

Concept 1, shown in exhibit 15, is an expanded signalized intersection. With the added lanes, there would be three approach lanes from each direction: a left turn lane, through lane, and through/right lane for eastbound and westbound US 14 traffic, and left-turn, through, and right-turn-only lanes for northbound and southbound County P traffic. As shown in tables 44 and 45, the resulting levels of service for the intersection would be LOS C or better for morning and afternoon peak hours through the year 2038.

Concept 2, the roundabout, would have two approach lanes from each direction (see exhibit 15). Implementation of both concepts would require additional right of way and access modifications in the immediate vicinity of the intersection. Additional issues include the long-term viability of land use in the southeast quadrant of the intersection, the proximity of Black Earth Creek and stormwater issues, and Dane County plans for the County P crossing of Black Earth Creek. Queues vary slightly between concepts but would be significantly reduced in either case, while safety would be improved over existing conditions.

Signalized intersections and roundabouts each have advantages and drawbacks. However, roundabouts appear to offer wide-ranging safety and operational benefits over many signalized intersection configurations. Recent research indicates that replacing signalized intersections with roundabouts can have profound safety benefits. In one study of 23 intersections, installing roundabouts provided a 90 percent reduction in fatal crashes, an 80 percent reduction in injury crashes, and a 40 percent reduction in all crash types.¹ Although conversions to roundabouts seem to have benefits for all location types, safety improvements appear to be most pronounced for rural intersections. Compared to signalized intersections, roundabouts typically:

- Cost more to install when retrofitting
- Cost about the same when building new
- Require more right of way
- Are not common in the United States, and could necessitate public education
- Experience fewer crashes, injury crashes, and fatal crashes
- Experience fewer pedestrian and bicycle crashes
- Result in reduced average delays and queuing
- Have lower maintenance costs
- Reduce fuel consumption
- Reduce pollution
- Can be more aesthetically pleasing (due to additional landscaping opportunities and reduced utility poles and signage)²

¹ Persaud, B N, et al. 2001. "Safety Effect of Roundabout Conversions in the United States: Empirical Bayes Observational Before-After Study," *Journal of the Transportation Research Board*, vol. 1751.

² Federal Highway Administration. 2000. *Roundabouts: an informational guide*. Report no. RD-00-067. Washington, DC: US Department of Transportation.

Furthermore, a roundabout at County P (Concept 2) would provide improved local access and circulation over a signalized intersection because the roundabout could be used to allow changing direction to access driveways on both sides of US 14 as right-in/right-out, even though queuing could potentially be slightly longer than with a signal. In both concepts, treatments at Brewery Road, such as the possibility of a signal, would need to be considered so that both intersections would function as a system.

Table 44 Intersections in Cross Plains: Weekday AM peak-hour level of service, average delay, and queue lengths

Intersection	Baseline 2008			Baseline 2018			Baseline 2028			Baseline 2038			Concept 1 ³ - 2038			Concept 2 ⁴ - 2038		
	LOS ⁵	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue
Market St.	A	8 sec	300 ft	B	15 sec	746 ft	C	29 sec	1092 ft	D	51 sec	1876 ft	B	11 sec	256 ft	B	11 sec	256 ft
CTH P	D	40 sec	759 ft	F	108 sec	1417 ft	F	214 sec	2040 ft	F	337 sec	2314 ft	C	28 sec	452 ft	D	52 sec	1602 ft
Brewery Rd. ⁶	F	67 sec	125 ft	F	283 sec	325 ft	F	757 sec	625 ft	F	1475 sec	925 ft	F	1475 sec	925 ft	F	1475 sec	925 ft
Brewery Rd. Signalized ⁷													B	13 sec	236 ft	B	13 sec	236 ft

Table 45 Intersections in Cross Plains: Weekday PM peak-hour level of service, average delay, and queue lengths

Intersection	Baseline 2008			Baseline 2018			Baseline 2028			Baseline 2038			Concept 1 - 2038			Concept 2 - 2038		
	LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue
Market St.	A	8 sec	241 ft	B	11 sec	420 ft	B	16 sec	632 ft	C	23 sec	960 ft	A	9 sec	179 ft	A	9 sec	179 ft
CTH P	B	19 sec	430 ft	C	29 sec	632 ft	E	62 sec	959 ft	F	102 sec	1138 ft	C	25 sec	306 ft	C	63 sec	372 ft
Brewery Rd.	D	30 sec	25 ft	F	51 sec	75 ft	F	120 sec	150 ft	F	312 sec	250 ft	F	312 sec	250 ft	F	312 sec	250 ft
Brewery Rd. Signalized													A	7 sec	140 ft	A	7 sec	140 ft

³ Concept 1: keeping the County P intersection signalized, adding lanes so that there are three approach lanes in each direction.

⁴ Concept 2: making the County P intersection a 2-lane roundabout.

⁵ LOS: Level of Service. For signalized intersections, overall intersection LOS is displayed. A<or = 10 sec, F>80 sec delays.

⁶ Unsignalized Intersection – only southbound left movement (worst movement) for Brewery Road. is displayed. Eastbound thru and Westbound thru and right movements are free flow. Eastbound left is LOS A-B. Southbound right is LOS A or B in the AM and C in the PM.

⁷ Signalized Brewery Road results also include adding lanes to make 2 thru lanes for eastbound and westbound traffic.

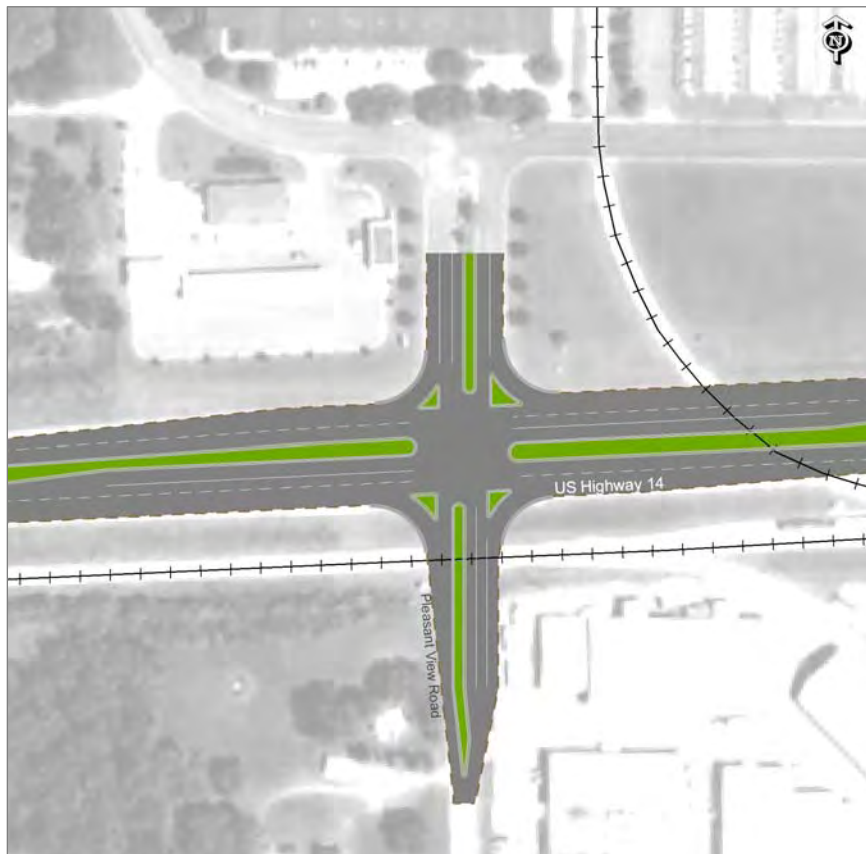
Pleasant View Road

According to the Madison Metropolitan Area *Regional Transportation Plan 2030*, Pleasant View Road is classified as a minor arterial south of US 14 and an urban collector north of it. Pleasant View Road serves nearby commercial and industrial land uses, as well as residential uses further south.

Analysis indicates that the intersection's current peak-hour level of service in both the AM and PM is acceptable, at LOS C. However, it is expected to worsen to LOS D in the PM peak hour by 2018 if no improvements are made. Synchro analysis indicated that the addition of dedicated 200-foot northbound right and left-turn lanes, which are minimum improvements, would maintain LOS D in the AM and PM peak hours through 2038.

Figure 16 below shows recommended improvements to the intersection at Pleasant View Road. These improvements reflect the use of WisDOT standards, such as 350-foot minimum turn-lane lengths, and would accommodate anticipated traffic through 2038. Longer-term strategies could include realigning the Pleasant View Road corridor to the west, as is noted in the City of Middleton's *2005 Southwest Quadrant Plan Update*. Because the intersection in its current location would satisfy anticipated traffic, realignment would be beyond the scope of this study. Potential future locations and configurations for Pleasant View Road could be further explored as a separate study.

Figure 16 Recommended improvements at Pleasant View Road



Deming Way

Deming Way is classified as an urban collector in the *Middleton 2005 Traffic Management Report*. The areas served by Deming Way are currently in mixed commercial use and are expected to intensify, remaining primarily commercial retail and office use, and generating several hundred trips per day. Balancing WisDOT's regional mobility goals with local access needs is a significant challenge for this intersection and the surrounding US 14 corridor.

An independent analysis of the intersection using recent count data collected by TranSmart Technologies in 2009 reveals that this intersection is expected to perform at LOS C or D during the AM peak hour through 2038. During the PM peak hour, however, the level of service is currently LOS E and drops to LOS F by 2018. Current field observations in the PM peak hour reveal that southbound left-turn movements and associated queues are already problematic at the intersection, primarily due to a lack of gaps created by continuous northbound right-turns. In addition, the current left-turn offset on Deming Way makes it difficult for a driver waiting to turn left to see past opposing left-turning vehicles.

Strategies to improve the operations of the intersection include adding a northbound right-turn lane and a second southbound left-turn lane with protected turn arrows by 2018. These improvements are anticipated to maintain the intersection's level of service at LOS D in the AM and PM peak hours through 2038. It is also recommended that the alignment of Deming Way be improved in order to reduce the current offset between opposing left turns on Deming Way. All right-turn lanes at Deming Way should be channelized and lengthened to WisDOT standards. Exhibit 17 shows the area between Deming Way and US 12/14 with recommended improvements.

US 12/14 Beltline Eastbound Ramps

The US 12/14 corridor is classified as a principal arterial connecting the commercial/office areas on the west side of the city of Middleton to southwest Madison and points east. In its regional context, US 12 connects Interstate 39/90 on the southeast side of the city of Madison to I-90/94 in Wisconsin Dells via the south and southwest side of Madison, Middleton, Sauk City, and Baraboo. US 12 and US 14 share a 9.5-mile corridor on the Beltline highway from Park Street in Madison to University Avenue in Middleton. The US 12/14/University Avenue interchange is the eastern terminus of the study corridor including the eastbound ramps.

The intersection at the eastbound ramps (west side of the Beltline) is currently operating at LOS C in the AM and PM peak hours. However, by 2028, the level of service is anticipated to drop to LOS E in the AM peak hour, primarily due to the heavy US 14 eastbound traffic turning left onto US 12/14 (530 vehicles during the AM peak hour). Adding another eastbound left-turn lane by 2028 is recommended; the eastbound US 12/14 entry ramp should also be widened to two lanes at this time. Dual eastbound left-turn lanes will maintain LOS C in the PM and LOS D in the AM through 2038. A sketch of the improvement is shown in exhibit 17.