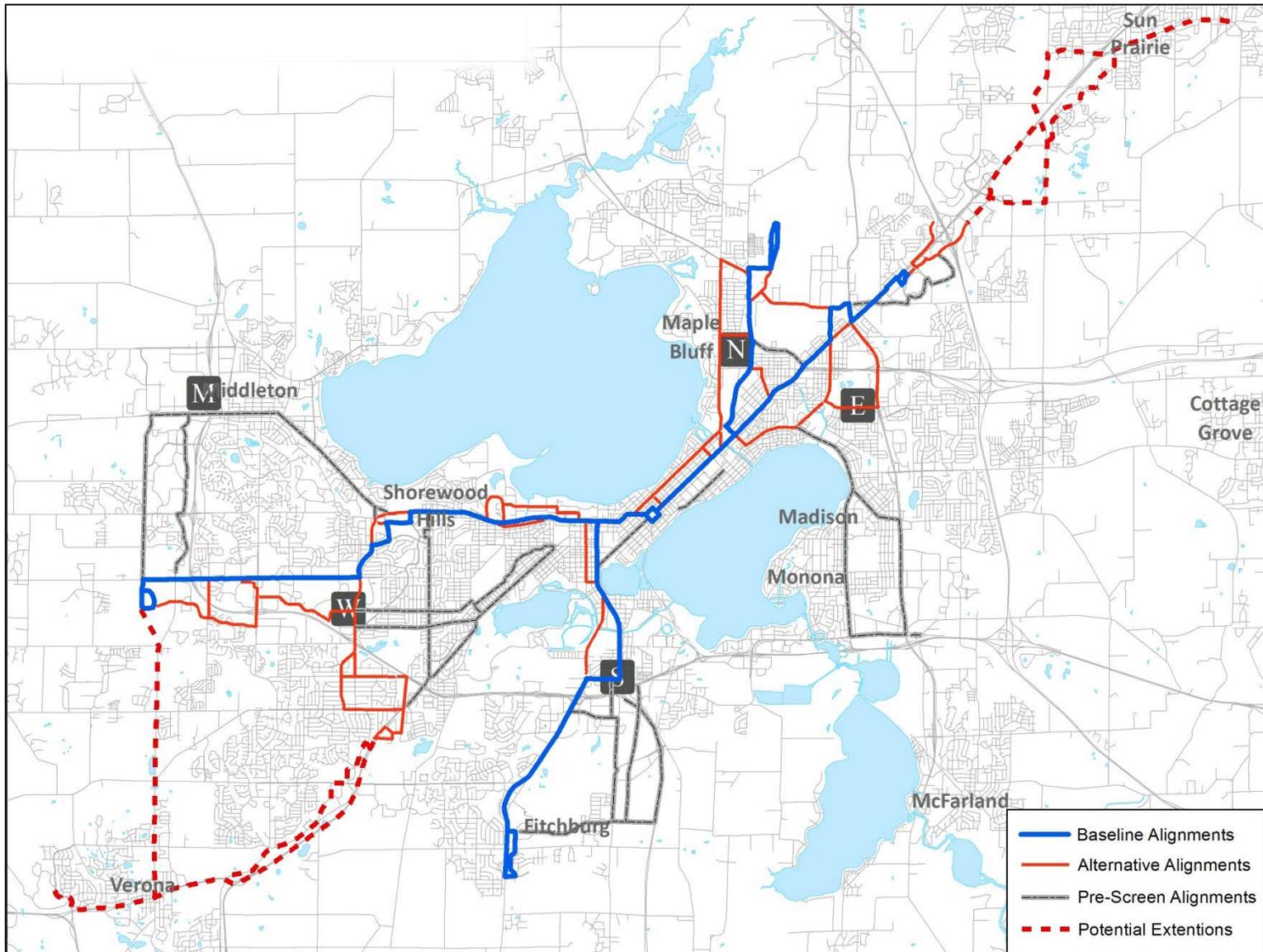
This document presents background information on travel corridors within the greater Madison area to identify which should be evaluated in more detail for potential implementation of bus rapid transit (BRT) service. BRT is an investment in bus service along selected travel corridors that is designed to provide fast, frequent and comfortable service. Corridors with high transit ridership, population, employment and development potential, along with reasonable travel conditions, generally provide the best opportunities to develop BRT service.

The corridor segments depicted in this review represent the first step in defining potential BRT service alignments. As subsequent steps are completed during the course of the study, refinement of these options will take place. There is also potential for new alignments to emerge.

The universe of alternatives considered for this review was developed by the staff at the Madison Area Transportation Planning Board; the area's metropolitan planning organization (MPO). The set of alternatives identified for initial consideration is shown in Figure 1. These alignment alternatives cover four corridors, each arranged radially around Capitol Square and oriented towards the North, East, South, and West transfer points. Common to all radial corridors is the Central Corridor which spans from east of the capitol to the University of Wisconsin campus. Several alternative routings along the main corridors, as well as potential future extensions to Sun Prairie, Monona, Middleton, and Verona, have been considered in this initial review. Additional corridors and travel segments were suggested by stakeholders in the early stages of the study, but were screened out by MPO staff for not meeting minimal acceptance levels. The additional segments initially suggested but screened out are described in Appendix A.

To identify the alignments with characteristics most suitable for further consideration of BRT service the strengths and weaknesses of the alternatives shown in Figure 1 were reviewed using a standard set of criteria. The results of the corridor review follows.

Figure 1: Initial Universe of Alternatives



## Methodology

To evaluate strengths and weaknesses of competing alternatives, each potential routing was measured in terms of five primary criteria: population, employment, existing ridership, transit oriented development (TOD) opportunities, and basic roadway characteristics. A summary of these measures and their sources is provided below. Some of the evaluation criteria use a ¼-mile buffer from the route alignment to determine the impact area of each alternative. This is a commonly used distance that represents the maximum distance that the majority of bus riders will walk to access the transit network.

- **Population within ¼-mile:**
  - Greater concentrations of population allow routes to operate more productively by serving a larger population with fewer resources.
  - The population of census blocks with centroids within ¼-mile was calculated for each alignment. Segment totals were assigned a value of low, medium or high population. These values were assigned within the context of each individual segment, not across the greater Madison area as a whole.
  - Data Source: 2010 US Decennial Census
  
- **Employment within ¼-mile:**
  - As with population density, a higher concentration of jobs allows transit routes to provide service more effectively. Segment totals were assigned a value of low, medium or high employment. These values were assigned within the context of each individual segment, not across the greater Madison area as a whole.
  - The number of jobs within the ¼-mile buffer was calculated at the Traffic Analysis Zone (TAZ) level. Because TAZs cover a relatively large area, the number of jobs was based on the employment density of each TAZ and the proportional share of the TAZ covered by the ¼-mile buffer.
    - *Example:* Assume a TAZ with 100 jobs per acre. One-third of the TAZ is covered by the alignment buffer; therefore 33 jobs are counted from the TAZ for that alignment.
  - Data Source: Employment data from InfoUSA and adjusted by the MPO, aggregated to the Traffic Analysis Zone (TAZ).
  
- **Existing transit ridership along route:**
  - Existing Metro customers represent the current demand for transit service in an area.
  - Passengers boarding at Metro stops along the alignments were used to calculate the average weekday daily ridership per segment.
  - Ridership at transfer points was excluded from this analysis because it is assumed that all alignment alternatives, with the exception of the East Corridor, would serve existing or relocated transfer points. Also, transfer point ridership is difficult to measure because some riders will continue using other routes available there or may have different travel patterns with a reconfigured transit network.

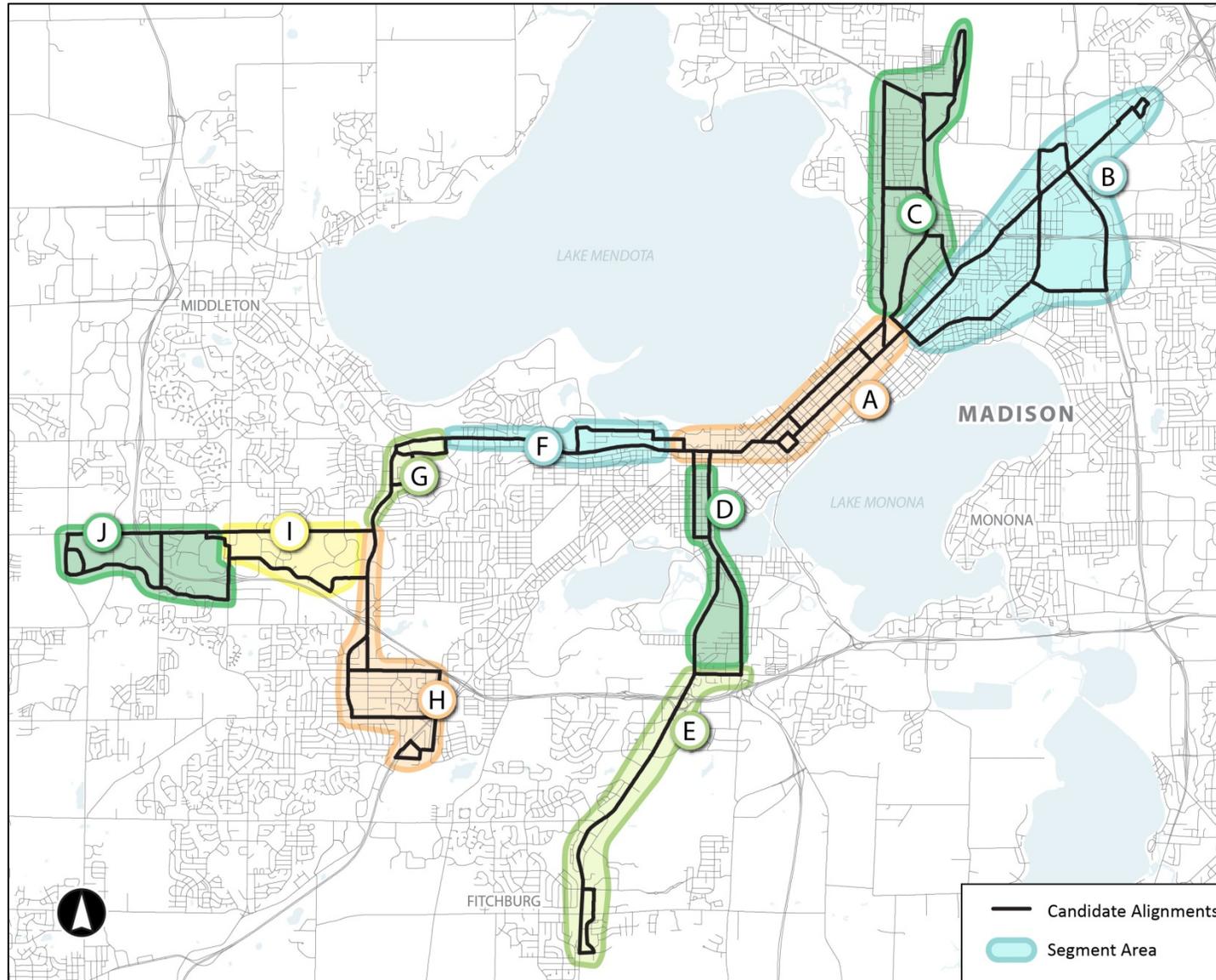
- Data Source: Average weekday daily ridership, October 2011 Metro farebox boarding data.
- **Transit Oriented Development (TOD) potential along corridor:**
  - TODs, developments designed and built to encourage transit use, increase demand for—and are benefitted by—high quality transit along a corridor.
  - TOD potential were gauged as low, medium or high based on visual inspection of existing land uses, the City of Madison Comprehensive Plan (2006), and work performed thus far by CARPC for the TOD Market Study. These values were assigned within the context of each individual segment, not across the greater Madison area as a whole.
  - Data Source: 2006 Madison Comprehensive Plan, aerial photos, and other sources.
- **Roadway suitability:**
  - The functional class of a roadway as well as speed, right-of-way, and traffic volumes all effect the implementation of a BRT system.
  - Alignment road suitability gauged as low, medium or high based on the ease of implementing the highest class of BRT service along the alignment.
  - Data Source: Roadway functional classification geographical information maintained by the MPO, City of Madison Traffic Flow Maps, and aerial photos.

The initial universe of alternatives was divided into groupings of two to five alternatives. Each of these groupings corresponded to the potential routing alternatives between major destination points or points of divergence in the baseline alignments (e.g., the point at which the north and east alignments diverge from their shared alignment through the Isthmus). This approach allowed the alternatives within each segment to be directly compared and contrasted to each other in order to identify the alignment with the best potential for further BRT planning. The approximate extents of each segment are described in Table 1 and show below in Figure 2.

**Table 1: Alignment Segment Descriptions**

Corridor	Segment ID	Description
Central	A	This segment is located entirely within Central Madison encompassing the University of Wisconsin-Madison campus, Capitol Square, and the Isthmus.
East	B	This segment continues east of Segment A between First Street and East Towne Mall.
North	C	This segment continues north of Segment A at First Street and assumes the terminus of the north alignment would be located at or near the Dane County Regional Airport.
South	D	This segment continues south of Segment A from the University of Wisconsin-Madison campus and to the South Transfer Point.
South	E	This segment extends south of Segment D from the South Transfer Point to Fitchburg.
West	F	This segment continues west of Segment A from Randall Avenue to Hill Farms along the University Avenue Corridor.
West	G	This segment continues south of Segment F from Hill Farms to Westgate.
West	H	This segment continues south of Segment G from Westgate to the Allied/Dunn's Marsh Neighborhood. The BRT route would likely need to follow either Segment H or Segments I and J.
West	I	This segment continues west of Segment G from Westgate to West Towne. The BRT route would likely need to follow either Segment H or Segments I and J.
West	J	This segment continues west of Segment I from West Towne to the planned University Research Park Phase II Development near Mineral Point Road and Pleasant View Road. The BRT route would likely need to follow either Segment H or Segments I and J.

Figure 2: Initial Universe of Alternatives by Segment



## Results and Discussion

### CENTRAL CORRIDOR

The central corridor is the shared segment of the BRT system that connects the UW campus, State Street, Capitol Square, and East Washington Avenue. Most existing bus routes that serve central Madison operate on some part of this corridor. Transit oriented development opportunities exist along East Washington Avenue.

**Table 2: Central Corridor Characteristics**

<b>Approximate Length</b>	2.7 miles (Randall Avenue to Baldwin Street)
<b>Existing Metro Bus Routes in the Area</b>	West of Capitol Square: 2, 3/7, 11, 12, 14/8, 15, 56, 57, 58, 70, 71, 72, 74 East of Capitol Square: 6, 14, 15, 25, 27, 29, 37, 56, 57
<b>Existing Travel Time</b>	Randall Avenue to Baldwin Street: Routes 14/15: 16 minutes
<b>Corridor Challenges</b>	Traffic congestion on Johnson Street; pedestrian, bicycle, and loading conflicts on State Street; and traffic signal timing on State Street

### Segment A Alternatives

This segment is located entirely within Central Madison between the University of Wisconsin-Madison campus, Capitol Square, and Baldwin Street. Street. This segment forms the basis of the central corridor.

<p><b>Alternative A-1</b></p> <p>Employment: High Ridership: 9,854 Population: Medium TOD Potential: High Roadway Suitability: High</p>	 <p>The map shows a red line representing the proposed BRT route. It starts at the intersection of University Avenue and W. Johnson Street, travels east on W. Johnson Street, then turns north on State Street, and finally turns east on E. Washington Avenue. A north arrow is located in the top left corner of the map.</p>
<p><b>Description:</b> This route takes the quickest and most direct path between the Capitol Square and 1<sup>st</sup> Street, following E. Washington Avenue entirely. It leaves the square via State Street and then accesses the University Avenue and W. Johnson Street couplet via W. Gorham Street.</p>	

<p><b>Alternative A-2</b></p> <p>Employment: High                  Ridership: 7,774                  Population: High                  TOD Potential: Low                  Roadway Suitability: Medium</p>	
<p><b>Description:</b> Alternative A-2 bypasses the Capitol Square using the E. Johnson / E. Gorham Street Couplet.</p>	
<p><b>Alternative A-3</b></p> <p>Employment: High                  Ridership: 7,892                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: Medium</p>	
<p><b>Description:</b> Alternative A-3 bypasses the Capitol Square using the E. Johnson / E. Gorham Street Couplet, then transitions to E. Washington Avenue via N. Butler Street.</p>	

**Segment A Discussion**

Because of the constrained geography of Central Madison caused by Lakes Monona and Mendota, there are a limited number of viable alternatives. Many existing bus routes travel through parts of this corridor, and Alternative A-1 is established as the fastest and most robust. Although most of the population on the Isthmus is concentrated north and south of E. Washington Avenue, major urban development is planned along E. Washington Avenue, which is more centrally located than other corridors and is within walking distance of most residences on the Isthmus. Additionally, the Johnson/Gorham Street couplet, Williamson Street, and Jenifer Street present major challenges for fast, reliable transit. See Appendix A for additional alternatives that were removed from the screening process, including Lower State Street, Broom/Bassett Streets, W. Washington Avenue, and the Capitol Loop. **Alternative A-1 is identified as the most promising alignment within Segment A to be advanced for further refinement.**

**Table 3: Segment A Rating Overview**

<b>Segment A</b>	<b>A1</b>	<b>A2</b>	<b>A3</b>
Employment	HIGH	HIGH	HIGH
Ridership	9,854	7,774	7,892
Population	MEDIUM	HIGH	MEDIUM
TOD Potential	HIGH	LOW	MEDIUM
Roadway Suitability	HIGH	MEDIUM	MEDIUM
	<b>Most Promising</b>		

### EAST CORRIDOR

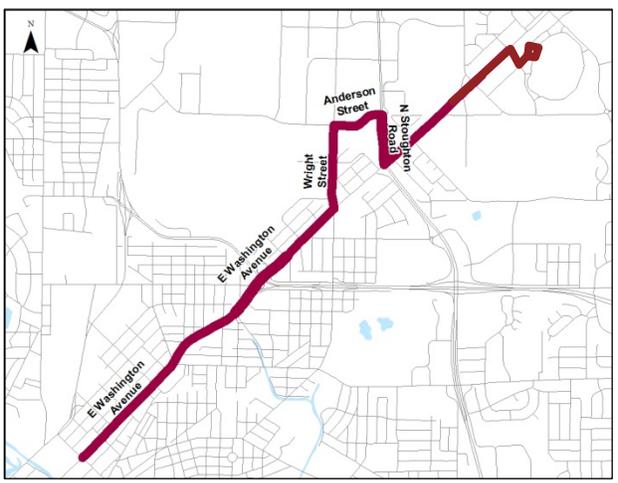
The east BRT line connects central Madison with established high density neighborhoods on the Isthmus, the MATC Truax campus, and retail areas at East Towne Mall. Transit oriented development opportunities exist along East Washington Avenue and in the East Towne area.

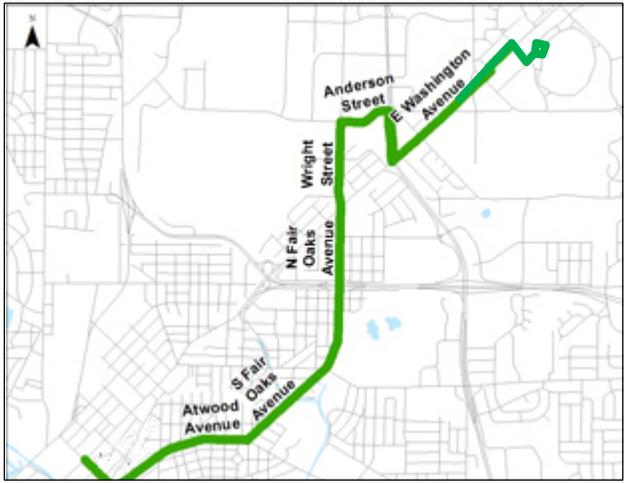
**Table 4: East Corridor Characteristics**

<b>Length</b>	4.5 miles (Baldwin Street to East Town Mall)
<b>Existing Metro Bus Routes in Area</b>	6, 25
<b>Existing Travel Time</b>	Capitol Square to East Towne Mall, Route 6: 30-37 minutes
<b>Challenges</b>	Traffic congestion on East Washington Avenue, service to MATC, connection from Anderson Street to East Washington Avenue, and transfers to other bus routes.

### Segment B Alternatives

This segment continues east of Segment A between 1<sup>st</sup> Street and East Towne Mall.

<p><b>Alternative B-1</b></p> <p>Employment: Medium                      Ridership: 1,934                      Population: Medium                      TOD Potential: Medium                      Roadway Suitability: High</p>	 <p>The map shows a red route starting on E Washington Avenue, heading east. It turns north at Wright Street, then east at Anderson Street, and finally north at N Stearns Street. A north arrow is located in the top left corner of the map area.</p>
<p>This route runs mainly along E. Washington Avenue from First Street to Eagan Road and East Towne, but deviates at Wright Street in order to serve the Madison Area Technical College (MATC).</p>	

<p><b>Alternative B-2</b></p> <p>Employment: Medium                  Ridership: 1,347                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: Low</p>	 <p>A map showing the proposed BRT route for Alternative B-2. The route is highlighted in green and starts at the bottom left, following Atwood Avenue and S Fair Oaks Avenue. It then turns north on N Fair Oaks Avenue, passing Wright Street, and continues north on Anderson Street. Finally, it turns east on E Washington Avenue towards the top right of the map.</p>
<p><b>Description:</b></p> <p>This route follows Atwood Avenue and Fair Oaks Avenue, serving Schenk’s Corners, before serving MATC and continues to E. Washington Avenue. It is assumed that the East Transfer Point would be relocated to be served by this route.</p>	
<p><b>Alternative B-3</b></p> <p>Employment: Medium                  Ridership: 1,222                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: Low</p>	 <p>A map showing the proposed BRT route for Alternative B-3. The route is highlighted in blue. It starts at the bottom left, following Atwood Avenue and S Fair Oaks Avenue. It then turns east on Milwaukee Street, passing Ramps, and continues east on E Washington Avenue. The route then turns north on S Stoughton Road and continues north on S Stoughton Road towards the top right of the map.</p>
<p><b>Description:</b></p> <p>Similar to B-2, this route follows Atwood Avenue and Fair Oaks Avenue, but continues to the East Transfer Point before heading north on Stoughton Road and continuing to E. Washington Avenue and East Towne. The circuitous routing and high travel times results in a roadway suitability ranking of Low.</p>	
<p><b>Alternative B-4</b></p> <p>Employment: Low                  Ridership: 1,570                  Population: Low                  TOD Potential: Medium                  Roadway Suitability: High</p>	 <p>A map showing the proposed BRT route for Alternative B-4. The route is highlighted in orange. It starts at the bottom left, following E Washington Avenue, and continues northeast along E Washington Avenue towards the top right of the map.</p>
<p>This routing takes the quickest and most direct path along E. Washington Avenue between First Street and East Towne.</p>	

<p><b>Alternative B-5</b></p> <p>Employment: Low                  Ridership: 1,218                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: Low</p>	
<p>This routing differs from B-2 only in its lack of direct service to MATC, which negatively affects the levels of employment and ridership.</p>	

**Segment B Discussion**

The fastest and most direct routing through this segment would entirely follow E. Washington Avenue as in alternative B-4. However, the lack of available transfers from other routes through a transfer point and the relatively low-density nature along E. Washington Avenue necessitate the review of deviations. A direct comparison between B-1 and B-4 shows that the deviation to MATC offers a significant boost to employment and ridership with a relatively small impact to the directness of the route. This is essentially equivalent to the current routing of Route 6 via MATC, using Anderson Road instead of Kinsman Boulevard – a cut-off expected to save about three minutes. B-2, B-3, and B-5’s deviations to serve transfers to east Madison service have an unacceptable level of circuitousness and high travel times.

**Alternative B-1 is the most promising alignment within Segment B to be advanced for further refinement.**

**Table 5: Segment B Rating Overview**

<u>Segment B</u>	<b>B1</b>	<b>B2</b>	<b>B3</b>	<b>B4</b>	<b>B5</b>
Employment	MEDIUM	MEDIUM	MEDIUM	LOW	LOW
Ridership	1,934	1,347	1,222	1,570	1,218
Population	MEDIUM	MEDIUM	MEDIUM	LOW	MEDIUM
TOD Potential	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM
Roadway Suitability	HIGH	LOW	LOW	HIGH	LOW
	<b>Most Promising</b>				

**NORTH CORRIDOR**

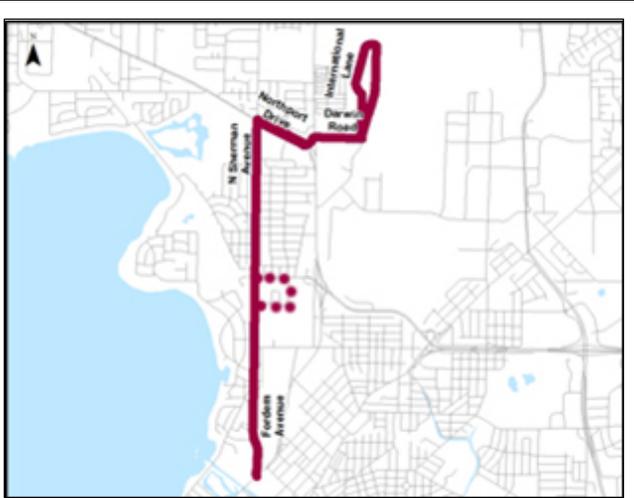
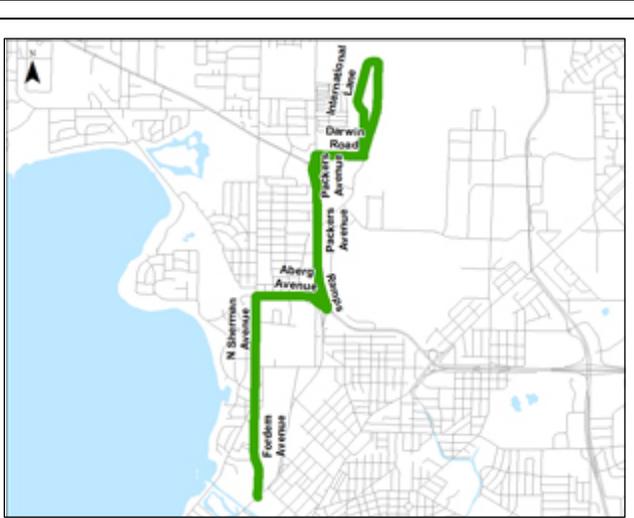
The north BRT line connects central Madison with established high density neighborhoods on the Isthmus, apartments, potential future growth areas, and the Dane County Regional Airport. The North Transfer Point would potentially be relocated or reconfigured to allow transfers to other bus routes. Transit oriented development opportunities exist along East Washington Avenue and Sherman Avenue.

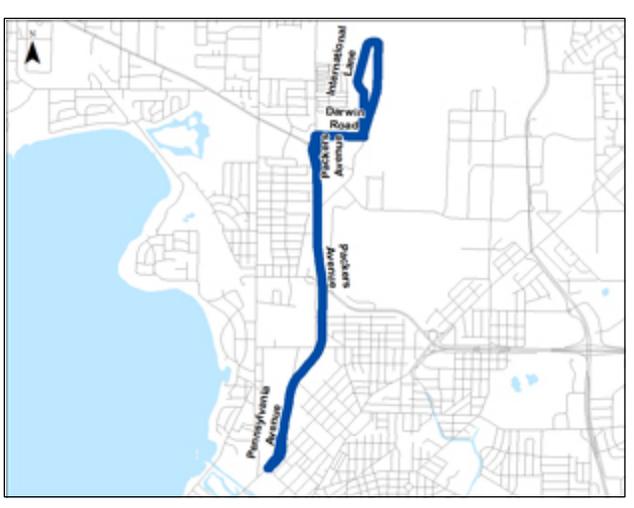
**Table 6: North Corridor Characteristics**

<b>Length</b>	4.4 miles (Baldwin Street to Dane County Regional Airport)
<b>Existing Metro Bus Routes in Area</b>	2, 4, 20, 21, 22, 27, 28, 29
<b>Existing Travel Time</b>	Capitol Square to Airport, Routes 2-20: 32 minutes
<b>Challenges</b>	Traffic congestion on East Washington Avenue, connection from East Washington Avenue to Fordem Avenue, North Transfer Point, connection from Northport Drive to International Lane

### Segment C Alternatives

This segment continues north of Segment A at First Street and assumes the terminus of the north alignment would be located at the Dane County Regional Airport.

<p><b>Alternative C-1</b></p> <p>Employment: Medium                  Ridership: 632                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: Medium</p>	 <p>A map showing the proposed route for Alternative C-1. The route is highlighted in red and starts on Fordem Avenue, runs north to N. Sherman Avenue, then east on Sherman Avenue, north on Northport Drive, east on Darwin Road, and finally north on International Lane to the airport. A north arrow is in the top left corner.</p>
<p><b>Description:</b></p> <p>This route follows Fordem Ave. and N. Sherman Ave. and accesses the Dane County Airport via Northport Dr., Darwin Dr., and International Ln. It assumes that the North Transfer Point will be relocated to be served by this route. If this is not feasible, Alternative C-1 would include a deviation to serve the NTP.</p>	
<p><b>Alternative C-2</b></p> <p>Employment: Medium                  Ridership: 530                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: Medium</p>	 <p>A map showing the proposed route for Alternative C-2. The route is highlighted in green and starts on Fordem Avenue, runs north to N. Sherman Avenue, then east on Sherman Avenue, north on Aberg Avenue, east on Packers Avenue, north on Darwin Road, and finally north on International Lane to the airport. A north arrow is in the top left corner.</p>
<p><b>Description:</b></p> <p>This route runs on N. Sherman Ave., turns at Aberg Ave. and then accesses the Dane County Airport via Packers Ave., Darwin Rd., and International Ln. Buses would likely stop on Aberg Ave. to serve the North Transfer Point, but not enter it.</p>	

<p><b>Alternative C-3</b></p> <p>Employment: Medium                  Ridership: 157                  Population: Low                  TOD Potential: Low                  Roadway Suitability: High</p>	 <p>A map showing the proposed BRT route for Alternative C-3. The route is highlighted in blue and starts at the intersection of Pennsylvania Avenue and Sherman Avenue. It travels north along Pennsylvania Avenue, then turns east onto Packers Avenue, and finally turns north onto Darwin Road. The map includes labels for Pennsylvania Avenue, Packers Avenue, Sherman Avenue, Darwin Road, and International Lane. A north arrow is present in the top left corner.</p>
<p><b>Description:</b></p> <p>This route travels on Pennsylvania Ave. and Packers Ave., the most direct route to Dane County Regional Airport. It assumes that the North Transfer Point would be moved to the east to be served by this Route.</p>	
<p><b>Alternative C-4</b></p> <p>Employment: Medium                  Ridership: 710                  Population: Medium                  TOD Potential: Low                  Roadway Suitability: Medium</p>	 <p>A map showing the proposed BRT route for Alternative C-4. The route is highlighted in orange and starts at the intersection of E Washington Avenue and Sherman Avenue. It travels north along Sherman Avenue, then turns east onto Packers Avenue, and finally turns north onto Darwin Road. The map includes labels for E Washington Avenue, Sherman Avenue, Packers Avenue, Darwin Road, and International Lane. A north arrow is present in the top left corner.</p>
<p>This route is similar to C-3 except that it uses North St. instead of First Street. This route is faster and more direct, but is duplicative of the East Corridor.</p>	

**Segment C Discussion**

Segment C links the Dane County Airport into the BRT system. The most major differences between the alternatives occur between those that use Packers Avenue versus those that use Sherman Avenue. While the alternatives that run along Packers Avenue have the potential for high operational speed, Packers Avenue, especially at the intersection of Aberg Avenue, is not pedestrian friendly and is dominated by low-density residential, industrial, and open space land uses. Using an alignment along Sherman Avenue would allow direct access to high density apartments at Sherman Terrace, the North Side Town Center, and many other destinations along with potential TOD sites identified in the City of Madison Comprehensive Plan. See Appendix A for other routing options that were explored. Many challenges exist to Alternative C-1, including the connection from E. Washington Ave. to Fordem Ave., relocating the North Transfer Point, and the connection from Northport Dr. to Darwin Rd. The connection from E. Washington Ave. to Fordem Ave. may be done with a busway in the rail corridor crossing the Yahara River; if that project proves to be infeasible, the routing would likely be via First St. and Johnson St. **Alternative C-1 is identified as the most promising alignment within Segment C to advance for further refinement.**

**Table 7: Segment C Rating Overview**

<b>Segment C</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>
Employment	MEDIUM	MEDIUM	MEDIUM	MEDIUM
Ridership	632	530	157	710
Population	MEDIUM	MEDIUM	LOW	MEDIUM
TOD Potential	MEDIUM	MEDIUM	LOW	LOW
Roadway Suitability	MEDIUM	MEDIUM	HIGH	MEDIUM
	<b>Most Promising</b>			

### SOUTH CORRIDOR

The south BRT line connects a variety of land uses in south Madison and Fitchburg, including high density student housing, apartments, and future growth areas. Transit oriented development opportunities exist along South Park Street and on Fish Hatchery Road south of the Beltline Highway.

**Table 8: South Corridor Characteristics**

<b>Length</b>	4.5 miles (University Avenue to Caddis Bend)
<b>Existing Metro Bus Routes in Area</b>	4, 5, 40, 44, 47, 48
<b>Existing Travel Time</b>	Capitol Square to Caddis Bend, Routes 5-40: 50 minutes
<b>Challenges</b>	Traffic congestion on Park Street, South Transfer Point, Beltline Highway Crossing, service to Arbor Heights neighborhood

### Segment D Alternatives

This segment continues south of Segment A from the University of Wisconsin-Madison to Badger Road and the South Transfer Point.

<p><b>Alternative D-1</b></p> <p>Employment: Medium                      Ridership: 1,066                      Population: Medium                      TOD Potential: High                      Roadway Suitability: High</p>	
<p><b>Description:</b></p> <p>This route runs down S. Park St. It eliminates the deviation to Fisher St. currently done by Route 5.</p>	

<p><b>Alternative D-2</b></p> <p>Employment: Medium                  Ridership: 2,501                  Population: High                  TOD Potential: High                  Roadway Suitability: Low</p>	
<p><b>Description:</b></p> <p>This routing differs from D-1 only in the use of Mills Street instead of Park Street between University Avenue and Erin Street.</p>	
<p><b>Alternative D-3</b></p> <p>Employment: Medium                  Ridership: 4,332                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: High</p>	
<p><b>Description:</b></p> <p>This routing differs from D-1 only in the use of Fish Hatchery Road instead of Park street south of Lakeside Street. It assumes the South Transfer Point would be relocated to be served by this Route.</p>	
<p><b>Alternative D-4</b></p> <p>Employment: Medium                  Ridership: 2,534                  Population: Medium                  TOD Potential: Low                  Roadway Suitability: Low</p>	
<p><b>Description:</b></p> <p>This routing combines the Mills Street deviation from D-2 with the Fish Hatchery Road deviation from D-3 and assumes the South Transfer Point will be relocated to be served by this Route.</p>	

**Segment D Discussion**

Employment, population, and ridership levels are relatively similar along all four alternatives since they serve similar geographic areas north of Wingra Creek.. The deviation to serve Mills St. would increase

access to population concentrations west of Park St., but would cause delays currently felt by Route 4. The Fish Hatchery Road routing would be faster than Park St., but Park St. has a substantial advantage in population and TOD potential, without the need to relocate the South Transfer Point. **Alternative D-1 is identified as the most promising alignment within Segment D to be advanced for further refinement.**

**Table 9: Segment D Rating Overview**

<u>Segment D</u>	<b>D1</b>	<b>D2</b>	<b>D3</b>	<b>D4</b>
Employment	MEDIUM	MEDIUM	MEDIUM	MEDIUM
Ridership	1,066	2,501	4,332	2,534
Population	MEDIUM	HIGH	MEDIUM	MEDIUM
TOD Potential	HIGH	HIGH	MEDIUM	LOW
Roadway Suitability	HIGH	LOW	HIGH	LOW
	<b>Most Promising</b>			

### Segment E Alternatives

This segment extends south of Segment D from the South Transfer Point to McKee Road. It is suggested that a possible extension to E. Cheryl Pkwy and other destinations in Fitchburg not currently served by transit be deferred until planned future development occurs. .

<p><b>Alternative E-1</b></p> <p>Employment: Medium                  Ridership: 261                  Population: Low                  TOD Potential: Low                  Roadway Suitability: High</p>	
<p><b>Description:</b></p> <p>This routing operates entirely on Principal Arterial roadways along Fish Hatchery Road between Badger Road and McKee Road.</p>	

### Segment E Discussion

Fish Hatchery Rd. is the only viable corridor south of the Beltline Hwy. See Appendix A for discussion on other possible alignments that were explored. **Alternative E-1 is the only alternative to advance for further refinement in this segment.**

### WEST CORRIDOR

The west BRT line connects some of the highest ridership areas in Madison. Existing routes in the University Avenue corridor, from the Hill Farms neighborhood to the University of Wisconsin (UW)-Madison campus, experience chronic overcrowding while UW-Madison is in session. Transit oriented development opportunities exist along University Avenue and between Westgate and West Towne Mall.

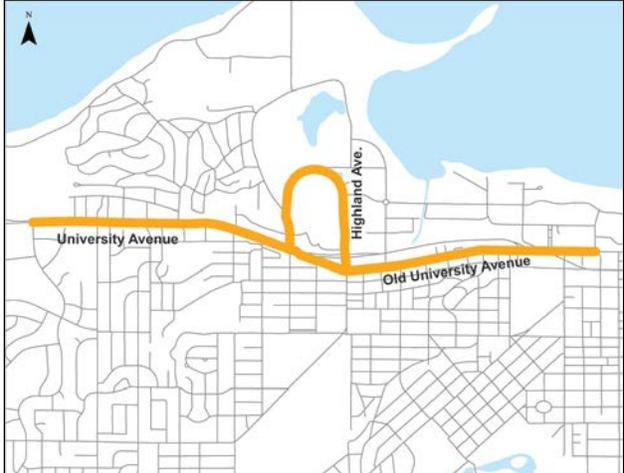
**Table 10: West Corridor Characteristics**

<b>Length</b>	7.4 miles (Randall Avenue to High Point Road)
<b>Existing Metro Bus Routes in Area</b>	2, 14/8, 15, 56, 57, 67, 73/63
<b>Estimated Travel Time</b>	Capitol Square to West Towne, Routes 6-67: 51 minutes
<b>Challenges</b>	Traffic congestion on University Avenue, service to UW Hospital, left turns from Sheboygan Avenue to Segoe Road and Whitney Way, West Transfer Point, West Towne Mall.

### Segment F Alternatives

This segment continues west of Segment A from N. Randall Avenue to University Avenue at Segoe Road.

<p><b>Alternative F-1</b></p> <p>Employment: High                  Ridership: 2,910                  Population: High                  TOD Potential: Low                  Roadway Suitability: Medium</p>	 <p>A map showing the proposed route for Alternative F-1. The route is highlighted in red and starts on the left side of the map, runs east along University Avenue, then turns south onto Campus Drive, and finally turns east back onto University Avenue. A north arrow is located in the top left corner of the map.</p>
<p><b>Description:</b></p> <p>This routing runs directly west from N. Randall Ave. along Campus Drive to University Avenue and Segoe Road. Access to the hospitals along University Bay Dr. is provided by other routes or by walking ¼- to 3/8-mile north from Farley Ave.</p>	
<p><b>Alternative F-2</b></p> <p>Employment: High                  Ridership: 8,215                  Population: High                  TOD Potential: Low                  Roadway Suitability: Low</p>	 <p>A map showing the proposed route for Alternative F-2. The route is highlighted in green and starts on the left side of the map, runs east along University Avenue, then turns south onto Highland Ave., then east onto Observatory Drive, then south onto Linden Drive, and finally east onto Charter Street. A north arrow is located in the top left corner of the map.</p>
<p><b>Description:</b></p> <p>This route sacrifices operational speed in order to provide direct service to the interior of University of Wisconsin’s campus and the UW Hospital and Clinics. This area is currently served extensively by Route 80 with a high level of fare-free service and extremely high utilization.</p>	

<p><b>Alternative F-3</b></p> <p>Employment: High                  Ridership: 5,799                  Population: High                  TOD Potential: Low                  Roadway Suitability: Medium</p>	
<p><b>Description:</b></p> <p>This route runs along Campus Drive, and provides direct service to the UW Hospital and Clinics by looping around University Bay Dr. counter-clockwise in both directions.</p>	
<p><b>Alternative F-4</b></p> <p>Employment: High                  Ridership: 5,426                  Population: High                  TOD Potential: Low                  Roadway Suitability: Low</p>	
<p><b>Description:</b></p> <p>This route runs along Old University Ave. and provides direct service to the UW Hospital and Clinics by looping around University Bay Dr. in both directions similar to Route 2.</p>	
<p><b>Alternative F-5</b></p> <p>Employment: High                  Ridership: 4,097                  Population: High                  TOD Potential: Low                  Roadway Suitability: Low</p>	
<p><b>Description:</b></p> <p>This route runs along Old University Ave., but does not provide direct services to the University Hospital and Clinics.</p>	

**Segment F Discussion**

All options in Segment F require a tradeoff between speed and access. Alternative F-1 offers the fastest service but requires passengers to walk farther to the UW and VA Hospitals and does not serve Old University Ave. Alternatives F-3, F-4, and F-5 offer more access but would likely not live up to the goal of providing faster service; Route 2 currently provides the longest travel time between the Capitol Square and West Transfer Point for existing bus service. However, these alternatives have been retained for more detailed analysis because of the employment and residential areas they serve. Alternative F-2 offers direct access to the University of Wisconsin campus and the University Hospital and Clinics, but would have a very low operation speed and excessive passenger volumes circulating within the UW campus would put constraints on the line. **Alternatives F-1, F-3 and F-4 are identified as the most promising alignments within Segment F to advance for fine tuning.**

**Table 11: Segment F Rating Overview**

<u>Segment F</u>	<b>F1</b>	<b>F2</b>	<b>F3</b>	<b>F4</b>	<b>F5</b>
Employment	HIGH	HIGH	HIGH	HIGH	HIGH
Ridership	2,910	8,215	5,799	5,426	4,097
Population	HIGH	HIGH	HIGH	HIGH	HIGH
TOD Potential	LOW	LOW	LOW	LOW	LOW
Roadway Suitability	MEDIUM	LOW	MEDIUM	LOW	LOW
	<b>Most Promising</b>		<b>Most Promising</b>	<b>Most Promising</b>	

**Segment G Alternatives**

This segment continues south of Segment G from Segoe Road to Whitney Way & Mineral Point Road.

**Alternative G-1**

Employment: Medium  
 Ridership: 222  
 Population: Low  
 TOD Potential: Low  
 Roadway Suitability: Medium

**Description:**

This routing continues west along University Avenue to Old Middleton Road and turns south on Whitney Way.



<p><b>Alternative G-2</b></p> <p>Employment: Medium                  Ridership: 1,432                  Population: High                  TOD Potential: Medium                  Roadway Suitability: Medium</p>	
<p><b>Description:</b></p> <p>This routing follows Segoe south to Sheboygan Ave. before turning south on to Whitney Way.</p>	
<p><b>Alternative G-3</b></p> <p>Employment: Medium                  Ridership: 1,508                  Population: High                  TOD Potential: Medium                  Roadway Suitability: Low</p>	
<p><b>Description:</b></p> <p>This routing follows a more complicated path from Segoe Rd. to Sheboygan Ave. to Eau Claire Ave. to Regent St. to Whitney Way. Many existing routes follow this pattern because of the unsignalized left turn at Sheboygan Ave. and Whitney Way.</p>	

**Segment G Discussion**

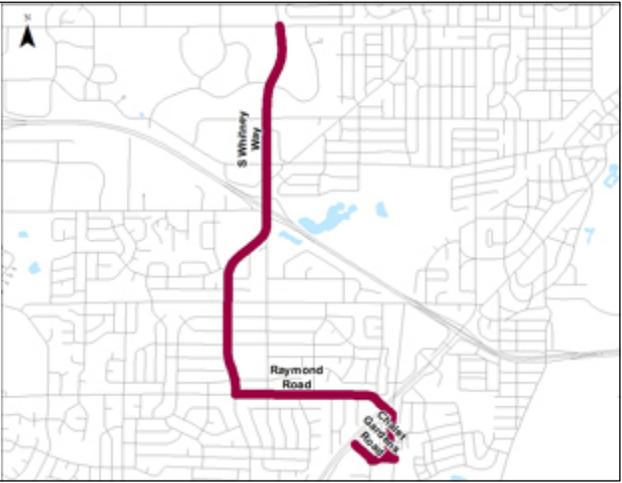
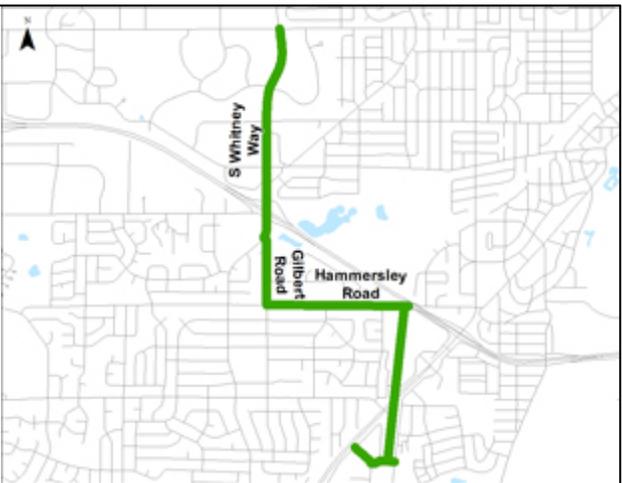
Within Segment G, deviating from University Avenue to serve Sheboygan Ave. provides more direct access to the population concentrations and Hill Farms State Office Building, an important potential TOD site, in that area, but increases travel times slightly. Transitioning from the current alignment for most service (G-3) to G-2 would likely require some changes at the intersection of Sheboygan Ave. and Whitney Way. Alternative G-1 has the least operational challenges and highest speed. **Alternatives G-1 and G-2 are identified as the most promising alignments within Segment G to advance for fine tuning.**

**Table 12: Segment G Rating Overview**

<u>Segment G</u>	<b>G1</b>	<b>G2</b>	<b>G3</b>
Employment	MEDIUM	MEDIUM	MEDIUM
Ridership	222	1,432	1,508
Population	LOW	HIGH	HIGH
TOD Potential	LOW	MEDIUM	MEDIUM
Roadway Suitability	MEDIUM	MEDIUM	LOW
	<b>Most Promising</b>	<b>Most Promising</b>	

### Segment H Alternatives

This segment continues south of Segment G from Whitney Way & Mineral Point Road to a potential terminus in the Allied/Dunn’s Marsh Neighborhood instead of serving the West Towne area.

<p><b>Alternative H-1</b></p> <p>Employment: Medium                  Ridership: 463                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: Low</p>	
<p><b>Description:</b></p> <p>This routing travels south from Mineral Point Road along Whitney Way and Raymond Road. A new connection from Raymond Rd. to Allied Dr. would be required to make this alternative work.</p>	
<p><b>Alternative H-2</b></p> <p>Employment: Medium                  Ridership: 428                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: Low</p>	
<p><b>Description:</b></p> <p>This routing travels south from Mineral Point Road along Whitney Way and Hammersley Road to the Southwest Commuter path. A new busway from Hammersley Rd. to Allied Dr. adjacent to the Southwest Commuter Path would be required to make this alternative work.</p>	

### Segment H Discussion

At this point in the study it has been determined that the West Corridor connections between population, employment and destinations will be better served with a terminus near the West Towne area, so no further evaluation of this segment will be conducted.

### Segment I Alternatives

This segment continues west of Segment G from Whitney Way & Mineral Point Road to West Towne Mall.

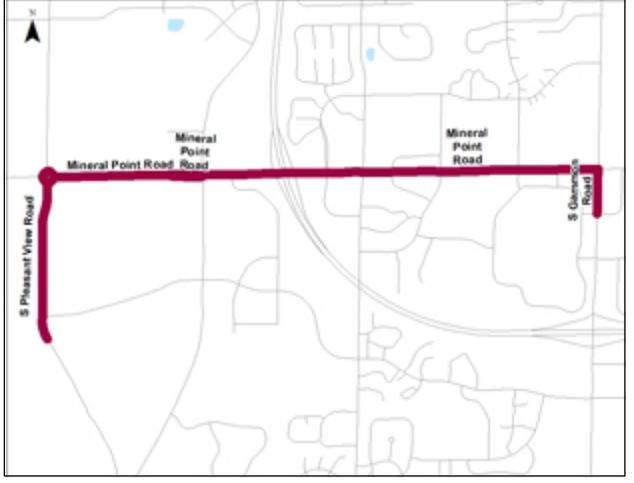
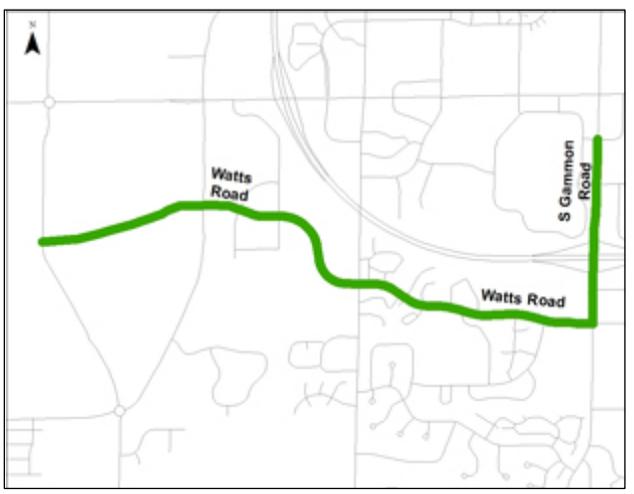
<p><b>Alternative I-1</b></p> <p>Employment: High                  Ridership: 341                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: High</p>	<p>A map showing a direct route highlighted in red. The route starts at S Gammon Road, turns east onto Mineral Point Road, and continues east to West Towne Mall. A north arrow is in the top left corner.</p>
<p><b>Description:</b></p> <p>This routing provides the fastest and most direct option by operating completely on Mineral Point Rd. and ending at the West Towne Mall. The bus, bicycle, and right turn-only lanes on Mineral Point Rd. would be utilized. It assumes that the West Transfer Point would be relocated to be served by this Route.</p>	
<p><b>Alternative I-2</b></p> <p>Employment: Medium                  Ridership: 416                  Population: Low                  TOD Potential: Medium                  Roadway Suitability: Low</p>	<p>A map showing a circuitous route highlighted in green. The route starts at S Gammon Road, goes east to Odana Road, then south to Tokay Boulevard, then east to S Whitney Way, and finally north to West Towne Mall. A north arrow is in the top left corner.</p>
<p><b>Description:</b></p> <p>This routing takes a more circuitous path along Whitney Way, Tokay Blvd. and Odana Rd. However, it serves Westgate, a significant potential TOD site, and does not require the relocation of the West Transfer Point.</p>	

### Segment I Discussion

Like other competitive alternatives within the study area, the choice between I-1 and I-2 requires a tradeoff between speed and access. The existing transit lanes on Mineral Point Road and direct routing make Alternative I-1 appealing regarding speed. However, many of the land uses along this road, as well as characteristics such as building setbacks, make pedestrian access to transit in this corridor more difficult. The feasibility of relocating the West Transfer Point needs to be explored further. Additionally, if I-1 were chosen and extended west of Gammon Rd., direct service to West Towne Mall would no longer be provided. **Both Alternatives I-1 and I-2 are noted as promising alignments within Segment I and will be advanced for further refinement.**

### Segment J Alternatives

This segment continues west of Segment I from West Towne Mall to the planned University Research Park Phase II Development near Mineral Point Road and Pleasant View Road.

<p><b>Alternative J-1</b></p> <p>Employment: Medium                  Ridership: 213                  Population: Low                  TOD Potential: Medium                  Roadway Suitability: High</p>	 <p>A map showing a direct routing for Alternative J-1. The route is highlighted in red and starts at the intersection of S Pleasant View Road and Mineral Point Road. It runs east along Mineral Point Road, then turns south at S Gammon Road, and finally turns east again at the intersection of S Gammon Road and Mineral Point Road. Labels on the map include 'S Pleasant View Road', 'Mineral Point Road', and 'S Gammon Road'. A north arrow is present in the top left corner.</p>
<p><b>Description:</b></p> <p>This routing operates between West Towne Mall and the University Research Park planned Phase II development on Mineral Point Road. The routing is direct, although the Beltline Highway crossing may result in delays.</p>	
<p><b>Alternative J-2</b></p> <p>Employment: Medium                  Ridership: 355                  Population: Medium                  TOD Potential: Medium                  Roadway Suitability: Low</p>	 <p>A map showing a circuitous routing for Alternative J-2. The route is highlighted in green and starts on the west side of Watts Road, runs east, then turns south, then east again, and finally turns south at S Gammon Road. Labels on the map include 'Watts Road' and 'S Gammon Road'. A north arrow is present in the top left corner.</p>
<p><b>Description:</b></p> <p>This routing operates on Gammon Road and Watts Road to the planned University Research Park Phase II development. It serves residential and retail areas but has a circuitous routing.</p>	

### Segment J Discussion

Given that Phase II of the University Research Park has not yet been completed, the study will evaluate the West Corridor with a terminal at West Towne mall. Further evaluation of Segment J west of the beltline will be deferred until development expands in that area.

*Madison Area Transportation Planning Board – An MPO*

# Madison Transit Corridor Study

A Project of the Capital Region Sustainable  
Communities Partnership

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## **Appendix A**

# Screened Alternative Routing

These alignment alternatives were considered for possible inclusion into the BRT study. They were removed during the screening process so that the Bus Rapid Transit study could analyze the strongest corridors in more detail. Some alternatives have been removed in favor of more alternate routings that were clearly superior, others were identified as potential future extensions of future routes.

## Middleton

<b>Routing</b>	University Avenue to Middleton Transfer Point via University Avenue
<b>Advantages</b>	Connects two major municipalities
<b>Reasons for Removal</b>	Low existing transit ridership compared to other west side alternatives Does not serve major residential areas in north Middleton Competes with planned commuter rail line
<b>Future Development</b>	Consider as a future BRT line Consider improvements to existing service (Routes 70, 71, 72, and 74)

## West Madison / Middleton

<b>Routing</b>	Middleton to West Towne via Pleasant View Road or via Deming Way and Junction Road
<b>Advantages</b>	Serves major employment centers
<b>Reasons for Removal</b>	Low existing transit ridership Circuitous roadway network Low redevelopment potential
<b>Future Development</b>	Consider improvements to existing service (Routes 15, 73, and 74)

## University Research Park Phase II

<b>Routing</b>	West Towne to Pleasant View Road and Watts Road via Mineral Point Road
<b>Advantages</b>	Serves a planned transit-oriented employment center
<b>Reasons for Removal</b>	The current study is focusing on already developed areas
<b>Future Development</b>	Consider as a future BRT extension

## Hilldale Mall

<b>Routing</b>	University Avenue to Sheboygan Avenue via Midvale Boulevard, Heather Crest, Kelab Drive, and Segoe Road
<b>Advantages</b>	Serves Hilldale Mall and residential areas on Midvale Boulevard
<b>Reasons for Removal</b>	Circuitous roadway network
<b>Future Development</b>	Maintain local service to the interior of the Hilldale Mall Consider pedestrian improvements from University Avenue to Hilldale Mall

## Midvale Boulevard

<b>Routing</b>	University Avenue to Allied / Dunn's Marsh via Segoe Road, Kelab Drive / Vernon Boulevard / Regent Street, Midvale Boulevard, Verona Road
<b>Advantages</b>	Serves Allied / Dunn's Marsh neighborhood and Midvale Boulevard
<b>Reasons for Removal</b>	Reduces service to Hill Farms and West Towne Most land uses are not supportive of transit Competes with crossing transit service (Routes 3/7, 6, 14, 18, and 19)
<b>Future Development</b>	Consider improvements to existing service

## Monroe Street

<b>Routing</b>	Central Madison to Westgate via Monroe Street and Odana Road or Tokay Boulevard, or to Allied / Dunn's Marsh via Monroe Street and Verona Road
<b>Advantages</b>	Serves Monroe Neighborhood
<b>Reasons for Removal</b>	Transit ridership is not competitive with University Avenue corridor Travel time improvements would be difficult to improve with traffic volumes and lane configurations on Monroe Street
<b>Future Development</b>	Consider as a future BRT line

## Southwest Commuter Path

<b>Routing</b>	Central Madison to Westgate via former Illinois Central Gulf Railroad corridor shared with bicycle path and Odana Road or Tokay Boulevard
<b>Advantages</b>	Provides low travel times to west Madison separated from traffic
<b>Reasons for Removal</b>	Land uses are not supportive of transit Engineering challenges and impacts to bicycle users are uncertain Does not alleviate overcrowding problems in the University Avenue corridor or serve the Monroe Street corridor
<b>Future Development</b>	None

## University Avenue Counter-Flow Lane

<b>Routing</b>	Eastbound from Campus Drive to Bassett Street via University Avenue (this configuration existed until about 1980 when it was converted to a bicycle lane)
<b>Advantages</b>	Provides a dedicated transit-only facility separated from traffic
<b>Reasons for Removal</b>	Impacts to bicyclists would be very high Bicycle use of the facility would likely continue, resulting in operational problems for transit Buses would not be able to pass bicyclists or other buses Engineering constraints related to the lane width are unknown
<b>Future Development</b>	None

## Nine Springs Neighborhood

<b>Routing</b>	South Park Street to Nine Springs Neighborhood via USH-14, former Chicago and Northwestern Railroad corridor, Syene Road, or East Cheryl Parkway
<b>Advantages</b>	Serves a planned major transit-oriented employment center
<b>Reasons for Removal</b>	The current study is focusing on already developed areas
<b>Future Development</b>	Consider as a future BRT line or extension

## Stewart Street

<b>Routing</b>	South Park Street to Fish Hatchery Road via a new Beltline Highway crossing at Perry Street or Longitude -89.400 and Stewart Street
<b>Advantages</b>	Serves a major employment center and potential future development area Eliminates congested Beltline Highway crossing at Fish Hatchery Road Provides a connection from South Park Street to Syene Road
<b>Reasons for Removal</b>	The potential Perry Street overpass is uncertain Does not serve transit dependant areas along Badger Road
<b>Future Development</b>	Consider as a future change or extension if the Perry Street overpass is completed and/or Nine Springs Neighborhood is developed

## West Washington Avenue

<b>Routing</b>	Park Street to Capitol Square via West Washington Avenue University Avenue / Johnson Street to Capitol Square via Broom / Bassett Streets and West Washington Avenue
<b>Advantages</b>	Provides faster, more direct routing compared to Park Street, University Avenue / Johnson Street, and State Street Potentially serves a future intercity bus and/or rail terminal Improves reliability and potentially eliminates some detours by eliminating routing on State Street
<b>Reasons for</b>	Does not serve the UW campus or State Street, major regional destinations

<b>Removal</b>	The site of the future intercity bus/rail terminal is uncertain Most detours in the Madison CBD are related to the Capitol Square
<b>Future Development</b>	Maintain local service Consider improvements to existing service connecting the Bassett Neighborhood to the UW campus (Routes 1, 10, 19, and 38)

## Lower State Street

<b>Routing</b>	University Avenue / Johnson Street to the Capitol Square via Lake Street and State Street
<b>Advantages</b>	Serves cultural activities along Lower State Street (400, 500, and 600 blocks)
<b>Reasons for Removal</b>	Long, unpredictable travel times caused by turns, traffic signals, high-volume pedestrian crossings, and other blockages
<b>Future Development</b>	Maintain local service (Routes 4 and 6)

## Capitol Loop

<b>Routing</b>	State Street to East Washington Avenue via Fairchild, Doty, and Webster Streets eastbound and via Webster and Dayton Streets westbound
<b>Advantages</b>	Eliminates most detours related to the Capitol Square
<b>Reasons for Removal</b>	The Capitol Loop has high traffic volumes, narrower sidewalks, and is not as pedestrian friendly as the Capitol Square Four block separation between eastbound and westbound buses is high, access between the area south of the Capitol and westbound buses would be compromised All local service would need to use the Capitol Loop to accommodate transfers
<b>Future Development</b>	Will likely be the detour route during major detours Develop strategies to reduce the scale and number of Capitol Square detours and improve information during detours Consider improvements to passenger facilities

## East Rail Corridor

<b>Routing</b>	Capitol Square to Winnebago Street or East Washington Avenue via Wilson Street and the East Rail Corridor (former Chicago and Northwestern Railroad and Milwaukee Road)
<b>Advantages</b>	Provides reliable travel to north and east Madison separated from traffic
<b>Reasons for Removal</b>	The one-mile busway does not provide a travel time advantage over other corridors because of turns and traffic signals needed to enter and exit it Impacts to bicycle users and future rail plans are uncertain Competes with parallel service on Jenifer Street and East Washington Avenue
<b>Future Development</b>	None

## East Madison and Monona

<b>Routing</b>	Capitol Square to Broadway via Atwood Avenue and Monona Drive or USH-51
<b>Advantages</b>	Extends BRT service to east Madison and Monona, including Dutch Mill
<b>Reasons for Removal</b>	Most land uses are unsupportive of transit
<b>Future Development</b>	Consider as a future BRT line Consider improvements to existing service (Routes 11, 12, 16, and 39)

## International Lane

<b>Routing</b>	Packers Avenue to Dane County Regional Airport via International Lane
<b>Advantages</b>	Provides faster, more direct routing
<b>Reasons for Removal</b>	Most land uses are not supportive of transit The deviation to Darwin Road serves a substantial residential area with little additional travel time Existing and potential transit ridership at Dane County Regional Airport alone is not sufficient to sustain BRT service levels
<b>Future Development</b>	Maintain appropriate local service to the employment area along International Lane (Existing Route 20)

## Aberg Avenue / Anderson Street

<b>Routing</b>	East Washington Avenue to Dane County Regional Airport via Aberg Avenue and Packers Avenue or Anderson Street and International Lane
<b>Advantages</b>	Increases service to East Washington Avenue Provides fast, reliable service to Dane County Regional Airport
<b>Reasons for Removal</b>	Travel times are not substantially lower than routing via Sherman Avenue or Packers Avenue Does not serve high-ridership areas near Fordem Avenue and Warner Park or identified TOD areas along Sherman Avenue Provides fewer opportunities to serve the North Transfer Point The routing is duplicative of the northeast Corridor
<b>Future Development</b>	Maintain existing service (Routes 17 and 20)

## Hayes Road

<b>Routing</b>	East Towne to Hayes Road via East Washington Avenue Frontage Road
<b>Advantages</b>	Serves residential area near Hayes Road currently served by Route 6
<b>Reasons for Removal</b>	Ridership levels are not supportive of BRT service levels Limited opportunities for extensions to the northeast
<b>Future Development</b>	Restructure existing service to provide convenient connections at East Towne and the North Transfer Point

## High Crossing

<b>Routing</b>	East Towne to High Crossing Boulevard via East Towne Boulevard and East Springs Boulevard
<b>Advantages</b>	Extends BRT service to established retail and residential areas with potential for future urban development
<b>Reasons for Removal</b>	Ridership levels are not supportive of BRT service levels
<b>Future Development</b>	Consider as a future BRT extension