



TRAFFIC ENGINEERING STUDY

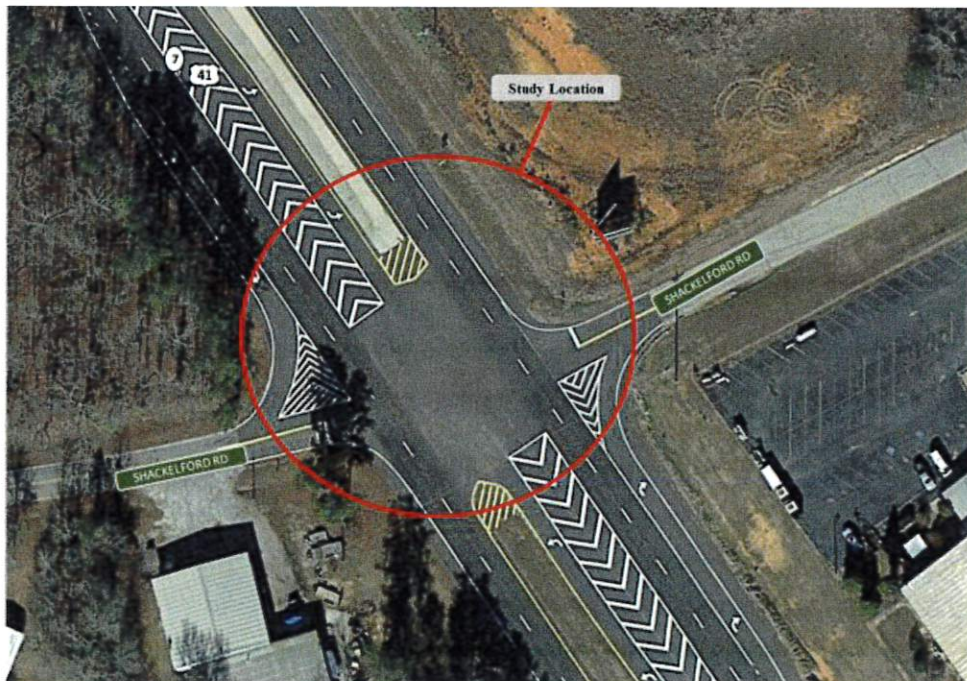
November 16, 2020

For the intersection of:

SR 7 @ Shackelford Road

Pike County

REQUESTED BY: Dan Woods, District 3 Traffic Operations Manager



Report Prepared by:
Jennifer Compton
District 3 Traffic Operations

LOCATION: Intersection of US 41/State Route 7 at Shackelford Road, M.P. 2.42

REASON FOR STUDY: To evaluate the intersection for operational and safety improvements.

DESCRIPTION OF THE INTERSECTION: US 41/State Route 7 is a four-lane divided highway that travels north-south connecting the City of Griffin in Spalding County to the City of Barnesville in Lamar County. Within the study section, SR 7 consists of 12-foot-wide double travel lanes with 8-foot-wide paved shoulders. There are right and left turn lanes at both approaches to the study intersection on SR 7. The grade along the study section is relatively flat with adequate sight distance in both directions. Shackelford Road consists of 10-foot-wide single travel lanes in each direction. Intersection ahead warning signs with name plaques are present on both northbound and southbound approaches of SR 7 to Shackelford Road. The western leg of Shackelford Road connects SR 7 to SR 3 north of Zebulon while its eastern leg, 380-feet in length, connects to Ethridge Mill Road that feeds residential and commercial areas.

Land use at this location consists of a mixture of wooded tracts at the northern quadrants, east and west of SR 7 with future-plans of a commercial development to the northwestern quadrant. Commercial developments are currently located on the southeastern and southwestern quadrants of the study location. Located approximately 800 feet south of the study intersection is an industrial development. There is no overhead lighting at this intersection.

EXISTING TRAFFIC CONTROL: SR 7 is free-flowing while Shackelford Road is stop-controlled with standard sized stop signs.

VEHICLE VOLUMES: The traffic volumes shown below were obtained from recently acquired field counts (August 2020). Due to the Covid-19 pandemic and the possibility of reduced traffic volumes, the acquired field counts were compared to TADA’s 2018 and 2019 online count data. The comparison results were very similar and therefore a growth rate factor was not necessary to increase current field counts. However, with plans of commercial development on Shackelford Road to the west of SR 7, a growth rate factor was used per the ITE Trip Generation Data manual. Using the square footage of the building, there would be an additional 590 trips per day generated on Shackelford Road. The trips were evenly divided for each approach and shown below.

Route and Direction	VPD
SR 7 NB	5,586
SR 7 SB	5,436
Shackelford Road EB	463
Shackelford Road WB	335

(See attached traffic volumes & variety store chart)

VEHICLE SPEEDS: SR 7: 60 MPH

Shackelford Road: EB 45 MPH, WB has no posted speed limit.

PEDESTRIAN MOVEMENTS: No sidewalks, crosswalks or overhead lighting exist currently. There is no evidence of pedestrian activity or paths within the study area. With 6 houses located within 0.15 miles of proposed new development, there is potential for a small amount of pedestrian traffic to generate.

PARKING: There is no on-street parking permitted in the vicinity of the study intersection.

COLLISION HISTORY: Crash data was researched over a five-year period from August 01, 2015 – August 01, 2020 using G.E.A.R.S. Results are as follows:

	Angles	Rear-ends	Injury Collisions	Fatalities
Beg. Aug 01, 2015	0	0	0	0
2016	2	0	2	0
2017	0	0	0	0
2018	0	0	0	0
2019	1	0	1	1
End. Aug 01, 2020	1	0	1	0
TOTAL:	4	0	4	1

(See attached collision diagram for more detail.)

ADJACENT SIGNALIZED INTERSECTIONS: The nearest signalized intersection is SR 7/US 41 at SR 3/US 19, approximately 1.5 miles north of the study intersection.

WARRANT ANALYSIS: A signal warrant analysis was performed using current volume counts. The intersection failed to meet any signal warrants.

(See attached signal warrant analysis.)

CONVENTIONAL (MINOR STOP) ANALYSIS: A conventional (minor stop) is the existing control type for the study intersection. An analysis was performed and found to operate as follows:

AM Peak Hour: Overall Intersection LOS A for a 20-year Practical Capacity Design Life

PM Peak Hour: Overall Intersection LOS A for a 20-year Practical Capacity Design Life
(See attached Level of Service & Summary reports for Conventional Intersection)

ROUNABOUT ANALYSIS: A multi-lane roundabout was analyzed and found to operate as follows:

AM Peak Hour: Overall Intersection LOS A for a 20-year Practical Capacity Design Life

PM Peak Hour: Overall Intersection LOS A for a 20-year Practical Capacity Design Life
(See attached Level of Service & Summary reports for Roundabout intersection)

RCUT ANALYSIS:

AM Peak Hour: Overall Intersection LOS A for a 20-year Practical Capacity Design Life

PM Peak Hour: Overall Intersection LOS B for a 20-year Practical Capacity Design Life
(See attached Level of Service & Summary reports for RCUT intersection)

ICE ANALYSIS: An alternative comparison analysis was conducted between the existing conditions, a multi-lane roundabout, and a reduced conflict U-turn intersection (RCUT). A signalized alternative was considered but failed to meet any signal warrants. The ICE Tool ranked an RCUT intersection as the best alternative for this intersection with a score of 8.6. The multi-lane roundabout scored as the next best alternative with a score of 6.6, followed by the existing, conventional (minor stop) intersection with a score of 6.4. The safety benefits to cost ratio resulted higher with the RCUT intersection:

Safety B/C ratio for RCUT: 9.3

Safety B/C ratio for multi-lane roundabout: 4.9

Safety B/C ration for conventional (minor stop) intersection: 0

CONCLUSION: Based upon the data gathered, existing operations and conditions, and the analyses conducted, we conclude that an RCUT (stop-controlled) intersection, in addition to a median crossing U-turn lane with truck loon to the north of the study intersection, would improve operations and could reduce crash severity at this intersection. There is an existing U-turn in place 725 feet to the south of the study intersection.

RECOMMENDATION: Based upon the scoring from the ICE Analysis and a higher safety benefits to cost ratio over the other alternatives, we recommend that an RCUT be constructed at the intersection of SR 7 at Shackelford Road, in addition to a median crossing U-turn lane and truck loon north of the intersection, once funding becomes available.

Jennifer Compton

11/16/2020

Traffic Specialist

Date

Tyler Peek

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District Traffic Engineer

Date