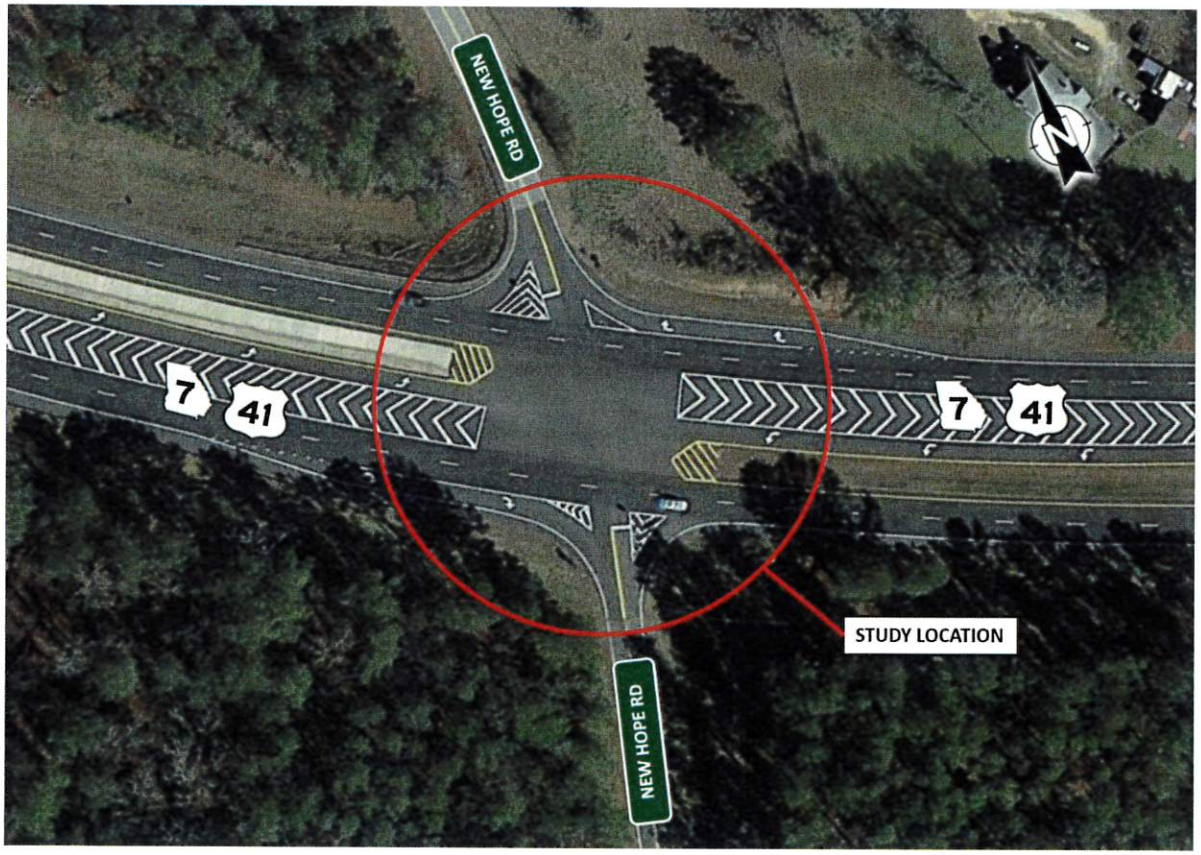
Georgia Department of Transportation

TRAFFIC ENGINEERING STUDY

October 2, 2020

For the intersection of:
State Route 7/US Route 41 @ New Hope Road
Pike County

REQUESTED BY: Dan Woods, District 3 Traffic Operations Manager



Report Prepared by:
Kevin T. Harpe
District 3 Traffic Operations

LOCATION: Intersection of State Route 7/US 41 at New Hope Road, M.P. 1.

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

DESCRIPTION OF THE INTERSECTION: State Route (SR) 7/US Route 41 is a minor arterial (as classified per GDOT's functional classification map) that travels north-south and connects the city of Griffin in Spalding County to the city of Barnesville in Lamar County to the south. Within the study section, SR 7 consists of 12-foot-wide double travel lanes in each direction with 8-foot-wide paved shoulders. There are left turn lanes and right turn lanes at both approaches to the study intersection on SR 7. The grade along the study section is relatively flat. New Hope Road is a major collector (as classified per GDOT's functional classification map) connecting SR 7 to the city of Zebulon on its western leg while its eastern leg is a rural local road that primarily services a residential area. New Hope Road consists of 11-foot-wide single travel lanes in each direction. There are dual-indicated, intersection ahead warning signs with name plaques on both northbound and southbound approaches of SR 7 to New Hope Road.

Land use at this location consists of a mixture of wooded tracts and residential parcels to the east and west of SR 7. There is an industrial development approximately 800 feet north of the study intersection. Both approaches of SR 7 are signed with dual intersection ahead, advance warning signs for New Hope Road. The eastern leg of New Hope Road includes rumble strips prior to the intersection with SR 7. There is no existing overhead lighting at this intersection.

EXISTING TRAFFIC CONTROL: SR 7 is free-flowing. New Hope Road is stop-controlled with large, dual-indicated stop signs. The right turn movements on both legs of New Hope Road are separated by a striped island and are yield-controlled.

SIGHT DISTANCE: Sight distance was observed and measured at the location. There is a horizontal curve along SR 7 to the north of the study intersection; however, the sight distance exceeded the requirements for all approaches.

VEHICULAR VOLUME: 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.

Route and Direction	VPD
SR 7 NB	5,184
SR 7 SB	5,281
New Hope Rd WB	425
New Hope Rd EB	560

(See attached traffic volumes)

VEHICULE SPEEDS: SR 7: 60 MPH
New Hope Road: WB 50 MPH, EB 45 MPH

PEDESTRIAN MOVEMENTS: There were no pedestrians observed at this location. There are no sidewalks, crosswalks or evidence of pedestrian traffic located at or near this location. In addition, no pedestrian generators exist within the study area.

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 February 18, 2015 – February 18, 2020 using G.E.A.R.S and the GDOT Numetrics tool. It should be noted that the collision data gathered for 2019 may be incomplete and will be evaluated again at a later date. Results are as follows:

	Angles	Rear-ends	Injury Collisions	Fatalities
Beg. Feb 18, **2015**	3	0	3	0
2016	1	1	1	0
2017	3	0	1	0
2018	2	0	0	0
2019	0	0	0	0
End. Feb 18, **2020**	0	0	0	0
TOTAL:	9	1	5	0

(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 4 miles north of the study intersection.

WARRANT ANALYSIS: A signal warrant analysis was performed using current volume counts. Right-turn volumes were discounted from all approaches. 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)

ROUNDABOUT 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: A reduced-conflict U-turn (RCUT) analysis with the addition of median crossing U-turn lanes 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 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 8.5. The multi-lane roundabout scored as the next best alternative with a score of 6.8, followed by the existing, conventional (minor stop) intersection with a score of 5.5. The safety benefits to cost ratio resulted higher with the RCUT intersection.

Safety B/C ratio for RCUT: 4.6
Safety B/C ratio for multi lane roundabout: 1.8
Safety B/C ratio for conventional (minor stop) intersection: 0

OTHER INFORMATION: During the observation phase of this study, traffic crossing SR 7 was observed multiple times coming to a complete stop in the median to wait on the necessary gap before continuing travel. Vehicle queuing and less than ideal conditions such as potential sight distance issues for motorists in the left turn lanes and the obstruction to northbound and southbound travelers on SR 7 are results of this maneuver.

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 both the north and south of the study intersection, would improve operations and could reduce crash severity at this 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 intersection with median crossing U-turn lanes and truck loons be constructed at the intersection of SR 7 at New Hope Road once funding becomes available.

Kevin Harpe

Traffic Specialist — 10/9/2020 Date

Tyler Peek

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District Traffic Engineer — 10/14/20 Date