



December 11, 2023

Mr. Tim Bryan, P.E.  
County Engineer  
Madison County Board of Supervisors  
3137 S. Liberty Street  
Canton, MS 39046

Re: Yandell Road – Turn Lane Analysis

Dear Tim:

A *Traffic Analysis* was conducted to evaluate the potential for adding turn lanes along Yandell Road to help increase the capacity of the roadway and make turning into/out of adjacent subdivisions easier. Per our scope of services, I evaluated intersections along Yandell Road, from the Madison Crossing Elementary School east to Bainbridge Crossing. The location of the study corridor is shown in **Figure 1 – Vicinity Map**. Figures referenced in this letter are provided as attachments.

**Existing Conditions**

Some turning movement counts were collected from prior counts on 8/26/21 for the Hwy 51/Yandell Road intersection and 5/2/23 for the Old Canton Road/Yandell Road intersection and Deerfield Club Drive/Yandell Road intersection. Additional counts for 21 intersections along Yandell Road were conducted to evaluate the turning volumes during peak hours. The volumes show 928 westbound vehicles on Yandell Road in the AM peak hour at US Hwy 51 and 836 eastbound vehicles in the PM Peak hour. The existing and historical peak hour traffic volumes are shown in **Figure 2**. The distribution of traffic is listed in **Table 1**.

Table 1 – Yandell Road 2021 Peak Hour Volumes at US Hwy 51 Intersection

Roadway	AM Pk Hr			PM Pk Hr		
	vph	%	Movement	vph	%	Movement
Hwy 51 - N	191	20.6%	WB Rt	116	13.9%	SB Left
Weisenberger	507	54.6%	WB Thru	463	55.4%	EB Thru
Hwy 51 - S	230	24.8%	WB Left	257	30.7%	NB Rt
Total	928			836		

Approximately 55% of the traffic on Yandell Road is crossing US Hwy 51 and using Weisenberger Road in the AM and PM peak hours. The volumes at Weisenberger Road/Parkway East/Denim Way have the majority of the traffic traveling to/from the north to access Gluckstadt Road and I-55. The 2021 volumes for the Weisenberger Road/Parkway East/Denim Way intersection are listed in **Table 2**.

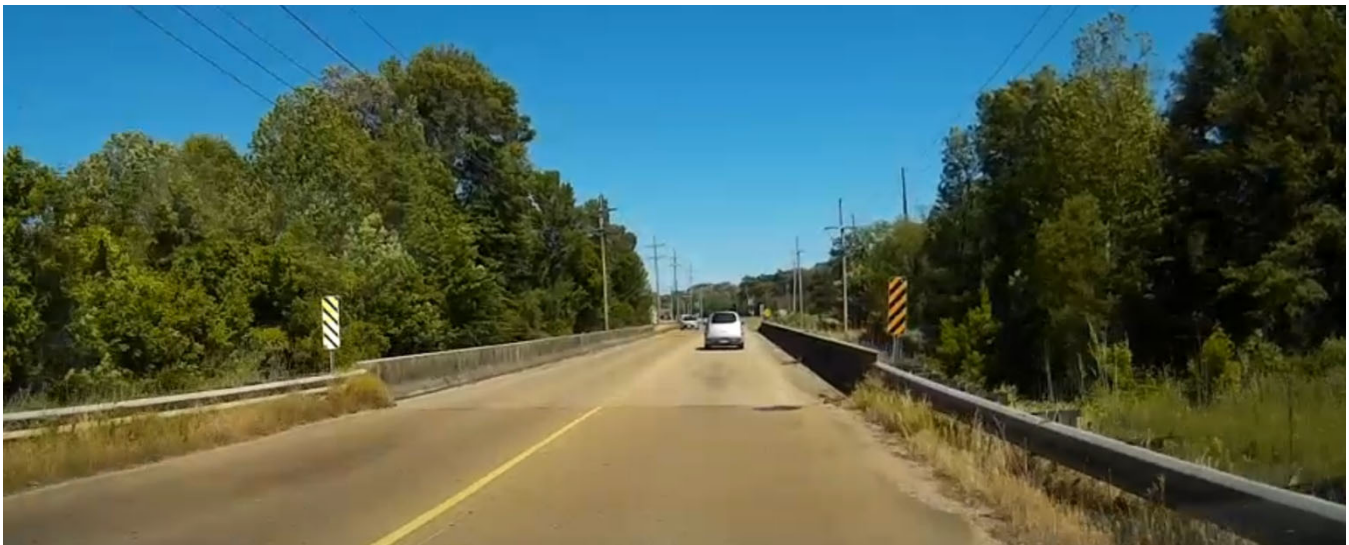
Table 2 – Weisenberger Road 2021 Peak Hour Volumes at Parkway East/Denim Way Intersection

Roadway	AM Pk Hr			PM Pk Hr		
	vph	%	Movement	vph	%	Movement
Weisenberger	632	81.9%	WB Rt	479	68.1%	SB Left
Denim Way	63	8.2%	WB Thru	167	23.8%	EB Thru
Parkway East	77	10.0%	WB Left	57	8.1%	NB Rt
Total	772			703		

The peak hour traffic volumes are over capacity for a 2-lane roadway on Yandell Road east of Hwy 51 with 928 westbound in the AM peak and 836 eastbound in the PM peak. Providing two eastbound and two westbound travel lanes is needed, provided that the volumes can be conveyed to another four-lane roadway. With the planned construction of the Reunion Parkway interchange on Interstate 55, some of the traffic on Weisenberger Road is likely to travel south on Parkway East to the new interchange.

**Weisenberger Road**

This restricted capacity along Yandell Road and Weisenberger Road could be alleviated with the widening of Weisenberger Road to a 5-lane facility. There are two restrictions on widening Weisenberger Road: 1) the  $\pm 200$  ft bridge over Bear Creek, and 2) the existing at-grade railroad crossing (#299762H) over the Canadian National/ Illinois Central (CNIC) railroad.



Above: Looking east on Weisenberger Road at bridge over Bear Creek.

Below: Looking east on Weisenberger Road at CNIC railroad crossing.



I discussed modifying the crossing with Mr. Josh Gordon at CN, as he is the manager of Public Works in Jackson. This modification is not a significant impact for the types of crossing gates that exist. We discussed the timeline for approval of modification to the crossing.

Widening Weisenberger Road from 2-lane to 5-lane would provide significant relief and additional capacity for Yandell Road, as the Hwy 51 intersection is a significant congestion point.

### **Yandell Road**



Above: Looking east on Yandell Road from US Hwy 51

Yandell Road was widened in recent years (2017/2018) to provide a 3-lane cross section in the +1,700 ft from Westfallen Drive to US Hwy 51. The road then narrows to 2-lanes with open ditch drainage, extending east. A dedicated westbound right turn lane exists at the east school driveway. Sheriff Department officers direct traffic at the school entrance/exit.

Extending the 5-lane cross section east from Hwy 51 to the west school driveway is recommended, as 50% of the westbound AM Peak hour traffic on Yandell Road comes from the west school driveway (254 vph southbound right turns-27%) and Clarkdell Road Extension (217 vph northbound left turns-23%). Sheriff deputies direct traffic at the school entrance/exit on Yandell Road in the morning and afternoon peaks.



Above: Looking east at school entrance/officer directing traffic.  
Below: Looking east at school exit/officer directing traffic.



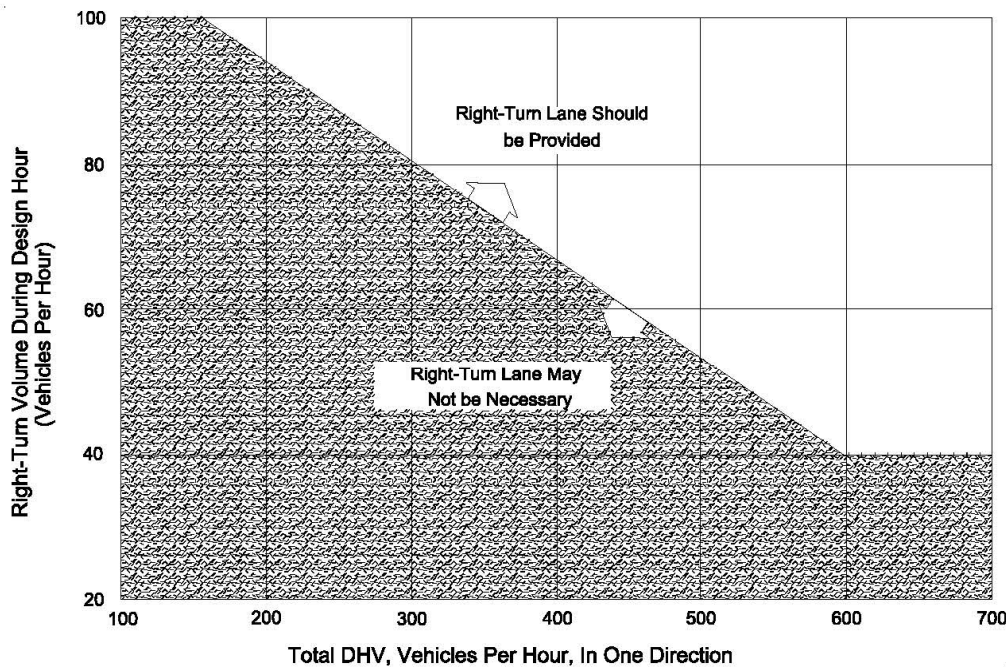


The majority of the property east of Westfalen Drive along Yandell Road is developing as single family homes in relatively dense concentrations ( $\pm 3$  homes per acre). The turning volumes into/out of these residential streets are increasing as more homes are being built/sold. Providing dedicated right turn lanes/left turn lanes at these subdivision access points is recommended to help reduce the impact of turning traffic on thru traffic delays. A center turn lane helps traffic in multiple ways, as a vehicle making a left turn from Yandell Road into a subdivision can take refuge in the center lane and not block thru traffic behind him while he waits for a gap in the other direction. A vehicle turning left out of the subdivision doesn't have to wait for a simultaneous gap in both directions at the same time, as they can get a gap in one direction and turn into the center turn lane and wait in the center turn lane for a gap in the other direction, making the left turn in a 2 stage movement.

**Auxiliary Turn Lane Warrants**

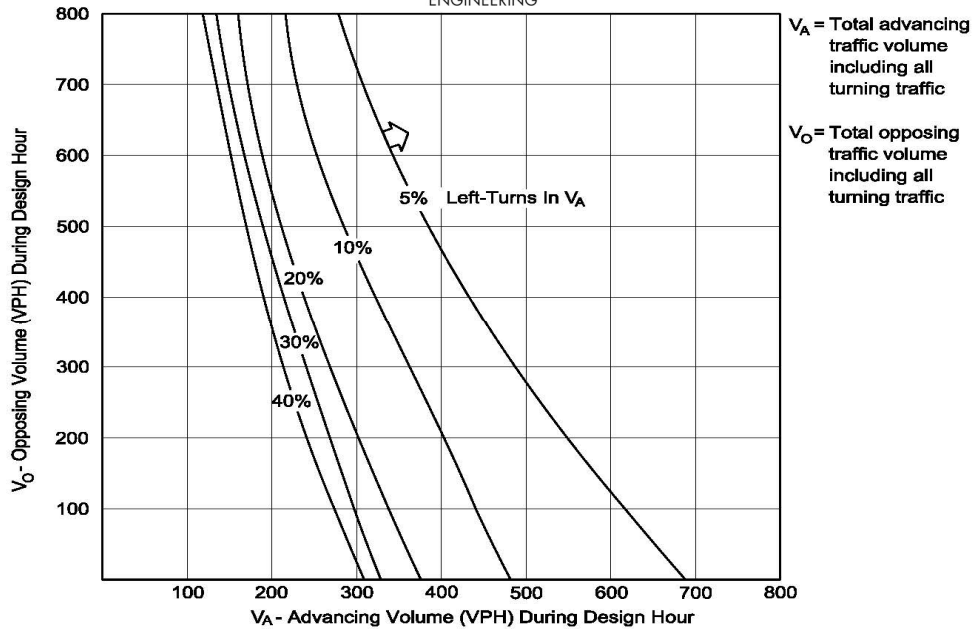
The need for auxiliary left turn/right turn lanes at the existing intersections along Yandell Road was evaluated. One tool that can be used to evaluate the need for providing auxiliary turn lanes is the National Cooperative Highway Research Program (NCHRP) Report 457. This report includes graphs for determining if auxiliary left turn lanes/right turn lanes are needed. The left turn lane criteria are based on the volume advancing, percent of left turns in the volume advancing, and the volume opposing. The right turn lane criteria are based on the right turning volume and the total volume advancing/design hour volume. The posted speed limit on Yandell Road is 40 mph.

The projected Right turning volumes were evaluated at the existing subdivision roadways/intersections along Yandell Road. The volumes were plotted on the graphics provided in the NCHRP Report 457 for *Right Turn Lanes at Non-Signalized Intersections on 2-lane Roadways* and *Left-Turn lanes at Non-Signalized Intersections on 2-Lane Roadways*.



**RIGHT-TURN LANES AT NON-SIGNALIZED INTERSECTIONS ON 2-LANE ROADWAYS**

The right turn lane warrant graph shows that with major street volumes above 600 vph, 40 vph turning would meet the warrant for providing a dedicated right turn lane. Intersections along Yandell Road are recommended to provide dedicated right turn lanes if they have 40 or more vehicles turning right during the peak hours to reduce impacts to thru traffic.



**LEFT-TURN LANES AT NON-SIGNALIZED INTERSECTIONS ON 2-LANE ROADWAYS (≤ 40 mph)**

Table 3 – Auxiliary Turn Lane Calculations

Yandell Rd Intersection	AM Peak Hour					PM Peak Hour					Warrant Met?	
	V <sub>a</sub>	V <sub>o</sub>	% Lefts	DHV	R <sub>ts</sub>	V <sub>a</sub>	V <sub>o</sub>	% Lefts	DHV	R <sub>ts</sub>	Left	Right
Madison Crossing Entrance	465	792	38%	792	263	647	424	1%	424	4	Met	Met
Glenwild Trail	698	287	0%	287	25	385	642	1%	642	55	-	Met
Glenwild Drive	655	277	0%	277	21	312	609	1%	609	16	-	-
Germany Drive	277	655	1%	655	4	609	312	1%	312	2	-	-
Hunters Way	619	243	0%	243	8	273	622	1%	622	9	-	-
Heritage Blvd	253	619	5%	619	4	622	273	3%	273	4	-	-
Smith-Carr Road	240	613	5%	613	7	581	289	2%	289	1	-	-
Coventry Lane	232	582	4%	582	5	589	264	3%	264	9	-	-
Hampton Hills Blvd	534	220	0%	220	11	257	574	2%	574	34	-	-
Johnson Lane	510	240	0%	240	17	301	485	4%	485	40	-	Met*
Porter Ridge	466	239	0%	239	2	287	476	0%	476	12	-	-
Cedar Grove Ln W	446	238	0%	238	7	281	467	0%	467	12	-	-
Harvey Crossing	237	396	7%	396	4	443	255	15%	255	18	Met	-
Deerfield Blvd	185	402	5%	402	4	378	242	9%	242	2	Met*	-
Cedar Grove Ln E	480	178	17%	178	1	280	347	13%	347	2	Met*	-
Deerfield Club Dr	180	457	19%	457	12	435	202	8%	202	4	Met*	-
Cedar Green Drive	337	145	1%	145	26	174	388	1%	388	81	-	Met
Wanstead Way	284	126	3%	126	19	160	305	8%	305	57	-	Met*
Bainbridge Pkwy	117	195	12%	195	0	258	132	24%	132	3	-	-
Bainbridge Crossing	107	174	6%	174	3	199	120	11%	120	6	-	-

\*-Warrant is marginal, but auxiliary turn lane is recommended.

Source: Kiser Traffic and Engineering, LLC. - 2023. Count Dates: 9/26/23, 9/28/23, 10/3/23, & 5/2/23.



**Recommendations**

Widening Weisenberger Road and Yandell Road to a 5-lane cross section from Parkway East to Clarkdell Road Extension is recommended. The northern westbound lane is recommended to extend from the southbound right turn lane exiting the Madison Crossing Elementary school. The southern eastbound thru lane is recommended to terminate as a dedicated right turn lane at Glenwild Trail. With the closely spaced residential access roads between Glenwild Trail and Hampton Hills Blvd, the 3-lane section is recommended to extend the  $\pm 0.8$  miles between these residential streets.

Similarly, the residential development along Yandell Road from Johnson Lane to Cedar Grove Lane East (0.85 miles) is recommended to have a 3-lane cross section. The intersection of Yandell Road/Old Canton Road is recommended to be signalized, and each approach of the intersection is recommended to have an exclusive/dedicated left turn lane, right turn lane and thru lane. A right turn lane is recommended on Yandell Road at Johnson Lane. A left turn lane is also recommended at Deerfield Club Drive/Future Woodgate driveway.

East of Deerfield Club Drive, a center turn lane is recommended from Cedar Green Drive east to Bainbridge Crossing (0.6 miles), with dedicated right turn lanes at Cedar Green Drive and Wanstead Way. These concepts are shown graphically in **Figures 3a-h**.

If you have additional questions or comments regarding these concepts, please let me know.

Sincerely,

Kiser Traffic and Engineering, LLC

A handwritten signature in blue ink that reads "Jonathan Kiser".

Jonathan A. Kiser, P.E., PTOE, PTP  
President

Attachments:

- Figure 1 – Vicinity Map
- Figure 2 – Existing Traffic
- Figure 3a – Weisenberger Road widening concept from Parkway East to US Hwy 51
- Figure 3b – Yandell Road widening concept from Fire Station to Clarkdell Road Extension
- Figure 3c – Yandell Road widening concept from Clarkdell Road to Germany Drive
- Figure 3d – Yandell Road widening concept from Germany Drive to Hampton Hills Blvd
- Figure 3e – Yandell Road widening concept from Johnson Lane to Gluckstadt Fire Department
- Figure 3f – Yandell Road widening concept from Harvey Crossing to Cedar Grove Lane East
- Figure 3g – Yandell Road widening concept from Cedar Grove Lane East to Cedar Green Drive
- Figure 3h – Yandell Road widening concept from Cedar Green Drive to Bainbridge Crossing

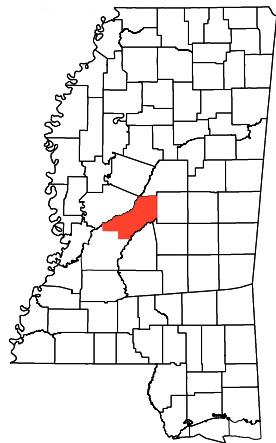


## Appendix Traffic Counts

## A1-A91

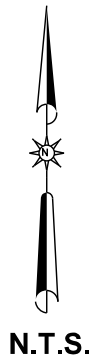
<u>Intersection</u>	<u>Pages</u>
Yandell Rd/ Clarkdell Road Extension	A1-6
Yandell Rd/ Madison Crossing Exit	A7-10
Yandell Rd/ Madison Crossing Entrance	A11-15
Yandell Rd/ Glenwild Trail	A16-19
Yandell Rd/ Glenwild Dr/Germany Dr	A20-23
Yandell Rd/ Hunters Way/Heritage Blvd	A24-27
Yandell Rd/ Smith-Carr Road	A28-31
Yandell Rd/ Coventry Lane	A32-35
Yandell Rd/ Hampton Hills Blvd	A36-39
Yandell Rd/ Johnson Lane	A40-43
Yandell Rd/ Porter Ridge	A44-47
Yandell Rd/ Cedar Grove Ln West	A48-51
Yandell Rd/ Harvey Crossing	A52-55
Yandell Rd/ Old Canton	A56-61
Yandell Rd/ Deerfield Blvd	A62-65
Yandell Rd/ Cedar Grove Ln East	A66-69
Yandell Rd/ Deerfield Club Drive	A70-75
Yandell Rd/ Cedar Green Drive	A76-79
Yandell Rd/ Wanstead Way	A80-83
Yandell Rd/ Bainbridge Pkwy	A84-87
Yandell Rd/ Bainbridge Crossing	A88-91





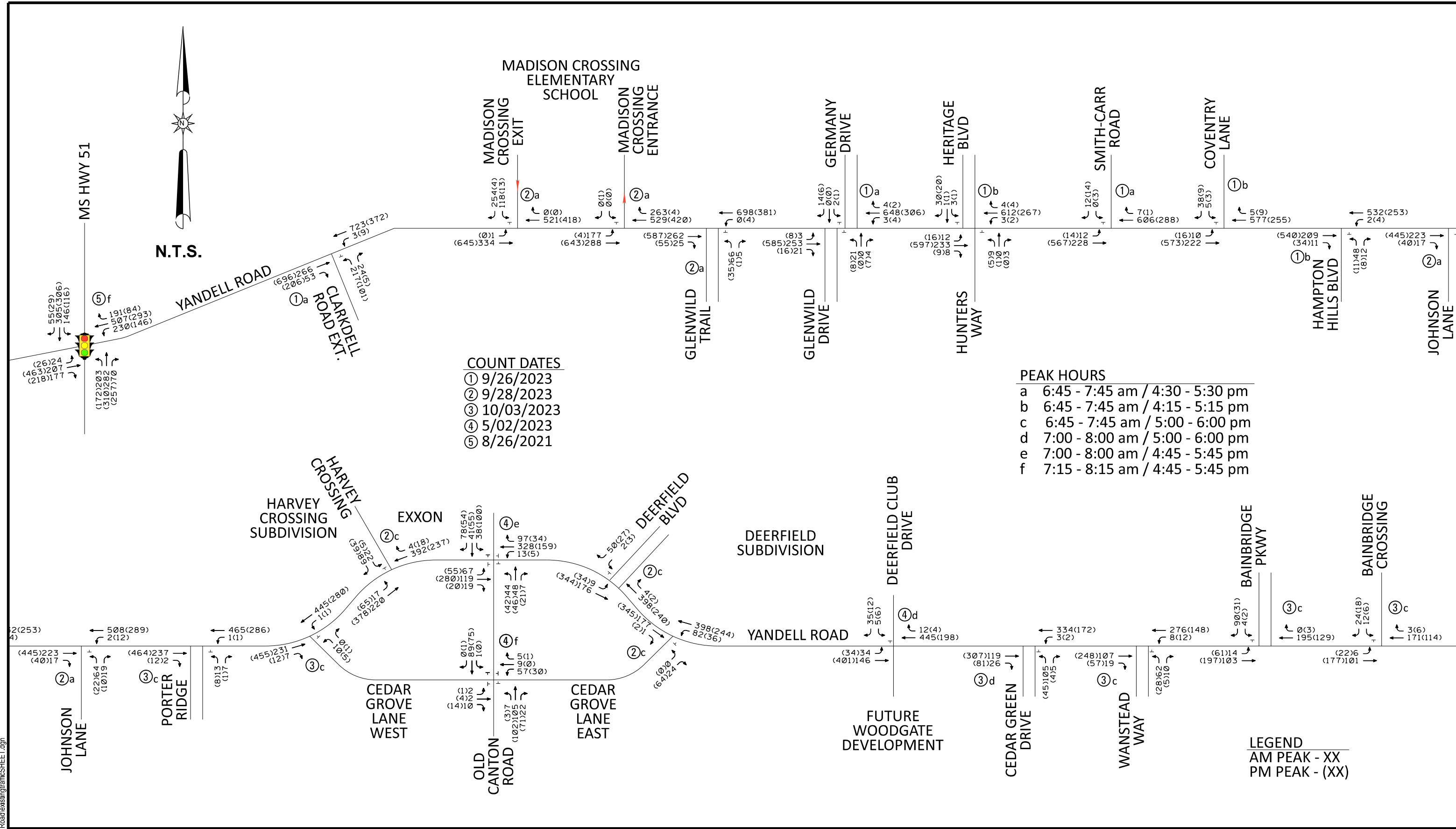
MADISON COUNTY

Project Location 



VICINITY MAP

FIGURE  
1



N.T.S.

COUNT DATES

- ① 9/26/2023
- ② 9/28/2023
- ③ 10/03/2023
- ④ 5/02/2023
- ⑤ 8/26/2021

PEAK HOURS

- a 6:45 - 7:45 am / 4:30 - 5:30 pm
- b 6:45 - 7:45 am / 4:15 - 5:15 pm
- c 6:45 - 7:45 am / 5:00 - 6:00 pm
- d 7:00 - 8:00 am / 5:00 - 6:00 pm
- e 7:00 - 8:00 am / 4:45 - 5:45 pm
- f 7:15 - 8:15 am / 4:45 - 5:45 pm

LEGEND  
 AM PEAK - XX  
 PM PEAK - (XX)

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EXISTING TRAFFIC

FIGURE

2



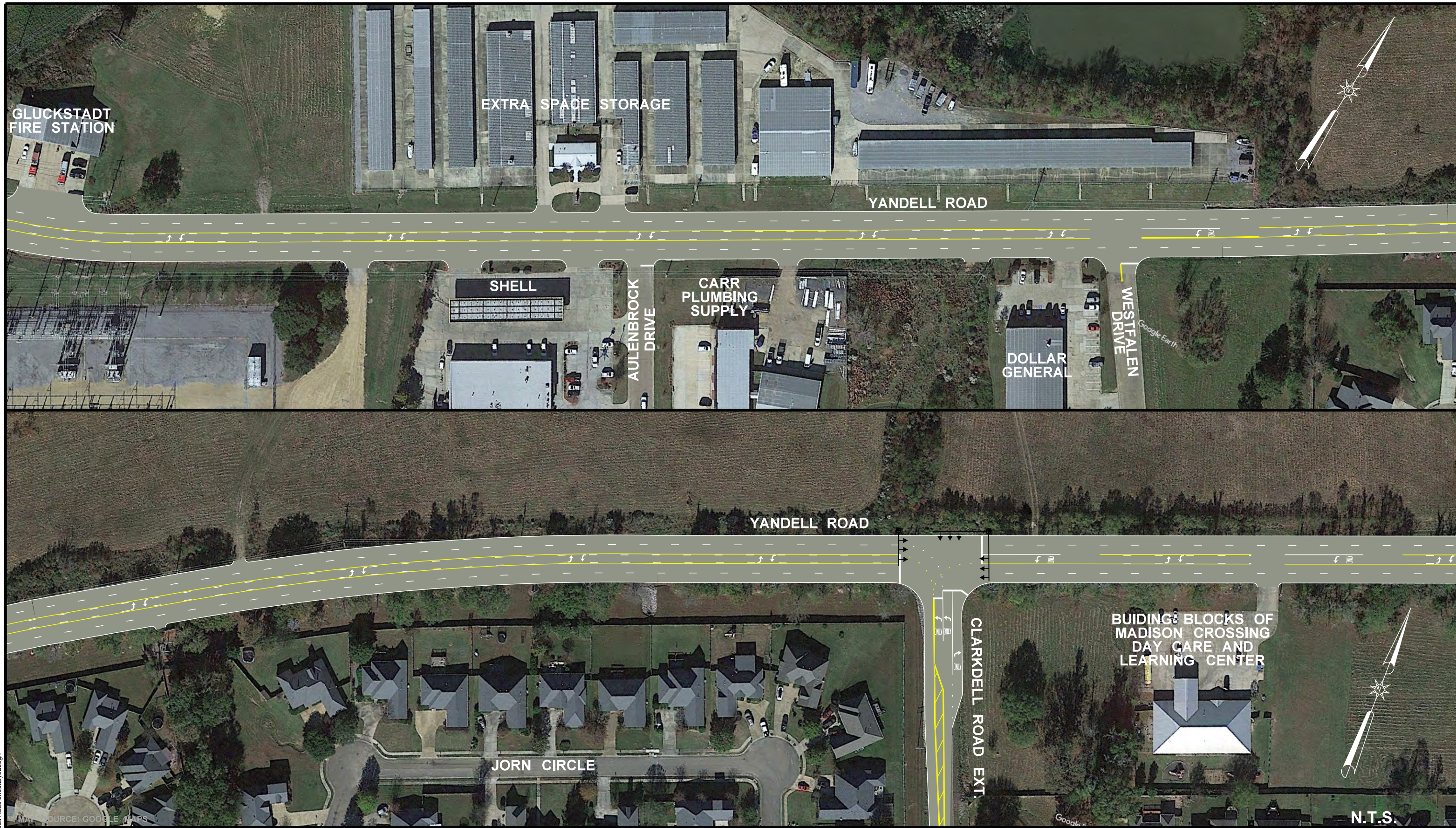
MAP SOURCE: GOOGLE MAPS

**WEISENBERGER ROAD WIDENING CONCEPT  
FROM PARKWAY EAST TO US HWY 51**

**FIGURE  
3a**

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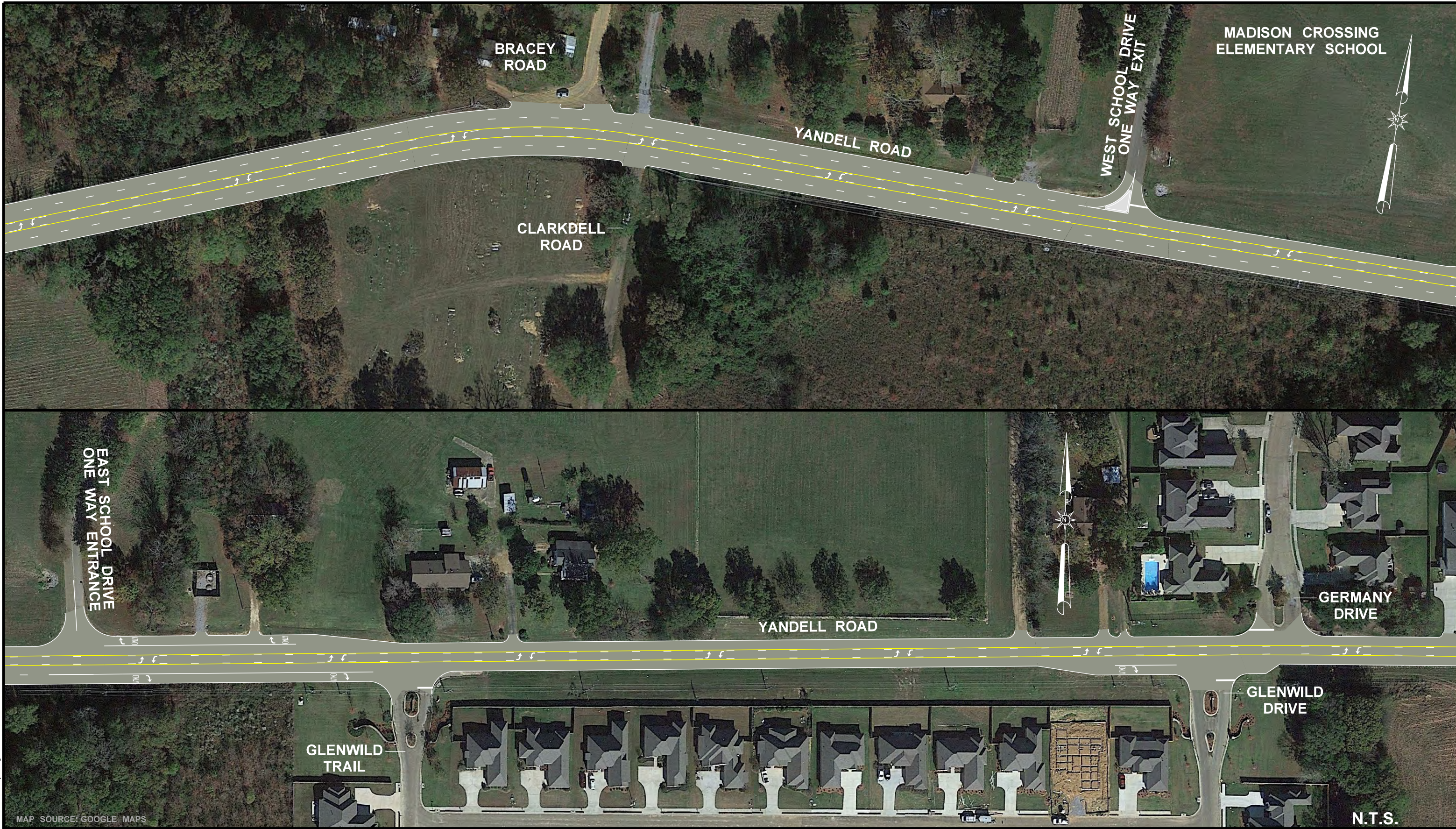
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**YANDELL ROAD WIDENING CONCEPT  
FROM FIRE STATION TO CLARKDELL ROAD EXTENSION**

**FIGURE  
3b**

N.T.S.



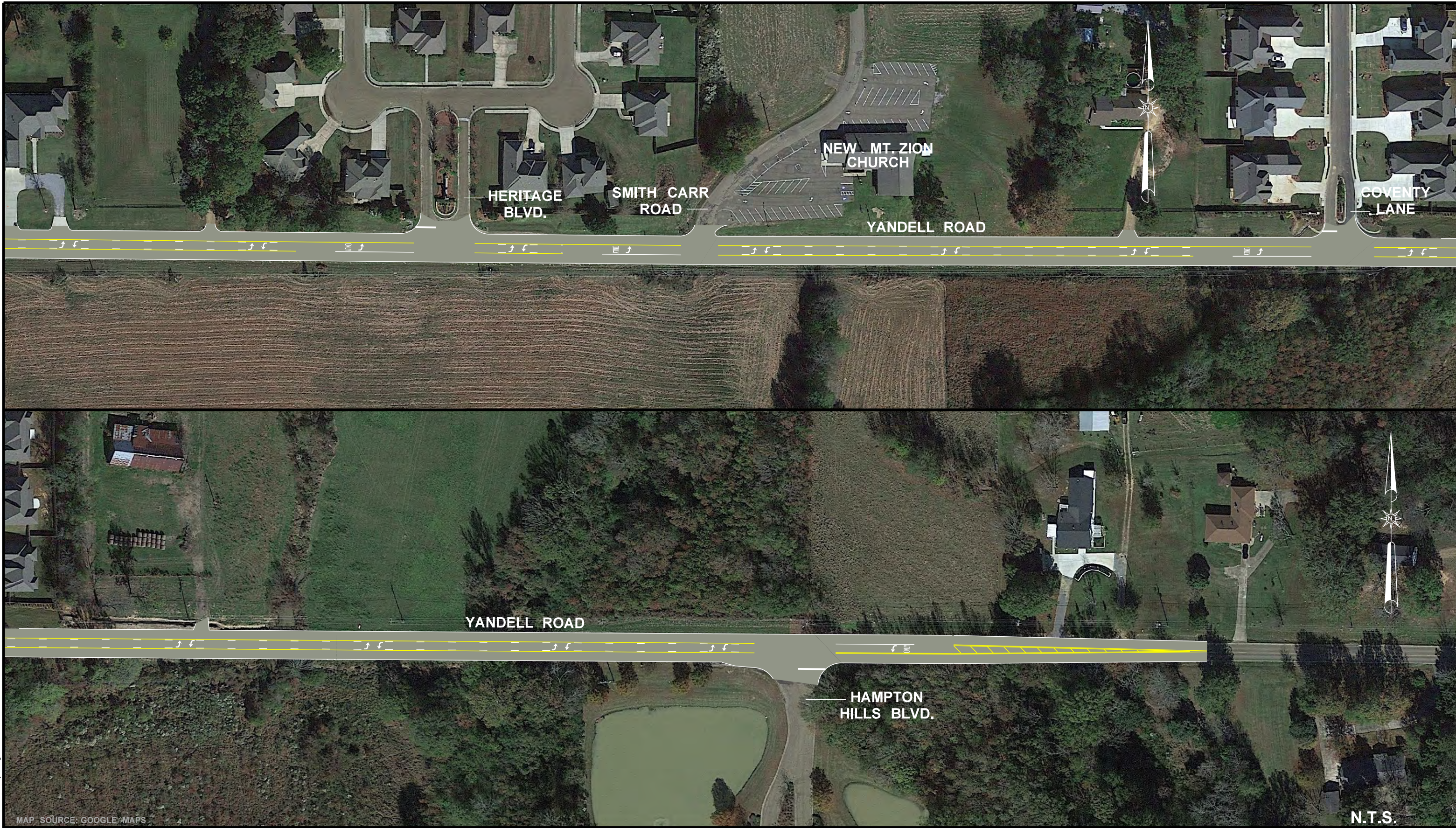
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MAP SOURCE: GOOGLE MAPS



YANDELL ROAD WIDENING CONCEPT  
FROM CLARKDELL ROAD TO GERMANY DRIVE

FIGURE  
3c



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MAP SOURCE: GOOGLE MAPS

N.T.S.



YANDELL ROAD WIDENING CONCEPT  
FROM GERMANY DRIVE TO HAMPTON HILLS BLVD.

FIGURE  
3d



**YANDELL ROAD WIDENING CONCEPT**  
**FROM JOHNSON LANE TO GLUCKSTADT FIRE DEPARTMENT**

**FIGURE**  
**3e**

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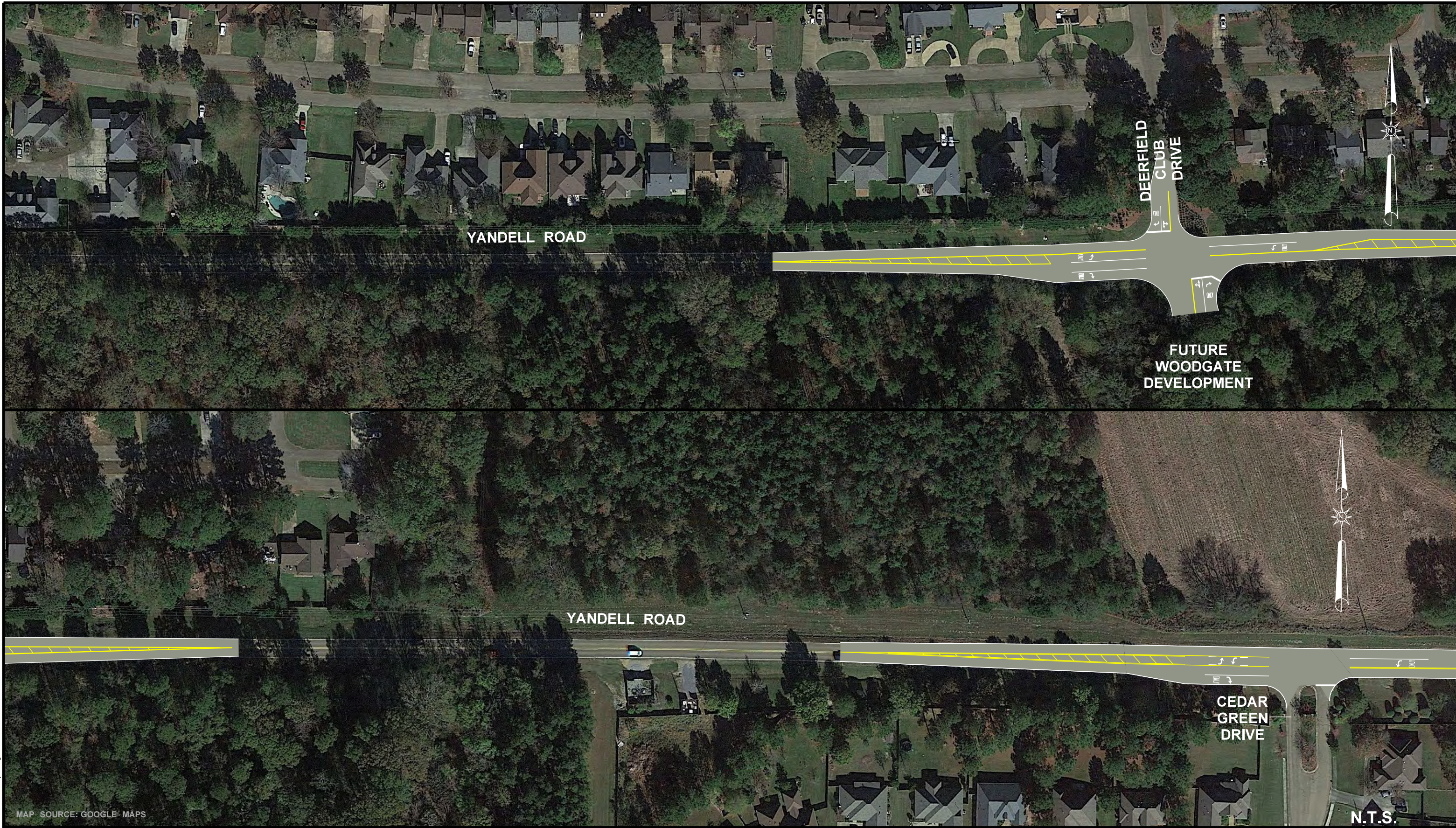
MAP SOURCE: GOOGLE MAPS



YANDELL ROAD WIDENING CONCEPT  
FROM HARVEY CROSSING TO CEDAR GROVE LANE EAST

FIGURE  
3f





MAP SOURCE: GOOGLE MAPS

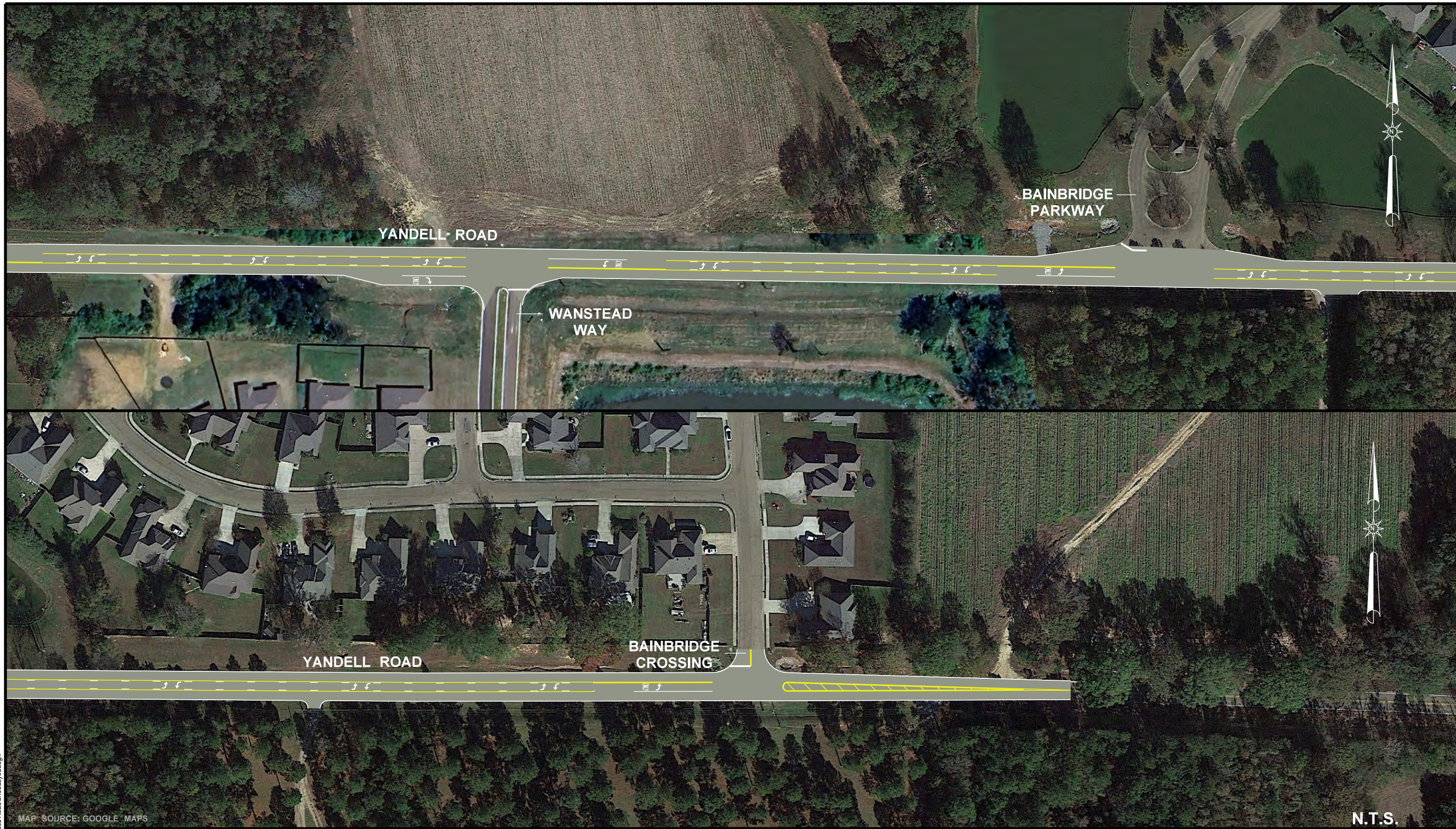
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**YANDELL ROAD WIDENING CONCEPT  
FROM CEDAR GROVE LANE EAST TO CEDAR GREEN DRIVE**

**FIGURE  
3g**

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YANDELL ROAD WIDENING CONCEPT  
 FROM CEDAR GREEN DRIVE TO BAINBRIDGE CROSSING

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 FIGURE  
 3h

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MAP SOURCE: GOOGLE MAPS