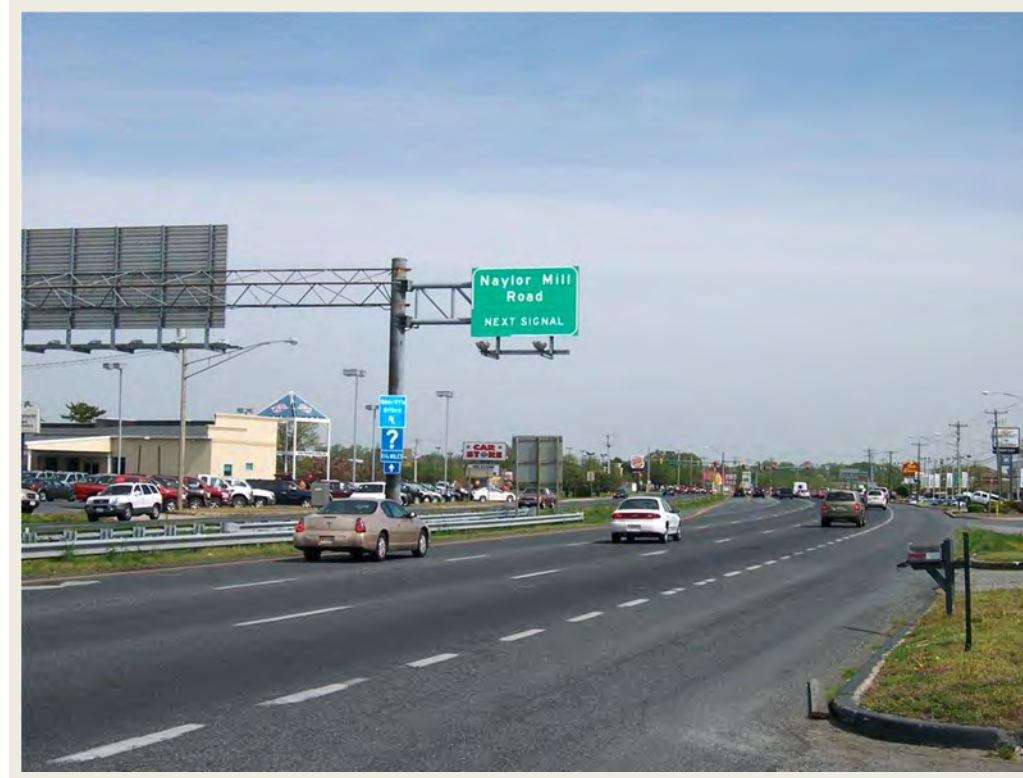


US 13 NORTH/NAYLOR MILL ROAD STUDY



Prepared for:
The Salisbury/Wicomico
Metropolitan Planning Organization

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Table of Contents

I. INTRODUCTION..... 1

II. EXISTING CONDITIONS.....1

III. 2015 CONDITIONS..... 17

IV. SHORT TERM RECOMMENDATIONS..... 22

V. BUILD OUT CONDITIONS..... 31

VI. LONG TERM RECOMMENDATIONS..... 36

VII. CONCLUSION 43

APPENDIX

Executive Summary

Salisbury is the largest city on the Eastern Shore of Maryland. It is served by the two major roadways of the Delmarva Peninsula. This is U.S. Route 13 which extends in a north-south direction and U.S. Route 50, a major route from Washington DC to Ocean City that traverses in an east-west direction. These roadways intersect each other in the northern portion of the city and its surrounding area. This ideal location at the two major crossroads has created much economic activity. Many different types of development have occurred in the area. This includes commercial, residential and industrial developments. In addition many prime properties are remaining to be developed. The existing and future traffic volumes associated with these developments will tax the roadway system. In order to determine the needed improvements in the corridor a study was requested by the Salisbury/Wicomico Metropolitan Planning Organization.

The study area was bounded by Salisbury Bypass/ Ocean Gateway Bypass (U.S. Route 13 and 50) to the south, Dagsboro Road to the north, U.S. Route 50 Business to the west and Brown Road to the east. See figure 1 for study area map.

In addition, the area is served by a system of primary roadways extending out from the center of the city connecting Salisbury to towns and rural areas of Wicomico County.

The study involved gathering existing traffic data, performing traffic counts, analyzing crash data, projecting traffic volumes for the year 2015 and the build out year beyond 2030 and performing traffic analysis. Based on the analysis recommendations were developed to improve the existing and future conditions. The short term recommendations include:

- Naylor Mill Road between Jersey Road and Scenic Drive – Trim trees and relocate signs.
- Naylor Mill Road between Scenic Road and Goddard Parkway – Construct a center turn lane.
- Naylor Mill Road @ Northgate Drive – Construct a right turn and left turn lane for the southbound Northgate Drive approach. Consideration should be given to signalizing this intersection when warrants are met.
- Dagsboro Road near Rum Ridge Road/Brown Road –Place signs and review passing zones.
- Dickerson Lane @ Dagsboro Road - Provide pavement markings and signs. Construct a left turn lane at Dickerson Lane.
- Kiley Drive @ Centre Road / Zion Road – Standardize the intersection by reconstructing it as a four-way stop or roundabout.
- East Naylor Mill Road @ North Mall Drive – Signalization is recommended at this intersection.

- East Naylor Mill Road @ South Mall Drive – Convert the south mall entrance intersection to a right in-right out.
- Naylor Mill Road @ Northwood Drive – Construct a bypass lane on Naylor Mill Road westbound and channelize the right turn movement from Northwood Drive to free flow onto eastbound Naylor Mill Road. Signalization is proposed at this location.
- Naylor Mill Road @ Goddard Parkway/Armstrong Parkway – Resurface the roadway and provide additional signing. Construct a left turn lane from westbound Naylor Mill Rd. onto Armstrong Parkway and to Goddard Parkway.
- Naylor Mill Road – Perform friction test, review drainage and resurface if needed.

Long Term improvements were recommended for the study area and are as follows:

- 1) Extend East North Point Drive from its existing terminus to Brown Road
- 2) Extend Parsons Lake Drive from its existing terminus to Brown Road
- 3) Extend Jasmine Drive from its existing terminus to North Pointe Drive
- 4) Extend Northwood Road from Naylor Mill Road to Connelly Mill Road
- 5) Extend Dagsboro Road from U.S. Route 13 to Northgate Drive extended
- 6) Extend Northgate Drive from its present terminus to the extension of Dagsboro Road
- 7) Extend West North Point Drive from its present terminus to Northwood Road extended
- 8) Extend Hampshire Road from Northgate Drive to the extension of Dagsboro Road
- 9) Extend Brown Road from Zion Road to the Salisbury Bypass
- 10) Reconstruct U.S. Route 50/ Naylor Mill Road interchange
- 11) Widen Naylor Mill Road to five lanes from Northwood Drive to Northgate Drive
- 12) Connect Parsons Lake Drive Extended and Centre Road
- 13) Provide Access Controls to U.S. Route 13 and improvements to the Naylor Mill Road intersection
- 14) Construct intersection improvements at Dagsboro Road @ Brown Road
- 15) Provide intersection improvements at Northwood Road @ Kiley Drive
- 16) Construct intersection improvements at Zion Road @ Brown Road
- 17) Develop a Pedestrian Network
- 18) Expand Transit Network

I. INTRODUCTION

The Salisbury/Wicomico Metropolitan Planning Organization (S/W MPO) has requested a study of the U.S. Route 13 North/Naylor Mill Road area be performed to determine the impact that future development will have on the area’s roadway system. This increase in population will result in more traffic on the area’s already busy roadways. In order to meet this growth, improvements will need to be made to the study area in order to accommodate the higher volume of motorists.

The study area is defined by the area between Dagsboro Road to the north, Brown Road to the east, Salisbury Bypass/Ocean Gateway Bypass (U.S. Route 13 and 50) to the south, and U.S. Route 50 Business to the west. See Figure 1 for Location Map.

Locations included in the analysis are as follows:

- U.S. Route 13 @ Dagsboro Road
- U.S. Route 13 @ North Pointe Drive
- U.S. Route 13 @ Naylor Mill Road
- U.S. Route 13 @ Centre Road
- Northwood Drive @ Kiley Drive
- Dagsboro Road @ Brown Road
- Brown Road @ Zion Road
- Zion Road @ East Naylor Mill Road
- South Mall Drive @ East Naylor Mill Road
- North Mall Drive @ East Naylor Mill Road
- Northgate Drive @ Naylor Mill Road
- Northwood Drive @ Naylor Mill Road
- Jersey Road @ Naylor Mill Road
- Log Cabin Road @ Naylor Mill Road
- U.S. Route 50 Westbound Ramp @ Naylor Mill Road
- U.S. Route 50 Eastbound Ramp @ Naylor Mill Road
- U.S. Route 50 Business @ Naylor Mill Road

This area is one of the most developed locations in the Salisbury area. U.S. Route 13 has dense commercial development bordering the roadway. The largest development is The Centre at Salisbury, a mall just north of Salisbury Bypass/ Ocean Gateway Bypass (U.S. Route 13 and 50). Naylor Mill Road is a major crossroad, with a wide range of development including commercial, industrial, and residential adjacent to the roadway. The areas further away from U.S. Route 13 are anticipated to see a large amount of growth in the upcoming years.

II. EXISTING CONDITIONS

A. Traffic Operations

The existing conditions were reviewed to evaluate geometrics, traffic volumes and traffic operations within the study area. This was performed based on field reviews, gathering and conducting traffic counts and performing analysis of the data. The roadway network through the study area operates reasonably well. Field observations conducted through the study area showed there are several instances where delays occur but these are not major delays. Motorists experience some delays at the U.S. Route 13/Naylor Mill Road intersection and at the Naylor Mill Road/Northwood Drive intersection. The U.S. Route 13 corridor is experiencing minimal delays through the intersections in both the northbound and southbound directions. A maximum of fifteen cars were queued in the northbound direction of U.S. Route 13 at the intersection of Naylor Mill Road during the PM period. In the southbound direction during the study period a maximum of 11 vehicles were queued at the U.S. Route 13 and Naylor Mill Road intersection. The next most congested area was along Naylor Mill Road. The intersection of Naylor Mill Road and Northwood Drive experienced congestion especially with westbound motorists turning left, blocking through motorists. There was some congestion in various other locations including along Naylor Mill Road near the north entrance/exit from the mall, near the Dagsboro Road/Dickerson Lane intersection and along the east side of North Pointe Drive.

B. Existing Roadway Network

The study area consists of several key roadways which are listed below:

U.S. Route 13 (Ocean Highway) is a six to eight lane, divided highway that traverses through Salisbury. This road operates north and south, beginning in Pennsylvania and ending in North Carolina, thereby servicing both local and long distance travel. U.S. Route 13 experiences a high volume of traffic through Salisbury due to the many businesses located adjacent to it.

U.S. Route 50 Business (Ocean Gateway) is a four lane, divided roadway that traverses in an east and west direction. Many motorists use this road to commute to and from the downtown area of Salisbury. U.S. Route 50 Business was formerly U.S. Route 50 before the bypass was built.

U.S. Route 13/ U.S. Route 50 (Salisbury Bypass/ Ocean Gateway Bypass) is a four lane expressway with three interchanges within the study area, The interchanges are at Naylor Mill Road, U.S. Route 13, and a partial interchange at Northwood Drive. The roadway is U.S. Route 50 between U.S Route 50 Business (Ocean Gateway) and U.S. 13/ Ocean Highway. It is U.S. 13 and U.S. 50 in the eastern portion of the study area.



US 13 NORTH/NAYLOR MILL RD STUDY

LOCATION MAP

FIG. I	SCALE: 1" = 1,600'	9/10
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Naylor Mill Road is mainly a two lane roadway that runs in an east and west direction. This roadway widens out near the U.S. Route 50 intersection. There is a high volume of traffic on this road because it provides direct access to U.S. Route 13 to the east and U.S. Route 50 to the west. Naylor Mill Road also handles traffic from residential neighborhoods and The Centre at Salisbury Mall.

Dagsboro Road is a two lane roadway that operates in an east-west direction. It mainly serves residential development. It is the northernmost road in the study area and provides access to U.S. Route 13.

North Pointe Drive is a two lane roadway that widens out to a multi-lane facility near U.S. Route 13. The speed limit is 30 mph and it provides access to various shopping centers and businesses. North Pointe Drive intersects U.S. Route 13.

Centre Road is a two lane roadway that runs east and west. Centre Road provides access to The Centre at Salisbury Mall and intersects U.S. Route 13.

Zion Road is a two lane roadway that is bordered by residential and agricultural land. It intersects U.S. Route 13 to the south of U.S. Route 50. Zion Road has an east-west orientation.

Brown Road is a two lane roadway that runs north and south. Brown Road is utilized mainly by residential traffic and connects Dagsboro Road to Zion Road.

Northgate Drive is a two lane roadway that operates in a north-south direction. Northgate Drive provides access to various offices. This road connects Hampshire Road to Naylor Mill Road.

Northwood Drive provides access to various offices, industrial and residential communities located to the west of U.S. Route 13. Northwood Drive terminates at Naylor Mill Road to the north and U.S. Route 13 to the south. Northwood Drive provides access to the U.S. Route 50 Salisbury Bypass/ Ocean Gateway Bypass to and from the west. Northwood Drive is a two lane roadway.

Jersey Road is a two lane roadway that runs north and south. Jersey Road provides access to various residential communities and agricultural land. Jersey Road intersects Naylor Mill Road toward the western part of the study area.

Log Cabin Road is a two lane roadway that operates in a north/ south direction. Log Cabin Road is a low-volume roadway.

See Figure 2 for Lane Configuration Diagram.

C. Traffic Volumes

Traffic counts were gathered and conducted at the intersections within the study area. The traffic count data was balanced to produce the average daily traffic and AM/PM peak hour

volumes along U.S. Route 13 and Naylor Mill Road from U.S. Route 13 to Log Cabin Road. PM peak hour volumes only are shown for the remainder of the network intersections along Naylor Mill Road, Zion Road and Brown Road. The highest volume roadway is U.S. Route 13 with an average daily traffic ranging from approximately 38,800 vehicles per day north of Dagsboro Road to over 58,000 vehicles per day north of U.S. Route 13 and 50. Naylor Mill Road between Northgate Drive and Northwood Drive is the next highest volume roadway with slightly over 12,000 vehicles per day. The remainder of Naylor Mill Road ranges from approximately 4,000 vehicles to 10,000 vehicles per day.

The major direction of traffic along U.S. Route 13 is southbound during the AM peak and northbound during the PM peak. Volumes in the peak direction range from approximately 1,600 to 2,100 vehicles per hour. The peak hour volumes along Naylor Mill Road range up to 650 vehicles in the peak direction. Roadways such as Northwood Drive, Northgate Drive, Zion Road, Brown Road and Jersey Road has peak hour, peak direction volumes ranging from 200 to 300 vehicles per hour.

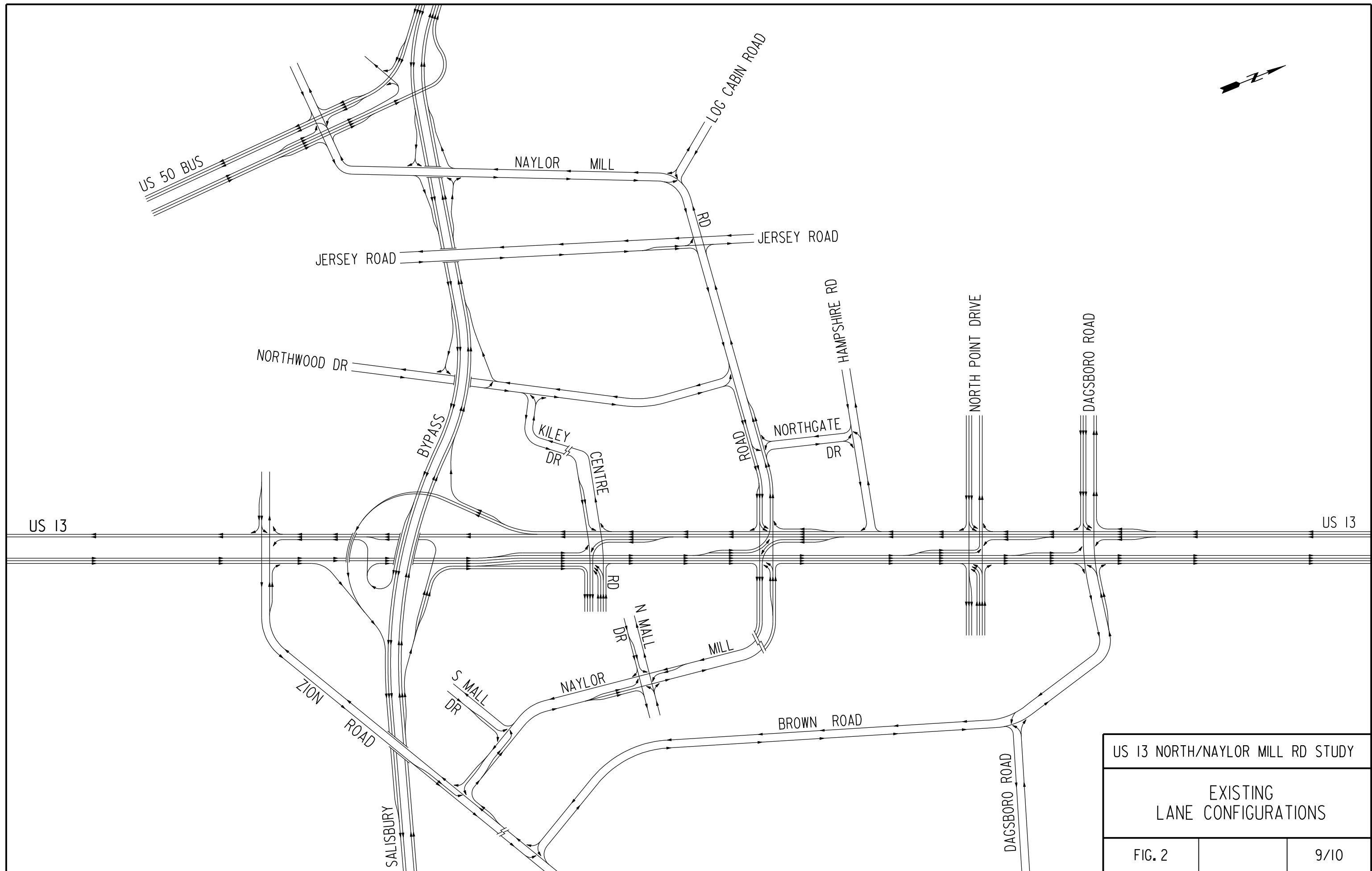
The 2009 peak hour traffic volumes are shown in Figure 3 and the 2009 average daily traffic volumes are shown in Figure 4.

D. Traffic Analysis

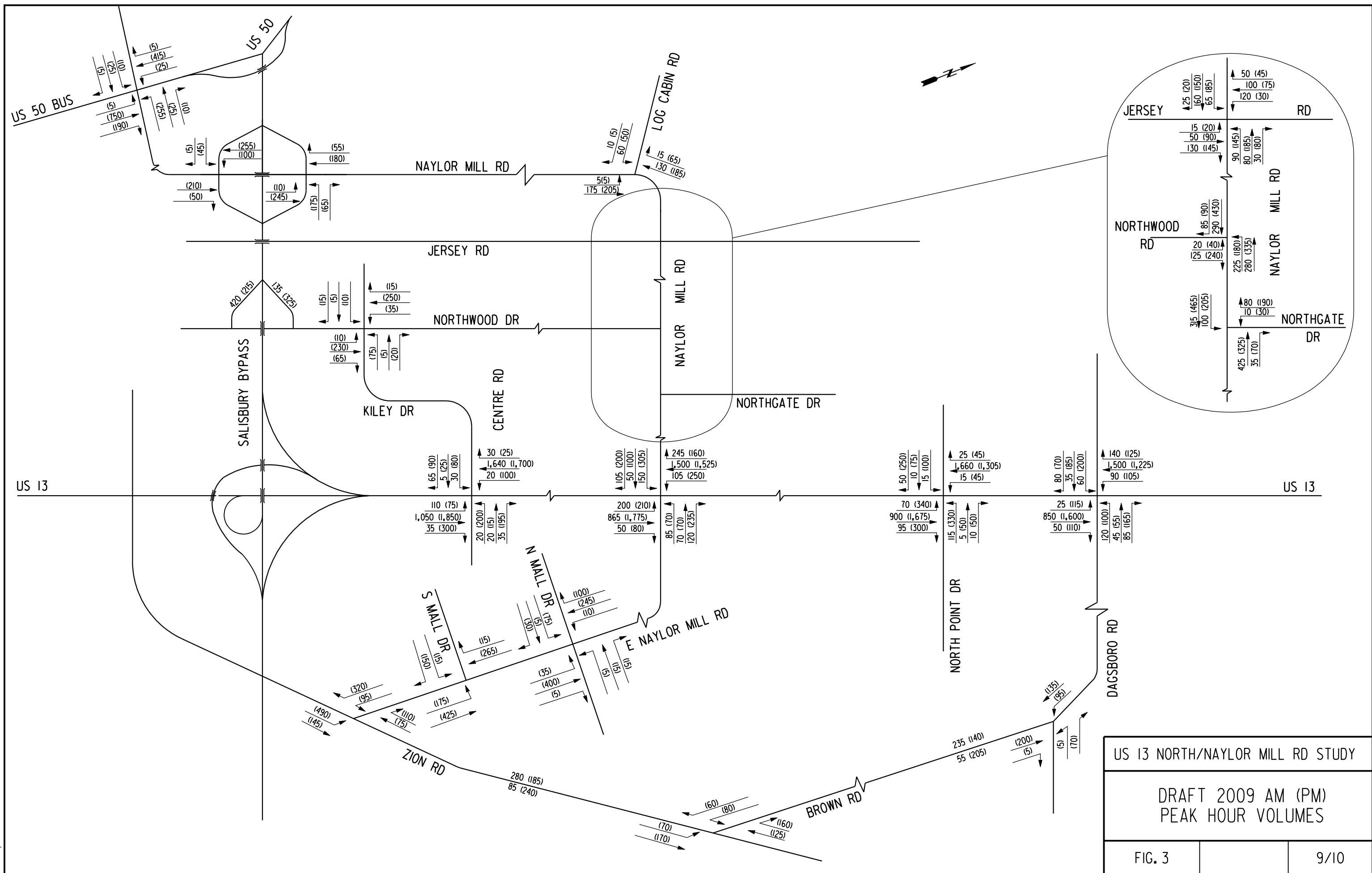
Traffic analysis was performed to evaluate the existing and programmed system capacity (i.e. the number of vehicles that can be accommodated on a facility or any segment of a facility) and can be used as a measure of a system's ability to serve through traffic and adjacent land use. System performance is measured as the ratio between the actual and projected traffic volumes and the actual or projected capacity and is expressed as the volume-to-capacity (v/c) ratio.

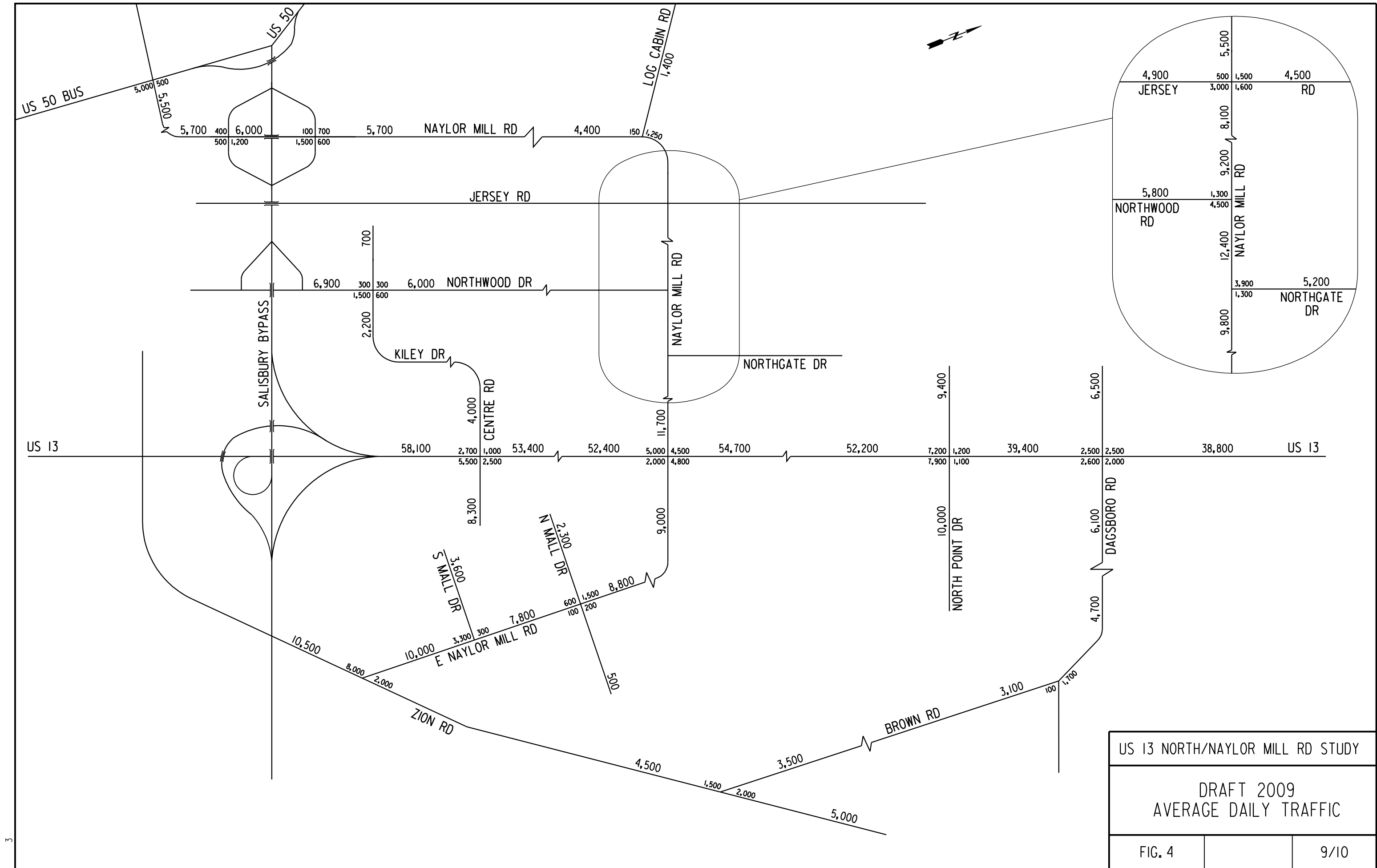
For the U.S. Route 13 North/ Naylor Mill Road study the roadway network and intersections were analyzed using the Synchro software program. A model was developed based on the existing conditions. The Highway Capacity Manual (HCM) outputs were used to determine the level of service (LOS) at each intersection. The intersections that had a level of service of 'C' or worse were:

- U.S. Route 13 @ Dagsboro Road (AM & PM)
- U.S. Route 13 @ Naylor Mill Road (PM)
- U.S. Route 13 @ Centre Road (PM)
- Northwood Drive @ Kiley Drive (PM)
- Naylor Mill Road @ Zion Road (PM)



US 13 NORTH/NAYLOR MILL RD STUDY		
EXISTING LANE CONFIGURATIONS		
FIG. 2		9/10





- Naylor Mill Road @ North Mall Drive (PM)
- Naylor Mill Road @ Northgate Drive (PM)
- Naylor Mill Road @ Northwood Drive (AM & PM)
- Naylor Mill Road @ Jersey Road (PM)
- Salisbury Bypass/Ocean Gateway Bypass (U.S. Route 50) Westbound Ramp @ Naylor Mill Road (PM)
- Salisbury Bypass/Ocean Gateway Bypass (U.S. Route 50) Eastbound Ramp @ Naylor Mill Road (PM)

Naylor Mill Road @ Northwood Drive had the lowest LOS with an “E” during the PM peak hour. This intersection operates at a poor LOS due to a high volume of traffic on Naylor Mill Road and vehicles on Northwood Drive are experiencing difficulty turning onto Naylor Mill Road. A total 430 vehicles travel east on Naylor Mill Road during the PM peak hour and 335 vehicles traveling west with an additional 180 vehicles making a left turn to southbound Northwood Drive. There were 280 vehicles that turned onto Naylor Mill Road from Northwood Drive during the PM peak hour with 240 of these motorists turning right.

The v/c ratio is a conventional measurement of Level of Service (LOS), which can be translated into the operating conditions a driver will experience while traveling on a particular roadway. LOS reflects driver satisfaction with a number of factors that influence the degree of congestion including speed and travel time, traffic interruption, freedom to maneuver, safety, driving comfort and convenience, and delays. While the actual operating conditions and LOS are dependent upon a multitude of other variables, most notably facility type, the level of congestion can be approximated based on the volume/capacity ratio.

LOS A represents a free flow where individual users are virtually unaffected by others in the traffic stream. LOS A describes a condition with low-traffic volumes and high speeds with little or no delays. There is little or no restriction in maneuverability due to the presence of other vehicles. Drivers can maintain their desired speeds and can proceed through signals without having to wait unnecessarily.

LOS B is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. LOS B affords above-average conditions, and is typically used for design of rural highways.

LOS C is also in the range of stable flows, but marks the beginning in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. LOS C is normally utilized as a measure of “average conditions” for design of facilities in suburban and urban locations. It is also considered acceptable in rural locations.

LOS D represents high density, but a stable flow. Speed and freedom to maneuver are severely restricted and the driver experiences a generally poor level of comfort. Small increases in traffic flow will generally cause operational problems at this level. LOS D is considered acceptable during short periods of time and is often used in large urban areas.

LOS E represents operating conditions at or near capacity. Operations at this level are usually unstable because small increases in flow or minor disturbances within the traffic stream will cause breakdowns.

LOS F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point, and queues form behind the point. LOS F is characterized by demand volumes greater than the roadway capacity as complete congestion occurs and, in an extreme case, the volume passing a given point drops to nearly zero. Under these conditions motorists seek other routes in order to bypass congestion, thus impacting adjacent streets.

See Table 1 for LOS chart.

TABLE 1
2009 LEVELS OF SERVICE

Intersection	2009	
	AM LOS	PM LOS
Dagsboro Rd @ U.S. Route 13	C	C
North Pointe Dr @ U.S. Route 13	B	B
Naylor Mill Rd @ U.S. Route 13	B	C
Centre Rd @ U.S. Route 13	A	C
*Northwood Dr @ Kiley Dr	-	Westbound Approach = C
*Dagsboro Rd @ Brown Rd	-	Northbound Approach = B
*Brown Rd @ Zion Rd	-	Southbound Approach = B
Zion Rd @ Naylor Mill Rd	-	C
*South Mall Drive @ Naylor Mill Rd	-	Eastbound Approach = B
*North Mall Drive @ Naylor Mill Rd	-	Eastbound Approach = C
*Northgate Dr @ Naylor Mill Rd	A	Southbound Approach = C
*Northwood Dr @ Naylor Mill Rd	C	Northbound Approach = E
Jersey Rd @ Naylor Mill Rd	B	C
*Log Cabin Rd @ Naylor Mill Rd	A	Southbound Approach = B
*U.S. Route 50 WB Ramp @ Naylor Mill Rd	-	Westbound Approach = C
*U.S. Route 50 EB Ramp @ Naylor Mill Rd	-	Eastbound Approach = C
*U.S. Route 50 Business @ Naylor Mill Rd	-	A

Signalized Intersections use HCM method to determine LOS

*Unsignalized Intersections are represented with lowest approach LOS

- Denotes there is no count data for the intersection



Naylor Mill Road and U.S. Route 50 Westbound Ramp Intersection. Today, this intersection operates well but is expected to experience a poor level of service under future traffic conditions.

E. Safety Analysis

Crashes are a consideration when analyzing the operation of a roadway. A summary of crashes within the study area was requested. The crash data was provided by the State Highway Administration’s Office of Traffic and Safety Traffic Safety Analysis Division. The data was prepared for the period between January 1st, 2006 and December 31st, 2008. Intersections and roadway segments throughout the study area were examined separately when analyzing the crash data.

1) Intersections

Based on the 2006-2008 crash data for the study area both intersections and segments of roadways within the study area were analyzed. The intersections having the highest amount of crashes are:

- U.S. Route 13 @ Dagsboro Road is a signalized intersection located in the northern part of the study area. This intersection experienced 16 crashes from 2006-2008. Nine of these crashes were rear end collisions of which six were in the northbound direction. The second highest type of collision at this intersection was left turn crashes. This occurred four times.
- U.S. Route 13 @ North Pointe Drive is a signalized intersection south of U.S. Route 13 @ Dagsboro Rd. There were twenty-nine crashes related to this intersection during the study period. Fourteen rear end crashed occurred at this intersection and seven angle crashes were recorded.
- U.S. Route 13 @ Naylor Mill Road is a major intersection. There were thirty-three crashes that took place related to this intersection between 2006 and 2008. Twenty one of these crashes were rear end type crashes.
- U.S. Route 13 @ Centre Road is a signalized intersection that provides access to The Centre at Salisbury Mall. This intersection experienced the second highest number of crashes during the study period with twenty-nine crashes. There were nineteen rear end crashes that occurred at this intersection in addition to four sideswipe crashes and four left turn crashes.
- East Naylor Mill Road @ Zion Road is the signalized intersection located on the east side of The Centre at Salisbury Mall. Eleven crashes were recorded related to this intersection between 2006 and 2008. The highest type of crash was rear end crashes with five at this intersection. A high number of crashes occurred during wet conditions. Six of the eleven occurred when the roads were wet.

- East Naylor Mill Road @ North Mall Drive is a four-way, unsignalized intersection north of the Zion Road @ East Naylor Mill Road intersection. Motorists experienced eleven crashes between 2006 and 2008. Eight of the crashes were angle type and six of these occurred between eastbound and southbound traffic.
- Naylor Mill Road @ Northwood Drive is an unsignalized intersection located 0.51 miles west of the U.S. Route 13 @ Naylor Mill Road intersection. A total of fourteen crashes occurred on Naylor Mill Road near this intersection during the study period. Six of the fourteen crashes occurred during wet conditions. Ten rear end crashes took place, six of which happened when vehicles were travelling eastbound. This high number of rear end collisions could be a result of the lack of a left turn lane westbound and the high volume of right turns from Northwood Drive.
- Naylor Mill Road near Goddard Parkway/Armstrong Parkway are two unsignalized intersection about 0.88 miles west of the U.S. Route 13 @ Naylor Mill Road intersection. Between 2006 and 2008 seventeen crashes took place on Naylor Mill Road near these intersections. Eight of these crashes involved vehicles travelling in opposite directions and sixteen occurred in wet weather.

The number of crashes for these intersections plus other remaining intersections is shown in Table 2.

2) Sections

Crash analysis was conducted along segments of roadways. Segments consist of half mile sections, and do not include any major intersection related crashes. The following segments experienced the most crashes from 2006 to 2008:

- U.S. Route 13 from log mile 13.42 to 13.09 This stretch of roadway is in between Dagsboro Road and North Point Drive. There were a total of thirty-two crashes on this road during the study period. Fourteen of these were rear end type crashes.
- U.S. Route 13 from log mile 13.07 to 12.67 This section of U.S. Route 13 is located between North Point Drive and Naylor Mill Road. Forty-seven crashes occurred on this stretch of roadway between 2006 and 2008. Twenty-two rear end crashes and seven fixed object crashes were recorded.
- U.S. Route 13 from log mile 12.64 to 12.16 This segment of U.S. Route 13 is in between Naylor Mill Drive and Centre Road. The highest number of crashes on a

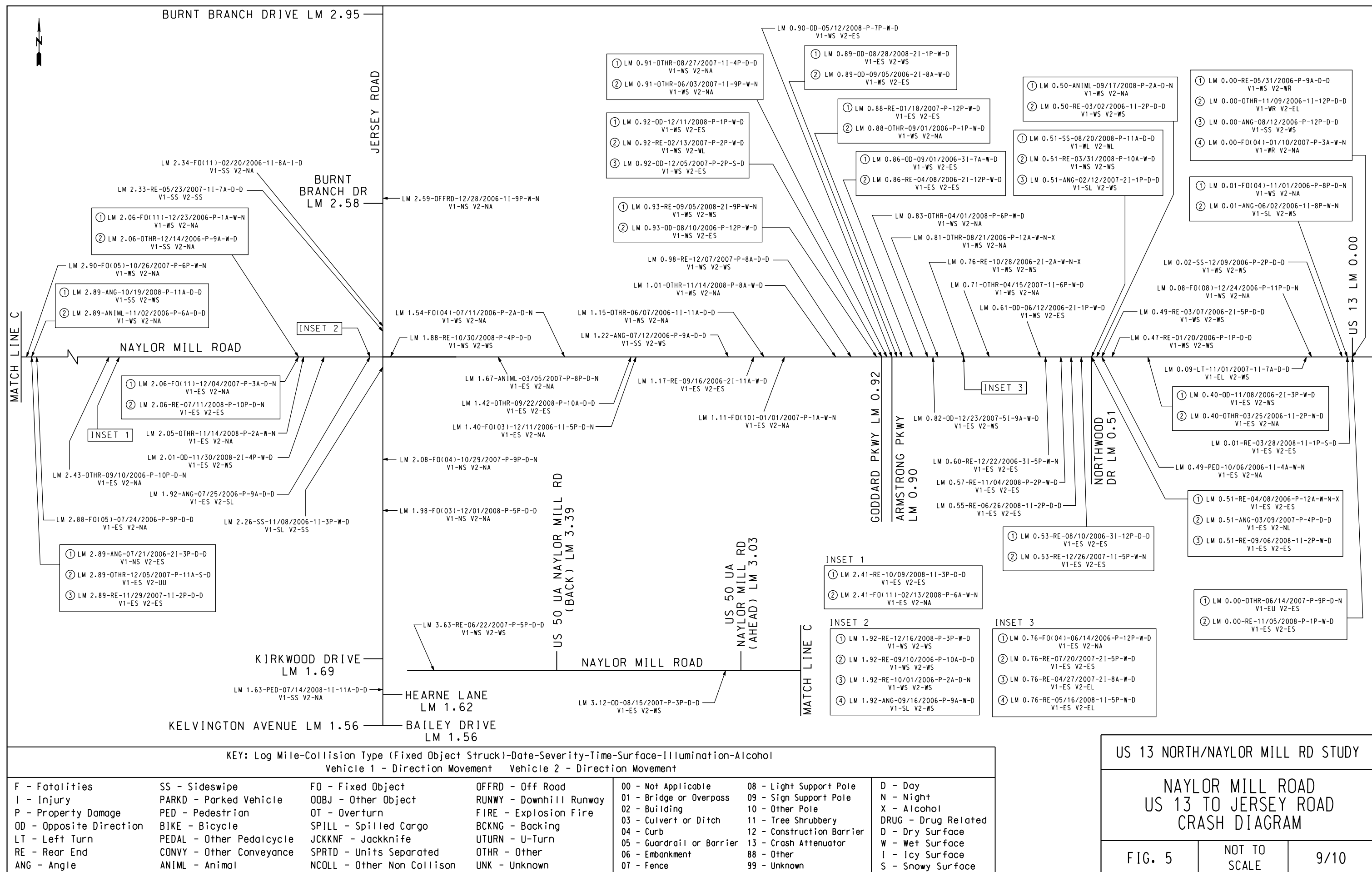
section of roadway within the study area occurred on this segment. Eighty-seven crashes were recorded during the study period. Of these eighty-seven crashes, forty-seven were rear end type and thirteen were sideswipe crashes.

- U.S. Route 13 from log mile 12.14 to 11.86 This stretch of roadway is located between Centre Road and the U.S. Route 50 bypass. There were a total of twenty-two crashes that occurred on this stretch of road between 2006 and 2008. Thirteen of these were rear end crashes.

TABLE 2
INTERSECTION RELATED CRASH SUMMARY 2006-2008

Intersection	Number of Intersection Related Crashes
U.S. Route 13 @ Naylor Mill Road	33
U.S. Route 13 @ Centre Road	29
U.S. Rout 13 @ North Pointe Drive	29
U.S. Route 13 @ Dagsboro Road	16
Naylor Mill Road @ Northwood Drive	14
East Naylor Mill Road @ North Mall Drive	11
East Naylor Mill Road @ Zion Road	11
Naylor Mill Road @ Jersey Road	7
Zion Road @ Brown Road	2
East Naylor Mill Road @ South Mall Drive	1

See Figures 5-10 for crash diagrams.



NAYLOR MILL ROAD
LM 0.00

- ① LM 0.00-RE-04/24/2006-P-11A-D-D
V1-SS V2-SS
- ② LM 0.00-SS-06/20/2006-P-1P-D-D
V1-SR V2-SS

LM 0.35-PED-02/23/2007-P-11P-D-N-X
V1-UU V2-NA

HAMPSHIRE RD
LM 0.35

NORTHGATE DRIVE

LM 0.06-LT-11/01/2006-P-11A-D-D
V1-NL V2-SS

LM 0.04-ANG-05/04/2008-11-6P-D-D
V1-EL V2-SS

KEY: Log Mile-Collision Type (Fixed Object Struck)-Date-Severity-Time-Surface-Illumination-Alcohol
Vehicle 1 - Direction Movement Vehicle 2 - Direction Movement

F - Fatalities	SS - Sideswipe	FO - Fixed Object	OFFRD - Off Road	00 - Not Applicable	08 - Light Support Pole	D - Day
I - Injury	PARKD - Parked Vehicle	OOBJ - Other Object	RUNWY - Downhill Runway	01 - Bridge or Overpass	09 - Sign Support Pole	N - Night
P - Property Damage	PED - Pedestrian	OT - Overturn	FIRE - Explosion Fire	02 - Building	10 - Other Pole	X - Alcohol
OD - Opposite Direction	BIKE - Bicycle	SPILL - Spilled Cargo	BCKNG - Backing	03 - Culvert or Ditch	11 - Tree Shrubby	DRUG - Drug Related
LT - Left Turn	PEDAL - Other Pedalcycle	JCKKNF - Jackknife	UTURN - U-Turn	04 - Curb	12 - Construction Barrier	D - Dry Surface
RE - Rear End	CONVY - Other Conveyance	SPRTD - Units Separated	OTHR - Other	05 - Guardrail or Barrier	13 - Crash Attenuator	W - Wet Surface
ANG - Angle	ANIML - Animal	NCOLL - Other Non Collision	UNK - Unknown	06 - Embankment	88 - Other	I - Icy Surface
				07 - Fence	99 - Unknown	S - Snowy Surface

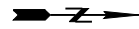
US 13 NORTH/NAYLOR MILL RD STUDY

NORTHGATE DRIVE FROM
NAYLOR MILL RD TO BURNT BRANCH DR
LM 0.00 TO LM 0.35
CRASH DIAGRAM

FIG. 6

NOT TO
SCALE

9/10



INSET 1

- ① LM 12.15-FO(04)-12/08/2006-P-10A-D-D
V1-SL V2-NA
- ② LM 12.15-LT-12/28/2006-P-10A-D-D
V1-SS V2-NL
- ③ LM 12.15-RE-11/04/2006-11-2P-D-D
V1-SS V2-SS
- ④ LM 12.15-OTHR-05/06/2006-11-8P-D-N
V1-SU V2-SS
- ⑤ LM 12.15-RE-01/11/2006-4I-10P-W-N-X
V1-SS V2-SS
- ⑥ LM 12.15-ANIML-11/10/2007-P-5P-D-N
V1-WS V2-NA
- ⑦ LM 12.15-RE-03/07/2007-P-8A-D-D
V1-SS V2-SS
- ⑧ LM 12.15-RE-05/12/2007-P-10P-W-N
V1-SS V2-SS
- ⑨ LM 12.15-LT-07/07/2008-2I-7P-D-D
V1-SS V2-NL
- ⑩ LM 12.15-ANG-12/31/2008-P-11A-D-D
V1-WS V2-NS
- ⑪ LM 12.15-SS-03/05/2008-P-9A-D-D
V1-SS V2-SS
- ⑫ LM 12.15-RE-08/08/2008-11-6P-D-D
V1-SS V2-SS

INSET 2

- ① LM 12.15-ANGLE-08/07/2006-P-6P-D-D
V1-NS V2-ES
- ② LM 12.15-LT-09/11/2006-2I-9P-D-N
V1-NS V2-SL
- ③ LM 12.15-OD-06/08/2006-P-4P-D-D
V1-NS V2-SS
- ④ LM 12.15-RE-08/08/2006-P-8A-D-D
V1-NS V2-NS
- ⑤ LM 12.15-OTHR-09/09/2007-11-12P-D-D
V1-UU V2-NS
- ⑥ LM 12.15-RE-07/16/2007-P-9A-D-D
V1-NS V2-NS
- ⑦ LM 12.15-SS-09/02/2007-P-2P-D-D
V1-NS V2-NS
- ⑧ LM 12.15-SS-11/24/2007-P-2P-D-D
V1-NR V2-NR
- ⑨ LM 12.15-LT-11/21/2008-P-5P-W-N
V1-SL V2-NS
- ⑩ LM 12.15-ANG-12/29/2008-2I-12P-D-D
V1-NS V2-ES
- ⑪ LM 12.15-SS-04/03/2008-1I-9P-W-N
V1-NS V2-NS
- ⑫ LM 12.15-FO(08)-07/09/2008-P-4A-D-N
V1-NS V2-NA

SALISBURY
BYPASSRAMP
TO US 13
LM 11.871LM 11.86-RE-09/01/2007-11-4P-D-D
V1-SL V2-SSLM 11.88-ANG-02/11/2006-P-1P-W-D
V1-NS V2-WSLM 11.92-FO(05)-10/15/2007-11-5P-D-D
V1-WS V2-NARAMP TO
US 13 NB
LM 11.941

US 13

LM 12.01-RE-10/14/2007-P-12P-D-D
V1-NS V2-NSLM 12.04-RE-02/11/2006-P-1P-W-D
V1-NS V2-NSLM 12.06-RE-07/17/2007-P-2P-D-D
V1-SS V2-SSLM 12.07-SDSWP-03/14/2006-P-12P-D-D
V1-SS V2-SSLM 12.09-RE-06/14/2006-2I-2P-W-D
V1-SS V2-SSLM 12.11-RE-04/25/2007-11-11A-D-D
V1-SS V2-SSLM 12.13-SS-03/24/2008-P-2P-D-D
V1-SS V2-SSLM 12.14-RE-09/16/2006-P-3P-D-D
V1-NS V2-NSLM 12.13-FO(08)-01/05/2007-P-8P-W-N
V1-NS V2-NALM 12.10-ANG-02/10/2006-2I-11A-D-D
V1-NS V2-WSLM 12.08-FO(04)-02/12/2006-P-10A-S-D
V1-NS V2-NALM 12.05-RE-03/09/2006-P-1P-D-D
V1-NS V2-NSLM 12.05-RE-10/06/2006-P-2P-W-D
V1-NS V2-NSLM 12.05-ANG-02/17/2008-11-11A-D-D
V1-WS V2-NSLM 12.11-SS-07/08/2006-11I-8A-D-D
V1-NS V2-NSLM 12.11-RE-09/02/2006-11I-1P-D-D
V1-NS V2-NSLM 12.11-RE-08/10/2006-4I-12P-W-D
V1-NS V2-NSRAMP TO
US 13 EB
LM 12.099CENTRE RD
LM 12.15

INSET 2

- ① LM 12.16-RE-12/04/2006-P-1P-D-D
V1-NS V2-NS
- ② LM 12.16-SS-06/15/2006-5I-1P-D-D
V1-NS V2-NS
- ③ LM 12.16-RE-08/30/2006-P-11A-D-D
V1-NS V2-NS
- ④ LM 12.16-SS-10/22/2007-2I-8P-D-N
V1-NS V2-NS
- ⑤ LM 12.16-SS-10/13/2007-P-10A-D-D
V1-NS V2-NS
- ⑥ LM 12.16-SS-04/05/2008-P-6P-D-D
V1-NS V2-NS

INSET 1

- ① LM 12.16-OTHR-04/03/2006-11I-9A-D-D
V1-SS V2-ER
- ② LM 12.16-RE-12/18/2007-11-7P-D-N
V1-SS V2-SS

- ① LM 12.17-RE-11/12/2006-P-1P-W-D
V1-SS V2-SS
- ② LM 12.17-RE-11/24/2007-2I-1P-D-D
V1-SS V2-SS
- ③ LM 12.17-PED-08/07/2007-1I-3P-D-D
V1-WS V2-NA
- ④ LM 12.17-OD-09/22/2007-1I-7P-D-N
V1-SS V2-NS
- ⑤ LM 12.17-RE-12/28/2007-1I-5P-D-N
V1-SS V2-SS

- ① LM 12.19-RE-05/25/2007-2I-5P-D-D
V1-SS V2-SS
- ② LM 12.19-RE-12/20/2007-1I-12P-D-D
V1-SS V2-SS
- ③ LM 12.19-RE-09/15/2008-P-4P-D-D
V1-SS V2-SS
- ④ LM 12.19-RE-09/14/2008-1I-1P-D-D
V1-SS V2-SS

- ① LM 12.21-FO(05)-03/18/2007-2I-2A-D-N-X
V1-SS V2-NA
- ② LM 12.21-RE-11/01/2008-P-6P-D-D
V1-SS V2-SS

LM 12.23-RE-10/21/2006-2I-1P-D-D
V1-SS V2-SSLM 12.24-RE-12/20/2007-P-12P-D-D
V1-SS V2-SS

- ① LM 12.25-RE-11/24/2006-P-6P-D-D
V1-SS V2-SS
- ② LM 12.25-RE-11/15/2007-3I-8A-W-D
V1-SS V2-SS

LM 12.25-RE-05/18/2008-P-7P-W-D
V1-NS V2-NSLM 12.24-FO(04)-01/23/2006-P-4P-W-D
V1-NS V2-NALM 12.23-OTHR-02/01/2007-P-6P-W-N
V1-NS V2-NULM 12.19-SS-02/20/2006-1I-1P-D-D
V1-NS V2-NSLM 12.17-RE-02/08/2007-P-1P-D-D
V1-NS V2-NRLM 12.17-SS-04/05/2007-P-10A-D-D
V1-NS V2-NSLM 12.17-RE-12/22/2007-2I-1P-D-D
V1-NS V2-NSLM 12.17-SS-11/13/2008-1I-12P-D-W
V1-NS V2-NS

MATCH LINE A

CLOVER ST
LM 12.25KEY: Log Mile-Collision Type (Fixed Object Struck)-Date-Severity-Time-Surface-Illumination-Alcohol
Vehicle 1 - Direction Movement Vehicle 2 - Direction Movement

F - Fatalities
I - Injury
P - Property Damage
OD - Opposite Direction
LT - Left Turn
RE - Rear End
ANG - Angle

SS - Sideswipe
PARKD - Parked Vehicle
PED - Pedestrian
BIKE - Bicycle
PEDAL - Other Pedalcycle
CONVY - Other Conveyance
ANIML - Animal

FO - Fixed Object
OOBJ - Other Object
OT - Overturn
SPILL - Spilled Cargo
JCKKNF - Jackknife
SPRTD - Units Separated
NCOLL - Other Non Collision

OFFRD - Off Road
RUNWY - Downhill Runway
FIRE - Explosion Fire
BCKNG - Backing
UTURN - U-Turn
OTHR - Other
UNK - Unknown

00 - Not Applicable
01 - Bridge or Overpass
02 - Building
03 - Culvert or Ditch
04 - Curb
05 - Guardrail or Barrier
06 - Embankment
07 - Fence

08 - Light Support Pole
09 - Sign Support Pole
10 - Other Pole
11 - Tree Shrubbery
12 - Construction Barrier
13 - Crash Attenuator
88 - Other
99 - Unknown

D - Day
N - Night
X - Alcohol
DRUG - Drug Related
D - Dry Surface
W - Wet Surface
I - Icy Surface
S - Snowy Surface

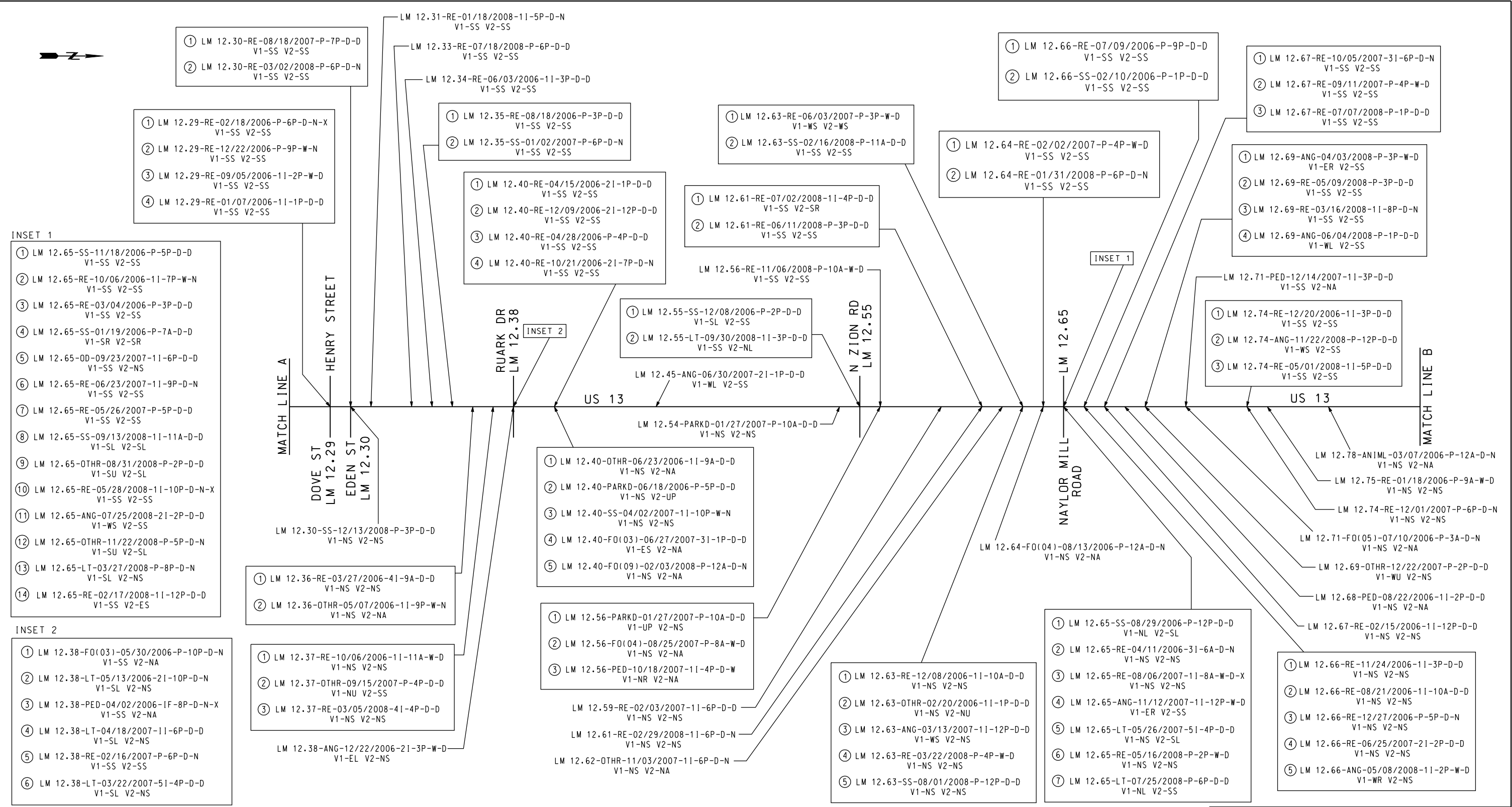
US 13 NORTH/NAYLOR MILL RD STUDY

US 13 FROM SALISBURY BYPASS
TO N. DAGSBORO ROAD
LOG MILE 11.83 TO LOG MILE 13.43
CRASH DIAGRAM

FIG. 7

NOT TO
SCALE

9/10



KEY: Log Mile-Collision Type (Fixed Object Struck)-Date-Severity-Time-Surface-Illumination-Alcohol						
Vehicle 1 - Direction Movement			Vehicle 2 - Direction Movement			
F - Fatalities	SS - Sideswipe	FO - Fixed Object	OFFRD - Off Road	00 - Not Applicable	08 - Light Support Pole	D - Day
I - Injury	PARKD - Parked Vehicle	O OBJ - Other Object	RUNWY - Downhill Runway	01 - Bridge or Overpass	09 - Sign Support Pole	N - Night
P - Property Damage	PED - Pedestrian	OT - Overturn	FIRE - Explosion Fire	02 - Building	10 - Other Pole	X - Alcohol
OD - Opposite Direction	BIKE - Bicycle	SPILL - Spilled Cargo	BCKNG - Backing	03 - Culvert or Ditch	11 - Tree Shrubbery	DRUG - Drug Related
LT - Left Turn	PEDAL - Other Pedalcycle	JCKKNF - Jackknife	UTURN - U-Turn	04 - Curb	12 - Construction Barrier	D - Dry Surface
RE - Rear End	CONVY - Other Conveyance	SPRTD - Units Separated	OTHR - Other	05 - Guardrail or Barrier	13 - Crash Attenuator	W - Wet Surface
ANG - Angle	ANIML - Animal	NCOLL - Other Non Collision	UNK - Unknown	06 - Embankment	88 - Other	I - Icy Surface
				07 - Fence	99 - Unknown	S - Snowy Surface

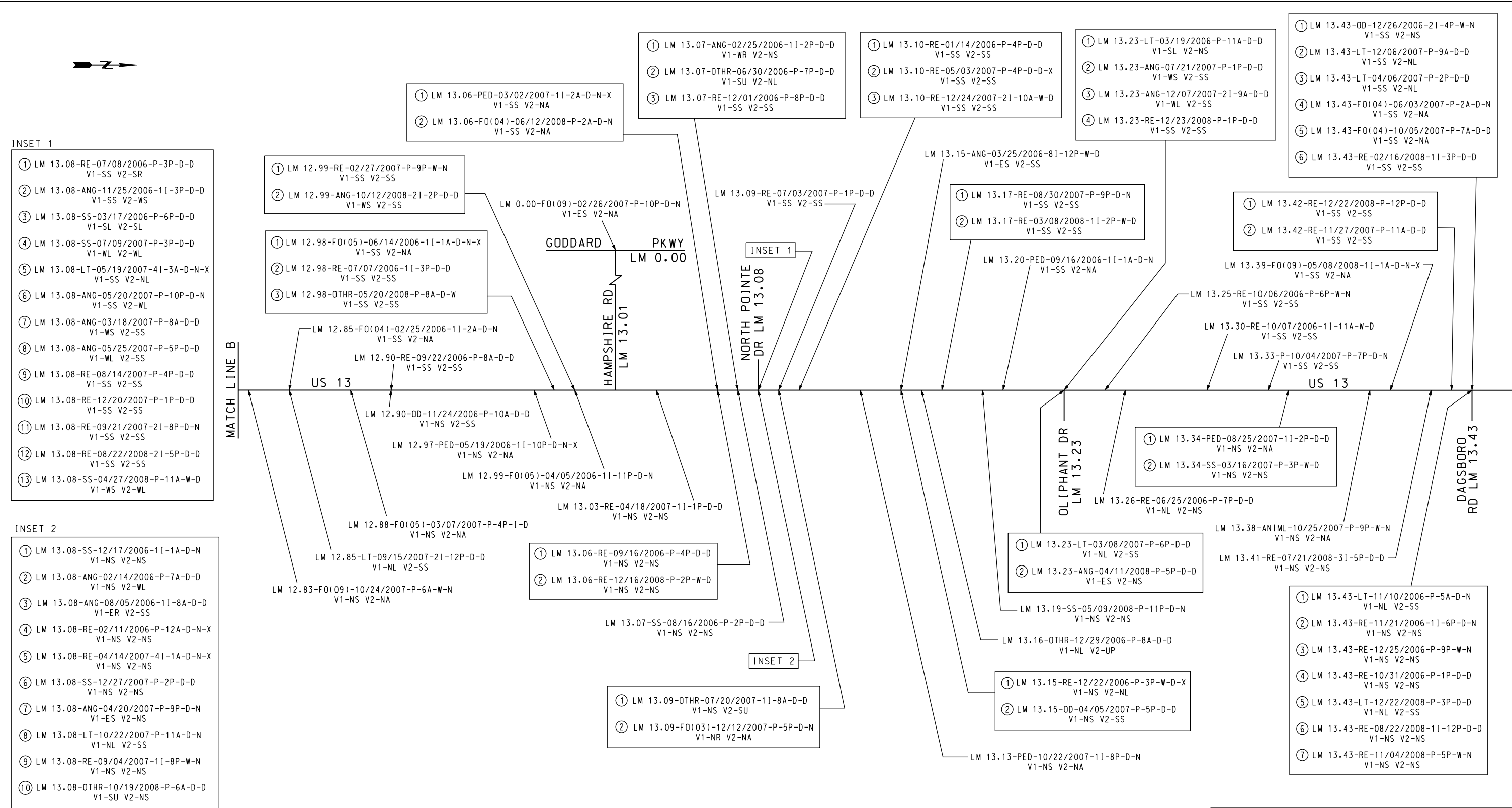
US 13 NORTH/NAYLOR MILL RD STUDY

US 13 FROM SALISBURY BYPASS
TO N. DAGSBORO ROAD
LOG MILE 11.83 TO LOG MILE 13.43
CRASH DIAGRAM

FIG. 8

NOT TO
SCALE

9/10



KEY: Log Mile-Collision Type (Fixed Object Struck)-Date-Severity-Time-Surface-Illumination-Alcohol						
Vehicle 1 - Direction Movement			Vehicle 2 - Direction Movement			
F - Fatalities	SS - Sideswipe	FO - Fixed Object	OFFRD - Off Road	00 - Not Applicable	08 - Light Support Pole	D - Day
I - Injury	PARKD - Parked Vehicle	OOBJ - Other Object	RUNWY - Downhill Runway	01 - Bridge or Overpass	09 - Sign Support Pole	N - Night
P - Property Damage	PED - Pedestrian	OT - Overturn	FIRE - Explosion Fire	02 - Building	10 - Other Pole	X - Alcohol
OD - Opposite Direction	BIKE - Bicycle	SPILL - Spilled Cargo	BCKNG - Backing	03 - Culvert or Ditch	11 - Tree Shrubby	DRUG - Drug Related
LT - Left Turn	PEDAL - Other Pedalcycle	JCKKNF - Jackknife	UTURN - U-Turn	04 - Curb	12 - Construction Barrier	D - Dry Surface
RE - Rear End	CONVY - Other Conveyance	SPRTD - Units Separated	OTHR - Other	05 - Guardrail or Barrier	13 - Crash Attenuator	W - Wet Surface
ANG - Angle	ANIML - Animal	NCOLL - Other Non Collison	UNK - Unknown	06 - Embankment	88 - Other	I - Icy Surface
				07 - Fence	99 - Unknown	S - Snowy Surface

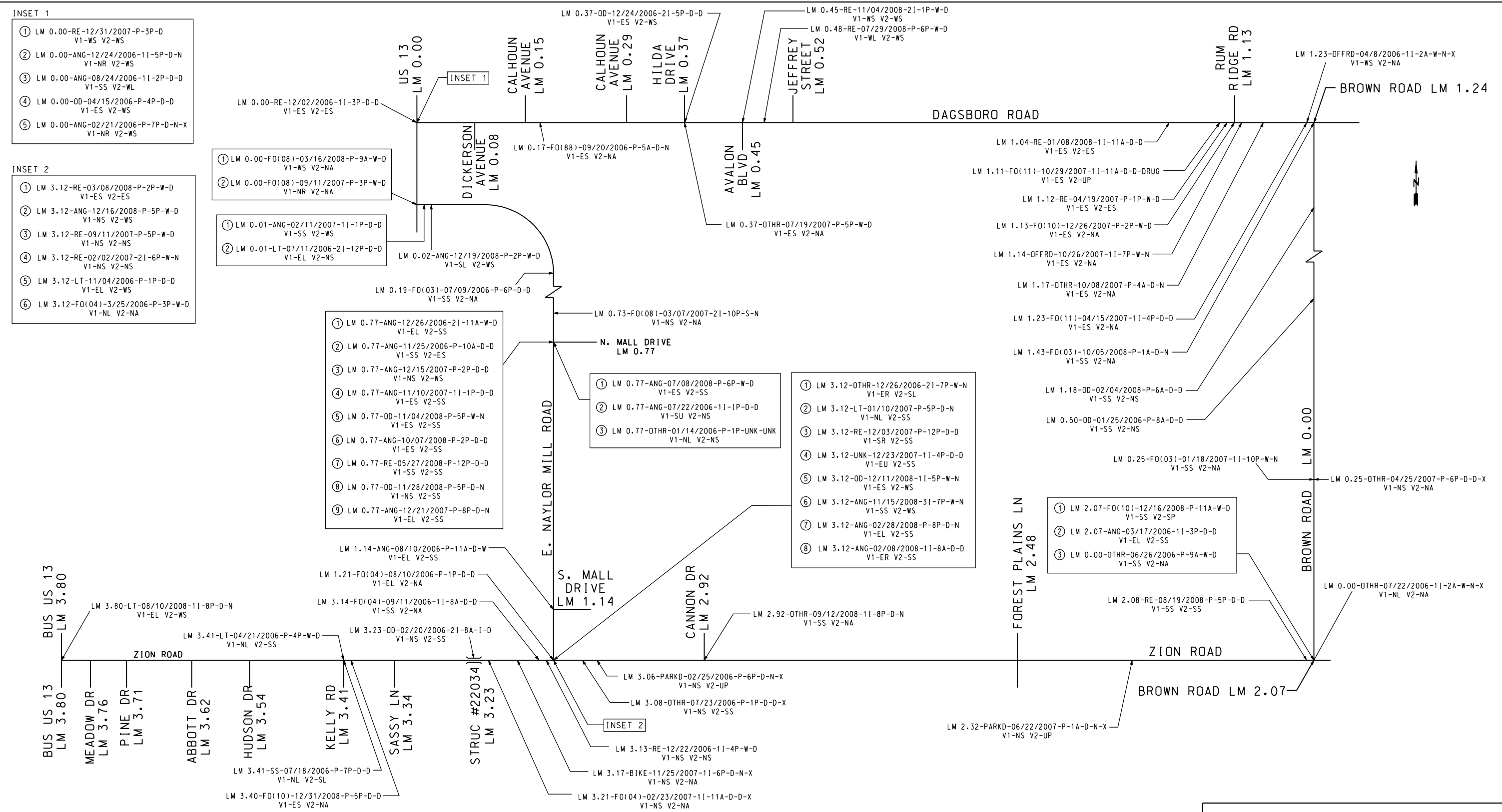
US 13 NORTH/NAYLOR MILL RD STUDY

US 13 FROM SALISBURY BYPASS
TO N. DAGSBORO ROAD
LOG MILE 11.83 TO LOG MILE 13.43
CRASH DIAGRAM

FIG. 9

NOT TO
SCALE

9/10



US 13 NORTH/NAYLOR MILL RD STUDY

ZION ROAD
DAGSBORO ROAD
CRASH DIAGRAM

FIG. 10 NOT TO SCALE 9/10

III. 2015 CONDITIONS

A. Travel Demand Forecasts

There are twenty-one proposed developments that were identified in the study area. These potential developments represent a large increase in population and employment as well as traffic volumes for the area by the year 2015. In order to determine the impacts of these developments, travel demand forecasts were produced for the study area. The forecasts were developed by growing the base traffic by 1% per year. This growth rate was provided by the SHA Travel Forecasting and Analysis Division. In addition to applying the 1% growth rate, trips were generated for the following proposed office and housing developments that were provided by the S/W MPO:

1. Westwood Business Center – 15,000 sq. ft. office
2. Windsor Development – 47,400 sq. ft. office/warehouse
3. Salisbury Aquatic Center – 60,000 sq. ft. facility
4. Kraus Co. – 44,475 sq. ft. warehouse
5. Westwood Commerce Park PDD – 106 acres office/warehouse
6. Sassafras Meadows – 110 single family lots
7. Westside Manor – 47 single family lots
8. Adventist Drive – 4 single family lots
9. New Dimensions Ministry – 440 seat assembly
10. Jersey Road-Lockman Annex – 70 townhomes/32,100 sq. ft. shopping center
11. MBAS Annexation – 30 townhomes
12. Three Creeks – 176 single family units
13. Bluewater Business Park – 24,200 sq. ft. office
14. Windsor Drive Business Center – 20,340 sq. ft. office/warehouse
15. Villages of Parsons Lake Section 2 – 150 single/multi-family units
16. Remainder of Parsons Lake – 480 single/multi-family units
17. Brown Farm Annexation – 288 single/multi-family units
18. Addison Ct. Apartments – 300 multi-family units/11,275 sq. ft. commercial building
19. North Point Commons – 300 multi-family units
20. Martin's Mill – 78 multi-family units
21. Aydelotte Farm PRD – 362 single family units/3 acre commercial

See Figure 11 for map with future development locations.

From these developments, trips were assigned to the roadway network. The background growth was added to the trips from the developments and 2015 peak hour volumes and ADT's were developed. These volumes are shown in Figure 12 and 13.

The average daily traffic by 2015 on U.S. Route 13 is anticipated to increase to approximately 55,000 to 75,000 vehicles per day. This is about a 30%-40% increase over existing traffic volumes. Various roadways are anticipated to carry over 10,000 vehicles per day including Dagsboro Road, Naylor Mill Road, North Pointe Drive, Zion Road and the Mall Ring Road connections. The travel demand forecasts showed that volumes along U.S. Route 13 are anticipated to increase 2,400 to 3,000 vehicles per hour in the PM peak direction. This is approximately a 25 to 40% increase. Naylor Mill Road is anticipated to see its largest increases in traffic near the U.S. Route 50 (Salisbury Bypass/ Ocean Gateway Bypass) interchange with volumes expected to more than double. The remaining sections of Naylor Mill Road will increase by approximately 200 vehicles per direction. This is about a 30% increase. North Pointe Drive east of U.S. Route 13 is anticipated to have peak hour volumes double.

B. Traffic Analysis

Traffic analysis was performed for all the study area intersections. The analysis showed that six intersections would be operating at failing levels of service. Most of these locations would be unsignalized thereby the failing movement would be the inability of the minor street traffic to access the main road. The six locations are:

- Brown Road at Zion Road (PM)
- Naylor Mill Road at North Mall Drive (PM)
- Naylor Mill Road at Northgate Drive (PM)
- Naylor Mill Road at Northwood Drive (PM)
- Naylor Mill Road at U.S. Route 50 (Salisbury Bypass/ Ocean Gateway Bypass) WB Ramp (PM)
- Naylor Mill Road at U.S. Route 50 (Salisbury Bypass/ Ocean Gateway Bypass) EB Ramp (PM)

Overall traffic operations are anticipated to get worse at all intersections except the Naylor Mill Road/Log Cabin Road intersection.

See Table 3 for the 2015 LOS Chart.

TABLE 3
2015 LEVELS OF SERVICE

Intersection	2009	2015
	PM LOS	PM LOS
Dagsboro Rd @ U.S. Route 13	C	D
North Pointe Dr @ U.S. Route 13	B	C
Naylor Mill Rd @ U.S. Route 13	C	D
Centre Rd @ U.S. Route 13	C	C
*Northwood Dr @ Kiley Dr	Westbound = C	Westbound = E
*Dagsboro Rd @ Brown Rd	Northbound = B	Northbound = C
*Brown Rd @ Zion Rd	Southbound = B	Southbound =F
Zion Rd @ Naylor Mill Rd	C	C
*South Mall Drive @ Naylor Mill Rd	Eastbound = B	Eastbound = D
*North Mall Drive @ Naylor Mill Rd	Eastbound = C	Eastbound = F
*Northgate Dr @ Naylor Mill Rd	Southbound = C	Southbound = F
*Northwood Dr @ Naylor Mill Rd	Northbound = E	Northbound = F
Jersey Rd @ Naylor Mill Rd	C	Roundabout v/c = .42
*Log Cabin Rd @ Naylor Mill Rd	Southbound = B	Southbound = C
*U.S. Route 50 WB Ramp @ Naylor Mill Rd	Westbound = C	Westbound = F
*U.S. Route 50 EB Ramp @ Naylor Mill Rd	Eastbound = C	Eastbound = F
*U.S. Route 50 Business @ Naylor Mill Rd	C	C

Signalized Intersections use HCM method to determine LOS
*Unsignalized Intersections are represented with lowest approach LOS



The Naylor Mill Road and Goddard Parkway/Armstrong Parkway intersection has experienced a number of crashes. It is recommended to construct a left run lane on westbound Naylor Mill Road onto Armstrong Parkway and Goddard Parkway to reduce this problem.



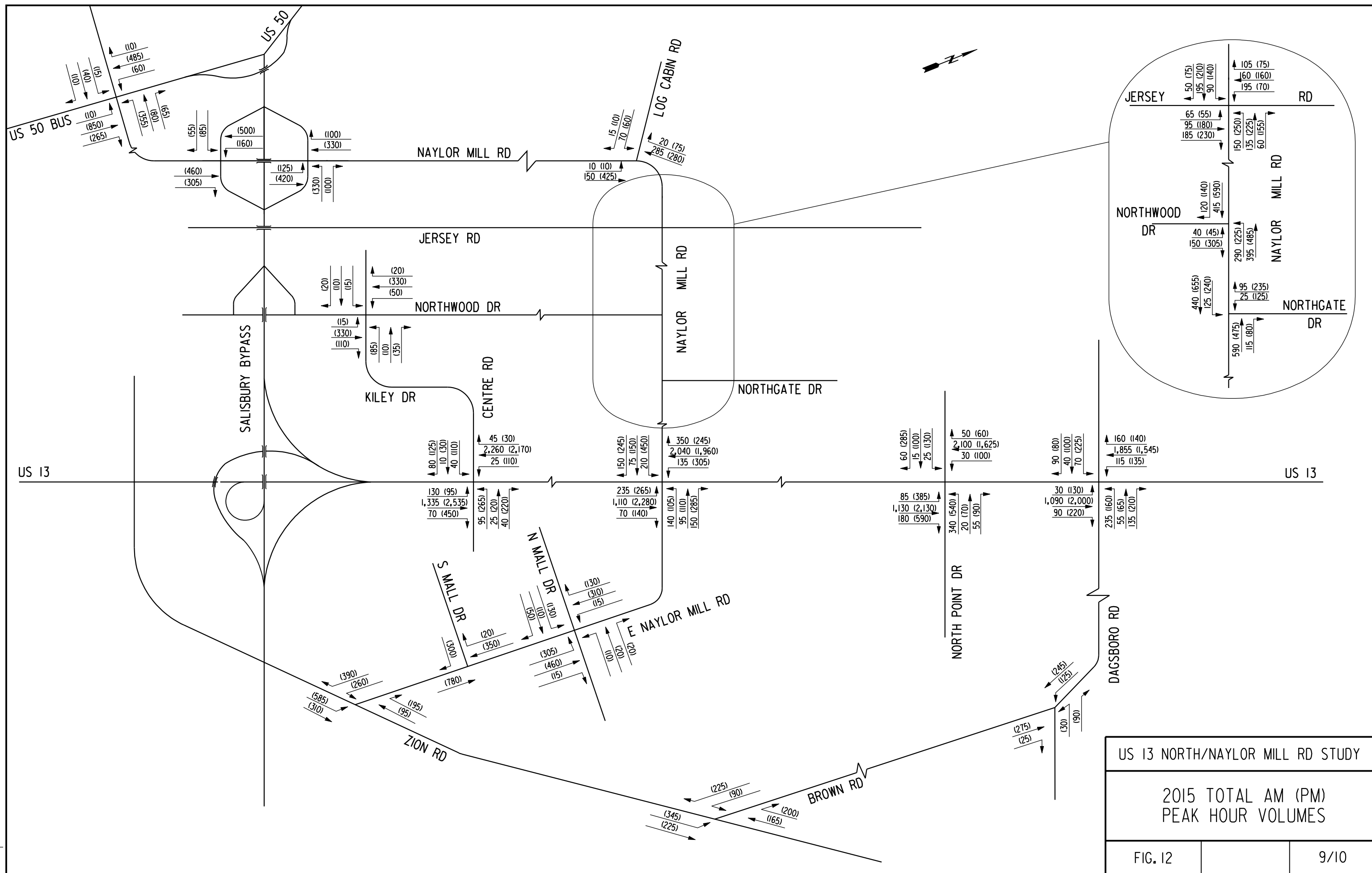
US 13 NORTH/NAYLOR MILL RD STUDY

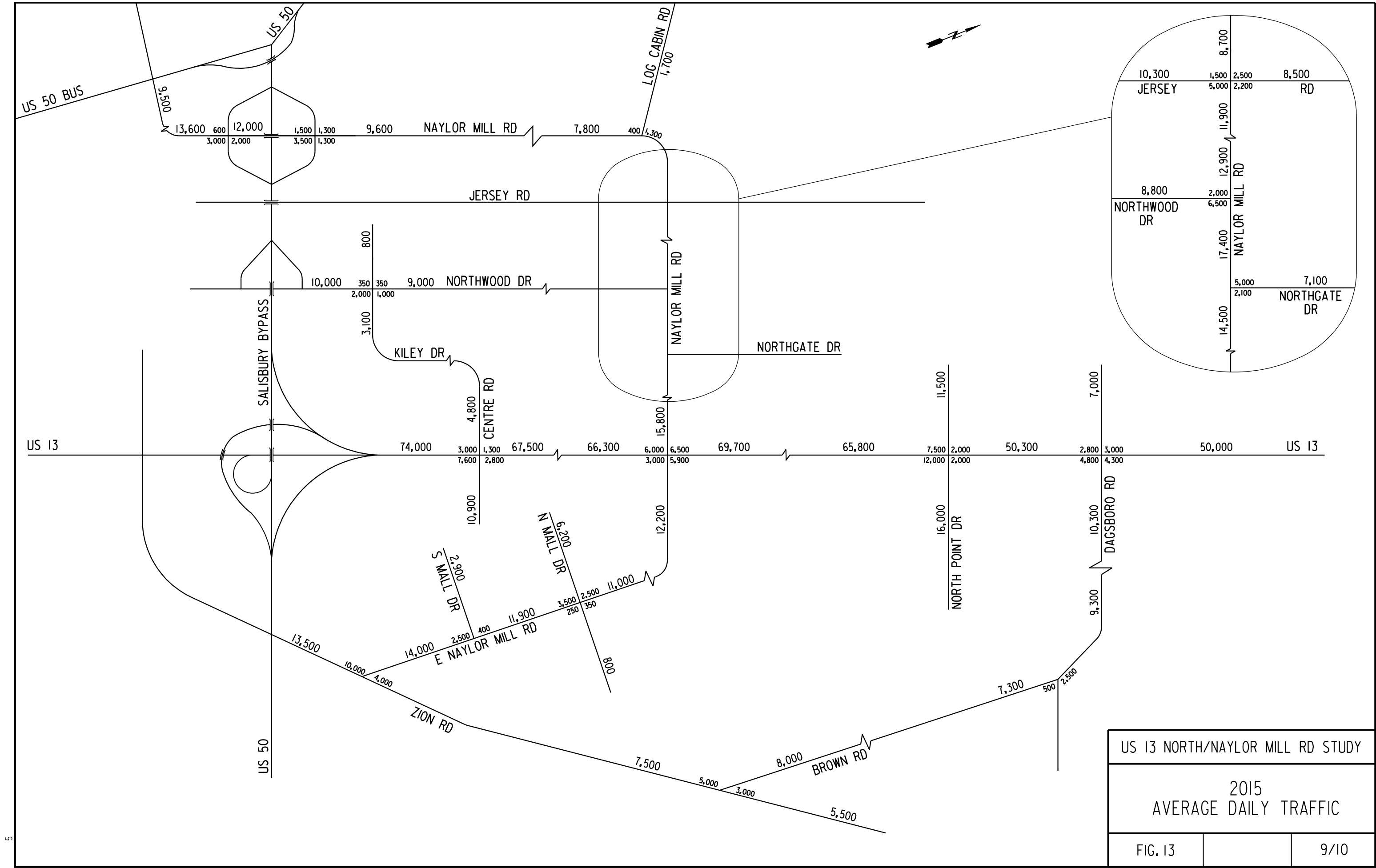
2015
PROPOSED DEVELOPMENT

FIG. II

SCALE:
1" = 1,600'

9/10





IV. SHORT TERM RECOMMENDATIONS

Field observations were conducted throughout the study area during peak and off peak periods to review traffic operations for the roadway and intersections within the study limits. In addition to the observations, safety issues through the area were analyzed. The 2015 traffic analysis identified various locations which are in need of improvements. Based on these areas of concern, improvements were developed to assist safety and traffic operations through the study area. See Figure 14 for Recommendation Locations. The following recommendations are proposed for the roadway segments and intersections:

- 1) **Naylor Mill Rd between Jersey Road and Scenic Drive** – Tree trimming is recommended along this segment of roadway so that signs can be adequately read. In addition, the restricted bridge sign in the eastbound direction should be moved further away from the bridge so that motorists have advanced warning.
- 2) **Naylor Mill Rd between Scenic Road and Goddard Parkway** - A center left turn lane should be considered for this section of roadway. This lane would benefit westbound motorist by allowing thru traffic to bypass vehicles turning left. The crash data shows three rear end and one opposite direction crashes have occurred on this section of roadway. The number of rear end collisions would possibly decrease with this proposed center lane. Currently, the road is 18.1 feet wide to the center line in the eastbound direction and about 30 feet wide total. Additional widening would be required in order for a turn lane to be created. Widening may require the relocation of existing utility poles. See Figure 15.
- 3) **Naylor Mill Road @ Northgate Drive** – A right turn and left turn lane is recommended at Northgate Drive southbound. This will allow right turning vehicles to bypass vehicles turning left. The road is approximately 41.5 feet wide having sufficient pavement to implement this improvement. See Figure 16. Signalization should be considered for this location when warrants are met.
- 4) **Dagsboro Road near Rum Ridge Rd/ Brown Rd** - A curve warning sign is recommended in the westbound direction in advance of the curve at this section of roadway. Speed advisory plates are needed in both directions so that motorists slow down. In addition it is recommended that passing zones be reviewed on Brown Rd. near the intersection. Field observations suggest vehicles may be allowed to pass to close to the intersection.
- 5) **Dickerson Lane @ Dagsboro Road** - Currently there are no pavement markings on Dickerson Lane between Dagsboro Road and Oliphant Drive. Signs and markings should be implemented to help facilitate traffic. A left turn lane is recommended at Dickerson Lane. However, additional lanes will require the relocation of utilities on the southwest corner of the intersection. See Figure 17.
- 6) **Kiley Drive @ Centre Road @ Zion Road** - This intersection is currently a three-way stop for a four legged intersection. The arrangement for the stop signs is confusing as to which legs of traffic are required to stop. In order to make this intersection more standardized it is suggested to make it a four-way stop or construct a roundabout at this location. As a four way stop it is recommended to move the legs of the intersection closer together because the current intersection is too spread out. If Kiley Drive and the entrance into the Marriott Residence Inn are moved north then this would help to make the intersection function better.
- 7) **East Naylor Mill Rd @ North Mall Drive** - Signalization is recommended at this intersection along with converting the South Mall Drive entrance intersection to a right in-right out at the South Mall Drive intersection. This will help facilitate future traffic in and out of the mall and will reduce the potential for angle crashes. This will assist in minimizing queuing conflicts from the Naylor Mill Road/Zion Road intersection. See Figure 18.
- 8) **Naylor Mill Road @ Northwood Drive** – There are two options for this intersection. The first involves constructing a bypass lane on Naylor Mill Road westbound. This will reduce the potential for rear end crashes and help eliminate through traffic from queuing. In addition to the bypass lane, the right turn movement from Northwood Drive could be channelized to free flow onto eastbound Naylor Mill Road. At this point Naylor Mill Road eastbound widens to two lanes and no widening would be required. The installation of a new traffic signal is programmed to occur at this intersection. The funding has been included in the Approved FY 12-16 Capital Improvement Program plan for the City of Salisbury. See Figure 19.
- 9) **Naylor Mill Road @ Goddard Parkway/Armstrong Parkway** - This section of roadway has experienced a high percentage of wet weather crashes (15 in a 3 year period). Resurfacing is recommended to help eliminate wet surface crashes. This high number of wet weather accidents suggests that traction on the roadway might not be sufficient. Another factor that might contribute to the high crash rate is the curve in the road about .07 miles to the east of the Naylor Mill Road @ Armstrong Parkway intersection. There are no curve warning signs or speed advisory signs in place. It is recommended these signs be added to give motorists advanced warning. In addition to curve warning signs, street name signs should be placed before the intersection to give turning motorists advanced notice of the intersection. In order to improve traffic flow, it would be beneficial to add a left turn lane from westbound Naylor Mill Rd. onto Armstrong Parkway. Currently Naylor Mill Road is 32 feet wide through this section. The three lane section previously discussed for the area to Scenic Drive could be continued to east of the railroad tracks. An option would be to provide three approximate 10.5 foot lanes but this would force traffic to have a drop off next to where they travel at the railroad crossing. Widening would be required to add this left turn lane but the addition of the lane would make the intersection safer. See Figure 20.
- 10) **Naylor Mill Road @ Jersey Road** - A roundabout is planned at this intersection by a developer which will reduce delays and improve the intersection operation.

RECOMMENDATION LOCATIONS

- ① NAYLOR MILL ROAD BETWEEN JERSEY ROAD AND SCENIC DRIVE
- ② NAYLOR MILL ROAD BETWEEN SCENIC DRIVE AND GODDARD PKWY
- ③ NAYLOR MILL ROAD @ NORTHGATE DRIVE
- ④ DAGSBORO ROAD NEAR RUM RIDGE ROAD/BROWN ROAD
- ⑤ DICKERSON LANE @ DAGSBORO ROAD
- ⑥ KILEY DRIVE @ CENTRE ROAD @ ZION ROAD
- ⑦ EAST NAYLOR MILL ROAD @ NORTH MALL DRIVE/SOUTH MALL DRIVE
- ⑧ NAYLOR MILL ROAD @ NORTHWOOD DRIVE
- ⑨ NAYLOR MILL ROAD @ GODDARD PKWY/ARMSTRONG PKWY
- ⑩ NAYLOR MILL RD @ JERSEY RD





LEGEND

- PROPOSED MODIFICATIONS

US 13 NORTH/NAYLOR MILL RD STUDY

2015 NAYLOR MILL ROAD
SCENIC DR TO GODDARD PARKWAY
PROPOSED IMPROVEMENTS

FIG. 15

SCALE:
1" = 150'

9/10



LEGEND

- PROPOSED MODIFICATIONS

US 13 NORTH/NAYLOR MILL RD STUDY

2015 NAYLOR MILL RD
@ NORTHGATE DRIVE
IMPROVEMENTS

FIG. 16

SCALE:
1" = 50'

9/10





US 13 NORTH/NAYLOR MILL RD STUDY

2015 NAYLOR MILL ROAD @
SOUTH MALL DR/NORTH MALL DR
PROPOSED IMPROVEMENTS

FIG. 18

SCALE:
1" = 140'

9/10



LEGEND

- PROPOSED MODIFICATIONS

US 13 NORTH/NAYLOR MILL RD STUDY

2015 NAYLOR MILL ROAD
@ NORTHWOOD DRIVE
PROPOSED IMPROVEMENTS

FIG. 19

SCALE:
1" = 80'

9/10



11) **Naylor Mill Road** - A friction test should be conducted along the entire length of Naylor Mill Road. There have been 45 wet surface crashes along the road during the three year study period. The roadway appears to need to be resurfaced or drainage needs to be reviewed.

12) **US 50 Ramps at Naylor Mill Road** - The growth in traffic due to proposed developments such as the Westwood Business Park will require that signalization be considered at the U.S. Route 50 interchange on/off ramp locations with Naylor Mill Road. Signalization will only be required at the time this development occurs.

See Table 4 for 2015 LOS comparison.



Naylor Mill Road and North Mall Drive Intersection is recommended for signalization. As part of this a right in/right out configuration at the South Mall Drive intersection would be included.

TABLE 4
2015 Level of Service Comparison

Intersection	2015	2015 with Improvements
	PM LOS	PM LOS
Dagsboro Rd @ U.S. Route 13	D	D
North Pointe Dr @ U.S. Route 13	C	C
Naylor Mill Rd @ U.S. Route 13	D	C
Centre Rd @ U.S. Route 13	C	C
Northwood Dr @ Kiley Dr	Westbound = E	Roundabout v/c = .31
Dagsboro Rd @ Brown Rd	Northbound = C	Northbound = C
Brown Rd @ Zion Rd	Southbound = F	Southbound = F
Zion Rd @ Naylor Mill Rd	C	C
South Mall Drive @ Naylor Mill Rd	Eastbound = D	Eastbound = C
North Mall Drive @ Naylor Mill Rd	Eastbound = F	C
Northgate Dr @ Naylor Mill Rd	Southbound = F	**Southbound Left Turn Only = F
Northwood Dr @ Naylor Mill Rd	Northbound = F	B
Jersey Rd @ Naylor Mill Rd	Roundabout v/c = .42	Roundabout v/c = .42
Log Cabin Rd @ Naylor Mill Rd	Southbound = C	Southbound = C
U.S. Route 50 WB Ramp @ Naylor Mill Rd	Westbound = F	C
U.S. Route 50 EB Ramp @ Naylor Mill Rd	Eastbound = F	A
U.S. Route 50 Business @ Naylor Mill Rd	C	C

Signalized Intersections use HCM method to determine LOS
Unsignalized Intersections are represented with lowest approach LOS
**If signalized LOS would be C

V. BUILD OUT CONDITIONS

A. Build Out Travel Demand Forecasts

Travel demand forecasts were developed by analyzing the anticipated developments that are expected to occur in the area plus growing the existing traffic to account for background and through traffic growth. There are numerous developments scheduled to be built between the years 2015 and beyond 2030. Trip generation was used to generate trips for the proposed developments and was assigned to the roadway network. The build out peak hour traffic volumes are shown in Figure 21 and ADT's are shown in Figure 22. Trips were generated for the following developments identified by S/W MPO and assigned to the roadway network:

1. West Side of U.S. Route 50, 67 acres of Office/Commercial Development
2. Salisbury Bypass @ Naylor Mill Road, 62 acres of Office/Commercial Development
3. Naylor Mill Road/West Side of West Road, 30 units of Residential Development
4. Naylor Mill Road/East Side of West Road, 45 acres of Office/Commercial Development
5. Naylor Mill Road/West of Log Cabin Road, 58 units of Residential Development
6. Southeast Corner of Naylor Mill Road/Jersey Road, 70 units of Residential Development
7. Between Log Cabin Road and Jersey Road, 57 units of Residential Development
8. East Side of Jersey Road, 256 units of Residential Development
9. Connelly Mill Annexation Area, 234 acres of Industrial Development
10. North of Naylor Mill Road/ West of Railroad Tracks, 76 acres of Industrial Development
11. West Side of Goddard Parkway, 20 acres of Industrial Development
12. South of Naylor Mill Road/West of Northwood Drive, 14 acres of Industrial Development
13. North of Naylor Mill Road/South of Hampshire Road, 61 acres of Industrial Development
14. East of Goddard Parkway/South of Connelly Mill Road, 83 acres of Industrial Development
15. North of Hampshire Road, 78 acres of Industrial Development
16. South of Hampshire Road, 20 acres of Commercial Development
17. North of Naylor Mill Road/West of Northgate Road, 35 acres of Commercial Development
18. South of Avalon Pike, 12 acres of Commercial Development
19. North of Mill Pond Village, 51 acres of Commercial Development
20. East Side of East Naylor Mill Road, 18 acres of Commercial Development
21. East of The Centre at Salisbury mall, 15 acres of Commercial Development
22. South of Zion Road/West of Forest Plains Lane, 190 units of Residential Development
23. South of Zion Road/East of Forest Plains Lane, 75 units of Residential Development
24. North of Zion Road/West of Brown Road, 168 units of Residential Development
25. North of Zion Road/East of Brown Road, 76 units of Residential Development
26. South of Dagsboro Road, 159 units of Residential Development

As shown from the list many of these developments are very preliminary and defined only by the potential acreage that they encompass. In general, the development of these parcels will be

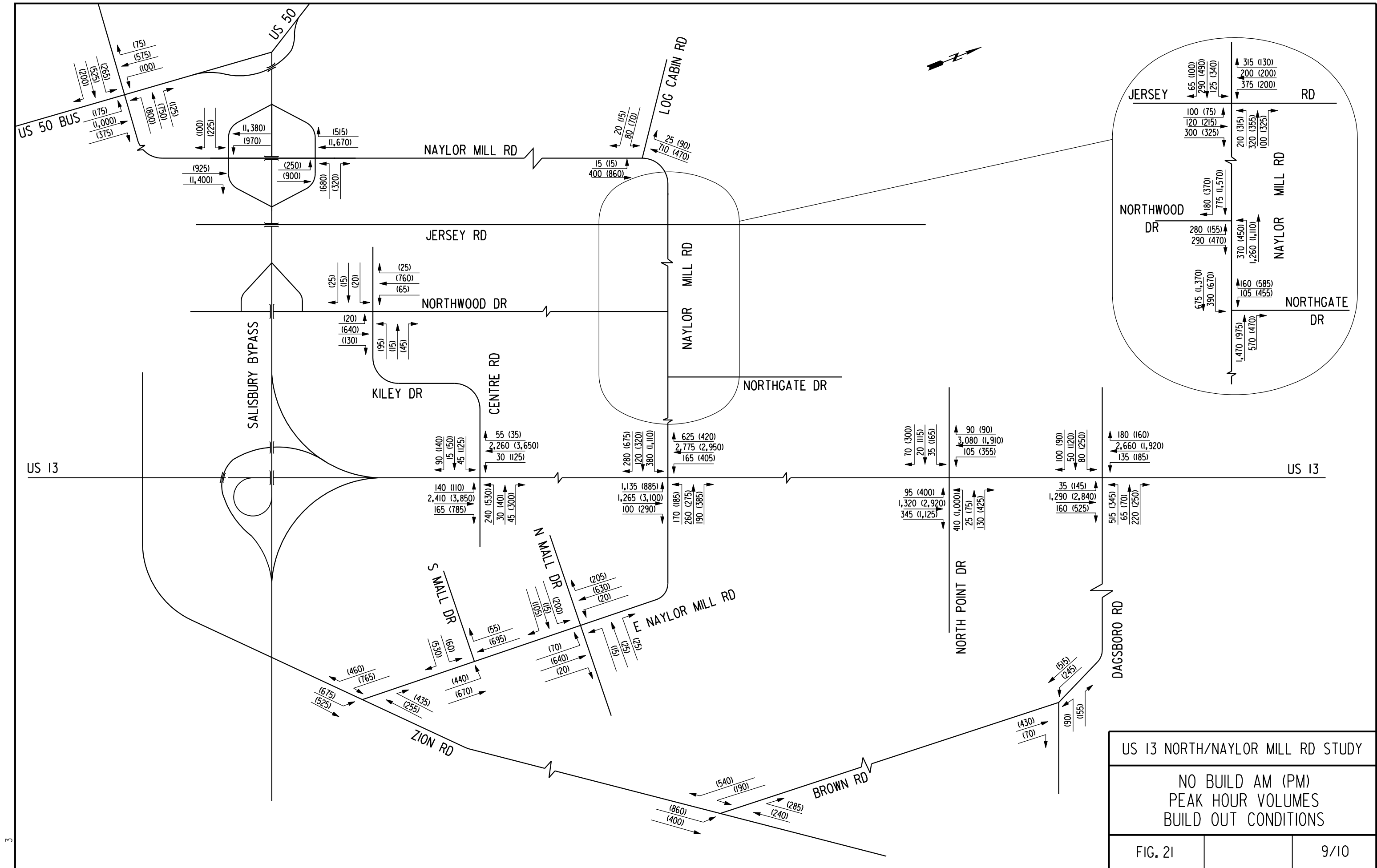
less in density and therefore develop less trips than shown in the development of the travel demand forecasts. In addition, there are twelve developments anticipated to occur by 2015 but will increase in size by beyond the year 2030. Trips were generated based upon the expansion of these developments and assigned to the roadway network. The following developments are anticipated to expand:

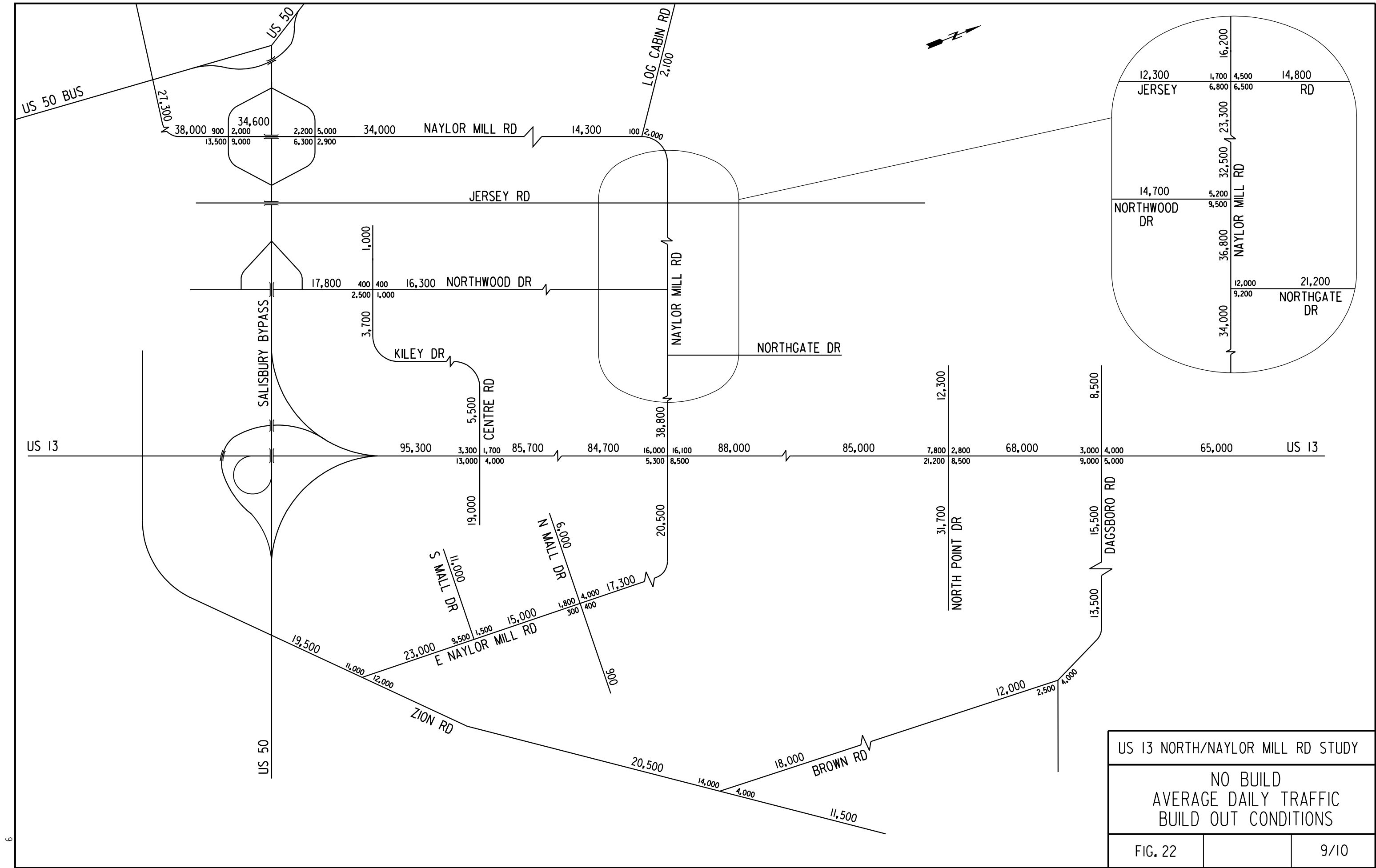
5. Westwood Commerce Park PDD, 106 acres of office/warehouse
6. Sassafras Meadows, 110 single family units
7. Westside Manor, 48 single family units
8. Adventist Drive Sketch, 3 single family units
10. Jersey Road-Lockman Annex Residential, 70 units
11. MBAS Annexation, 30 townhome units
12. Three Creeks, 176 single family units
15. Villages of Parsons Lake Section 2, 150 single/multi-family units
16. Remainder of Parsons Lake, 480 single/multi-family units
17. Brown Farm Annexation, 288 single/multi-family units
20. Martin's Mill, 79 multi-family units
21. Aydelotte Farm PRD, 363 residential units

It should be noted that the following developments that are to be complete in 2015 are not anticipated to expand by 2030:

1. Westwood Business Center
2. Windsor Development
3. Salisbury Aquatic Center
4. Kraus Company
9. New Dimensions Ministry
13. Bluewater Business Park
14. Windsor Drive Business Center
18. Addison Court Apartments
19. North Point Commons

Traffic was generated for the 38 developments that are new or will expand. These trips were assigned to the roadway network. This was added to the 2015 travel demand volumes. The travel demand forecast shows that the largest growth in the study area will occur along Naylor Mill Road to the east of U.S. Route 13 and North Pointe Drive. Traffic volumes are anticipated to grow to between 30,000 and 40,000 vehicles per day between U.S. Route 13 and U.S. Route 50 along Naylor Mill Road. Volumes along U.S. Route 13 are expected to increase to approximately 95,000 vehicles per day. Almost all roadways in the study area are anticipated to





grow to over 10,000 vehicles per day. Peak hour volumes in the peak direction will grow to over 1,000 vehicles per day along Naylor Mill Road, North Pointe Drive and Northgate Drive. U.S. Route 13 volumes for most of the study area will grow to over 3,000 vehicles per hour in the peak direction.

The long term developments are shown in Figure 23.

B. Traffic Analysis

Traffic analysis was performed to determine the impacts of the growth in traffic volumes. This was accomplished by using the Synchro software to develop a model with future traffic volumes and roadway conditions. Future conditions were analyzed to determine intersection and roadway operations throughout the study area. The analysis shows that a heavy increase in traffic is expected by the build out year beyond 2030 and the current roadway system in Salisbury will not be able to accommodate the projected volumes. Thirteen intersections within the study area are expected to receive failing levels of service in the build out year. Thus improvements are needed to the roadway system. The only intersection that does not fail is U.S. 50 Business at Naylor Mill Road.

Levels of service for No Build can be found in Table 5.

TABLE 5
BUILDOUT LEVEL OF SERVICE

Intersection	No Build PM LOS
Dagsboro Rd @ U.S. Route 13	F
North Pointe Dr @ U.S. Route 13	F
Naylor Mill Rd @ U.S. Route 13	F
Centre Rd @ U.S. Route 13	F
*Northwood Dr @ Kiley Dr	Westbound = F
*Dagsboro Rd @ Brown Rd	Northbound = F
*Brown Rd @ Zion Rd	Southbound = F
Zion Rd @ Naylor Mill Rd	F
*South Mall Drive @ Naylor Mill Rd	Eastbound = F
*North Mall Drive @ Naylor Mill Rd	Eastbound = F
*Northgate Dr @ Naylor Mill Rd	Southbound = F
*Northwood Dr @ Naylor Mill Rd	Northbound = F
Jersey Rd @ Naylor Mill Rd	Roundabout v/c = .88
*Log Cabin Rd @ Naylor Mill Rd	Southbound = F
*U.S. Route 50 WB Ramp @ Naylor Mill Rd	Westbound = F
*U.S. Route 50 EB Ramp @ Naylor Mill Rd	Eastbound = F
*U.S. Route 50 Business @ Naylor Mill Rd	C

Signalized Intersections use HCM method to determine LOS

*Unsignalized Intersections are represented with lowest approach LOS



LEGEND
○ - PROPOSED DEVELOPMENT (PLANS SUBMITTED)
□ - OTHER DEVELOPMENT (NO PLANS SUBMITTED)

US 13 NORTH/NAYLOR MILL RD STUDY		
PROPOSED DEVELOPMENTS BUILD OUT CONDITION		
FIG. 23	SCALE: 1" = 1,600'	9/10

VI. LONG TERM RECOMMENDATIONS

I. Proposed Improvements

Based upon the analysis a comprehensive list of transportation improvements was developed to address deficiencies in the roadway network. These improvements were developed to attempt to provide as many options and alternative modes to the users of the facilities in the study area. From a roadway standpoint, this includes providing new connections to reduce trips along U.S. Route 13 and other major roadways such as Naylor Mill Road. Also identified are improvements necessitated to the existing roadway system. Although passenger vehicles are the primary method of travel, recommendations were explored to reduce the number of single vehicle automobile trips and allow persons the option and encourage using other modes of transportation.

The City of Salisbury Comprehensive Plan was utilized as a basis for development of the improvements to help facilitate the flow of traffic through the city. In addition, various other potential needs for the area were identified. The following is a list of recommended improvements:

- 1) **East North Pointe Drive** - East North Pointe Drive should be extended from its existing terminus to Brown Road. This roadway would provide access to many commercial developments and tie in the proposed residential developments along Brown Road. These future trips will not need to access U.S. Route 13. This in turn will relieve some congestion on U.S. Route 13. This will also provide an east-west connection that is lacking in the northern portion of the study area.
- 2) **Parsons Lake Drive** - The extension of Parsons Lake Drive will provide alternative access from Brown Road to Naylor Mill Road. This will provide for a means for the proposed Parsons Lake development to access the Naylor Mill Road area including the Centre at Salisbury Mall. Trips will be reduced along Zion Road and Dagsboro Road. This will especially help operations at the Zion Road/Naylor Mill Road and the Zion Road/Brown Road intersections.
- 3) **Jasmine Drive** - This roadway presently stubs out north of Naylor Mill Road. The extension of this roadway to East North Pointe Drive will reduce trips through the critical U.S. Route 13/Naylor Mill Road intersection by providing a parallel roadway on the east side of U.S. Route 13. It will serve to provide access to proposed commercial development north of Mill Pond Village.
- 4) **Northwood Drive Extension** - Northwood Drive is proposed to be extended north of Naylor Mill Road to Connelly Mill Road at Foskey Lane. This proposed road would connect with the future extensions of Hampshire Road, West North Pointe Drive and Dagsboro Road. This would create a parallel roadway to U.S. Route 13 thereby

reducing traffic on this congested facility. Since Northwood Drive has a partial interchange with U.S. Route 50, this further enhances this connection. The roadway would provide for development opportunities to the north of Naylor Mill Rd.

- 5) **Dagsboro Road Extension** - Extend Dagsboro Road to the west to the extended Northgate Drive. Motorists from Delaware and points along the Maryland line would benefit by being able to access the industrial zoned land located along the west side of U.S. Route 13. Motorists could also use this route to access Naylor Mill Rd/ Northwood Dr corridors.
- 6) **Northgate Drive Extension** - Extend Northgate Drive to connect with the extension of Dagsboro Road. This proposed road would be located behind the existing commercial development of the Sam's Club, Wal-Mart and Kohl's. This would allow for motorists to these developments to have an alternative route to the U.S. Route 13 corridor and provide a service road type connection between the developments.
- 7) **West North Pointe Drive** - This roadway is proposed to be constructed from Northgate Drive extended to Northwood Drive. This would tie into the existing North Pointe Drive which forms a signalized intersection with U.S. Route 13 and ultimately will traverse to the east to Brown Road. This would provide the benefit of reducing existing trips that must dogleg onto U.S. Route 13. This will provide alternative access to trips from the Connelly Mill Road area to access various commercial developments without utilizing U.S. Route 13.
- 8) **Hampshire Road** - Hampshire Road extended from Northgate Drive extended to Northwood Drive extended will provide access to allow for various developments. This includes various industrial and commercial zoned land in the area to the west of U.S. Route 13.
- 9) **Brown Road/US 50 Interchange** - U.S. Route 13 serves as a vital link both to short and long distance trips within and throughout the area. This will in the future cause very congested conditions on U.S. Route 13. In turn to relieve that traffic, consideration should be given to providing a new interchange at U.S. Route 50/ Brown Rd which would serve more local trips. The extension of Brown Road south to connect with the Salisbury Bypass between U.S. Route 13 Business and U.S. Route 50 Business would need to be completed as a part of improvement. Improvements would need to be made to the Brown Rd/ Zion Rd intersection to facilitate the future travel demand.
- 10) **Reconstruct the U.S. Route 50 Salisbury Bypass Interchange with Naylor Mill Road** - The area near the US 50/Naylor Mill Road interchange is anticipated to

witness a large amount of growth in the upcoming years. This will include such developments as the Westwood Business Center, Westwood Commercial Park, Windsor Development and a large amount of potential commercial and office zoned acreage that is available. This will generate a high volume of trips if all the developments go forward. The number of trips generated will cause the interchange to fail.

The U.S. Route 50/Naylor Mill Road interchange consists of tight diamond ramps with a single lane as it intersects with Naylor Mill Road. The Naylor Mill Road bridge over U.S. Route 50 is one lane each direction with no turn lanes to the interchange ramps. The type of interchange reconstruction will depend on the amount of development that occurs in the area. Naylor Mill Road will need to be widened to a five lane section through this area between the entrance of the major developments and the interchange.

- 11) **Widen Naylor Mill Road-** Naylor Mill Road is anticipated to see a large percentage of traffic growth along certain sections of the roadway. The roadway will be in need of widening to a five lane section from Northwood Drive to the existing five lane section just east of Northgate Drive. From Northwood Drive to the west, this section would be reduced to three lanes until nearing the U.S. Route 50 interchange. A transition would take place at Northwood Drive which would also include the needed turn lanes for the extension of Northwood Drive. Intersection improvements will be necessary to provide for turn lanes at locations such as Jasmine Drive.

- 12) **Provide a Connection between Parsons Lake Drive Extended and Centre Road-** Large residential developments are anticipated to occur in the area of Brown Road. This includes The Villages of Parsons Lake and the Brown Farm annexation among several developments. Many of these trips will have a desire to access the U.S. Route 13 and U.S. Route 50 corridors. Many motorists will want to use the U.S. Route 13/Naylor Mill Road intersection which is already very constrained. In order to better divide traffic, it is recommended that a connection be explored between the Parsons Lake Drive intersection at Naylor Mill Road and Centre Road. This will eliminate motorists dog-legging along Naylor Mill Road.

Two issues are involved with this connection. This includes the reconstruction of the storm water management pond and if Centre Road in this section is a public or private road. If it is a private road discussion would need to take place with the owner to determine this alternatives viability and if the City would be interested in taking over ownership of the section to U.S. Route 13.

- 13) **Provide U.S. Route 13 Access controls and provide Improvements to the Naylor Mill Rd Intersection** - The traffic growth along U.S. Route 13 will substantially tax

the ability of the roadway to function adequately. The combination of providing a system of parallel roadways and providing horizontal connections to reduce short distance trips on U.S. Route 13 will greatly assist in improving operations. The large number of crashes that are occurring along U.S. Route 13 along with the increase in volumes will require improvements. The improvements would involve combining access points and/ or providing service roads either in front or behind the businesses. The Naylor Mill intersection is the most critical location. Consideration should be given to provide grade separation for one or multiple movements or providing some type of continuous flow intersection.

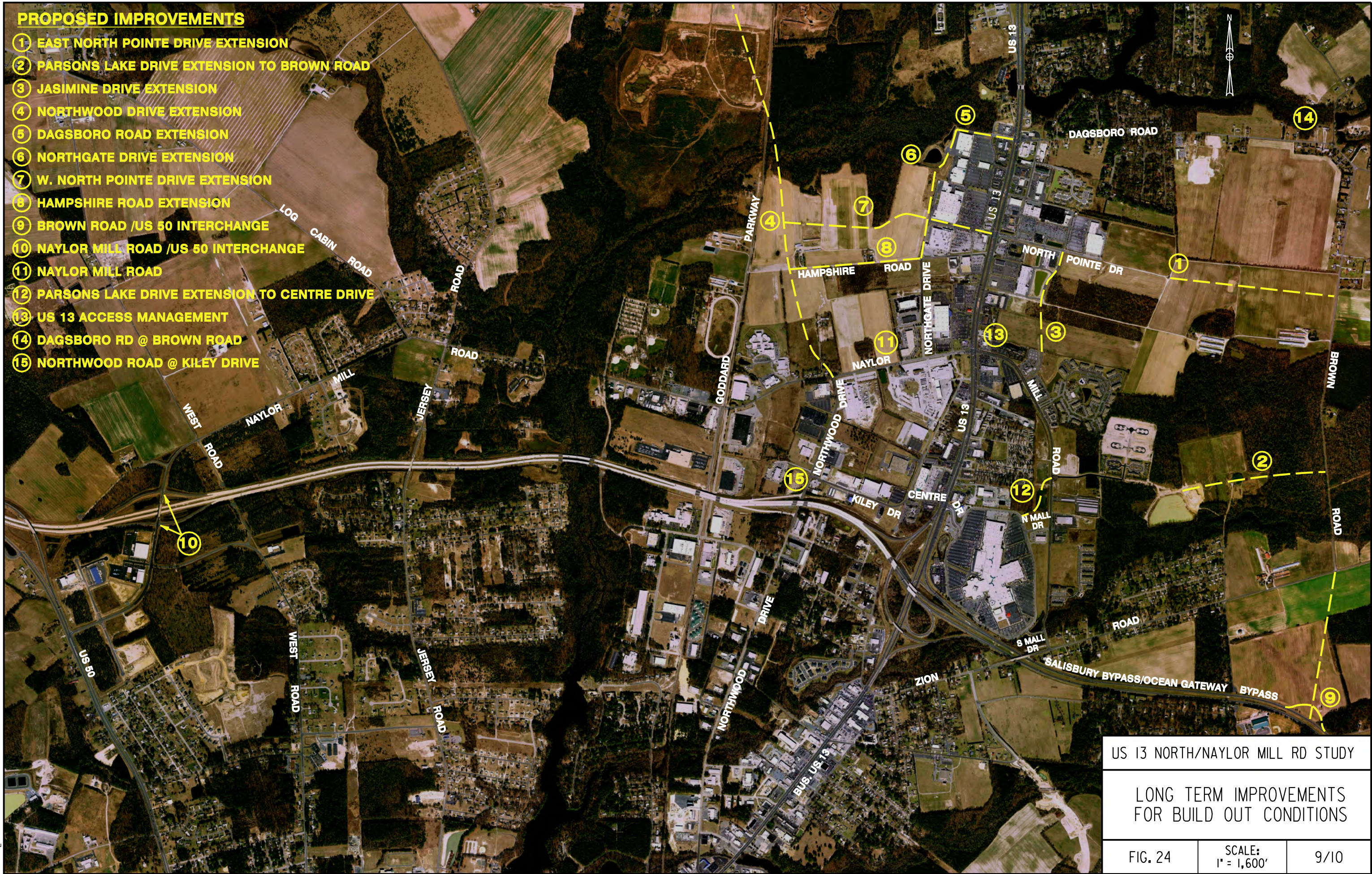
- 14) **Dagsboro Road @ Brown Rd** - This improvement involves realigning the Dagsboro Road/ Brown Road intersection to make the through movement being from Dagsboro Road eastbound to Brown Road southbound and the reverse. This would only be needed if the U.S. Route 50/ Brown Road interchange is constructed. The reason is this would better serve the higher volume movements.
- 15) **Northwood Drive @ Kiley Drive** - The extension of Northwood Drive will increase traffic volumes through the intersection of Kiley Drive. Although not a major need, by 2030 motorists would experience long delays to access Kiley Drive from Northwood Drive from Kiley Drive. The solution to this would be to provide a roundabout at this location.

- 16) **Zion Road @ Brown Road** - Signalization is recommended at this intersection. This will minimize southbound delays and queues through the intersection.

See Figure 24 for Long Term Recommendation Locations.

- 17) **Develop a Pedestrian Network** - Pedestrian connections are very limited through the study area. It appears for the most part that sidewalks have only occurred only with specific developments. The importance of providing pedestrian connections will assist in reducing the number of automobile trips through the area. This will allow people the option of possibly walking to their destination for short distance trips. The first step in this is to require new developments to provide sidewalks along their frontage. This will provide the start of a pedestrian network.

The second step is to develop connections between existing sidewalks. For example, along the south side of East North Pointe Drive the sidewalk should be completed between its present terminus and Dickerson Lane. The partial sidewalk on the west side of Dickerson Lane should be completed and a crosswalk across the north leg of East North Pointe Drive should be provided. The free flow right turn lane should be



eliminated to provide for a safer pedestrian movement. The remainder of the pedestrian network would involve the City and/or County to provide for some of the strategic connections. This will also involve working with the Maryland State Highway Administration to evaluate what can be accomplished to create a safer crossing of U.S. Route 13. This could involve upgrading the traffic signals to provide for APS and countdown signals plus some type of crosswalk treatment such as brick pavers. The funding could possibly be partially provided by the Sidewalk Retrofit program from the Maryland Department of Transportation.

A plan should be developed that identifies the location and properties of a sidewalk network. This would provide for a basis to be used in the construction of sidewalks throughout the area.

- 18) **Expand Transit Network** - In addition to the roadway network, public transportation serves the residents and businesses throughout the study area reducing roadway congestion. Both fixed route and demand response services are provided. Transit service is provided by Shore Transit. There are ten fixed routes in the Wicomico, Worcester and Somerset County area system. This includes the three routes which serve the study area. These are Route 111 North Salisbury- Delmar, Route 121 Central Salisbury and Route 708 Salisbury Crisfield. The Route 111 and Route 121 provide service Monday through Saturday. The Route 703 provides only Sunday service. Shore Transit is relocating its primary transfer point to a new location at U.S. Route 50 at Walston Switch Road which provides a connection between these and other routes. The following locations have stops through the study area:

- The Centre at Salisbury
- Naylor Mill Road @ Runaway Bay Apartments
- Naylor Mill Road @ Vernon Powell Shoe Company
- Naylor Mill Road @ Golden Corral Buffet & Grill
- Wal-Mart/Sam's Club
- Northgate Drive at the Social Security Administration Building
- Lodges @ Naylor Mill
- Northwood Drive @ Blind Industries and Services of Maryland
- Goddard Parkway @ Naylor Mill Business Park
- Lord Salisbury Plaza
- Chili Way @ North Pointe Plaza
- Toys R Us
- Avalon Plaza

As growth continues to occur in this area transit routes should be reviewed and the possibility for expansion should be considered. This would include the development of the industrial areas near Northwood Drive, Northgate Drive and Hampshire Drive when these roadways are extended. The area near Brown Road in the future should be considered for service to meet the growing residential population. Also tying in service between routes besides the Charles Street connection should be explored. Finally amenities such as bus shelters, signing and sidewalks leading to the stops should be part of the transit improvements.



Signalization is recommended at the Zion Road/Brown Road intersection

19) Build Traffic Volumes and Analysis

Traffic volumes for build conditions were redistributed based on the proposed roadway improvements. See Figure 25 for Build Peak Hour Volumes and Figure 26 for Build Average Daily Traffic.

Traffic anaylsis was conducted on the build volumes. The analysis utilized the redistributed traffic volumes and the Synchro software program for the Highway Capacity Manual results. The results showed that two locations would experience failing conditions. This would be at U.S. Route 13/ Naylor Mill Road which would require at least a partial grade separation and Log Cabin Road at Naylor Mill Road which is only caused by the delay from the side road.

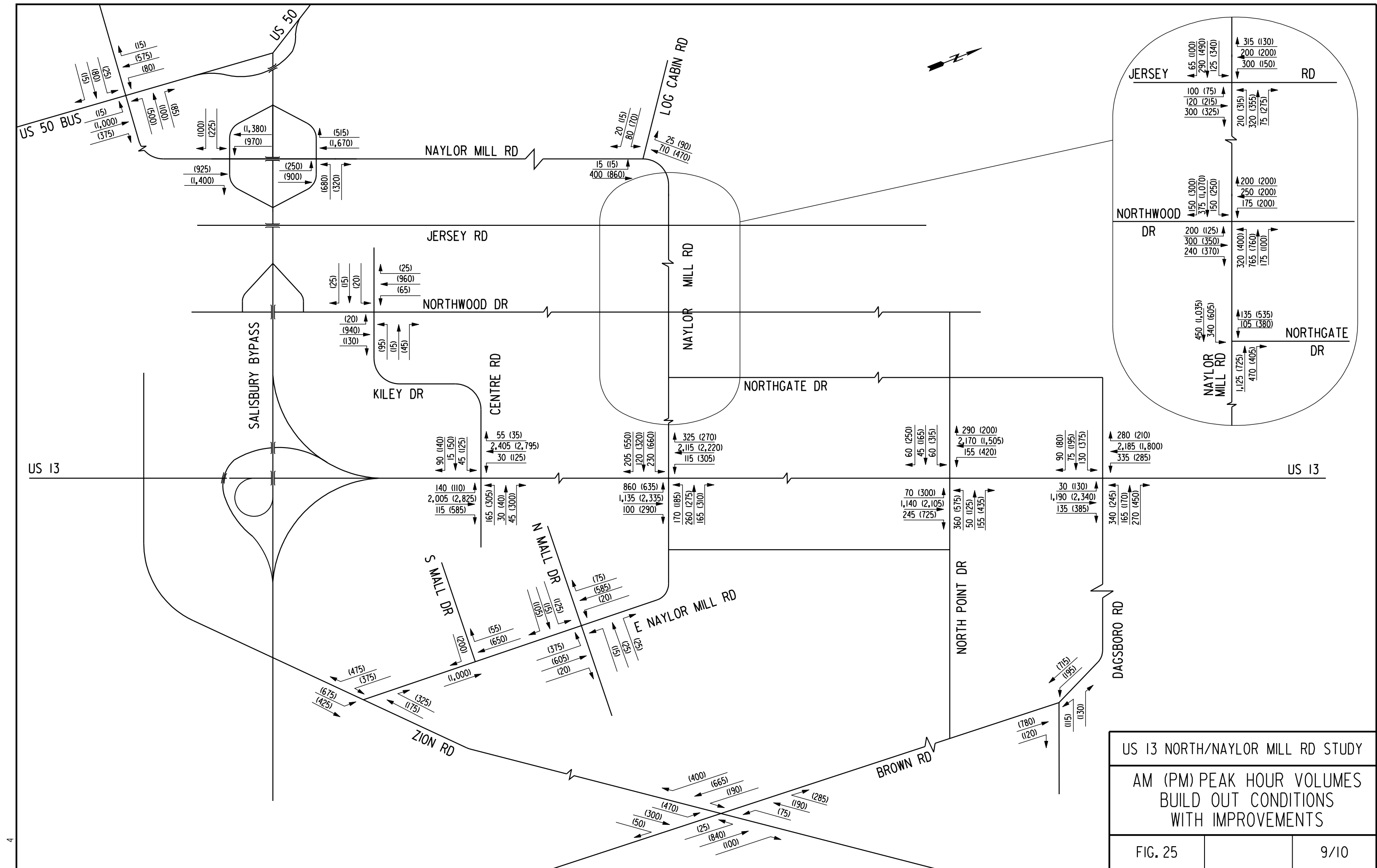
See Table 6 for LOS Comparison.

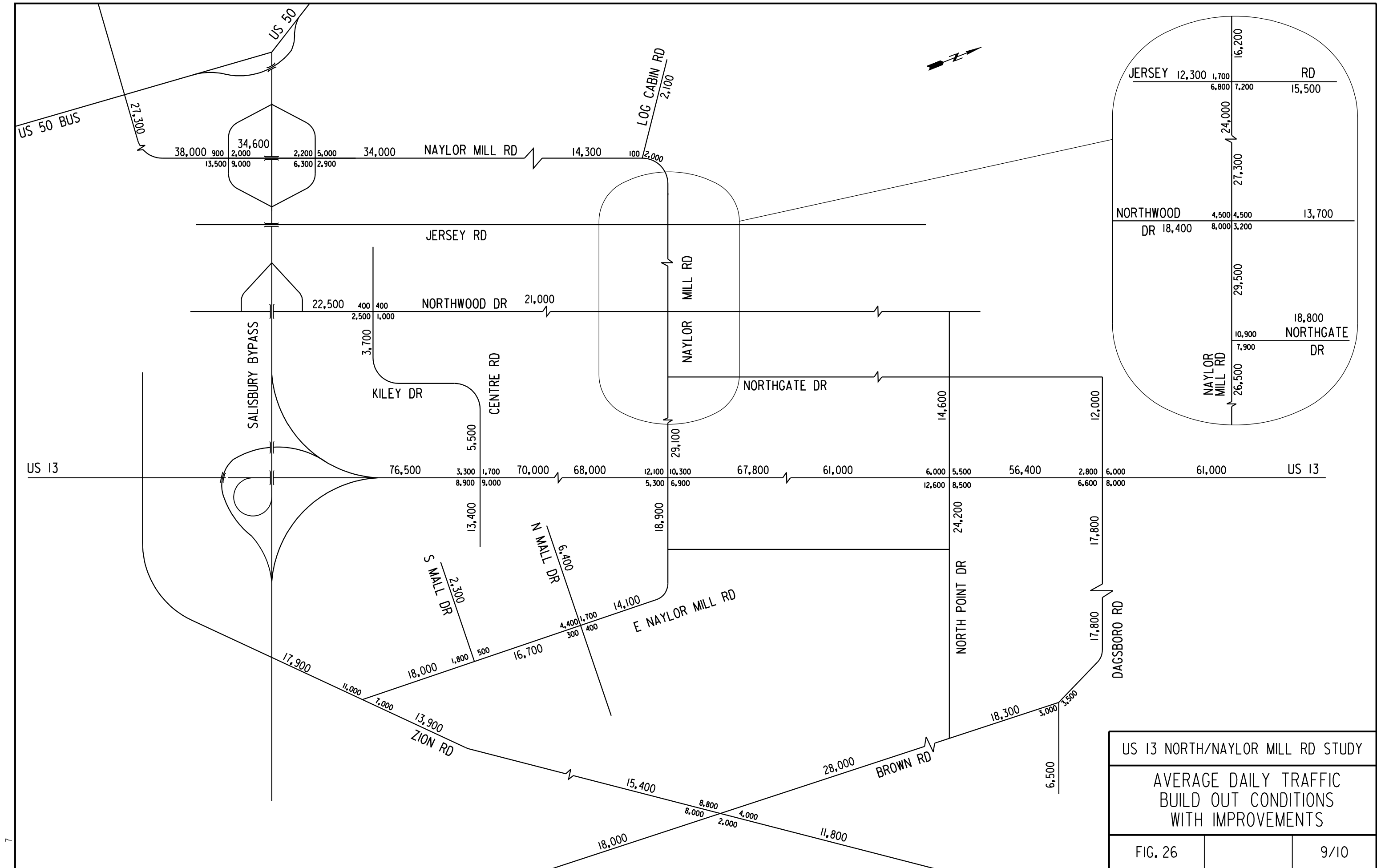
TABLE 6

BUILDOUT LEVEL OF SERVICE COMPARISON

Intersection	No Build	Build
	PM LOS	PM LOS
Dagsboro Rd @ U.S. Route 13	F	D
North Pointe Dr @ U.S. Route 13	F	E
Naylor Mill Rd @ U.S. Route 13	F	F
Centre Rd @ U.S. Route 13	F	D
Northwood Dr @ Kiley Dr	Westbound = F	
Dagsboro Rd @ Brown Rd	Northbound = F	C
Brown Rd @ Zion Rd	Southbound = F	C
Zion Rd @ Naylor Mill Rd	F	D
South Mall Drive @ Naylor Mill Rd	Eastbound = F	N/A
North Mall Drive @ Naylor Mill Rd	Eastbound = F	C
Northgate Dr @ Naylor Mill Rd	Southbound = F	D
Northwood Dr @ Naylor Mill Rd	Northbound = F	E
Jersey Rd @ Naylor Mill Rd	Roundabout v/c = .88	Roundabout v/c = .80
*Log Cabin Rd @ Naylor Mill Rd	Southbound = F	Southbound = F
U.S. Route 50 WB Ramp @ Naylor Mill Rd	Westbound = F	D
U.S. Route 50 EB Ramp @ Naylor Mill Rd	Eastbound = F	C
U.S. Route 50 Business @ Naylor Mill Rd	C	C

Signalized Intersections use HCM method to determine LOS
Unsignalized Intersections are represented with lowest approach LOS





VII. CONCLUSION

The U.S. Route 13 corridor north of U.S. Route 13 and 50 (Salisbury Bypass/ Ocean Gateway Bypass) is one of the most densely developed areas in Salisbury. There are many commercial properties bordering the roadway. The Centre at Salisbury located just north of US 50 is the area's largest development. There are many other roadways within the study limits including Centre Road, Dagsboro Road North Point Drive and Naylor Mill Road. Naylor Mill Road is the longest primary roadway in the study area. It has a mix of commercial, industrial, and residential development adjacent to the roadway. In the upcoming years, a large amount of growth is anticipated in the immediate study area including areas further away from U.S. Route 13.

Traffic data was collected for the study area including a detailed field review. Analysis of the existing traffic and crash data was performed. Travel demand forecasts were developed for 2015 based on projected pipeline development consisting of 21 developments, as well as additional regional growth. Recommendations were developed to be implemented in the short term based on the analysis of the data. These recommendations will improve existing and interim year 2015 traffic operations efficiently with increasing roadway safety through the study area. These recommendations include:

- Naylor Mill Road between Jersey Road and Scenic Drive – Trim trees and relocate signs.
- Naylor Mill Road between Scenic Road and Goddard Parkway – Construct a center turn lane.
- Naylor Mill Road @ Northgate Drive – Construct a right turn and left turn lane for the southbound Northgate Drive approach. Signalization should be considered when warrants are met.
- Dagsboro Road near Rum Ridge Road/Brown Road –Place signs and review passing zones.
- Dickerson Lane @ Dagsboro Road - Provide pavement markings and signs. Construct a left turn lane at Dickerson Lane.
- Kiley Drive @ Centre Road @ Zion Road – Standardize the intersection by reconstructing it as a four-way stop or roundabout.
- East Naylor Mill Road @ North Mall Drive – Signalization is recommended at this intersection.
- East Naylor Mill Road @ South Mall Drive – Convert the South Mall entrance intersection to a right in-right out.
- Naylor Mill Road @ Northwood Drive – Construct a bypass lane on Naylor Mill Road westbound and channelize the right turn movement from Northwood Drive to free flow onto eastbound Naylor Mill Road. Signalization is also recommended at this intersection.

- Naylor Mill Road @ Goddard Parkway/Armstrong Parkway – Resurface the roadway and provide additional signing. Construct a left turn lane from westbound Naylor Mill Rd. onto Armstrong Parkway and to Goddard Parkway.
- Naylor Mill Road – Perform friction test, review drainage and resurface if needed.

Based on future development and projected regional growth for the build out year of 2030 or beyond, the traffic volumes were analyzed to determine how the roadway system would operate. Many of these future developments are only conceptual in nature and therefore identified only as a number of acres of developments. This often over estimates the level of development that will actually occur in that time period. The results show that the study area is expected to experience congestion and delay on many roadways in the future. Failing levels of service are expected at many intersections located within the roadway network. It is recommended that various improvements be planned for to accommodate traffic volumes for the build out year of beyond 2030. These recommendations are as follows:

- 1) Extend East North Point Drive from its existing terminus to Brown Road
- 2) Construct Parsons Lake Drive from its existing terminus to Brown Road
- 3) Extend Jasmine Drive from East North Point Drive to Naylor Mill Road
- 4) Connect Northwood Road from Naylor Mill Road to Connelly Mill Road
- 5) Construct Dagsboro Road from its existing terminus west of U.S. Route 13 to tie into Northgate Drive extended
- 6) Extend Northgate Drive from Hampshire Road to Dagsboro Road extended
- 7) Extend West North Point Drive from Northgate Road extended to Northwood Drive extended
- 8) Connect Hampshire Road from Northgate Drive to Northwood Drive extended
- 9) Extend Brown Road from Zion Road to U.S. Route 50
- 10) Reconstruct U.S. Route 50/Naylor Mill Road interchange
- 11) Widen Naylor Mill Road from Northwood Drive to U.S. Route 13
- 12) Connect Parsons Lake Drive Extended and Centre Road
- 13) Provide Access Controls along U.S. Route 13 and improvements to the Naylor Mill Rd intersection
- 14) Realign the Dagsboro Rd @ Brown Rd intersection
- 15) Construct a Roundabout at Northwood Rd @ Kiley Drive
- 16) Signalize Zion Road @ Brown Road
- 17) Develop a Bicycle/Pedestrian Network
- 18) Expand Transit Service

APPENDIX

Table 1 - Proposed Developments (Plans Have Been Submitted)

#	NAME	DESCRIPTION	BUILDOUT	AS OF 2015
1	Westwood Bus. Ctr. Condo	Additional 15,000 s.f. bldg.	15,000 s.f. office bldg.	15,000 s.f. office bldg.
2	Windsor Development	Office/warehouse	47,388 s.f. office/warehouse	47,388 s.f. office/warehouse
3	Salisbury Aquatic Center	Aquatic facility & other recreational activities	60,070 s.f. facility	60,070 s.f. facility
4	Kraus Co.	Warehouse	44,475 s.f. warehouse	44,475 s.f. warehouse
5	Westwood Commerce Park PDD (Remainder)	Office/Warehouse	212 ac. of office/warehouse	106 ac. of office/warehouse
6	Sassafras Meadows	SF Residential	220 additional SF lots	110 SF lots
7	Westside Manor	SF Residential	95 SF lots	47 SF lots
8	Adventist Drive Sketch	SF Residential	7 SF lots	4 SF lots
9	New Dimensions Ministry	Place of Assembly	440 seat assembly & congregation facility	440 seat assembly & congregation facility
10	Jersey Rd.-Lockman Annex.	SF, MF Residential & Commercial	140 Residential units & 32,100 s.f. shopping center	70 Res. Units & 32,100 s.f. comm.
11	MBAS Annexation	Residential - TH	60 TH units	30 TH units
12	Three Creeks	SF Residential	352 SF lots	176 SF lots
13	Bluewater Business Park	24,190 s.f. office	24,190 s.f. office	24,190 s.f. office
14	Windsor Dr. Business Center	Office/warehouse	20,336 s.f. office/warehouse	20,336 s.f. office/warehouse
15	Villages of Parsons Lake, Sec. 2	SF & MF Residential	300 units	150 units
16	Remainder of Parsons Lake	SF & MF Residential	960 units	480 units
17	Brown Farm Annexation	SF & MF Residential	1,152 MF units	288 units
18	Addison Ct. Apartments	MF Residential & Commercial	300 MF units & 11,275 s.f. commercial building	300 MF units & 11,275 s.f. comm. building
19	North Point Commons	MF Residential	300 MF units	300 MF units
20	Martin's Mill	Residential & Institutional	157 MF units & church & related facilities expansion	78 MF units & church expansion
21	Aydelotte Farm PRD	Residential & Commercial	725 units and 3 ac. commercial	362 Res. units; 3 ac. comm.
TOTAL			151,389 s.f. office/warehouse; 212 ac. office/warehouse; 43,375 s.f. of commercial; 3 ac. of commercial; 60,070 s.f. aquatic facility; 440 seat church expansion; Unspecified church expansion; 4,768 Res. Units	151,389 s.f. office/warehouse; 106 ac. office/warehouse; 43,375 s.f. of commercial; 3 ac. of commercial; 60,070 s.f. aquatic facility; 440 seat church expansion; Unspec. church expan.; 2,395 Res. Units

Table 2 - Other Development Areas (No Plans Have Been Submitted)

#	NAME	DESCRIPTION	BUILDOUT	AS OF 2015
1	N/A	West side of U.S. Route 50	67 ac. of office/comm.	---
2	N/A	Intersection of Salisbury Bypass-Naylor Mill Rd.	62 ac. of office/comm.	---
3	N/A	Naylor Mill Rd./West side of West Rd.	30 Res. Units	---
4	N/A	Naylor Mill Rd./East side of West Rd.	45 ac. of office/comm.	---
5	N/A	Naylor Mill Rd./West of Log Cabin Rd.	58 Res. Units	---
6	N/A	SE corner of Naylor Mill Rd./Jersey Rd.	70 Res. Units	---
7	N/A	Between Log Cabin Rd. and Jersey Rd.	57 Res. Units	---
8	N/A	East side of Jersey Rd.	256 Res. Units	---
9	N/A	Connelly Mill Annexation Area	234 ac. of industrial land	---
10	N/A	North of Naylor Mill Rd., west of RR tracks	76 ac. of industrial land	---
11	N/A	West side of Goddard Parkway	20 ac. of industrial land	---
12	N/A	South of Naylor Mill Rd., west of Northwood Dr.	14 ac. of industrial land	---
13	N/A	North of Naylor Mill Rd./South of Hampshire Rd.	61 ac. of industrial land	---
14	N/A	East of Goddard Parkway, south of Connelly Mill Br.	83 ac. of industrial land	---
15	N/A	North of Hampshire Rd.	78 ac. of commercial land	---
16	N/A	South of Hampshire Rd.	20 ac. of commercial land	---
17	N/A	North of Naylor Mill Rd., west of Northgate Dr.	35 ac. of commercial land	---
18	N/A	South of Avalon Park	12 ac. of comm. land	---
19	N/A	North of Mill Pond Village	51 ac. of comm. land	---
20	N/A	East side of East Naylor Mill Rd.	18 ac. of comm. land	---
21	N/A	East of the Centre at Salisbury	15 ac. of comm. land	---
22	N/A	South of Zion Rd./West of Forest Plains Ln.	190 Res. Units	---
23	N/A	South of Zion Rd./East of Forest Plains Ln.	75 Res. Units	---
24	N/A	North of Zion Rd./West of Brown Rd.	168 Res. Units	---
25	N/A	North of Zion Rd./East of Brown Rd.	76 Res. Units	---
26	N/A	South of Dagsboro Rd.	159 Res. Units	---
TOTAL			403 ac. of commercial land; 488 ac. of industrial land; 1,139 Res. Units	---

