Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

TOWN OF NOLENSVILLE

MAJOR THOROUGHFARE PLAN

Prepared August 2005

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Town of Nolensville, Tennessee

Final Major Thoroughfare Plan

Prepared August 2005

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1. INTRODUCTION

The purpose of the Major Thoroughfare Plan is to identify short-term, mid-term, and long-term transportation system needs within the Town of Nolensville and to identify transportation improvements to meet those capacity and mobility needs. The basis of these recommendations are an evaluation of the existing transportation system, as well as an evaluation of the Year 2025 conditions of Nolensville's transportation system. The Year 2025 conditions are based on estimates of future demographics, future land use, and future transportation demand.

This document presents the results of the existing conditions analyses, the Year 2025 analyses, and the development of a final recommended Major Thoroughfare Plan for the Town of Nolensville. For this report, the following tasks were conducted:

- Background data collection, including demographics, land use, traffic counts, and field inventories;
- Analysis of existing conditions on major roadway segments;
- Analysis of historical traffic growth on major roadway segments;
- Identification of Year 2025 land use and demographics;
- Identification of recommended roadway improvements to address capacity and mobility issues through the Year 2025;
- Estimation of Year 2025 traffic volumes with implementation of the recommended roadway improvement projects;
- Analysis of Year 2025 traffic volumes with implementation of the recommended roadway network; and
- Prioritization of recommended improvements.

2. STUDY AREA AND DEMOGRAPHICS

Nolensville is an incorporated jurisdiction located in eastern Williamson County, Tennessee, approximately 20 miles southeast of downtown Nashville. Although the Town is primarily a residential community, there are also some shopping facilities, small office buildings, and institutional land uses provided to support the Town residents.

For the purposes of this planning effort, it was determined that the study area boundary would include areas that are currently outside the current corporate limits of the Town of Nolensville. Specifically, consideration was given to areas in which residential and commercial growth are likely to occur during the next 20 years. The study area is shown in Figure 1.

Currently, the Town of Nolensville is primarily a residential community that also includes small-scale support services and businesses. In January 2005, a Land Use Study was prepared by Bill Terry & Associates, and within that study, Nolensville's Year 2000, population was identified as 3,099 persons, and the Year 2005, population was estimated to be 3,273 persons.

Until recently, the residential developments were not typically developed as subdivisions and included large lots. Also, a large amount of undeveloped agricultural property remains within the Town limits and within the Urban Growth Boundary. However, a number of large residential subdivisions are being developed in Nolensville, and more are in the planning stage. Based on the completion of these developments, the information with the January 2005, Land Use Study identifies Nolensville's Year 2015, population as 8,528 persons. Assuming the same growth over an additional ten years, the Year 2025, population would be 13,783 persons.

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Study Area

N

No Scale

3. EXISTING CONDITIONS

3.1 EXISTING TRANSPORTATION SYSTEM

An inventory of existing roadway conditions was developed for the major roadways within the study area. The major roadway within the study area, Nolensville Road, is a two-lane arterial roadway that includes one travel lane in each direction. These travel lanes are 11-12 feet wide, and shoulders are provided in most locations outside the downtown core.

Within the study area, there are a number of additional roadways that provide important east-west connections:

- Britain Lane
- Sunset Road
- Sam Donald Road
- Clovercroft Road
- Williams Road
- York Road
- Rocky Fork Road
- And Kidd Road / McFarlin Road

These roadways, which are rural in nature and design, include one travel lane in each direction. The travel lanes are 9-11 feet wide, and shoulders are rarely provided. Also, significant horizontal and vertical curvature is often found on these roadways.

In the vicinity of Stonebrook Boulevard, the roadways that serve the residential and commercial properties are more suburban in nature. Although these roadways are two-lane roadways, the travel lanes are often 12-16 feet wide, and shoulders are provided in most locations. However, these roadways do not provide any significant mobility or connectivity to areas outside this specific community.

The results of the inventory are shown in Table 1.

TABLE 1. INVENTORY OF EXISTING CONDITIONS

Roadway	Segment	Lanes	Width (ft)	Count Collected By	Year 2004 ADT	LOS	Shoulders	Curvature Issues?	Bicycle Facilities ?	Transit Facilities ?
Nolensville Road	north of downtown	2	22-26	TDOT	8,850	B	Limited	No	No	No
Nolensville Road	south of downtown	2	22-26	FTG	4,370	A	Limited	No	No	No
Britain Lane	west of Nolensville Rd	2	20-22	FTG	470	A	No	Yes	No	No
Sunset Road	west of Nolensville Rd	2	20-22	FTG	2,720	A	No	Yes	No	No
Sam Donald Road	west of Nolensville Rd	2	20-22	FTG	550	A	No	Yes	No	No
Clovercroft Road	west of Nolensville Rd	2	20-22	FTG	2,410	A	No	Yes	No	No
York Road	east of Nolensville Rd	2	20-22	FTG	1,270	A	No	Yes	No	No
Rocky Fork Road	east of Nolensville Rd	2	20-22	TDOT	2,910	A	No	Yes	No	No
Kidd / McFarlin Road	east of Nolensville Rd	2	20-22	FTG	2,220	A	No	Yes	No	No
Fly Road	south of McFarlin Road	2	20-22	FTG	780	A	No	Yes	No	No

3.2 EXISTING AVERAGE DAILY TRAFFIC VOLUMES

As part of an annual coverage count program, TDOT collects average daily traffic (ADT) volumes on major interstate, arterial, and collector roadway segments throughout Tennessee. For the purpose of this study, the count locations within the study area and the Year 2004, counts at these locations were obtained from TDOT. In addition to the TDOT counts, recent ADT counts have been collected by Fischbach Transportation Group, Inc.

Currently, the portion of Nolensville Road that travels through the town of Nolensville accommodates approximately 8,850 vehicles per day. With the exception of Nolensville Road, each of the roadways within the study area accommodates fewer than 5,000 vehicles per day.

Existing traffic volumes are shown in Figure 2.

3.3 CAPACITY ANALYSIS ON EXISTING ROADWAY NETWORK

Capacity analyses were conducted for the roadway segments where ADT counts were available. The capacity analysis result in the determination of a Level of Service (LOS) for a roadway segment. The LOS is a concept used to describe how well an intersection or roadway segment operates. LOS A is the best, while LOS F is the worst. LOS D is typically considered to be the minimum acceptable LOS for adequate traffic operations. Table 2 includes a general description of traffic operations for each LOS.

The methodology used in evaluating the daily capacity of roadways was developed by the consultant team and is based on research performed by the State of Alabama Department of Transportation and the Maryland State Highway Administration. Calculation of LOS is determined by comparing roadway classification, number of lanes and travel characteristics to established levels. Table 3 presents the LOS thresholds for a variety of roadway types and sizes.

As shown, each of the traffic volumes within the study area are within the capacity of a standard two-lane roadway. However, the existing substandard cross-sections on many of the roadways within the study area limit the ability of these facilities to safely and efficiently accommodate the existing traffic volumes.

Existing levels of service are shown in Figure 2.

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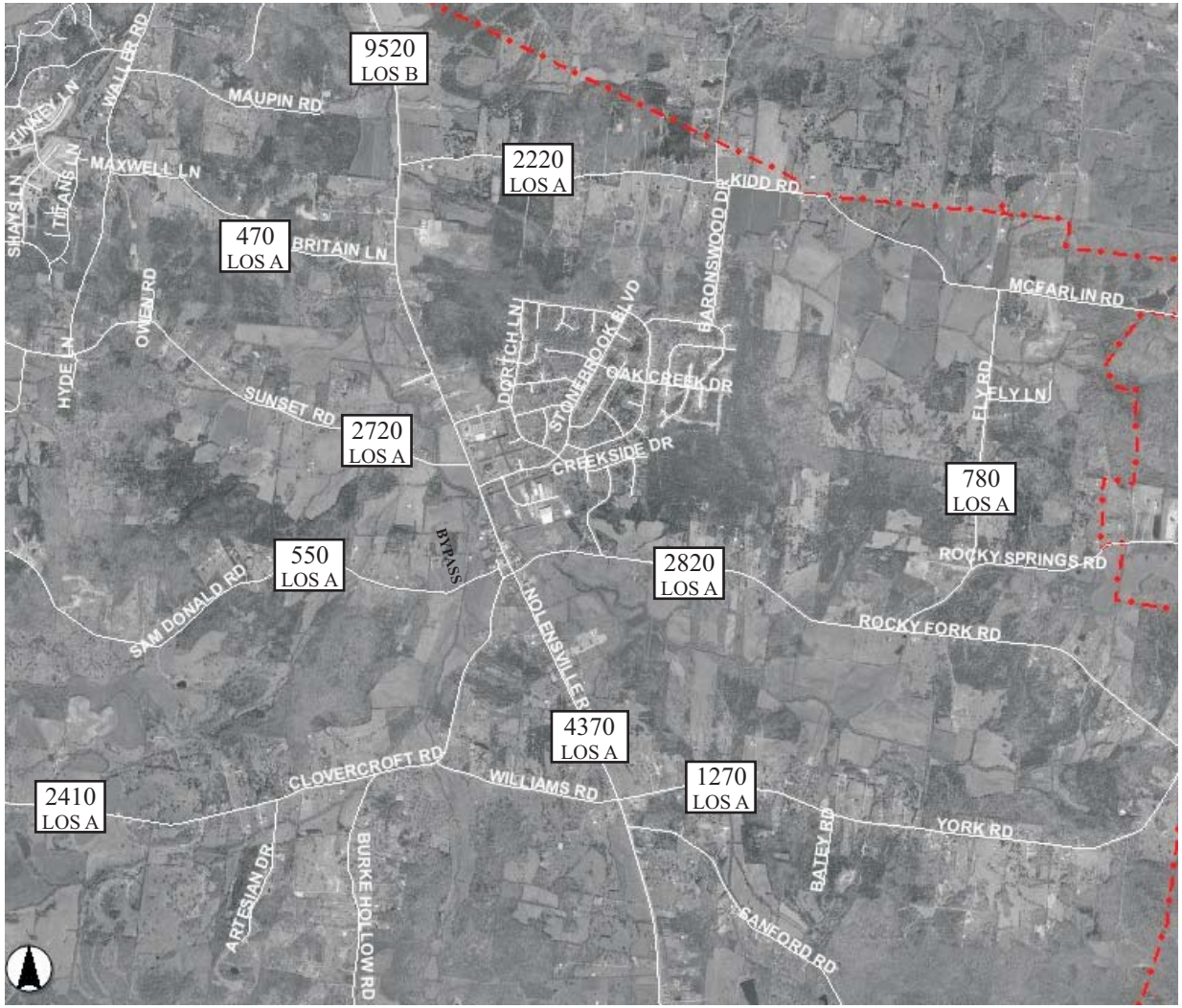
Year 2004 Existing Traffic Volumes



N

No Scale

6500
LOS A

Daily Traffic Volume
Level of Service

TABLE 2. GENERAL DESCRIPTIONS OF LEVEL OF SERVICE

LEVEL OF SERVICE	DESCRIPTION
A	Represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high.
B	Within the range of stable flow, but the presence of others in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A.
C	Within the range of stable flow, but LOS C marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.
D	LOS D represents high-density, but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.
E	LOS E represents operating conditions at or near capacity levels. Freedom to maneuver within the traffic stream is extremely difficult. Comfort and convenience levels are extremely poor, and driver frustration is generally high.
F	LOS F is used to define forced or breakdown flow. This condition exists when the amount of traffic approaching a point exceeds the amount which can traverse the point.

Source: Highway Capacity Manual 2000 (HCM2000)

TABLE 3. ROADWAY SEGMENT ADT'S AND LOS

ROAD TYPE	LOS A	LOS B	LOS C	LOS D	LOS E
2 Lane Arterial	6,500	9,400	11,600	14,000	18,700
3 Lane Arterial	8,200	11,600	14,400	17,500	23,300
4 Lane Arterial	10,700	15,400	19,000	23,000	30,700
5 Lane Arterial	12,400	17,600	21,900	26,500	35,300
2 Lane Collector	5,100	7,400	9,100	11,000	14,700
3 Lane Collector	6,400	9,200	11,300	13,700	18,300
4 Lane Collector	8,400	12,000	14,900	18,000	24,000
5 Lane Collector	10,700	15,400	19,000	23,000	30,700

Source: Alabama Department of Transportation and Maryland State Highway Administration

3.4 HISTORICAL GROWTH ON NOLENSVILLE ROAD

It is important to note that the Tennessee Department of Transportation (TDOT) conducts an annual count program throughout the state. This count program includes the annual collection of average daily traffic (ADT) counts at numerous fixed locations. Specifically, consideration was given to the typical annual growth that has occurred in the vicinity of the project site. The results of the growth analysis are shown in Table 4.

TABLE 4. HISTORICAL GROWTH ON NOLENSVILLE ROAD

Year	Station 51 Nolensville Road Average Daily Traffic (ADT) Volume	Annual Growth	Overall Growth
2001	9,910		
2002	11,010	11.10%	
2003	9,520	-13.53%	
2004	8,850	-7.04%	**-3.57%**

4. RECOMMENDATIONS

4.1 IMPROVEMENT PROJECTS

As previously described, there is a direct correlation between land use and trip generation, and each particular land use generates traffic based on the size and intensity of the developed area. Using the information included in the Town of Nolensville's January 2005, Land Use Study, projected traffic volumes were developed for the roadway segments within the study area. The results of this exercise indicate that a widening improvement will be necessary on Nolensville Road through the Town of Nolensville. For the other major roadways within the study area, improvements will be needed primarily to improve the safety and efficiency of vehicular travel on these roadways. Also, in order to accommodate the traffic volumes projected for the Year 2025, as well as improve the opportunities for mobility and connectivity within the study area, certain roadway extensions and realignments are needed.

As a result, Fischbach Transportation Group, Inc. developed a series of recommended transportation projects that will provide adequate traffic capacity and improve overall mobility in the Nolensville area. These recommendations shown in Figure 3 and described below.

Nolensville Road
As previously mentioned, this roadway serves as the major arterial roadway within the study area. In order to accommodate the future traffic volumes on Nolensville Road, it is recommended that this facility be widened to five lanes through the study area. Also, it is important to note that the Tennessee Department of Transportation (TDOT) has prepared a Feasibility Analysis for a Bypass around the downtown core. Should the Bypass be constructed, it is likely that the existing portion of Nolensville Road that travels through the downtown core will not need to be widened.

Britain Lane / Maxwell Lane
It is recommended that these two facilities be connected in order to provide a connection between Nolensville Road and Waller Road. As a continuous collector roadway, this facility should include one travel lane in each direction, plus shoulders, with turn lanes at Nolensville Road and Waller Road. This improved connection is needed in order to facility mobility and connectivity in the growing community. Such a connection will help to reduce the daily and peak hour traffic volumes on both Nolensville Road, as well as provide adequate access to the properties bounded by these roadways.

Sunset Road
It is recommended that this facility be improved as a minor arterial roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections. Projected traffic volumes indicate that this project is necessary to alleviate the congestion which will occur on this roadway segment unless additional capacity is provided. Also, this improved connection is needed in order to facility mobility and connectivity in the growing community. Such a connection will help to reduce the daily and peak hour traffic volumes on Nolensville Road, as well as provide adequate access to the properties adjacent to this roadway.
Sam Donald Road

It is recommended that this facility be improved as a minor arterial roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections. In addition, the easternmost portion of Sam Donald Road should be realigned so that it intersects Nolensville Road south of the current intersection. Projected traffic volumes indicate that this project is necessary to alleviate the congestion which will occur on this roadway segment unless additional capacity is provided. Also, this improved connection is needed in order to facility mobility and connectivity in the growing community. Such a connection will help to reduce the daily and peak hour traffic volumes on Nolensville Road, as well as provide adequate access to the properties adjacent to this roadway.

Clovercroft Road / Williams Road

It is recommended that the east-west portion of Clovercroft Road be improved as a minor arterial roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections. In addition, the intersection of Clovercroft Road and Williams Road should be reconstructed so that Clovercroft Road and Williams Road form a continuous east-west connection between the City of Brentwood and Nolensville Road. Projected traffic volumes indicate that this project is necessary to alleviate the congestion which will occur on this roadway segment unless additional capacity is provided. Also, this improved connection is needed in order to facility mobility and connectivity in the growing community. Such a connection will help to reduce the daily and peak hour traffic volumes on Nolensville Road, as well as provide adequate access to the properties adjacent to this roadway.

North-South Portion of Clovercroft Road

It is recommended that the north-south portion of Clovercroft Road be improved as a collector roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections. Projected traffic volumes indicate that this project is necessary to alleviate the congestion which will occur on this roadway segment unless additional capacity is provided. Also, this improved connection is needed in order to facility mobility and connectivity in the growing community. Such a connection will help to reduce the daily and peak hour traffic volumes on Nolensville Road, as well as provide adequate access to the properties adjacent to this roadway.

New North-South Roadway from Clovercroft Road to Sunset Road at Waller Road

It is recommended that a new north-south roadway be constructed as a collector roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections. Projected traffic volumes indicate that this project is necessary to facility mobility and connectivity in the growing community. Such a connection will help to reduce the daily and peak hour traffic volumes on Nolensville Road, as well as provide adequate access to the properties adjacent to this roadway.

York Road

It is recommended that York Road be improved as a minor arterial roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections. Projected traffic volumes indicate that this project is necessary to alleviate the congestion which will occur on this roadway segment unless additional capacity is provided. Also, this improved connection is needed in order to facility mobility and connectivity in the growing community. Such a

connection will help to reduce the daily and peak hour traffic volumes on Nolensville Road, as well as provide adequate access to the properties adjacent to this roadway.

Rocky Fork Road
It is recommended that Rocky Fork Road be improved as a minor arterial roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections. In addition, the westernmost portion of Rocky Fork Road should be reconstructed so that it intersects Nolensville Road directly opposite the realignment of the easternmost portion of Sam Donald Road. Projected traffic volumes indicate that this project is necessary to alleviate the congestion which will occur on this roadway segment unless additional capacity is provided. Also, this improved connection is needed in order to facility mobility and connectivity in the growing community. Such a connection will help to reduce the daily and peak hour traffic volumes on Nolensville Road, as well as provide adequate access to the properties adjacent to this roadway.

Kidd Road / McFarlin Road
It is recommended that Kidd Road and McFarlin Road be improved as a minor arterial roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections. Projected traffic volumes indicate that this project is necessary to alleviate the congestion which will occur on this roadway segment unless additional capacity is provided. Also, this improved connection is needed in order to facility mobility and connectivity in the growing community. Such a connection will help to reduce the daily and peak hour traffic volumes on Nolensville Road, as well as provide adequate access to the properties adjacent to this roadway.

New North-South Roadway from Rocky Fork Road to Kidd Road, west of Fly Road
It is recommended that a new north-south roadway be constructed as a collector roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections. Projected traffic volumes indicate that this project is necessary to facility mobility and connectivity in the growing community. Such a connection will help to reduce the daily and peak hour traffic volumes on Nolensville Road, as well as provide adequate access to the properties adjacent to this roadway.

Fly Road
It is recommended that Fly Road be improved as a collector roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections. In addition, the southernmost portion of Fly Road should be reconstructed so that it intersects Rocky Fork Road east of the current intersection of these roadways. Also, this roadway should be extended south of Rocky Fork Road to York Road. Projected traffic volumes indicate that this project is necessary to alleviate the congestion which will occur on this roadway segment unless additional capacity is provided. Also, this improved connection is needed in order to facility mobility and connectivity in the growing community. Such a connection will help to reduce the daily and peak hour traffic volumes on Nolensville Road, as well as provide adequate access to the properties adjacent to this roadway.

New East-West Roadway between New North-South and Fly
It is recommended that a new east-west roadway be constructed as a collector roadway to include one travel lane in each direction, plus shoulders, with turn lanes at key intersections.

Projected traffic volumes indicate that this project is necessary to facility mobility and connectivity in the growing community. Such a connection will provide adequate access to the properties adjacent to this roadway.

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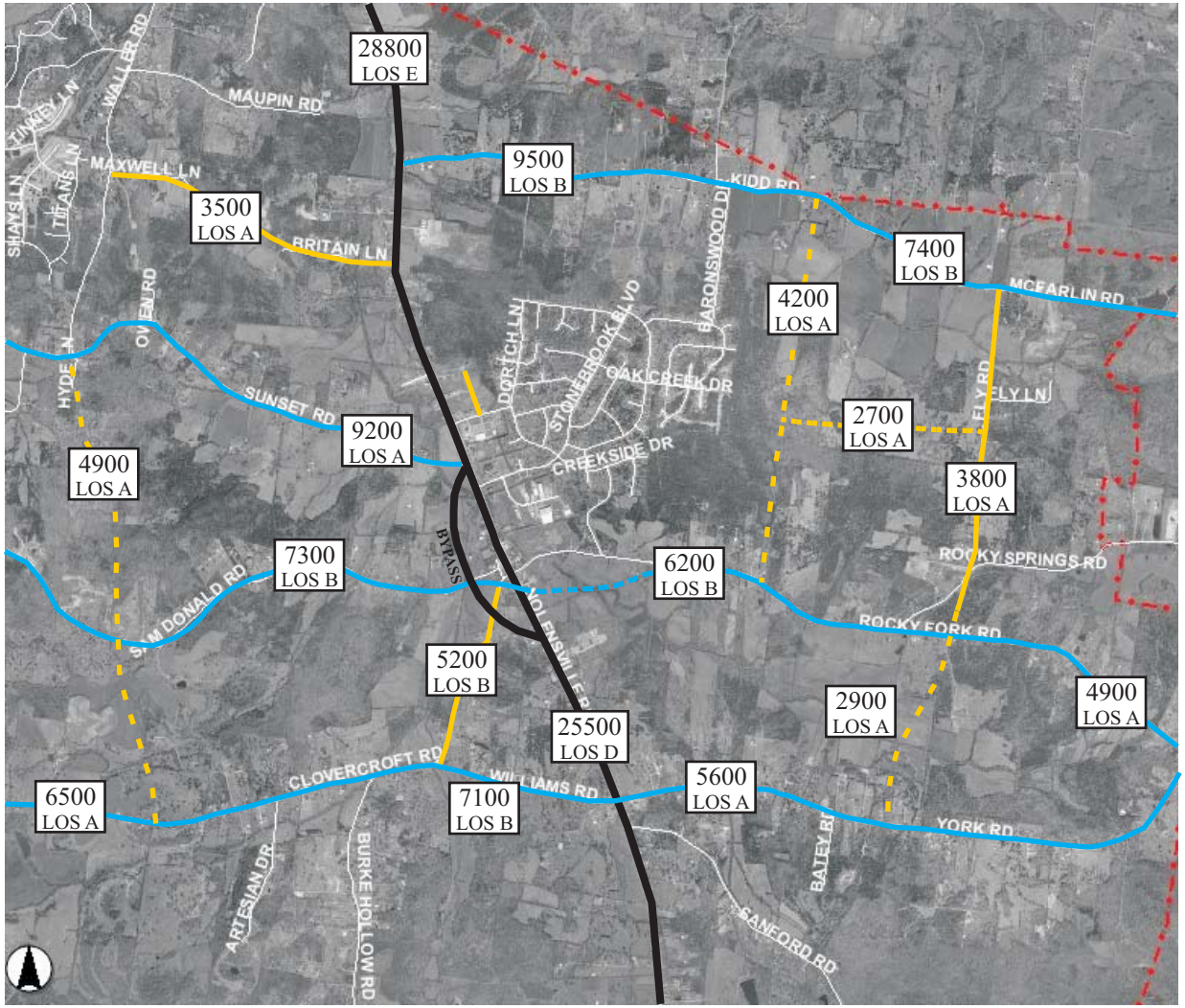
Year 2025 Projected Traffic Volumes



N

No Scale

6500 LOS A — Daily Traffic Volume Level of Service

Major Arterial Roadway (5 lanes)
Minor Arterial Roadway (3 lanes)
Collector Roadway (2-3 lanes)

4.2 YEAR 2025 DAILY VOLUMES ON THE RECOMMENDED NETWORK

Because there is a direct correlation between land use and trip generation, each particular land use generates traffic based on the size and intensity of the developed area. Therefore, using the historical growth rates, as well as the potential for future residential and commercial development within the study area, projected traffic volumes were developed for the Year 2025. Also, these traffic volumes reflect the implementation of the recommended projects within the study area. These traffic volumes are shown in Figure 3 and Table 5.

4.3 YEAR 2025 LOS ON THE RECOMMENDED NETWORK

Based on the Year 2025 traffic volumes, a Level of Service was identified for the roadway segments within the study area. Specifically, for each roadway segment analyzed, a LOS was determined by comparing roadway classification, number of lanes, and travel characteristics to the established thresholds. These Levels of Service are shown in Figure 3 and Table 5.

TABLE 5. PROJECTED CLASSIFICATIONS, LANEAGE, TRAFFIC VOLUMES, AND LEVELS OF SERVICE

Roadway	Segment	Classification	Lanes	ADT	LOS
Nolensville Road	downtown	Major Arterial	2	23,700	F
Britain Lane	west of Nolensville Road	Collector	2	3,500	A
Sunset Road (new alignment)	west of Nolensville Road	Minor Arterial	3	8,400	B
Sunset Road (old alignment)	west of Nolensville Road	Collector	2	5,100	A
Sam Donald Road	west of Nolensville Road	Minor Arterial	3	7,300	A
Clovercroft Road (north-south)	west of Nolensville Road	Collector	2	5,200	B
Clovercroft Road (east-west)	west of Nolensville Road	Minor Arterial	3	7,100	A
Split Log Road (north-south)	western edge of the study area	Collector	2	4,900	A
York Road	east of Nolensville Road	Minor Arterial	3	5,600	A
Rocky Fork Road	east of Nolensville Road	Minor Arterial	3	6,200	A
Oak Creek Drive (Ext.)	east of current town limits	Collector	2	2,700	A
Kidd Road / McFarlin Road	east of Nolensville Road	Minor Arterial	3	7,400	A
Fly Road	south of Oak Creek Drive (Ext.)	Collector	2	3,800	A

5. IDENTIFICATION AND EVALUATION OF MANAGEMENT STRATEGIES

5.1 TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is a general term for various strategies that increase transportation system efficiency. Specifically, TDM emphasizes the movement of people and goods rather than automobiles and emphasizes public transit, ridesharing and non-motorized travel, particularly under congested urban conditions. Some TDM strategies improve the transportation options available to consumers while other strategies create changes in trip scheduling, route, destination or mode. Although most individual TDM strategies only affect a small portion of total travel, the cumulative impacts of a comprehensive TDM program can be significant.

The Institute of Transportation Engineers (ITE) identifies the following TDM strategies that tend to be particularly effective at reducing traffic congestion in communities the size of the Town of Nolensville:

Ridesharing Programs

While carpooling uses private, individual automobiles, vanpooling uses vans that are owned by a business, non-profit agency, or government agency and made available specifically for commuting. Vanpooling is particularly suitable for commutes that are longer than 10 miles. Either form of ridesharing has a low cost per passenger-mile, and ridesharing is one of the most common and cost-effective alternatives to single-occupant vehicles. This is particularly true in areas that are not well served by public transit. Also, ridesharing is an important mobility option for non-drivers, particularly in small towns and rural areas. However, for work trips, carpooling and vanpooling are only appropriate for commuters with predictable schedules. For this reason, many commuters do not rideshare full-time but instead share rides a couple of times each week. Ridesharing can reduce peak-period vehicle trips and therefore reduce congestion, parking costs, incident risks, and pollution emissions. Such programs can be developed either informally or with the help of ridematching systems maintained by employment centers or government agencies.

Flextime

Some employment centers allow employees some flexibility in their daily work schedules. For example, rather than all employees working 8:00 to 4:30, some might work 7:30 to 4:00, and others 9:00 to 5:30. This shifts travel to off-peak periods, which can reduce traffic congestion directly. Alternatively, telecommuting involves the use of telephone, internet, and fax capabilities to substitute for physical travel. This gives people a way to avoid traveling under congested conditions.

Transit Improvements

Improvements or additions to existing transit systems can be effective congestion reduction strategies. These modes tend to be particularly cost effective under urban-peak travel conditions, when congestion problems are most severe. Some studies find that communities with good transit systems have significantly less traffic congestion than those that do not, because they tend to encourage more efficient overall transportation and land use patterns. Typically, if a corridor has enough vehicle traffic to experience traffic congestion there is enough demand for transit and ridesharing to provide congestion reduction benefits. However, many transit systems are not effective in communities where automobile ownership and usage is prized. Also, many transit systems are not effective in communities where land use policies do not encourage transit usage. Specifically, standard suburban neighborhoods typically lack the development densities that are necessary to support conventional fixed-route public transportation. In addition, the circuitous street patterns prevent effective bus circulation and therefore make it difficult to provide efficient and effective transit service. Also, the circuitous street patterns force long, uncomfortable walks on roadways that may not include sidewalks. Often, the only bus stops within such developments are located on the arterial roadways that serve the neighborhood. In contrast, interconnected street patterns facilitate efficient bus routings through neighborhoods. Because interconnected roadway networks promote alternative modes of transportation, adequate pedestrian facilities are available between the land uses and the bus facilities. Also, walking distances to bus stops are reduced because of shorter blocks and the interconnected roadway network.

Park and Ride Facilities

In urban settings, park and ride lots are often provided at transit stations, bus stops, and highway on-ramps. In more suburban settings, existing, underutilized parking lots – such as shopping center parking lots – are designated and used for park and ride lots. For most motorists who use park and ride lots, parking is generally free or significantly less expensive than in urban centers. Typically, park and ride facilities can increase transit and rideshare travel. Specifically, by encouraging shifts to transit and ridesharing, park and ride facilities reduce urban traffic congestion and worksite parking demand. However, such a program only provides modest reductions in local road traffic, pollution, energy use and consumer costs, since a local automobile trip is still made. Costs are primarily associated with facility construction, which typically costs several thousand dollars per space, and facility operation. Therefore, in order to maximize the cost-efficiency of such a program, park and ride facilities should be developed as part of an overall transit and rideshare improvement program. Also, ridesharing is typically at it most efficient when several smaller park and ride facilities are provided in different locations.

Formation of a Transportation Management Association (TMA)

Transportation Management Associations (TMAs) are private, non-profit, member-controlled organizations that provide transportation services within a jurisdiction, commercial area, or institutional land use. Typically, regional or local governments, chambers of commerce, or major employers can help create a TMA and provide seed funding. Often, longer-term funding for is provided through dues paid by member businesses and government grants.

TMAs provide an institutional framework for TDM programs and services. In particular, TMAs can provide one or more of the following services in order to encourage more efficient use of transportation and parking resources.

- Access Management
- Commute Trip Reduction
- Commuter Financial Incentives
- Flextime Support
- Guaranteed Ride Home Services
- Marketing and Promotion
- Pedestrian and Bicycle Planning
- Rideshare Matching and Vanpool Coordination
- Shared Parking Coordination
- Shuttle Services
- Special Event Transport Management
- Telecommuting Support
- Transit Improvements

Also, TMAs can support land use and development to create more accessible and efficient land use patterns. Finally, TMAs can provide parking management and brokerage services that result in more efficient use of parking resources, thereby reducing the need to expand parking capacity and reduce the total amount of land that must be paved

5.2 TRANSPORTATION SYSTEM MANAGEMENT

Transportation System Management (TSM) is a general term for various strategies that increase transportation system capacity. Specifically, TSM emphasizes the ability to maximize the capacity of an existing transportation system without adding additional infrastructure. The Institute of Transportation Engineers (ITE) identifies the following TSM strategies that tend to be particularly effective at reducing traffic congestion in communities the size of the Town of Nolensville:

Intelligent Transportation Systems
Intelligent Transportation Systems include the application of a wide range of new technologies, including driver information, vehicle control and tracking systems, transit improvements and electronic charging (see ITS Online and ITS America). These can provide a variety of transportation improvements, including driver convenience, reduced congestion, increased safety, more competitive transit, and support for pricing incentives.

Motorist Information Systems
Motorist information can include changeable message signs, radio reports and Internet information about traffic conditions. These can reduce motorist stress by letting them anticipate conditions.

Incident Detection and Management

A significant portion of traffic congestion results from some sort of traffic incident, such as a disabled vehicle, a crash or dangerous driving. Many urban regions have coordinated programs that prevent, identify and respond to such events quickly and efficiently. These may include centralized traffic management centers, video traffic surveillance, emergency response teams and special resources for dealing with specific problems, such as cranes and even helicopters to move disabled vehicles.

One-Way Streets

In some situations, converting from two-way to one-way streets. This can increase traffic flows and simplify intersections, although it may make access to buildings less convenient.

R*eversible Lanes*

In some situations it is possible to have a traffic lane that is reversed to carry traffic in the direction of maximum flow, for example, into a city center during the morning rush hour and outward during the evening rush hour.

Intersection Improvements

Various strategies that increase intersection capacity can reduce delays, since intersections are often a limiting factor in roadway traffic flow. These include additional lanes at the intersection approach, left- and right-turn lanes, and improved signal synchronization.

6. CONNECTIVITY AND ACCESS MANAGEMENT STRATEGIES

Connectivity

Typically, an interconnected network of streets and sidewalks serve to disperse vehicular trips. This pattern, which also includes the elimination of many dead-end roads, provides multiple route choices, and so the overall network capacity is increased, vehicular traffic is dispersed, and congestion is reduced. Also, this network encourages alternative transportation modes such as walking and biking by making such modes practical, safe, and attractive for short trips. With this interconnectivity, neighborhood streets serve local residential trips, other neighborhood trips, and some through traffic. Any opportunity to increase the connectivity of existing roadways within the existing neighborhoods east of Nolensville Road would facilitate efficient traffic operations within the study area.

In neighborhoods with effective and well-utilized interconnectivity, the roadways are usually designed for speeds of 15-25 mph. These low speeds are encouraged by the provision of narrow street widths and the placement of on-street parking. Also, low vehicle speeds are supported by the prevalence of T-intersections, significant pedestrian activity, and interesting streetscapes. Typically, such streets have one travel lane in each direction and parking on at least one side, for a width of 28-30 feet. Overall, the connected patterns of well-designed streets improve community access in spite of low design speeds and narrow widths. These roadway characteristics are not consistent with those that are currently found in the existing neighborhoods east of Nolensville Road.

Traffic congestion and roadway costs tend to increase with lower development densities and increased dependence on private automobiles. Regardless of population density, transportation systems that include greater street connectivity, a more pedestrian-friendly environment, shorter route options, and more extensive transit service tend to reduce per-capita vehicle travel, congestion delays, traffic accidents and pollution emissions.

Often, the roadways within a typical suburban neighborhood design are designed without any sidewalks at all. Where sidewalks are provided, they are typically four feet wide, and they often lack a grass strip and/or parking strip to provide a buffer between pedestrians and moving vehicles. In contrast, more urban developments are designed so that walking is as convenient as possible. Specifically, the design of urban developments include considerable emphasis on short walking distances between land uses so that the walking experience is both safe and pleasant. Minimum sidewalk widths are 5-6 feet so that two pedestrians are able to walk comfortably side-by-side.

For standard suburban neighborhood developments, trip generation estimates are based on the tendency for people to travel in automobiles between individual, stand-alone land uses that are found in non-adjacent developments. For these developments, the rate at which automobile trips are generated strongly varies with the land use characteristics of particular sites, location of particular sites, and time of day. In contrast, within neighborhood developments that include adequate connectivity, land uses may be strategically located in order to reduce trip generation. Specifically, the land uses are co-mingled so that one trip may serve several purposes. Also, by reducing distances between residences and town centers, people more likely to walk or bike

between such land uses. Overall, these neighborhoods are more self-sufficient and therefore capture many of their own trips, thereby reducing the overall internal and external vehicle trip generation.

Access Management

Many urban and suburban jurisdictions have implemented one or more access management strategies in order to link roadway design to land use in order to improve access to properties on either side of a given transportation facility. Such practices include limiting the number of driveways and intersections on arterial roadways, constructing medians to control turning movements, encouraging clustered development, and creating more pedestrian-oriented street designs. Specifically, the following measures increase vehicle speeds, reduce congestion delays, and reduce incidents:

1. Limit the number of driveways per lot
2. Locate driveways away from intersections
3. Connect parking lots and consolidate driveways so that motorists are able to travel between parcels without reentering an arterial
4. Increase minimum lot frontage on major streets
5. Promote a connected street system so as to avoid street networks that direct all local traffic onto arterial roadways
6. Encourage internal access to outparcels so that numerous curb cuts are avoided on arterial roadways
7. Regulate the location, spacing, and design of driveways

7. PRIORITIZATION OF RECOMMENDED PROJECTS

Consideration was given to the prioritization of recommended projects so that the Town of Nolensville is able to schedule the completion of each project and identify appropriate funding. Specifically, consideration was given to the effect that each improvement project will have on projected traffic volumes, transit and bicycle usage, vehicle occupancy, pedestrian accommodation, and safety, and quality of life. The results of this consideration suggest that, because the majority of the recommended projects are improvements to provide standard cross-sections on existing roadway facilities, these projects cannot be differentiated in terms of priority. Specifically, rather than imposing a fixed schedule, the following projects should be completed as developments are approved an constructed with access on these roadways:

1. Britain Lane / Maxwell Lane
2. Sunset Road
3. Sam Donald Road
4. Clovercroft Road / Williams Road
5. North-South Portion of Clovercroft Road
6. York Road
7. Rocky Fork Road
8. Kidd Road / McFarlin Road
9. Fly Road

In addition, the following projects should be completed as developments are approved an constructed with access on these roadways:

1. New North-South Roadway from Clovercroft Road to Sunset Road at Waller Road
2. New North-South Roadway from Rocky Fork Road to Kidd Road, west of Fly Road
3. New East-West Roadway between New North-South and Fly

However, because Nolensville Road serves as the primary north-south connection through the study area, improvements to this facility should be expedited. Specifically, this facility should be widened and improved, including the provision of turn lanes at key intersections and the construction of the proposed Bypass within five years.

8. IDENTIFICATION OF RECOMMENDED CROSS-SECTIONS

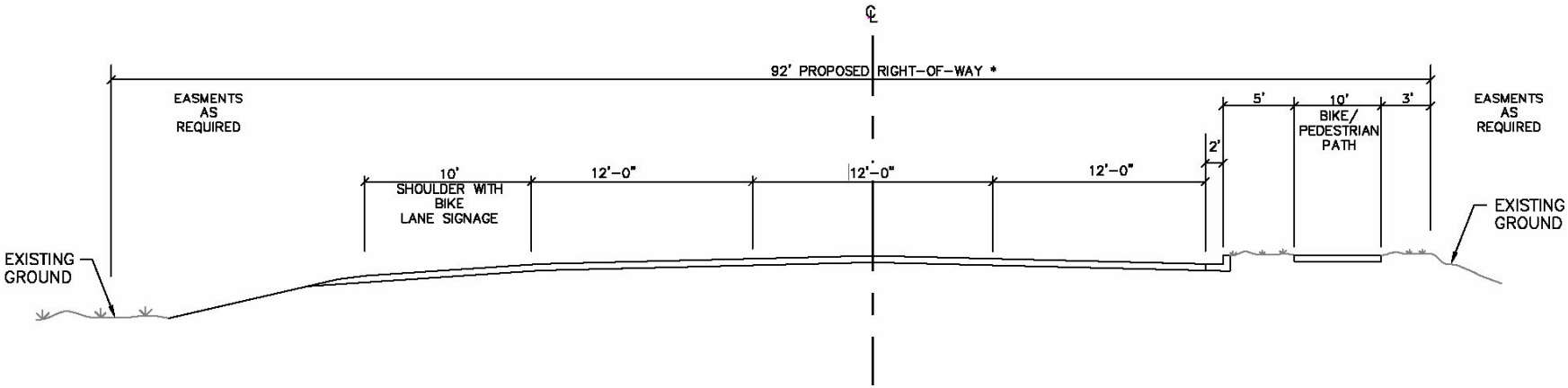
As shown in Figure 3 and Table 5, a recommended classification system has been identified for the major roadways within the study area. Specifically, the roadway facilities are classified as collector roadways, minor arterial roadways, and major arterial roadways. This type of hierarchical street pattern serves to collect the vehicle trips and distribute them to facilities that have increasingly higher capacities.

For each of these roadway classifications, lane widths should be 11-12 feet, and a shoulder at least five feet wide should be provided on each side of each roadway. Also, it would be desirable to provide a sidewalk that is at least five feet wide on each side of each roadway. If provided, sidewalks should be separated from the edge of the closest travel lane by at least five feet. Finally, it would be desirable to provide a bicycle lane or bicycle route on each roadway classified in Figure 3 and Table 5.

A prototypical cross-section for a three-lane roadway is shown in Figure 4. It is important to note that this cross-section can be modified for a two-lane roadway by eliminating the center turn lane. Also, both a curb-and-gutter drainage system and a ditch drainage system are shown in this typical cross-section. One or both of these drainage systems can be constructed on each of the roadways within the study area. While the curb-and-gutter system allows maximum safety for pedestrian activity, the ditch cross-section allows the maximum flexibility for future widenings and improvements.

At intersections on the collector and arterial roadways, dedicated left turn lanes should be provided on each approach. Also, intersections should be designed with curb radii that accommodate the right-turning movements of large vehicles.

FIGURE 4. TYPICAL CROSS-SECTION FOR A THREE-LANE ROADWAY



9. CONCLUSION

This document completes the Town of Nolensville's Major Thoroughfare Plan. The existing and future (Year 2025) conditions have been analyzed and reported. Also, specific improvements have been recommended in order to accommodate the expected future traffic demands for the Town of Nolensville through the Year 2025.