



September 27, 2024

Gulf Regional Planning Commission
1635 Popp's Ferry Rd Suite G
Biloxi, MS 39532

Attn: Kenneth Yarrow
Executive Director

RE: **West Wortham Road/Highway 49 Traffic Analysis**
Gulf Regional Planning Commission
Harrison County

Mr. Yarrow,

Overstreet & Associates (OA) entered into a contract with Gulf Regional Planning Commission (GRPC) on February 28, 2024, to prepare a Corridor Study from U.S. Highway 49 west to the intersection of West Wortham Road/Robinwood Drive & Old Highway 49 intersection along West Wortham Road in Harrison County, Mississippi.

The County stated many concerns in the area, which included:

1. Congestion at the east end, near U.S. Highway 49, and the number of driveway accesses with turning movements that are not accommodated,
2. Known concerns at the intersection of West Wortham Road and U.S. Highway 49,
3. The curve near West Wortham Road/U.S. Highway 49 intersection,
4. KCS Railroad, &
5. Growing residential neighborhoods and future capacity issues,

OA was tasked with:

1. Propose options to address safety and existing/proposed traffic volumes,
2. Provide the positive and negative impacts for each option, &
3. Address ROW acquisition needs, existing utilities, and estimated cost for each option.



Below are the options that were considered:

Option 1

Option 1 includes revising the existing intersection of West Wortham Road and U.S. Highway 49, including a channeling median, approximately 250' of restrictive slotted curb. Beyond the revised intersection, West Wortham Road will be widened from a single-lane two-way roadway section to a five-lane (two lanes each direction with a center turn lane) roadway section for approximately 1,700' and reduced down to a three-lane section (one lane each way and center turn lane) to the intersection of West Wortham Road/Robinwood Drive and Old Highway 49. The roadway section will include raised pavement markers along the edge of the roadway and centerline. The intersection of West Wortham Road/Robinwood Drive and Old Highway 49 will be All-Way stop-controlled. Turn lanes would also be added to the southbound West Wortham Road and Old Highway 49 approaches.

Positive benefits of Option 1:

1. This option represents the most cost-effective option.
2. The revised intersection layout at U.S. Highway 49 and West Wortham Road allows traffic turning off U.S. Highway 49 to freely travel along West Wortham Road with any traffic control, such as yield lines.
3. The wider roadway section allows slower traffic to access the outer lanes and center turn lane to access businesses while allowing through traffic to continue along West Wortham Road.
4. Compared to the options presented, the right-of-way required for this option is the minimal amount of right-of-way required and is included in all options.
5. At the intersection of West Wortham Road/Robinwood Drive and Old Highway 49, the additional turn lanes along Old Highway 49 and West Wortham Road reduces traffic delays as traffic volumes increase.
6. Minor utility adjustments involving adjusting water valve tops and sewer manhole tops will be required in some areas to meet the final pavement grade.

Negative benefits of Option 1:

1. The slotted curb at the intersection of U.S. Highway 49 and West Wortham Road does not allow westbound traffic to access the fuel station business on the south side of West Wortham Road until the final driveway entrance.
2. Since the intersection of West Wortham Road/Robinwood Drive and Old Highway 49 is stop controlled, traffic along West Wortham Road could back up to the railroad tracks during times of high traffic volume.



Estimated Construction Cost:

Option 1A \$4.9M

Option 1B \$1.1M

Option 2

The intersection of U.S. Highway 49 and West Wortham Road will be as described in Option 1 and will also include a turnaround bay approximately 400' west from the West Wortham Road/U.S. Highway 49 intersection to allow U-turn movements. The roadway section along West Wortham Road will also be the same lane configuration as described in Option 1. Option 2 includes a roundabout at the intersection of West Wortham Road/ Robinwood Drive and Old Highway 49.

Positive Benefits of Option 2:

1. The revised intersection layout at U.S. Highway 49 and West Wortham Road allows traffic turning off U.S. Highway 49 to freely travel along West Wortham Road with any traffic control, such as yield lines.
2. The wider roadway section allows slower traffic to access the outer lanes and center turn lane to access businesses while allowing through traffic to continue along West Wortham Road.
3. The turning bay allows eastbound traffic on West Wortham Road to perform a U-turn to access businesses on the south side of West Wortham Road.
4. At the intersection of West Wortham Road/Robinwood Drive and Old Highway 49, the roundabout allows for continuous traffic movement. The continuous movement eliminates the need for left turn lanes described in Option 1. Also, it reduces the chances of traffic backing up towards the railroad tracks.
5. Construction of a roundabout will require lighting. This will illuminate the area and provide lighting conditions at the intersection.
6. This option would eliminate the need for the existing flashing red light, which would reduce maintenance costs.

Negative Benefits of Option 2:



1. This option costs more than Option 1 due to the addition of the turning bay and construction of the roundabout, including lighting.
2. This option will require more right-of-way acquisition than Option 1. The main areas of right-of-way acquisition will be unimproved properties at the turning bay and roundabout locations.
3. This option will also require more utility relocations, primarily at the roundabout location. The utility relocation at the proposed roundabout location consists of relocation of power poles which typically requires more coordination and effort to relocate than other utilities. The other utility conflict is at the turning bay where water and/or sewer services will need to lengthen to locate the service boxes outside the roadway.

Estimated Construction Cost:

Option 2A \$5.2M

Option 2B \$2.2M

Option 3

The intersection of U.S. Highway 49 and West Wortham Road will be as described in Option 1. The roadway section along West Wortham Road will also be the same lane configuration as described in Option 1 but includes revising the radius of the existing curve west of the U.S. Highway 49/West Wortham Road intersection. Option 3 also consists of the roundabout at the intersection of West Wortham Road/Robinwood Drive and Old Highway 49.

Positive Benefits of Option 3:

1. The revised intersection layout at U.S. Highway 49 and West Wortham Road allows traffic turning off U.S. Highway 49 to freely travel along West Wortham Road with any traffic control, such as yield lines.
2. The wider roadway section allows slower traffic to access the outer lanes and center turn lane to access businesses while allowing through traffic to continue along West Wortham Road.
3. At the intersection of West Wortham Road/Robinwood Drive and Old Highway 49, the roundabout allows for continuous traffic movement. The continuous movement eliminates the need for left turn lanes described in Option 1. Also, it reduces the chances of traffic backing up towards the railroad tracks.
4. Construction of a roundabout will require lighting. This will illuminate the area and provide lighting conditions at the intersection.

5. This option would eliminate the need for the existing flashing red light, which would reduce maintenance costs.

Negative Benefits of Option 3:

1. This option costs more than Options 1 and 2 due to the longer curve length associated with the larger curve radius section and construction of the roundabout, including lighting.
2. This option will require more right-of-way acquisition than Options 1 and 2. The primary areas of right-of-way acquisition will take place on unimproved properties adjacent to the roundabout location and improved properties where the curve radius changes. The right-of-way costs (damages) associated with the improved properties will cost more than unimproved properties. The damages and the Dominos property can be significant. The proposed layout eliminates most of their parking, including ADA parking, and will likely require the construction of a new parking lot along the side or rear of the building. This cost (damage) could be expensive.
3. This option will also require more utility relocations than Options 1 & 2. The utility relocation at the proposed roundabout location consists of the relocation of power poles, which typically requires more coordination and effort than other utilities. The other utility relocation will take place on the south side of West Wortham Road at the location of the increased road radius. This area consists of water, sewer, and underground power, including the relocation of ground-mounted transformers.

Estimated Construction Cost:

Option 3A \$6.0M

Option 4

The intersection of U.S. Highway 49 and West Wortham Road will be as described in Option 1. The roadway section along West Wortham Road will also be the same lane configuration as described in Option 1, but it includes revising the geometric layout and creating an ess curve west of the U.S. Highway 49/West Wortham Road intersection. Option 3 also consists of the roundabout at the intersection of West Wortham Road/ Robinwood Drive and Old Highway 49.

Positive Benefits of Option 4:

1. The revised intersection layout at U.S. Highway 49 and West Wortham Road allows traffic turning off of U.S. Highway 49 to freely travel along West Wortham Road with any traffic control, such as yield lines.
2. The wider roadway section allows slower traffic to access the outer lanes and center turn lane to access businesses while allowing through traffic to continue along West Wortham Road.



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3. At the intersection of West Wortham Road/Robinwood Drive and Old Highway 49, the roundabout allows for continuous traffic movement. The continuous movement eliminates the need for left turn lanes described in Option 1. Also, it reduces the chances of traffic backing up towards the railroad tracks.
 4. Construction of a roundabout will require lighting. This will illuminate the area and provide lighting conditions at the intersection.
 5. This option would eliminate the need for the existing flashing red light, which would reduce maintenance costs.

Negative Benefits of Option 4:

1. This option costs more than the previous three options due to the reverse curve length and construction of the roundabout, including lighting.
2. In addition to the construction costs, the right-of-way costs associated with the roundabout are the same as options 2 & 3. Similar to option 3, there will be significant right-of-way costs associated with the realignment of West Wortham Road. The right-of-way costs (damages) associated with improved properties of Dominos and Sai Quick Stop will make this option the most expensive. Since the roadway is being realigned behind these buildings, the damages will likely require reconstruction of their parking and site access to comply with access, parking, and ADA requirements, in addition to any site utilities that may need to be relocated and/or adjusted.
3. Similar to option 3, the realignment of West Wortham Road will require the relocation of water, sewer, and underground electrical utilities, including ground-mounted transformers. Some existing street lights will also need to be removed. This option also includes the utility relocations associated with the roundabout.

Estimated Construction Cost:

Option 4A \$5.7M



**OVERSTREET
& ASSOCIATES**
CONSULTING ENGINEERS

overstreeteng.com

161 Lameuse St. Suite 203

Biloxi, MS 39530

228.967.7137

Sincerely,

F. Jason Overstreet, P.E.

1328

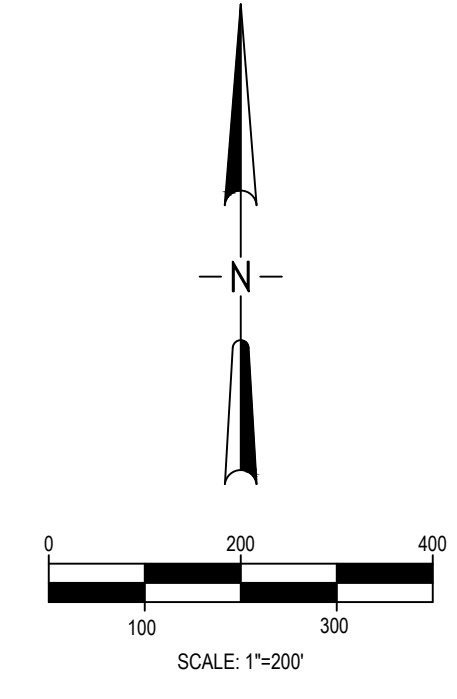
cc: *Jaclyn Turner, P.E., County Engineer*
Jeff Loftus, GRPC

Attachment:

Exhibits (Sheets 1-10)

Traffic Analysis Report by Kiser Traffic and Engineering dated May 5, 2024

File: c:\Users\laker\one engineers\all team - documents\docs\1313 - gpc west wortham traffic study\50 drafting\SHEETS\1313_Option 1A_shaded.dwg User Name: Stephen Santibanez Date: 9/25/2024 2:52 PM



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**GULF REGIONAL
PLANNING COMMISSION**
WEST WORTHAM ROAD
HIGHWAY 49 TO OLD HIGHWAY 49
CORRIDOR STUDY

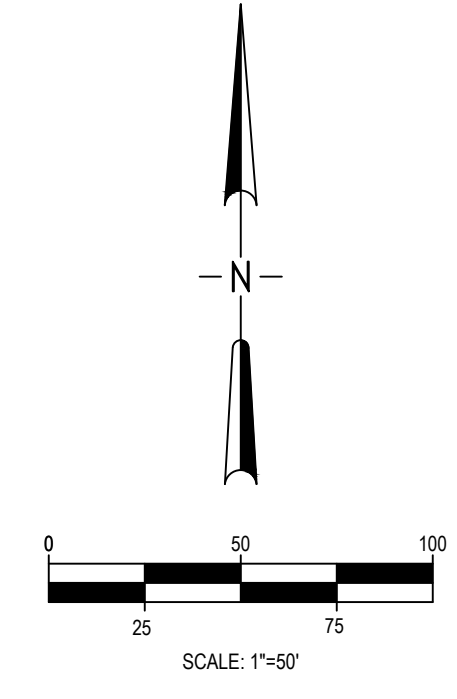


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	OPTION 1 OVERALL LAYOUT
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OPTION 1A PLAN			
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OPTION 1B PLAN	



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CORRIDOR STUDY



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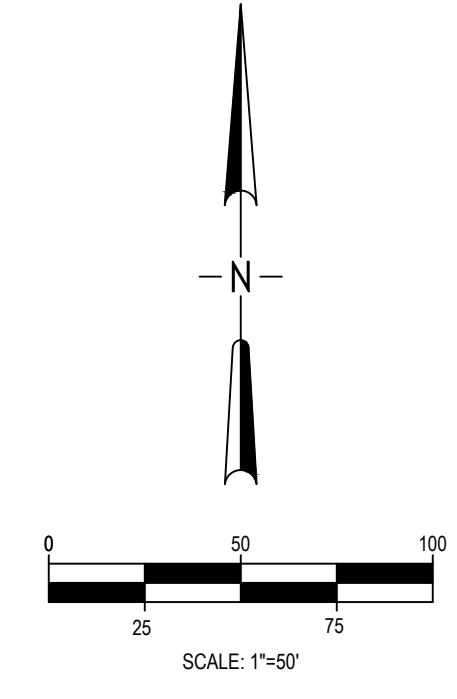
OPTION 2
OVERALL LAYOUT

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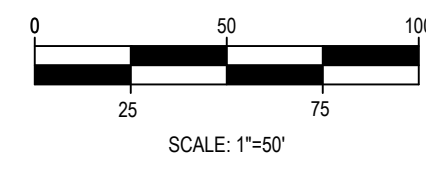
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OPTION 2A PLAN			
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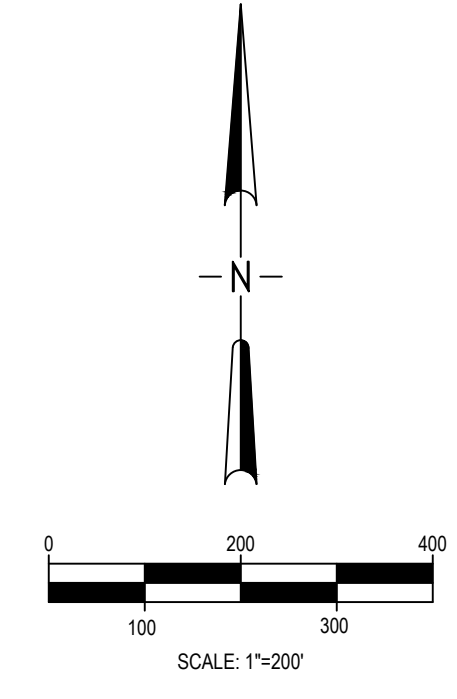
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HIGHWAY 49 TO OLD HIGHWAY 49
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OPTION 2B PLAN

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HIGHWAY 49 TO OLD HIGHWAY 49
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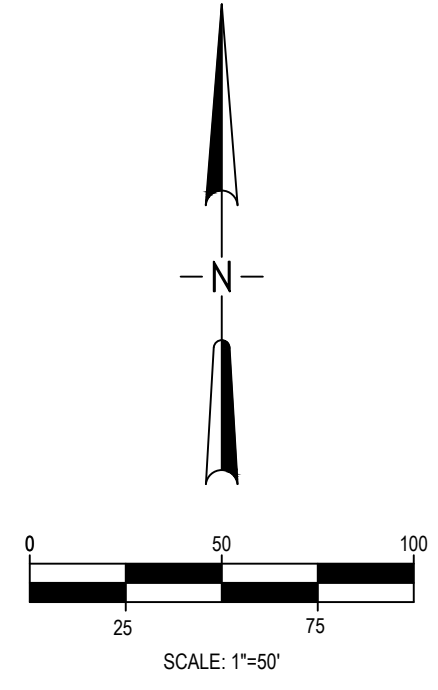
OPTION 3 OVERALL LAYOUT

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 HIGHWAY 49 TO OLD HIGHWAY 49
 CORRIDOR STUDY



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OPTION 3A PLAN			
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HIGHWAY 49 TO OLD HIGHWAY 49
CORRIDOR STUDY



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OPTION 4
OVERALL LAYOUT

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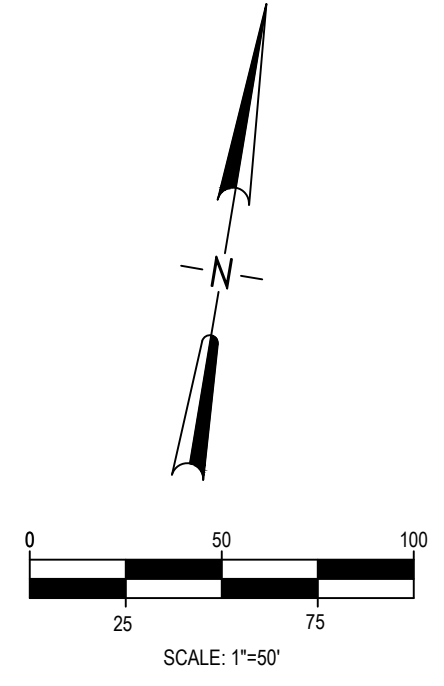
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 $PT=STA. 28+03.87$
 DESIGN SPEED=40 MPH

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 $D=13^{\circ}15'00''$
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 $PT=STA. 31+99.61$
 DESIGN SPEED=40 MPH

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 DESIGN SPEED=40 MPH



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**GULF REGIONAL
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 CORRIDOR STUDY



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SHEET NUMBER	10
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Kiser Traffic and Engineering, LLC
P.O. Box 2441
Madison, MS 39130
601.720.0262

May 3, 2024

Mr. F. Jason Overstreet, P.E.
Overstreet and Associates, PLLC
161 Lameuse Street
Biloxi, MS 39530

Re: Traffic Analysis for West Wortham Road/US Hwy 49 in Harrison County, MS

Dear Jason:

Per the request from Gulf Regional Planning Commission (GRPC), a traffic analysis was conducted on the traffic circulation on West Wortham Road at Old Hwy 49 and US Hwy 49. Traffic counts and crash data were provided by GRPC for analysis.

Existing Traffic

Traffic counts were collected on the afternoon of March 27, 2024, and morning of March 28, 2024 at the two study intersections including:

- 1) US Hwy 49/W. Wortham Road
- 2) Old Hwy 49/W. Wortham Road

The southbound left turn from Old Hwy 49 to West Wortham Road was 362 vph in the AM Peak, representing 53% of the total intersection traffic in this one movement. The eastbound volume at US Hwy 49/West Wortham Road was split with 155 vph turning left(37%), 3 thru(1%), and 256 rights(62%).

A wreck occurred at the US Hwy 49/West Wortham Road intersection during the afternoon traffic count on 3/27/24. The eastbound approach of West Wortham Road was blocked at US Hwy 49 from 4:17-5:33 PM as a result of the wreck and response by emergency service personnel. The PM Peak hour eastbound volume was estimated based on traffic volumes before/after the wreck. The peak hour traffic volumes are shown graphically in **Figure 2**.

Signal Warrant Analysis

The Manual on Uniform Traffic Control Devices (MUTCD) outlines the factors for justifying installation of a traffic control signal. Three of the 9 warrants are vehicular volume based warrants: 1) eight-hour vehicular volume, 2) four-hour vehicular volume and 3) peak hour. The MUTCD states that a traffic control signal should not be installed unless one or more of the warrants are met. Warrant #1, the eight-hour warrant, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. Warrant #2, the four-hour warrant, is intended where the volume of the intersecting traffic is the principal reason to consider installing a traffic control signal.

Warrant #3, the peak-hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. Warrant #7 is the Crash Experience Warrant. Crash records were obtained from GRPC to evaluate the frequency of crashes that are correctable by signalization. The three vehicular volume based warrants, and crash experience warrant were evaluated at the study intersection on West Wortham Road at Old Hwy 49.

West Wortham Road at Old Hwy 49 is the east/west major street movement with a posted speed limit of 30 mph. The hourly traffic volumes were compared to the MUTCD threshold volumes for Condition A – Minimum Vehicular Volume and for Condition B-Interruption of Continuous Traffic in Warrant 1, as well as the volume Warrants in #2 and #3. The detail of the hourly volumes and warrant analysis are provided in **Table 1**. The traffic count sheets are provided as an attachment to this letter.



Table 1
West Wortham Road/Old Hwy 49
Signal Warrant Analysis

Start Time	Approach						Warrant 1A		Warrant 1B		Warrant #2	Warrant #3
	EB	WB	EB+ WB	SB Lt+Th	SB Rt	SB Total	Major- 400	Minor- 120	Major- 600	Minor- 60	Four Hour	Peak Hour
06:00 AM							-	-	-	-	-	-
07:00 AM	86	126	212	423	1	424	-	Yes	-	Yes	Yes	Yes
08:00 AM	42	123	165	201	1	202	-	Yes	-	Yes	-	-
09:00 AM							-	-	-	-	-	-
10:00 AM							-	-	-	-	-	-
11:00 AM							-	-	-	-	-	-
12:00 PM							-	-	-	-	-	-
01:00 PM							-	-	-	-	-	-
02:00 PM	31	177	208	112	2	114	-	Yes	-	Yes	-	-
03:00 PM	24	273	297	189	2	191	-	Yes	-	Yes	-	-
04:00 PM	33	251	284	153	6	159	-	Yes	-	Yes	-	-
05:00 PM	58	367	425	180	2	182	Yes	Yes	-	Yes	Yes	-
Subtotal	274	1,317	1,591	1,258	14	1,272	1	6	0	6	2	1
Count date: 3/27, 3/28/24	Warrant Met?						No		No		No	Yes

Source: GRPC, Kiser Traffic and Engineering, 2024. Volumes are in vehicles per hour.

Warrant 3, the Peak Hour Warrant is met with existing traffic volumes at the Old Hwy 49/West Wortham Road intersection.

Railroad Crash History

The crash history of the adjacent Kansas City Southern Railway Company (KCS) Railroad crossing on West Wortham Road between US Hwy 49 and Old Hwy 49 was researched through the Federal Rail Administration (FRA) Highway-Rail Grade Crossing Incident Reports. There were 2 crash reports for the adjacent rail crossing #305212Y. The crashes are summarized in **Table 2**.

Table 2-Railroad Crossing Crash History

Date	Vehicle	Circumstances	Time of Day	Weather	Injured	Killed	Type of Crossing Warning
8/27/1998	Truck	Truck drove into Train	Day	Clear	1	0	Gates/Flashers/Bells on both sides of crossing
10/31/1997	Truck	Truck drove into Train	Day	Rain	0	0	Gates/Flashers/Bells on both sides of crossing

Source: FRA, 2024.

No significant trends were identified in the historical railroad crash records. The at-grade railroad crossing on West Wortham Road crossing currently has gates, bells and flashing lights.



Intersection Crash History

The crash records were provided by GRPC from January 1, 2019 to December 31, 2023, for West Wortham Road from Old Hwy 49 to US Hwy 49. The injuries are summarized in **Table 3**, and the crash types by year are summarized in **Table 4**.

Table 3
Crash Types/Totals by Year

3a-Old Hwy 49/West Wortham Road-Robinwood Dr intersection

Crash Type Description	Year					Total Crashes
	2019	2020	2021	2022	2023	
Angle	5	3	5	2	4	19
Opposite Direction Sideswipe					1	1
Rear end slow or stop				2	1	3
Run off Road - Right			1			1
Sideswipe		1				1
Total	5	4	6	4	6	25

3b-West Wortham Road-from US Hwy 49 to Old Hwy 49

Crash Type Description	Year					Total Crashes
	2019	2020	2021	2022	2023	
Angle		1	1			2
Deer			1			1
Opposite Direction Sideswipe			1			1
Rear end slow or stop			1	1		2
Run off Road - Left			1	1		2
Run off Road - Right			1		1	2
Total	0	1	6	2	1	10

3c-US Hwy 49/West Wortham Road-Grand Way Blvd intersection

Crash Type Description	Year					Total Crashes
	2019	2020	2021	2022	2023	
Angle	1	4	1	1		7
Animal					2	2
Deer				1		1
Left turn Same Roadway	7	5	1	2	5	20
Overturn				1		1
Rear end slow or stop	7	9	4	3	5	28
Run off Road - Left			1		1	2
Run off Road - Right	1	1	1			3
Sideswipe			4	2		6
Total	16	19	12	10	13	70

Source: GRPC, Kiser Traffic and Engineering, 2024.



Table 4
Injury Totals by Crash Type - Years 2019-2023

4a-Old Hwy 49/West Wortham Road

Crash Type Description	Injury Count
Angle	4
Opposite Direction Sideswipe	0
Rear end slow or stop	1
Run off Road - Right	0
Sideswipe	1
Total	6

4b-West Wortham Road-From US 49 to Old Hwy 49

Crash Type Description	Injury Count				Total
	1	2	3	4	
Angle					0
Deer					0
Opposite Direction Sideswipe				1	4
Rear end slow or stop	1	1			3
Run off Road - Left			1		3
Run off Road - Right	1				1
Total	2	2	3	4	11

4c-US Hwy 49/West Wortham Road-Grand Way Blvd intersection

Crash Type Description	Injury Count					Total	
	1	2	3	5	7	Injured	Killed
Angle	2		3			11	1
Animal						0	
Deer						0	
Left turn Same Roadway				1	1	30	
Overturn	1					1	
Rear end slow or stop	6	2	1			13	
Run off Road - Left						0	
Run off Road - Right	2					2	
Sideswipe	1		1			4	
Total	15	10	24	5	7	61	1

Note: 1 angle crash in 2020 resulted in a fatality.

Source: GRPC, Kiser Traffic and Engineering, 2024.



The crash data identifies that Old Hwy 49/West Wortham Road meets the crash warrant for signalization in 2019 and 2021 with 5 or more crashes correctable by signalization (Angle crashes). Additionally, the West Wortham Road crashes between US Hwy 49 and Old Hwy 49 include *run off road left/right* and *Opposite Direction Sideswipe* crashes. Providing raised pavement markers (RPM's) with reflective material and rumble stripes along the edge lines could help to reduce this crash type on West Wortham Road between US Hwy 49 and Old Hwy 49. The construction of a center turn lane would also further separate the opposing directions of traffic and reduce the potential for these crash types.

The US Hwy 49/West Wortham Road-Grand Way Blvd intersection had 70 crashes reported in the 5-year period from 2019-2023. The 20 *left turn same roadway* crashes could be reduced by converting to *protected only* north/south left turns, instead of protected/permitted. This crash type accounted for 29% of the crashes and 50% of the injuries (30 people injured) at the intersection. There was a *left turn same roadway* crash that occurred during the traffic count on 3/27/24 that appeared to have injuries, as an ambulance was dispatched. The northbound left turning vehicle did not yield to the southbound thru vehicle and the result was a high speed/high angle collision. **Table 5** identifies the light condition for the different crash types at the US Hwy 49/West Wortham Road intersection.

Table 5
US Hwy 49/West Wortham Road - Crash Type w/ Light Condition

Crash Type Description	Dark Lighted	Dark-Not Lighted	Dawn/Dusk	Daylight	Total
Angle		1		6	7
Animal		1		1	2
Deer		1			1
Left turn Same Roadway	4	5		11	20
Overturn				1	1
Rear end slow or stop	3	4	2	19	28
Run off Road - Left				2	2
Run off Road - Right	1			2	3
Sideswipe	1	1		4	6
Total	9	13	2	46	70

Source: GRPC, Kiser Traffic and Engineering, 2024.

Crash data identifies that 34% of the US Hwy 49/West Wortham Road crashes occurred in Darkness or Dawn/Dusk conditions. Two of the quadrants have luminaires at this intersection on the signal mast arm poles. Additional lighting along the intersection approaches could help to reduce the intersection crash frequency.

Traffic Impacts

The intersection delays were evaluated using the information provided in the Highway Capacity Manual to evaluate the levels-of-service (LOS) for the study intersections. The LOS analysis included the existing /Year 2024 traffic. The intersections identified in this analysis include the intersection of US Hwy 49/West Wortham Road and Old Hwy 49/West Wortham Road. The capacity analysis sheets are provided as an attachment to this letter/report. The capacity analysis results are summarized in **Table 6**.



Table 6
Year 2024 Existing Traffic - Capacity Analysis Summary

All-way Stop Intersection	Time Period	Approach LOS				Intersection LOS
		EB	WB	NB	SB	
Old Hwy 49/ West Wortham Rd	AM Peak	A	A	A	B	B (12.6 sec)
	PM Peak	A	B	A	B	B (10.6 sec)
Signalized Intersection	Time Period	Approach LOS				Intersection LOS
		EB	WB	NB	SB	
US Hwy 49/ West Wortham Rd	AM Peak	C	E	A	B	B (16.9 sec)
	PM Peak	C	D	A	B	B (12.7 sec)

Source: Kiser Traffic and Engineering, 2024, HCM 2010.

The capacity analysis reveals that the 2024 existing traffic volumes/study intersections are operating with minimal delays, with existing geometry and traffic control. While the westbound calculated LOS at US Hwy 49 is E/D for the AM/PM peak hours, this movement has less than 10 vph in the peak hours.

Roundabout Concept

The construction of a roundabout at the intersection of West Wortham Road/Old Hwy 49 could be an alternative to signalization at this intersection. Signalization would require construction of dedicated left turn lanes for effective use of the signal; however, a roundabout would not require the construction of dedicated left turn lanes. The LOS calculations show that the intersection approaches are currently operating at LOS A/B for all approaches.

The intersection of West Wortham Road/Old Hwy 49 was evaluated for a roundabout, as roundabouts can be more efficient (less delays) than traffic signals. The results are summarized in **Table 7**.

Table 7
Year 2024 Existing Traffic - Roundabout Analysis

Roundabout Intersection	Time Period	Approach LOS				Intersection LOS
		EB	WB	NB	SB	
Old Hwy 49/ West Wortham Rd	AM Peak	A	A	A	A	A (7.0 sec)
	PM Peak	A	A	A	A	A (6.5 sec)

Source: Kiser Traffic and Engineering, 2024, HCM 2010.

The results of the roundabout analysis show a decrease in intersection delays for the overall intersection from LOS B to LOS A in both the AM and PM peak hours.



Street Lighting

Current design standards in the AASHTO Roadway Lighting Design Guide, 7th Edition, October 2018, for Principal Arterials with an asphalt surface in a commercial area requires Average Maintained Illuminance (E_{avg}) at 1.6 fc.

Roadway lighting has a significant impact on safety. Per the Lighting Design Guide, the Crash Modification Factor (CMF) for roadway lighting decreases nighttime crashes of all severities by 20% and nighttime injury and non-injury crashes by 28% and 17%, respectively. When lighting is installed at intersections, nighttime injury crashes are predicted to be reduced by 38%. Lighting is recommended to extend ± 700 ft north and south of the study intersection.

Summary of Recommendations

Based on the analysis of existing traffic volumes and crash data, the intersections of West Wortham Road/US Hwy 49 and West Wortham Road/Old Hwy 49 have a high frequency of crashes. The crash warrant (for signalization) in the MUTCD is met for two years (2019 and 2021) and 19 of the 25 crashes (76%) are angle crashes at the Old Hwy 49 intersection with West Wortham Road. The traffic control being an All-Way Stop is likely why the injury total is only 4 injuries in the 19 angle crashes. However, existing traffic is shown to operate at LOS B in both the AM and PM peak hours. If a roundabout is installed to replace the All-Way Stop, then street lighting would be necessary to illuminate the intersection for vehicles to navigate around the roundabout. With the residential nature of the area/intersection, and single family homes in close proximity to the intersection, the All-Way Stop is likely the least intrusive traffic control device. Construction of a southbound left turn lane and westbound right turn lane would help to alleviate intersection delays as traffic volumes increase at this study intersection.

The section of West Wortham Road from Old Hwy 49 to the Dollar General area had an *opposite direction sideswipe* crash and a couple of *run off road right/left crashes*. The narrow cross section and rural nature of West Wortham Road may contribute to these types of crashes. Providing rumble stripes along the pavement edge lines will help alert motorists of their lane departure with an audible warning as their tires run over the grooved asphalt. Similarly, the use of raised pavement markers (RPM's) along the centerline and edge striping will also provide a visual warning at night with the reflectors in the RPM's and physical warning as the vehicle's tires drive over the RPM's alerting drivers of their lane departure.

Roadway concepts provided have also shown widening this section of West Wortham Road to 3-lanes/5-lanes. The directional volumes for the AM/PM peak hours were AM Peak - 414 vph EB/203 vph WB, PM Peak - 185 vph EB (estimated)/347 vph WB. Florida Department of Transportation (FDOT) volume tables identify the hourly capacity of 2-lane road in one direction at 800 vph. The need for a center turn lane to remove turning vehicles from blocking thru lanes is likely needed on West Wortham Road in the developed area from Dollar General to US Hwy 49. As property adjacent to West Wortham Road west of Dollar General develops, east/west thru traffic is also likely to benefit from a center turn lane, as the property is subdivided with more than 20 parcels with frontage along West Wortham Road.

The intersection of US Hwy 49 with West Wortham Road has a high crash rate, particularly with *left turn same roadway* crashes. One *left turn same roadway* crash occurred during the traffic count, where a northbound left turning vehicle turned in front of a southbound thru vehicle on US Hwy 49 and was struck. Converting to *protected only* north/south left turn movements is recommended based on the crash history at this intersection. Additionally, street lighting is recommended on US Hwy 49 within ± 700 ft of the intersection.



May 3, 2024

The gas station driveway on the west approach of the West Worth Road/US Hwy 49 intersection was observed to have westbound vehicles stopped on West Wortham Road waiting to turn left into the gas station and back up traffic into US Hwy 49. Adding slotted curb along West Wortham Road is recommended to divert westbound gas station traffic to the western site driveway. A channelized island is also recommended in the east gas station driveway on West Wortham Road to restrict turns at this driveway to right-in/right-out turning movements.

If you have any questions or comments regarding this analysis, please call me at (601) 720-0262.

Sincerely,

Kiser Traffic and Engineering, LLC

A handwritten signature in cursive script that reads 'Jonathan Kiser'.

Jonathan A. Kiser, P.E., PTOE, PTP
Professional Traffic Engineer &
Transportation Planner

Attachments: Figure 1 – Study Area
Figure 2 – 2024 Existing Traffic
Figure 3A – US Hwy 49/Wortham Road Concept
Figure 3B – Old Hwy 49/Wortham Road Roundabout Concept

FRA Incident Reports KCS/Wortham Road	A1-2
<u>Miovision/GRPC Traffic counts – 2024</u>	A3-12
West Wortham Road/Old Hwy 49	A3-7
West Wortham Road/US Hwy 49	A8-12
<u>Highway Capacity Analysis Sheets</u>	B1-6
Year 2024 Existing Traffic AM/PM	B1-4
Roundabout @ Old Hwy 49/West Wortham Rd AM/PM	B5-6



HARRISON COUNTY

STUDY AREA 



N.T.S.

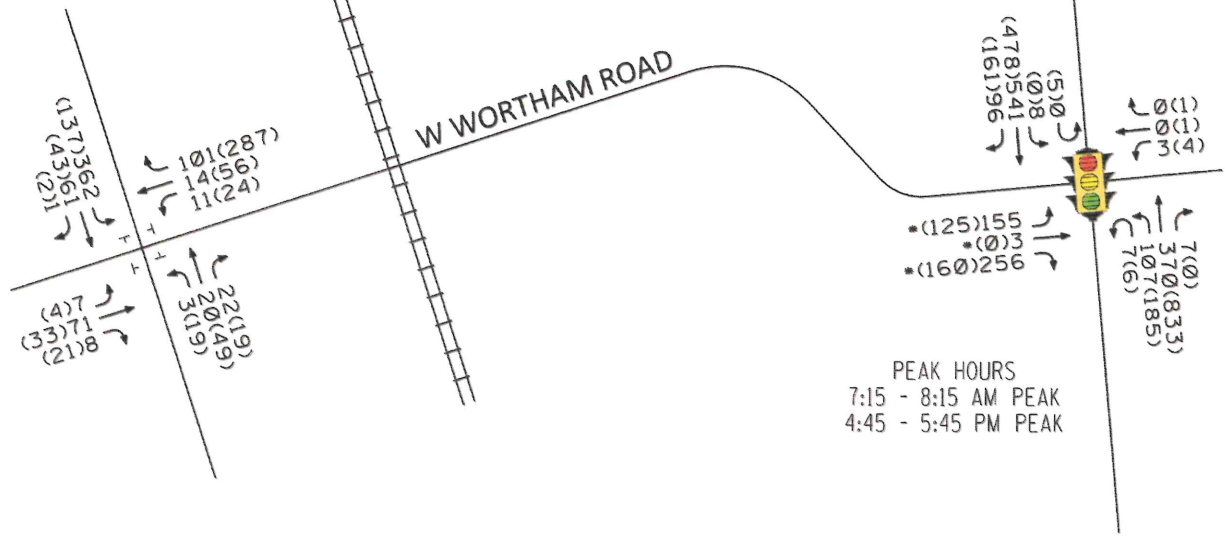


VICINITY MAP

FIGURE
1



PEAK HOURS
 7:00 - 8:00 AM PEAK
 5:00 - 6:00 PM PEAK



COUNT DATE: 3/28/2024 - AM VOLUMES
 3/27/2024 - PM VOLUMES

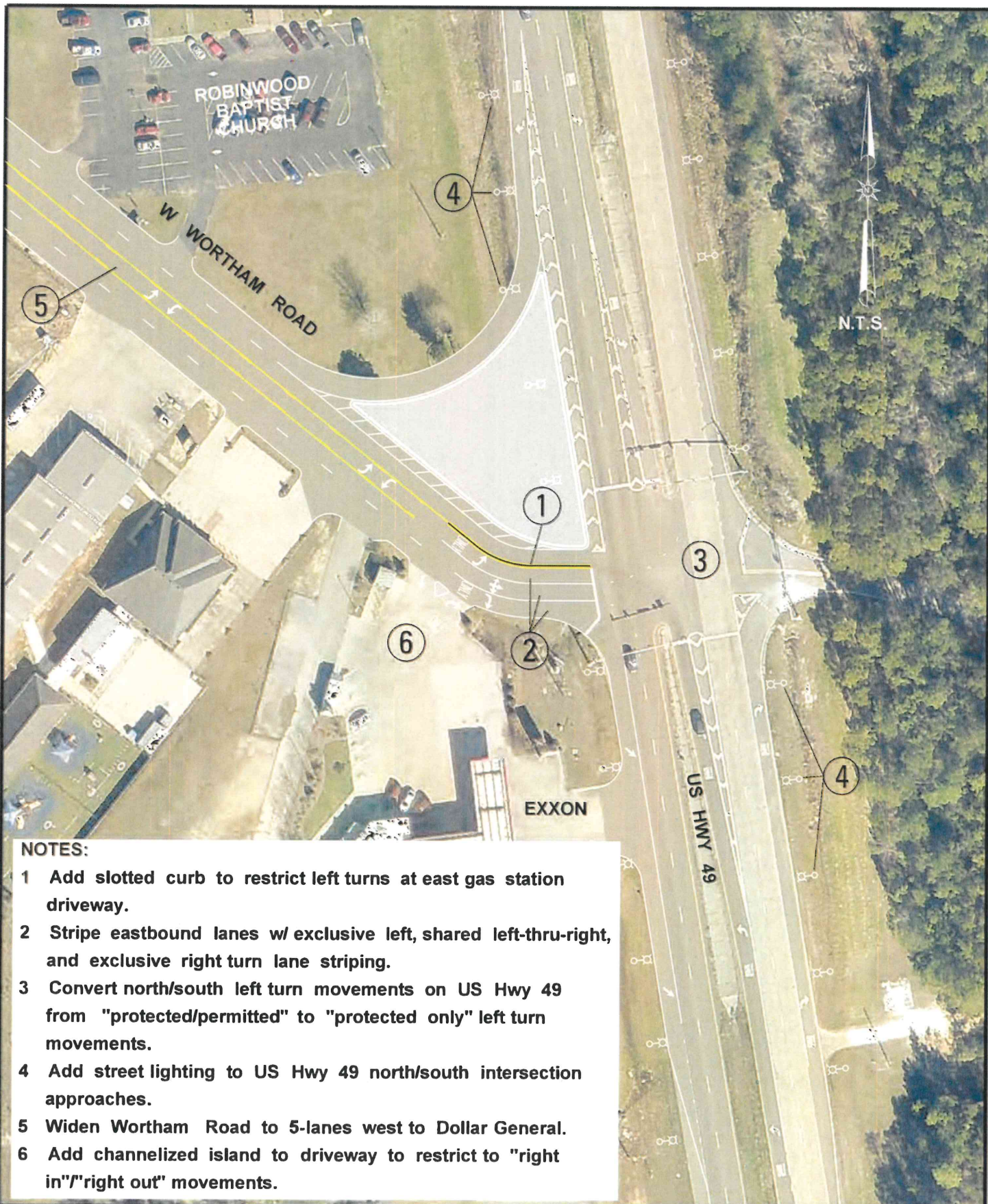
LEGEND
 AM PEAK HOUR - XX
 PM PEAK HOUR - (XX)

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YEAR 2024 EXISTING TRAFFIC

FIGURE
 2



NOTES:

- 1 Add slotted curb to restrict left turns at east gas station driveway.
- 2 Stripe eastbound lanes w/ exclusive left, shared left-thru-right, and exclusive right turn lane striping.
- 3 Convert north/south left turn movements on US Hwy 49 from "protected/permited" to "protected only" left turn movements.
- 4 Add street lighting to US Hwy 49 north/south intersection approaches.
- 5 Widen Wortham Road to 5-lanes west to Dollar General.
- 6 Add channelized island to driveway to restrict to "right in"/"right out" movements.

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US HWY 49 / WORTHAM ROAD CONCEPT

FIGURE 3A



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OLD HWY 49 / WORTHAM ROAD
 ROUNDABOUT CONCEPT

FIGURE
 3B

HIGHWAY-RAIL GRADE CROSSING
ACCIDENT/INCIDENT REPORT

A1

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

OMB Approval No. 2130-0500

Name Of		Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad Kansas City Southern Railway Company [KCS]		1a. KCS	1b. 137419
2. Other Railroad Involved in Train Accident/Incident		2a.	2b.
3. Railroad Responsible for Track Maintenance Kansas City Southern Railway Company [KCS]		3a. KCS	3b. 137419
4. U.S. DOT-AAR Grade Crossing ID No. 305212Y		5. Date of Accident/Incident 08/27/98	6. Time of Accident/Incident 04:25 PM
7. Nearest Railroad Station SAUCIER		8. Division TRANSCONTINENTAL	9. County HARRISON
		10. State Abbr. 28	Code MS
11. City (if in a city) SAUCIER		12. Highway Name or No. ROBINHD FOREST CHURC	
		<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private	
Highway User Involved		Rail Equipment Involved	
13. Type C. Truck-trailer F. Bus J. Other Motor Vehicle A. Auto D. Pick-up truck G. School Bus K. Pedestrian B. Truck E. Van H. Motorcycle M. Other (specify)		Code B	
14. Vehicle Speed (est. mph at impact) 45		15. Direction (geographical) 1. North 2. South 3. East 4. West	
		Code 4	
16. Position 1. Stalled on crossing 3. Moving over crossing 2. Stopped on Crossing 4. Trapped		Code 3	
17. Equipment 1. Train (units pulling) 2. Train (units pushing) 3. Train (standing)		4. Car(s) (moving) 5. Car(s) (standing) 6. Light loco(s) (moving) 7. Light loco(s) (standing)	
		8. Other (specify) A. Train pulling- RCL B. Train pushing- RCL C. Train standing- RCL	
		Code 1	
18. Position of Car Unit in Train 1			
19. Circumstance 1. Rail equipment struck highway user 2. Rail equipment struck by highway user		Code 2	
20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither		Code 4	
20b. Was there a hazardous materials release by 1. Highway User 2. Rail Equipment 3. Both 4. Neither		Code	
20c. State the name and quantity of the hazardous material released, if any			
21. Temperature (specify if minus) 96 °F		22. Visibility (single entry) 1. Dawn 2. Day 3. Dusk 4. Dark	
		Code 2	
23. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow		Code 1	
24. Type of Equipment Consist 1. Freight train 4. Work train 7. Yard/Switching (single entry) 2. Passenger train 5. Single car 8. Light loco(s) 3. Commuter train 6. Cut of cars 9. Main./inspect. car		A. Spec. MoW Equip Code 1	
25. Track Type Used by Rail Equipment Involved 1. Main 2. Yard 3. Siding 4. Industry		Code 1	
26. Track Number or Name SINGLE MAIN			
27. FRA Track Class 4		28. Number of Locomotive Units 3	
29. Number of Cars 27		30. Consist Speed (Recorded if available) R. Recorded E. Estimated 25 mph	
		Code E	
31. Time Table Direction 1. North 2. South 3. East 4. West		Code 2	
32. Type of Crossing 1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other (specify) Warning 3. Standard FLS 6. Audible 9. Watchman 12. None		33. Signaled Crossing Warning	
Code(s) 07		34. Whistle Ban 1. Yes 2. No 3. Unknown	
		Code 2	
35. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach		Code 1	
36. Crossing Warning Interconnected with Highway Signals 1. Yes 2. No 3. Unknown		Code 2	
37. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown		Code 2	
38. Driver's Age 40		39. Driver's Gender 1. Male 2. Female	
		Code 1	
40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown		Code 2	
41. Driver 1. Drove around or thru the gate 4. Stopped on crossing 2. Stopped and then proceeded 5. Other (specify) 3. Did not stop		Code 3	
42. Driver Passed Standing Highway Vehicle 1. Yes 2. No 3. Unknown		Code 2	
43. View of Track Obscured by (primary obstruction) 1. Permanent Structure 3. Passing Train 5. Vegetation 7. Other (specify) 2. Standing railroad equipment 4. Topography 6. Highway Vehicles 8. Not Obstructed		Code 8	
Casualties to:		Killed	
		Injured	
44. Driver was 1. Killed 2. Injured 3. Uninjured		Code 2	
45. Was Driver in the Vehicle? 1. Yes 2. No		Code 1	
46. Highway-Rail Crossing Users 0		47. Highway Vehicle Property Damage (est. dollar damage) \$9,000	
48. Total Number of Highway-Rail Crossing Users (include driver) 1			
49. Railroad Employees 0		50. Total Number of People on Train (include passengers and crew) 4	
51. Is a Rail Equipment Accident / Incident Report Being Filed 1. Yes 2. No		Code 2	
52. Passengers on Train 0			
53a. Special Study Block		53b. Special Study Block	
54. Narrative Description			
55. Typed Name and Title		56. Signature	
		57. Date	

HIGHWAY-RAIL GRADE CROSSING
ACCIDENT/INCIDENT REPORT

A2

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

OMB Approval No. 2130-0500

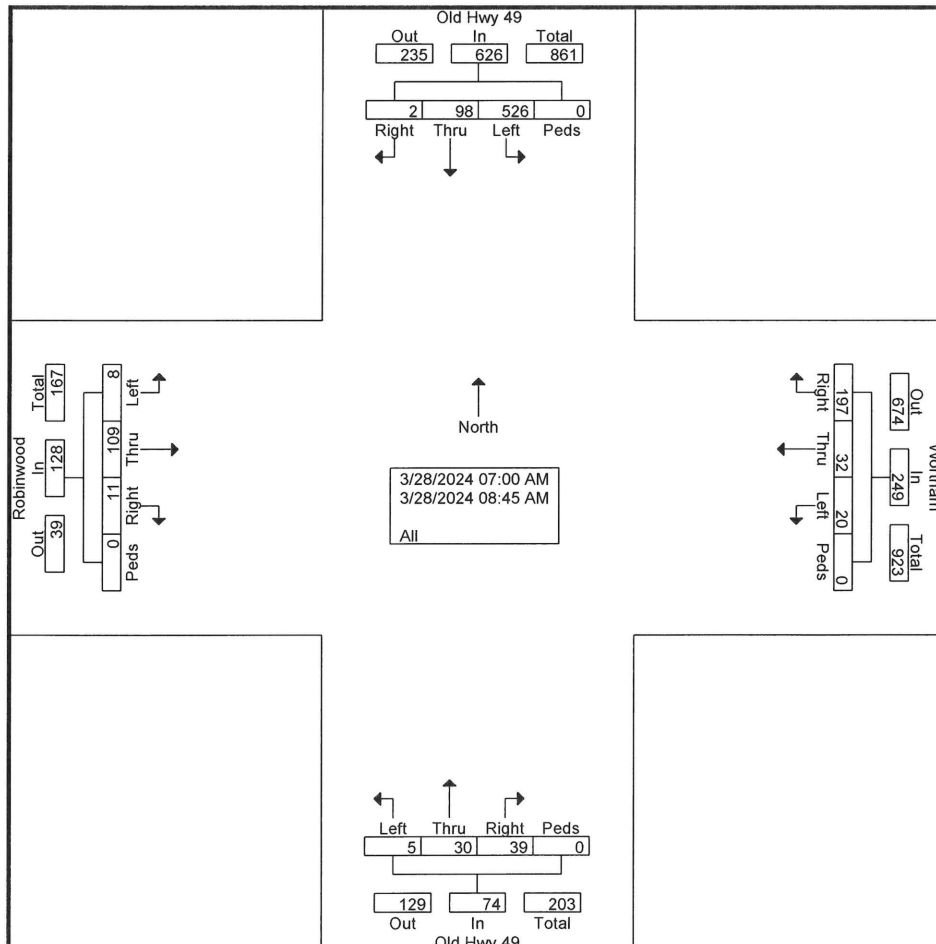
Name Of		Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad Kansas City Southern Railway Company [KCS]		1a. KCS	1b. 121130
2. Other Railroad Involved in Train Accident/Incident		2a.	2b.
3. Railroad Responsible for Track Maintenance Kansas City Southern Railway Company [KCS]		3a. KCS	3b. 121130
4. U.S. DOT-AAR Grade Crossing ID No. 305212Y		5. Date of Accident/Incident 10/31/97	6. Time of Accident/Incident 11:55 AM
7. Nearest Railroad Station GULFPORT		8. Division TRANSCONTINENTAL	9. County HARRISON
		10. State Abbr. 28	Code MS
11. City (if in a city) GULFPORT		12. Highway Name or No. WORTHAM ROAD	
		<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private	
Highway User Involved		Rail Equipment Involved	
13. Type C. Truck-trailer F. Bus J. Other Motor Vehicle A. Auto D. Pick-up truck G. School Bus K. Pedestrian B. Truck E. Van H. Motorcycle M. Other (specify) B		17. Equipment 1. Train (units pulling) 5. Car(s) (standing) 2. Train (units pushing) 6. Light loco(s) (moving) 3. Train (standing) 7. Light loco(s) (standing) C. Train standing- RCL 1	
14. Vehicle Speed (est. mph at impact) 8		15. Direction (geographical) 1. North 2. South 3. East 4. West 3	
16. Position 1. Stalled on crossing 3. Moving over crossing 2. Stopped on Crossing 4. Trapped 3		18. Position of Car Unit in Train 1	
		19. Circumstance 1. Rail equipment struck highway user 2. Rail equipment struck by highway user 2	
20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither 4		20b. Was there a hazardous materials release by 1. Highway User 2. Rail Equipment 3. Both 4. Neither	
20c. State the name and quantity of the hazardous material released, if any			
21. Temperature (specify if minus) 70 °F		22. Visibility (single entry) 1. Dawn 2. Day 3. Dusk 4. Dark 2	
		23. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow 3	
24. Type of Equipment Consist 1. Freight train 4. Work train 7. Yard/Switching (single entry) 2. Passenger train 5. Single car 8. Light loco(s) 3. Commuter train 6. Cut of cars 9. Main./inspect. car 1		25. Track Type Used by Rail Equipment Involved 1. Main 2. Yard 3. Siding 4. Industry 1	
27. FRA Track Class 2		28. Number of Locomotive Units 3	
29. Number of Cars 45		30. Consist Speed (Recorded if available) R. Recorded 25 mph E. Estimated E	
31. Time Table Direction 1. North 2. South 3. East 4. West 1			
32. Type of Crossing 1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other (specify) Warning 3. Standard FLS 6. Audible 9. Watchman 12. None		33. Signaled Crossing Warning	
Code(s) 07		34. Whistle Ban 1. Yes 2. No 3. Unknown 2	
35. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach 1		36. Crossing Warning Interconnected with Highway Signals 1. Yes 2. No 3. Unknown 2	
37. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown 2			
38. Driver's Age 32		39. Driver's Gender 1. Male 1 2. Female	
40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown 2		41. Driver 1. Drove around or thru the gate 4. Stopped on crossing 2. Stopped and then proceeded 5. Other (specify) 3. Did not stop 3	
42. Driver Passed Standing Highway Vehicle 1. Yes 2. No 3. Unknown 2		43. View of Track Obscured by (primary obstruction) 1. Permanent Structure 3. Passing Train 5. Vegetation 7. Other (specify) 2. Standing railroad equipment 4. Topography 6. Highway Vehicles 8. Not Obstructed 8	
Casualties to:		44. Driver was 1. Killed 2. Injured 3. Uninjured 3	
Killed		45. Was Driver in the Vehicle? 1. Yes 2. No 1	
Injured			
46. Highway-Rail Crossing Users 0		47. Highway Vehicle Property Damage (est. dollar damage) \$8,500	
0		48. Total Number of Highway-Rail Crossing Users (include driver) 1	
49. Railroad Employees 0		50. Total Number of People on Train (include passengers and crew) 3	
52. Passengers on Train 0		51. Is a Rail Equipment Accident / Incident Report Being Filed 1. Yes 2. No 2	
53a. Special Study Block		53b. Special Study Block	
54. Narrative Description			
55. Typed Name and Title		56. Signature	
		57. Date	

Intersection: Wortham/Old 49
 Counter: Miovision
 County/State: Harrison/MS
 Weather: Cloudy/Dry

File Name : old49-woram
 Site Code : 00000000
 Start Date : 3/28/2024
 Page No : 1

Groups Printed- All

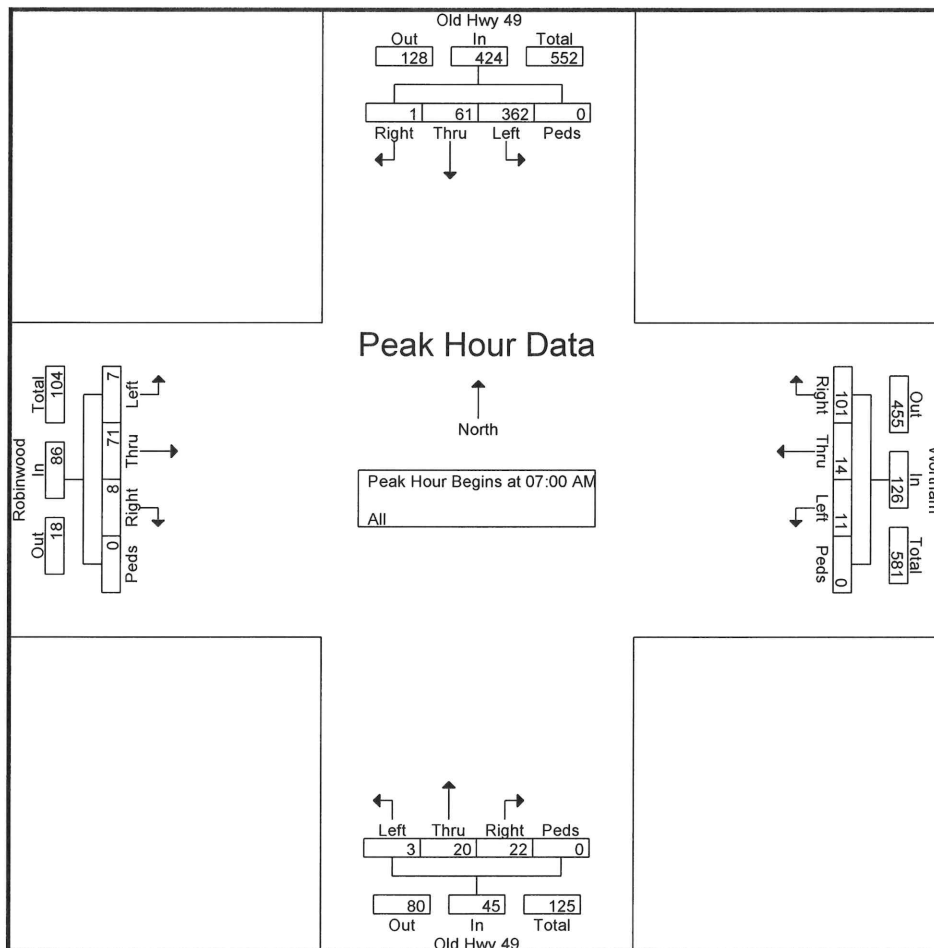
Start Time	Old Hwy 49 Southbound					Wortham Westbound					Old Hwy 49 Northbound					Robinwood Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	72	9	1	0	82	1	2	16	0	19	0	3	6	0	9	1	16	1	0	18	128
07:15 AM	108	24	0	0	132	3	5	34	0	42	0	13	5	0	18	6	22	3	0	31	223
07:30 AM	109	17	0	0	126	2	3	22	0	27	3	2	5	0	10	0	11	3	0	14	177
07:45 AM	73	11	0	0	84	5	4	29	0	38	0	2	6	0	8	0	22	1	0	23	153
Total	362	61	1	0	424	11	14	101	0	126	3	20	22	0	45	7	71	8	0	86	681
08:00 AM	39	11	1	0	51	4	10	30	0	44	0	1	7	0	8	0	10	1	0	11	114
08:15 AM	47	8	0	0	55	3	4	29	0	36	1	1	3	0	5	0	12	1	0	13	109
08:30 AM	39	10	0	0	49	1	3	11	0	15	1	4	3	0	8	1	10	1	0	12	84
08:45 AM	39	8	0	0	47	1	1	26	0	28	0	4	4	0	8	0	6	0	0	6	89
Total	164	37	1	0	202	9	18	96	0	123	2	10	17	0	29	1	38	3	0	42	396
Grand Total	526	98	2	0	626	20	32	197	0	249	5	30	39	0	74	8	109	11	0	128	1077
Apprch %	84	15.7	0.3	0		8	12.9	79.1	0		6.8	40.5	52.7	0		6.2	85.2	8.6	0		
Total %	48.8	9.1	0.2	0	58.1	1.9	3	18.3	0	23.1	0.5	2.8	3.6	0	6.9	0.7	10.1	1	0	11.9	



Intersection: Wortham/Old 49
 Counter: Miovision
 County/State: Harrison/MS
 Weather: Cloudy/Dry

File Name : old49-woram
 Site Code : 00000000
 Start Date : 3/28/2024
 Page No : 2

Start Time	Old Hwy 49 Southbound					Wortham Westbound					Old Hwy 49 Northbound					Robinwood Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	72	9	1	0	82	1	2	16	0	19	0	3	6	0	9	1	16	1	0	18	128
07:15 AM	108	24	0	0	132	3	5	34	0	42	0	13	5	0	18	6	22	3	0	31	223
07:30 AM	109	17	0	0	126	2	3	22	0	27	3	2	5	0	10	0	11	3	0	14	177
07:45 AM	73	11	0	0	84	5	4	29	0	38	0	2	6	0	8	0	22	1	0	23	153
Total Volume	362	61	1	0	424	11	14	101	0	126	3	20	22	0	45	7	71	8	0	86	681
% App. Total	85.4	14.4	0.2	0		8.7	11.1	80.2	0		6.7	44.4	48.9	0		8.1	82.6	9.3	0		
PHF	.830	.635	.250	.000	.803	.550	.700	.743	.000	.750	.250	.385	.917	.000	.625	.292	.807	.667	.000	.694	.763



Intersection: Wortham/Old 49
 Counter: Miovision
 County/State: Harrison/MS
 Weather: Cloudy/Dry

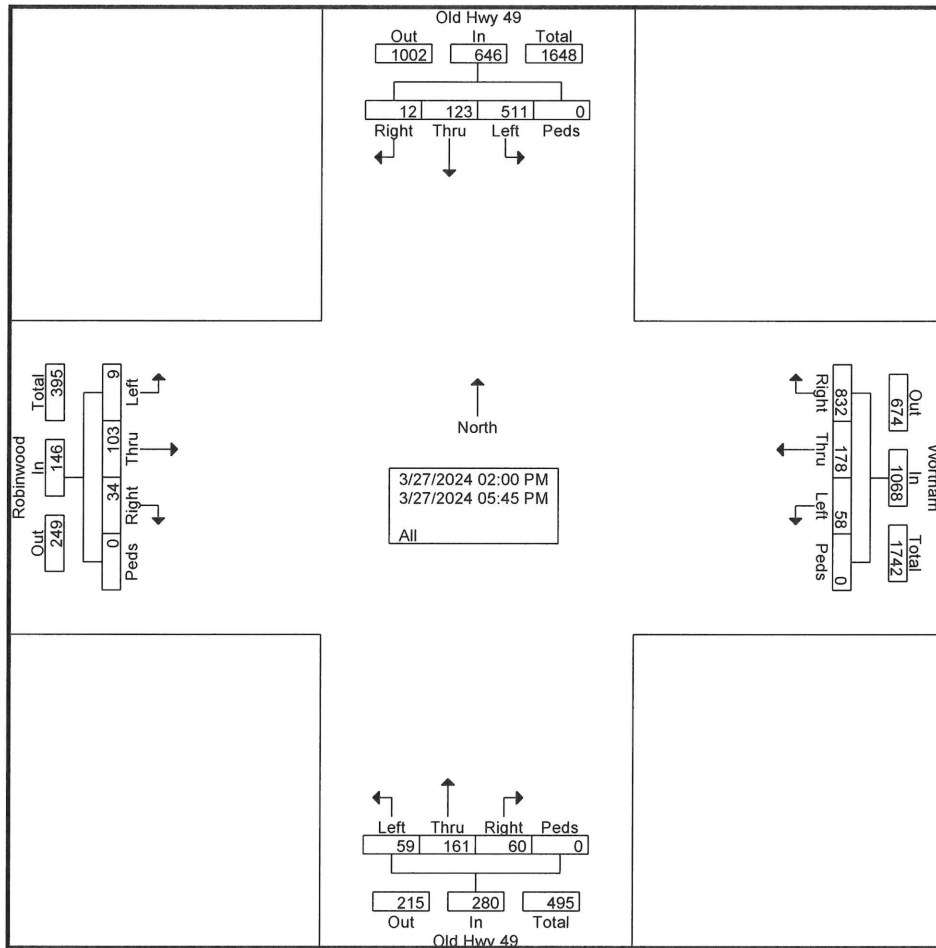
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 Site Code : 00000000
 Start Date : 3/27/2024
 Page No : 1

Groups Printed- All

Start Time	Old Hwy 49 Southbound					Wortham Westbound					Old Hwy 49 Northbound					Robinwood Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
02:00 PM	31	5	0	0	36	4	7	36	0	47	3	4	2	0	9	1	5	2	0	8	100
02:15 PM	18	1	0	0	19	0	8	42	0	50	1	14	1	0	16	0	6	2	0	8	93
02:30 PM	27	5	1	0	33	1	7	36	0	44	1	10	3	0	14	0	7	1	0	8	99
02:45 PM	21	4	1	0	26	1	5	30	0	36	2	8	4	0	14	1	4	2	0	7	83
Total	97	15	2	0	114	6	27	144	0	177	7	36	10	0	53	2	22	7	0	31	375
03:00 PM	47	11	1	0	59	4	8	43	0	55	1	5	7	0	13	0	6	0	0	6	133
03:15 PM	28	13	0	0	41	0	12	40	0	52	3	11	0	0	14	0	7	0	0	7	114
03:30 PM	52	10	1	0	63	5	19	63	0	87	2	7	4	0	13	0	2	0	0	2	165
03:45 PM	23	5	0	0	28	3	16	60	0	79	7	8	2	0	17	2	6	1	0	9	133
Total	150	39	2	0	191	12	55	206	0	273	13	31	13	0	57	2	21	1	0	24	545
04:00 PM	29	5	1	0	35	5	8	56	0	69	4	8	2	0	14	0	7	1	0	8	126
04:15 PM	26	9	1	0	36	3	10	41	0	54	5	10	5	0	20	0	8	0	0	8	118
04:30 PM	28	7	2	0	37	3	14	55	0	72	6	15	6	0	27	0	4	2	0	6	142
04:45 PM	44	5	2	0	51	5	8	43	0	56	5	12	5	0	22	1	8	2	0	11	140
Total	127	26	6	0	159	16	40	195	0	251	20	45	18	0	83	1	27	5	0	33	526
05:00 PM	26	14	0	0	40	6	11	61	0	78	12	8	6	0	26	1	5	4	0	10	154
05:15 PM	42	15	0	0	57	9	19	72	0	100	3	18	3	0	24	2	12	2	0	16	197
05:30 PM	37	6	1	0	44	8	13	94	0	115	0	13	8	0	21	1	11	6	0	18	198
05:45 PM	32	8	1	0	41	1	13	60	0	74	4	10	2	0	16	0	5	9	0	14	145
Total	137	43	2	0	182	24	56	287	0	367	19	49	19	0	87	4	33	21	0	58	694
Grand Total	511	123	12	0	646	58	178	832	0	1068	59	161	60	0	280	9	103	34	0	146	2140
Apprch %	79.1	19	1.9	0		5.4	16.7	77.9	0		21.1	57.5	21.4	0		6.2	70.5	23.3	0		
Total %	23.9	5.7	0.6	0	30.2	2.7	8.3	38.9	0	49.9	2.8	7.5	2.8	0	13.1	0.4	4.8	1.6	0	6.8	

Intersection: Wortham/Old 49
 Counter: Miovision
 County/State: Harrison/MS
 Weather: Cloudy/Dry

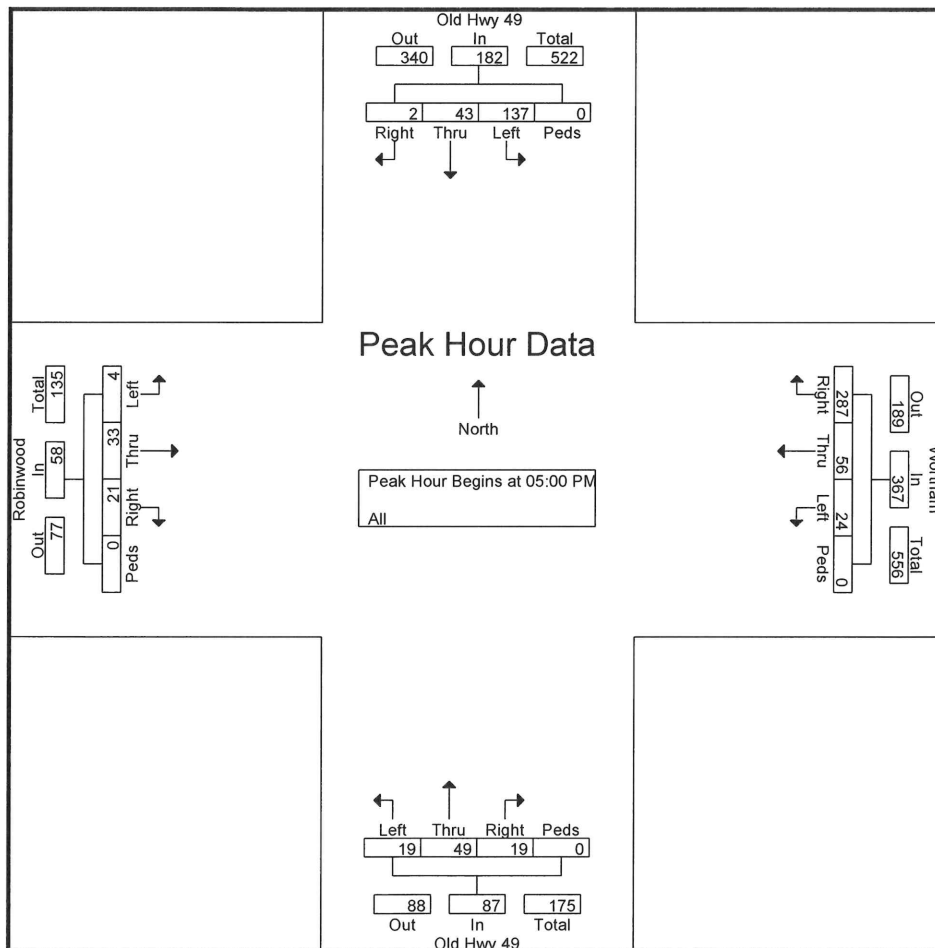
File Name : old49-worPM
 Site Code : 00000000
 Start Date : 3/27/2024
 Page No : 2



Intersection: Wortham/Old 49
 Counter: Miovision
 County/State: Harrison/MS
 Weather: Cloudy/Dry

File Name : old49-worPM
 Site Code : 00000000
 Start Date : 3/27/2024
 Page No : 3

Start Time	Old Hwy 49 Southbound					Wortham Westbound					Old Hwy 49 Northbound					Robinwood Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	26	14	0	0	40	6	11	61	0	78	12	8	6	0	26	1	5	4	0	10	154
05:15 PM	42	15	0	0	57	9	19	72	0	100	3	18	3	0	24	2	12	2	0	16	197
05:30 PM	37	6	1	0	44	8	13	94	0	115	0	13	8	0	21	1	11	6	0	18	198
05:45 PM	32	8	1	0	41	1	13	60	0	74	4	10	2	0	16	0	5	9	0	14	145
Total Volume	137	43	2	0	182	24	56	287	0	367	19	49	19	0	87	4	33	21	0	58	694
% App. Total	75.3	23.6	1.1	0		6.5	15.3	78.2	0		21.8	56.3	21.8	0		6.9	56.9	36.2	0		
PHF	.815	.717	.500	.000	.798	.667	.737	.763	.000	.798	.396	.681	.594	.000	.837	.500	.688	.583	.000	.806	.876

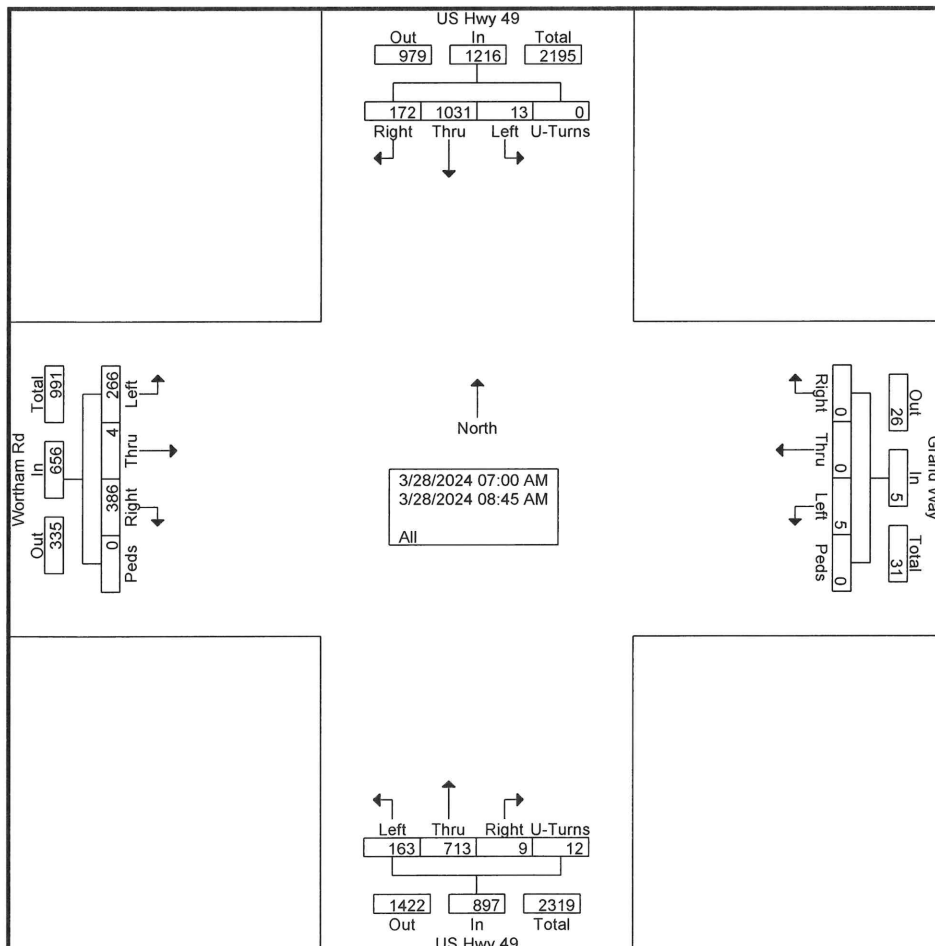


Intersection: Wortham/US 49
 Counter: Miovision
 County/State: Harrison/MS
 Weather: Cloudy/Dry

File Name : 49-worAM
 Site Code : 0000000
 Start Date : 3/28/2024
 Page No : 1

Groups Printed- All

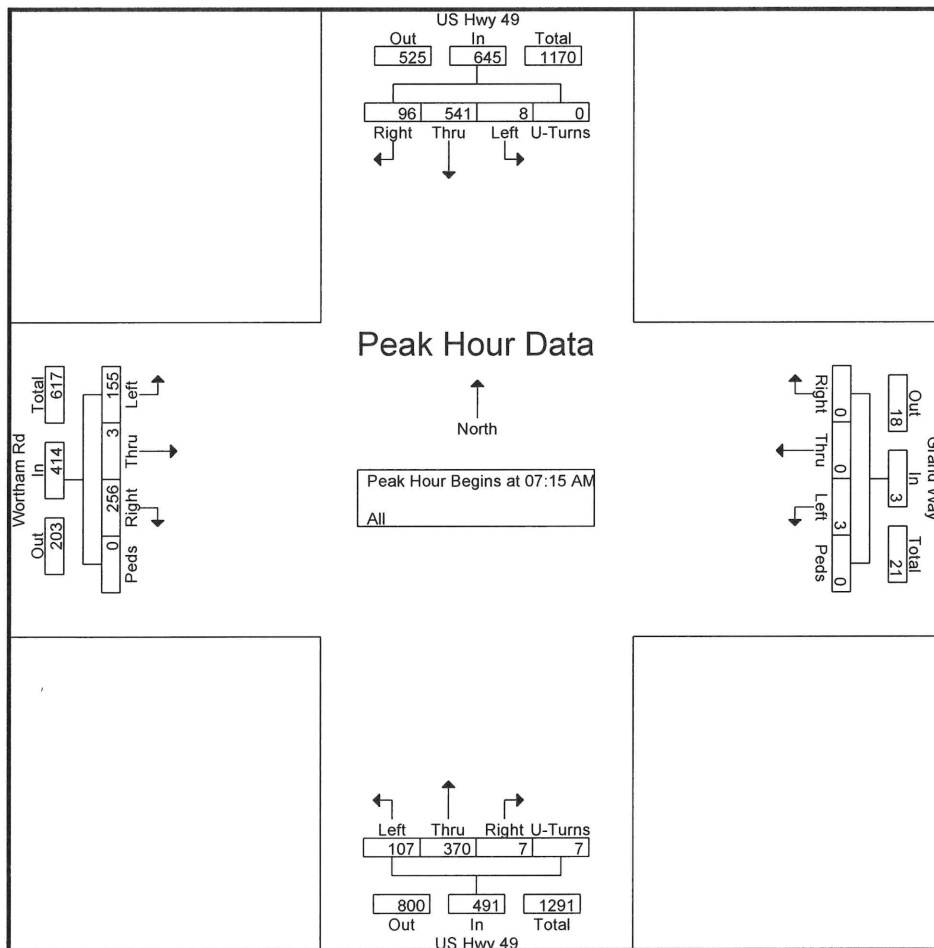
Start Time	US Hwy 49 Southbound					Grand Way Westbound					US Hwy 49 Northbound					Wortham Rd Eastbound					Int. Total
	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	1	146	17	0	164	0	0	0	0	0	11	69	2	0	82	32	0	46	0	78	324
07:15 AM	3	145	29	0	177	0	0	0	0	0	29	79	3	0	111	46	0	71	0	117	405
07:30 AM	1	156	24	0	181	0	0	0	0	0	16	99	2	2	119	48	2	81	0	131	431
07:45 AM	2	132	20	0	154	2	0	0	0	2	30	100	2	1	133	33	0	63	0	96	385
Total	7	579	90	0	676	2	0	0	0	2	86	347	9	3	445	159	2	261	0	422	1545
08:00 AM	2	108	23	0	133	1	0	0	0	1	32	92	0	4	128	28	1	41	0	70	332
08:15 AM	1	115	24	0	140	2	0	0	0	2	21	89	0	0	110	28	0	35	0	63	315
08:30 AM	1	104	18	0	123	0	0	0	0	0	11	98	0	4	113	34	1	29	0	64	300
08:45 AM	2	125	17	0	144	0	0	0	0	0	13	87	0	1	101	17	0	20	0	37	282
Total	6	452	82	0	540	3	0	0	0	3	77	366	0	9	452	107	2	125	0	234	1229
Grand Total	13	1031	172	0	1216	5	0	0	0	5	163	713	9	12	897	266	4	386	0	656	2774
Apprch %	1.1	84.8	14.1	0		100	0	0	0		18.2	79.5	1	1.3		40.5	0.6	58.8	0		
Total %	0.5	37.2	6.2	0	43.8	0.2	0	0	0	0.2	5.9	25.7	0.3	0.4	32.3	9.6	0.1	13.9	0	23.6	



Intersection: Wortham/US 49
 Counter: Miovision
 County/State: Harrison/MS
 Weather: Cloudy/Dry

File Name : 49-worAM
 Site Code : 00000000
 Start Date : 3/28/2024
 Page No : 2

Start Time	US Hwy 49 Southbound					Grand Way Westbound					US Hwy 49 Northbound					Wortham Rd Eastbound					Int. Total
	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	3	145	29	0	177	0	0	0	0	0	29	79	3	0	111	46	0	71	0	117	405
07:30 AM	1	156	24	0	181	0	0	0	0	0	16	99	2	2	119	48	2	81	0	131	431
07:45 AM	2	132	20	0	154	2	0	0	0	2	30	100	2	1	133	33	0	63	0	96	385
08:00 AM	2	108	23	0	133	1	0	0	0	1	32	92	0	4	128	28	1	41	0	70	332
Total Volume	8	541	96	0	645	3	0	0	0	3	107	370	7	7	491	155	3	256	0	414	1553
% App. Total	1.2	83.9	14.9	0		100	0	0	0		21.8	75.4	1.4	1.4		37.4	0.7	61.8	0		
PHF	.667	.867	.828	.000	.891	.375	.000	.000	.000	.375	.836	.925	.583	.438	.923	.807	.375	.790	.000	.790	.901



Intersection: Wortham/US 49
 Counter: Miovision
 County/State: Harrison/MS
 Note: Crash Block EB 4:17-5:33

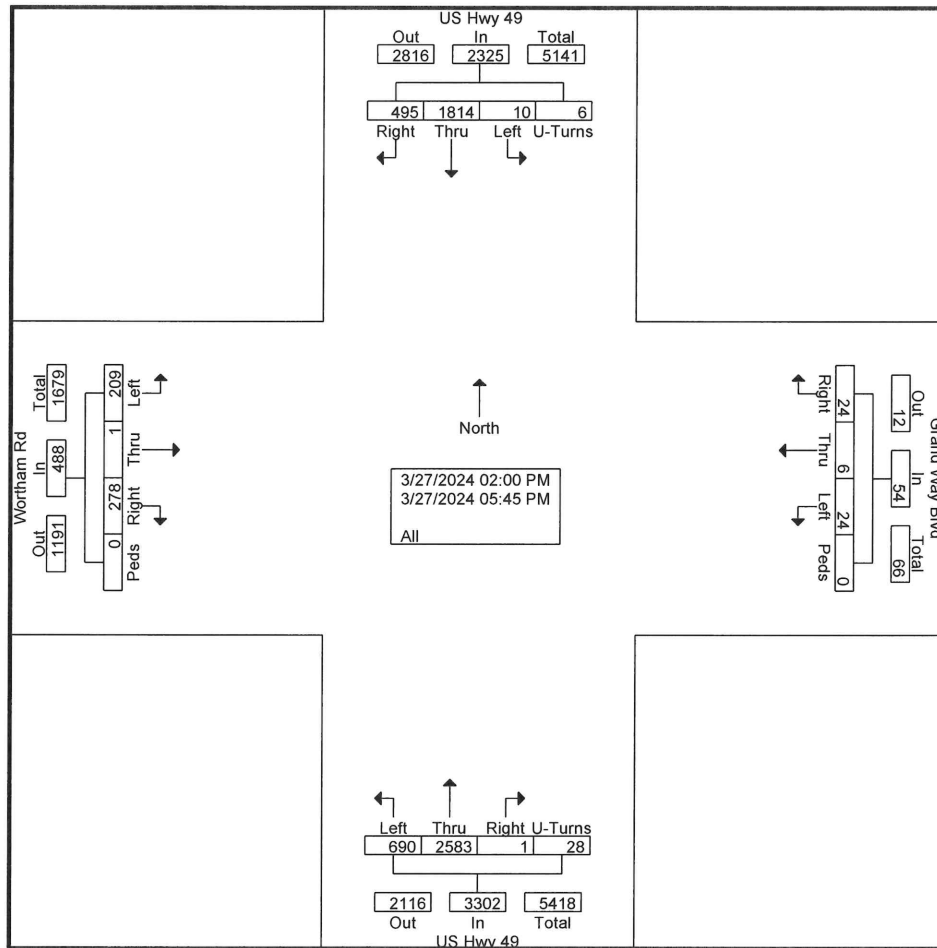
File Name : 49-worpm
 Site Code : 0000000
 Start Date : 3/27/2024
 Page No : 1

Groups Printed- All

Start Time	US Hwy 49 Southbound					Grand Way Blvd Westbound					US Hwy 49 Northbound					Wortham Rd Eastbound					Int. Total
	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	Peds	App. Total	
02:00 PM	1	108	19	1	129	4	3	2	0	9	40	118	0	1	159	17	1	17	0	35	332
02:15 PM	1	102	28	0	131	1	0	6	0	7	31	114	0	3	148	14	0	20	0	34	320
02:30 PM	0	108	18	0	126	0	0	3	0	3	27	110	0	1	138	16	0	20	0	36	303
02:45 PM	1	96	15	0	112	0	0	1	0	1	41	143	0	2	186	10	0	25	0	35	334
Total	3	414	80	1	498	5	3	12	0	20	139	485	0	7	631	57	1	82	0	140	1289
03:00 PM	1	115	28	0	144	0	0	1	0	1	47	121	0	3	171	24	0	24	0	48	364
03:15 PM	0	132	27	0	159	2	0	0	0	2	34	123	1	3	161	27	0	31	0	58	380
03:30 PM	0	130	38	0	168	0	0	3	0	3	61	156	0	1	218	22	0	31	0	53	442
03:45 PM	0	97	27	0	124	3	1	1	0	5	44	166	0	2	212	17	0	24	0	41	382
Total	1	474	120	0	595	5	1	5	0	11	186	566	1	9	762	90	0	110	0	200	1568
04:00 PM	0	115	36	0	151	3	0	2	0	5	48	176	0	2	226	13	0	22	0	35	417
04:15 PM	2	114	31	0	147	3	1	1	0	5	38	174	0	0	212	4	0	3	0	7	371
04:30 PM	4	118	31	0	153	1	0	3	0	4	42	203	0	0	245	0	0	0	0	0	402
04:45 PM	0	116	36	4	156	2	0	1	0	3	28	213	0	0	241	0	0	0	0	0	400
Total	6	463	134	4	607	9	1	7	0	17	156	766	0	2	924	17	0	25	0	42	1590
05:00 PM	0	130	42	1	173	0	0	0	0	0	48	231	0	1	280	0	0	0	0	0	453
05:15 PM	0	119	46	0	165	2	1	0	0	3	54	214	0	0	268	0	0	2	0	2	438
05:30 PM	0	113	37	0	150	0	0	0	0	0	55	175	0	5	235	23	0	38	0	61	446
05:45 PM	0	101	36	0	137	3	0	0	0	3	52	146	0	4	202	22	0	21	0	43	385
Total	0	463	161	1	625	5	1	0	0	6	209	766	0	10	985	45	0	61	0	106	1722
Grand Total	10	1814	495	6	2325	24	6	24	0	54	690	2583	1	28	3302	209	1	278	0	488	6169
Apprch %	0.4	78	21.3	0.3		44.4	11.1	44.4	0		20.9	78.2	0	0.8		42.8	0.2	57	0		
Total %	0.2	29.4	8	0.1	37.7	0.4	0.1	0.4	0	0.9	11.2	41.9	0	0.5	53.5	3.4	0	4.5	0	7.9	

Intersection: Wortham/US 49
 Counter: Miovision
 County/State: Harrison/MS
 Note: Crash Block EB 4:17-5:33

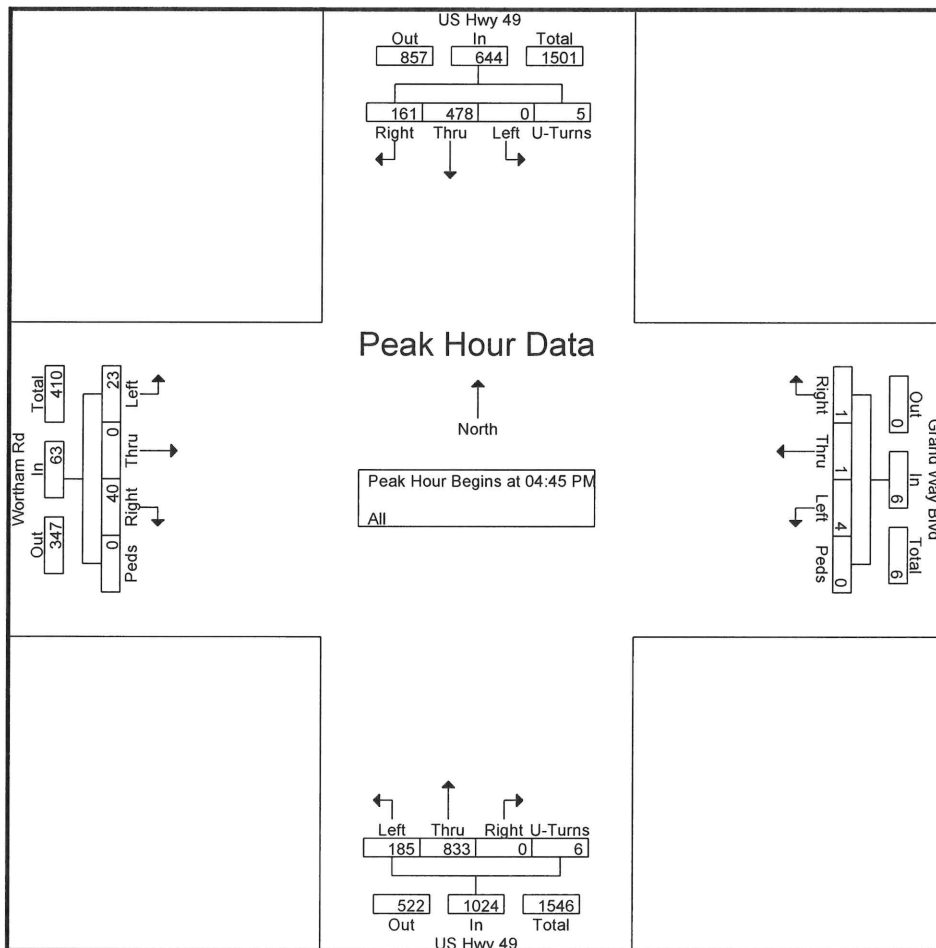
File Name : 49-worpm
 Site Code : 0000000
 Start Date : 3/27/2024
 Page No : 2



Intersection: Wortham/US 49
 Counter: Miovision
 County/State: Harrison/MS
 Note: Crash Block EB 4:17-5:33

File Name : 49-worpm
 Site Code : 00000000
 Start Date : 3/27/2024
 Page No : 3

Start Time	US Hwy 49 Southbound					Grand Way Blvd Westbound					US Hwy 49 Northbound					Wortham Rd Eastbound					Int. Total
	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	116	36	4	156	2	0	1	0	3	28	213	0	0	241	0	0	0	0	0	400
05:00 PM	0	130	42	1	173	0	0	0	0	0	48	231	0	1	280	0	0	0	0	0	453
05:15 PM	0	119	46	0	165	2	1	0	0	3	54	214	0	0	268	0	0	2	0	2	438
05:30 PM	0	113	37	0	150	0	0	0	0	0	55	175	0	5	235	23	0	38	0	61	446
Total Volume	0	478	161	5	644	4	1	1	0	6	185	833	0	6	1024	23	0	40	0	63	1737
% App. Total	0	74.2	25	0.8		66.7	16.7	16.7	0		18.1	81.3	0	0.6		36.5	0	63.5	0		
PHF	.000	.919	.875	.313	.931	.500	.250	.250	.000	.500	.841	.902	.000	.300	.914	.250	.000	.263	.000	.258	.959



HCM 6th AWSC
3: Old Hwy 49 & Robinhood Drive/Wortham Road

04/25/2024

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	71	8	11	14	101	3	20	22	362	61	1
Future Vol, veh/h	7	71	8	11	14	101	3	20	22	362	61	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	77	9	12	15	110	3	22	24	393	66	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	9	8.2	14.8
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	8%	9%	85%
Vol Thru, %	44%	83%	11%	14%
Vol Right, %	49%	9%	80%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	86	126	424
LT Vol	3	7	11	362
Through Vol	20	71	14	61
RT Vol	22	8	101	1
Lane Flow Rate	49	93	137	461
Geometry Grp	1	1	1	1
Degree of Util (X)	0.065	0.138	0.184	0.605
Departure Headway (Hd)	4.785	5.319	4.843	4.727
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	740	668	735	760
Service Time	2.868	3.394	2.911	2.783
HCM Lane V/C Ratio	0.066	0.139	0.186	0.607
HCM Control Delay	8.2	9.3	9	14.8
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0.2	0.5	0.7	4.1

HCM 6th Signalized Intersection Summary
 8: US Hwy 49 & Wortham Road/Grand Way Blvd

04/25/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	3	256	3	0	0	114	370	7	8	541	96
Future Volume (veh/h)	155	3	256	3	0	0	114	370	7	8	541	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	3	278	3	0	0	124	402	0	9	588	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	372	7	337	7	0	0	514	1846		572	1659	
Arrive On Green	0.21	0.21	0.21	0.00	0.00	0.00	0.06	0.52	0.00	0.01	0.47	0.00
Sat Flow, veh/h	1752	31	1585	1781	0	0	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	171	0	278	3	0	0	124	402	0	9	588	0
Grp Sat Flow(s),veh/h/ln	1783	0	1585	1781	0	0	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	6.0	0.0	11.9	0.1	0.0	0.0	2.4	4.4	0.0	0.2	7.5	0.0
Cycle Q Clear(g_c), s	6.0	0.0	11.9	0.1	0.0	0.0	2.4	4.4	0.0	0.2	7.5	0.0
Prop In Lane	0.98		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	379	0	337	7	0	0	514	1846		572	1659	
V/C Ratio(X)	0.45	0.00	0.83	0.42	0.00	0.00	0.24	0.22		0.02	0.35	
Avail Cap(c_a), veh/h	538	0	478	450	0	0	688	1846		689	1659	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.4	0.0	26.8	35.4	0.0	0.0	8.4	9.3	0.0	9.7	12.1	0.0
Incr Delay (d2), s/veh	0.8	0.0	7.9	34.1	0.0	0.0	0.2	0.3	0.0	0.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	4.9	0.1	0.0	0.0	0.7	1.3	0.0	0.1	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	0.0	34.7	69.5	0.0	0.0	8.7	9.5	0.0	9.8	12.7	0.0
LnGrp LOS	C	A	C	E	A	A	A	A		A	B	
Approach Vol, veh/h		449			3			526			597	
Approach Delay, s/veh		31.1			69.5			9.3			12.7	
Approach LOS		C			E			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	41.5		19.6	9.1	37.7		4.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	37.0		21.5	11.5	31.0		18.0				
Max Q Clear Time (g_c+1), s	2.2	6.4		13.9	4.4	9.5		2.1				
Green Ext Time (p_c), s	0.0	2.3		1.2	0.1	3.3		0.0				

Intersection Summary

HCM 6th Ctrl Delay	16.9
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th AWSC
 3: Old Hwy 49 & Robinhood Drive/Wortham Road

05/01/2024

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	33	21	24	56	287	19	49	19	137	43	2
Future Vol, veh/h	4	33	21	24	56	287	19	49	19	137	43	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	36	23	26	61	312	21	53	21	149	47	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.5	11.3	9.1	10.4
HCM LOS	A	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	22%	7%	7%	75%
Vol Thru, %	56%	57%	15%	24%
Vol Right, %	22%	36%	78%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	87	58	367	182
LT Vol	19	4	24	137
Through Vol	49	33	56	43
RT Vol	19	21	287	2
Lane Flow Rate	95	63	399	198
Geometry Grp	1	1	1	1
Degree of Util (X)	0.135	0.087	0.478	0.287
Departure Headway (Hd)	5.151	4.951	4.316	5.225
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	687	716	830	681
Service Time	3.246	3.033	2.366	3.31
HCM Lane V/C Ratio	0.138	0.088	0.481	0.291
HCM Control Delay	9.1	8.5	11.3	10.4
HCM Lane LOS	A	A	B	B
HCM 95th-tile Q	0.5	0.3	2.6	1.2

HCM 6th Signalized Intersection Summary
 8: US Hwy 49 & Wortham Road/Grand Way Blvd

05/01/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	0	160	4	1	1	191	833	0	5	478	161
Future Volume (veh/h)	125	0	160	4	1	1	191	833	0	5	478	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	136	0	174	4	1	1	208	905	0	5	520	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	268	0	238	9	2	2	609	1996		375	1716	
Arrive On Green	0.15	0.00	0.15	0.01	0.01	0.01	0.09	0.56	0.00	0.01	0.48	0.00
Sat Flow, veh/h	1781	0	1585	1173	293	293	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	136	0	174	6	0	0	208	905	0	5	520	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1759	0	0	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.6	0.0	6.9	0.2	0.0	0.0	3.5	9.9	0.0	0.1	5.8	0.0
Cycle Q Clear(g_c), s	4.6	0.0	6.9	0.2	0.0	0.0	3.5	9.9	0.0	0.1	5.8	0.0
Prop In Lane	1.00		1.00	0.67		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	268	0	238	14	0	0	609	1996		375	1716	
V/C Ratio(X)	0.51	0.00	0.73	0.43	0.00	0.00	0.34	0.45		0.01	0.30	
Avail Cap(c_a), veh/h	582	0	517	481	0	0	768	1996		512	1716	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.7	0.0	26.7	32.5	0.0	0.0	6.6	8.5	0.0	8.8	10.3	0.0
Incr Delay (d2), s/veh	1.5	0.0	4.3	19.8	0.0	0.0	0.3	0.7	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	2.7	0.2	0.0	0.0	0.8	2.6	0.0	0.0	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	0.0	31.0	52.3	0.0	0.0	6.9	9.2	0.0	8.8	10.8	0.0
LnGrp LOS	C	A	C	D	A	A	A	A		A	B	
Approach Vol, veh/h		310			6			1113			525	
Approach Delay, s/veh		29.3			52.3			8.8			10.7	
Approach LOS		C			D			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	41.5		14.4	10.1	36.3		5.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	37.0		21.5	11.5	31.0		18.0				
Max Q Clear Time (g_c+1), s	2.1	11.9		8.9	5.5	7.8		2.2				
Green Ext Time (p_c), s	0.0	5.8		1.0	0.3	2.9		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		12.7
HCM 6th LOS		B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 2010 Roundabout
 3: Old Hwy 49 & Robinhood Drive/Wortham Road

05/02/2024

Intersection				
Intersection Delay, s/veh	7.0			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	94	137	49	460
Demand Flow Rate, veh/h	96	139	49	469
Vehicles Circulating, veh/h	480	33	488	30
Vehicles Exiting, veh/h	19	504	88	142
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.8	4.5	6.0	8.0
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	96	139	49	469
Cap Entry Lane, veh/h	699	1093	694	1097
Entry HV Adj Factor	0.984	0.983	0.991	0.980
Flow Entry, veh/h	94	137	49	460
Cap Entry, veh/h	688	1075	688	1075
V/C Ratio	0.137	0.127	0.071	0.428
Control Delay, s/veh	6.8	4.5	6.0	8.0
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	2

HCM 2010 Roundabout
 3: Old Hwy 49 & Robinhood Drive/Wortham Road

05/02/2024

Intersection				
Intersection Delay, s/veh	6.5			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	63	399	95	198
Demand Flow Rate, veh/h	64	407	96	202
Vehicles Circulating, veh/h	227	79	193	110
Vehicles Exiting, veh/h	85	210	98	376
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.7	7.7	4.9	5.5
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	64	407	96	202
Cap Entry Lane, veh/h	900	1044	932	1012
Entry HV Adj Factor	0.989	0.980	0.989	0.980
Flow Entry, veh/h	63	399	95	198
Cap Entry, veh/h	890	1023	921	992
V/C Ratio	0.071	0.390	0.103	0.200
Control Delay, s/veh	4.7	7.7	4.9	5.5
LOS	A	A	A	A
95th %tile Queue, veh	0	2	0	1