Chapter 4

TRANSPORTATION

Although the Virginia Department of Transportation (VDOT) has primary responsibility for the highway system, Tappahannock is a strong partner in transportation planning. This occurs because of its role in identifying highway improvement needs and its policies and regulations which guide land use and development in the Town. Tappahannock growth along with a general increase in travel throughout the region will mean more traffic on local highways. Thus transportation has become a growth management issue for the Town and clearly indicates that the Tappahannock transportation system for the year 2030 will require special consideration.

This element of the Comprehensive Plan sets the framework for addressing this issue. The goals and objectives statement contained in this chapter provides the general guidance for developing more specific policies and implementation approaches. Background for transportation planning is provided through an assessment of the existing transportation network, of highway capacity, of safety conditions and of planned improvements and pertinent issues, problems, and opportunities. Finally, the current traffic situation in Tappahannock is used as the basis for developing short and long term strategies to satisfy year 2030 needs.

BACKGROUND AND ANALYSIS

Safe and efficient transportation systems for the movement of people and goods remain fundamental to the continued economic growth and development of small urban areas such as Tappahannock. Although the town is relatively urban in nature, the actual population (2,068 in 2000) is neither over 5,000 persons to place it in the urban places category, nor is it over 3,500 to qualify Tappahannock for a separate state-funded small urban area transportation plan. With considerations for certain social and environmental issues, transportation planning for the Town of Tappahannock is an integral part of this comprehensive planning process.

For purposes of analysis, the study area extends only to the corporate limits of Tappahannock, except in those areas affected by the proposed bypass/truck route. Within the town and the immediate surrounding area, all air, water, and surface transportation facilities publicly maintained and/or operated have been considered.

Tappahannock is fortunate to have a navigable waterway and a major river crossing as well. Currently, the Town is home to an operating airport although an improved replacement facility is being located outside of Town limits. Primary highway transportation routes intersect in the central business district, and this has been both the bane and the boon to town commerce.

The Town of Tappahannock is served by the Bowling Green Residency within the Fredericksburg Construction District of the Virginia Department of Transportation (VDOT). VDOT maintains an area maintenance shop within the corporate boundaries of the town. As the

town does not maintain its own roads, this small VDOT shop performs the actual work in addition to regular assignments.

Functional Classification of Highways

The skeletal framework of the County's highway system is the arterial and collector highways shown on Map 4-1. The map also reveals that the majority of the highway system is composed of local roads and secondary highways primarily functioning to provide access to individual properties. The state's classification is based on the Federal Functional Classification of Highways which further classifies highways as rural or urban based on the proportions of vehicle miles of travel and road mileage. Characteristics of the broad classification of highways are as follows:

Principal Arterial: Carries a high volume of traffic for intrastate, inter-county and inter-city travel. Traffic on this type of road normally has the right-of-way except in areas of high hazard, where controls are used.

Minor Arterial: Carries a high volume of traffic for intra-county and inter-community travel. These roads normally serve the higher classification roads providing access to and from the arterial.

Major Collector: Serves intra-county and inter-community travel, but at a lower volume, and usually connects to an arterial to provide access to the surrounding land. Access is not directly from this road but from a sub-road connected to the collector. They may serve community shopping areas, schools, parks and cluster developments.

Minor Collector: Serves intra-community travel at a volume below the major collector. Provides access to the land using lower order roads and sometimes direct access from itself.

Route 360/17, Church Lane/Tappahannock Boulevard, provides the only means of arterial access for east/west and north/south through traffic. Route 360/17 also serves as local traffic access in the central business district and the business corridor area. By performing this dual function without a through traffic relief facility, Route 360/17 is often overloaded at peak hours of operation. Route 360/17 is currently functionally classified as a principal arterial. The only other federal aid functionally classified road is Route 627, Airport Drive, in the industrial park area. It is classified as a major collector.

Traffic Volumes and Trends

Total average daily traffic (ADT) on U.S. 17 through the Town exceeded 23,000 vehicles per day in 2004 as surveyed by the VDOT. These numbers are considered lower than normal as travelers avoided Tappahannock during the construction of the new bridges for Church Lane/Tappahannock Boulevard over Hoskins Creek. Prior to construction, traffic volumes along portions of the roadway averaged 27,000 vehicles per day. No data has yet been released on the traffic volumes along the roadway since the construction project has been completed. These

volumes reflect the importance of this route as a major arterial highway serving the town. Table 4-1 shows Average Daily Traffic Trends of Primary Highways in the Tappahannock area from 1981 to 2001. Traffic volumes on these highway sections increased by 1 to 7 percent per year during this time period; a growth rate that far exceeds the annual growth rate of the town and county population during that same time period. It is evident that the recent development trends in the town, county and region are resulting in increased travel on the county's primary highway system. If these traffic trends continue the major roadways serving the town and surrounding areas will be operating at or above capacity as they are currently configured. Table 4-2 shows that truck traffic from 1981 to 2001 increased at approximately the same rate as the overall traffic volume with the exception of Church Lane north of Queen Street.

Map 4-1: Functional Classification of Highways

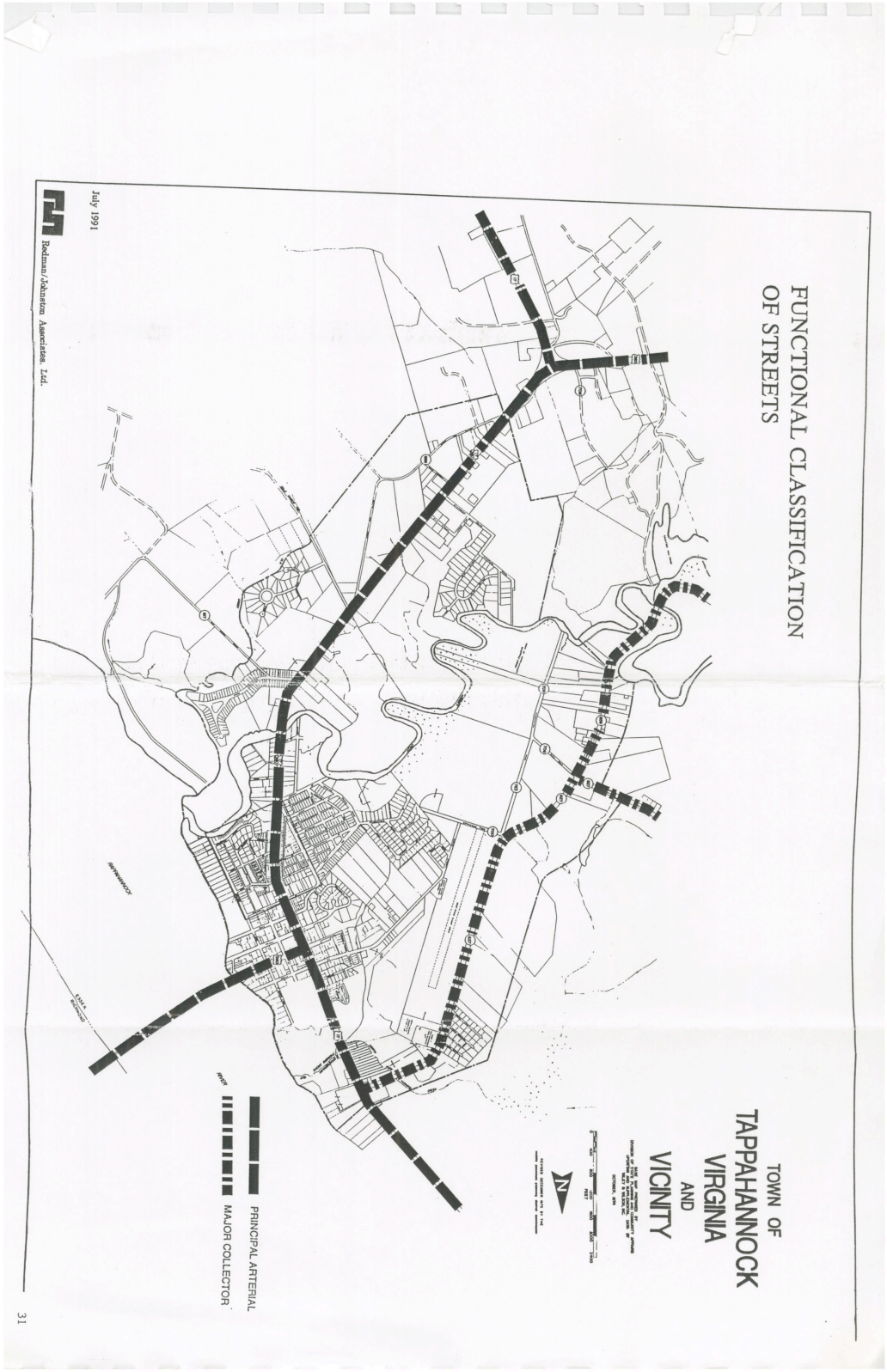

FUNCTIONAL CLASSIFICATION
OF STREETS
TOWN OF
TAPPAHANNOCK
VIRGINIA
AND
VICINITY
PRINCIPAL ARTERIAL
MAJOR COLLECTOR
July 1991
Redman/Johnston Associates, Ltd.
31

Table 4-1
Average Daily Traffic on Primary Routes

Route	From	To	1981	2001	% Change
17	Rt. 703	Tappahannock	5,990	7,200	20%
17/360	Tappahannock	Brays Fork	11,530	27,000	134%
360	Rt. 624, W/Warsaw	Tappahannock	7,010	13,000	85%
17	Brays Fork	Center Cross	4,835	7,300	51%

Table 4-2
Average Daily Truck Traffic on Primary Routes

Route	From	To	1981	2001	% Change
17	Rt. 703	Tappahannock	587	576	-2%
17/360	Tappahannock	Brays Fork	1,083	2,160	99%
360	Rt. 624, W/Warsaw	Tappahannock	567	1040	83%
17	Brays Fork	Center Cross	484	584	21%

Source Table 4-1 and 4-2: Average Daily Traffic Volumes on Interstate, Arterial and Primary routes, VDOT, 1981 and 2001 editions.

Only 17 percent of Tappahannock traffic is considered through traffic according to the VDOT 360/17 Corridor Study. 83 percent of traffic actually stops in town for a duration of 30 minutes or longer, which illustrates that the town serves as a destination for most motorists. This further reinforces the notion that the town is the "hub" for the region.

There is a need for a bypass that would carry commercial traffic around the Town of Tappahannock. There are safety concerns because of the narrow streets and the commercial traffic through the corridor.
The Table 4-3 below shows trends in average daily traffic for primary roads in the town. The average annual percent increase in traffic well exceeds the rate of growth for dwelling units. Many routes have experienced traffic increases of 10 to 17 percent a year. If these trends are projected into the next twenty years, the traffic will exceed those levels for which VDOT is currently planning. The build out study completed earlier this year by the Middle Peninsula Planning District Commission showed significant increases along some roadways should

development increase within Town Limits. Additional growth in surrounding communities would also add to current traffic levels as the Town is a regional center.

Table 4-3
Projected Growth in ADT on Highways Without By-Pass

Route	From	To	1981(3)	1988(2)	%Change	2010(1)	% Change
Rt. 17	Rt. 360E	NCL Tapp.	6,815	15,230	123%	21,790	43%
Rt. 17	Rt. 360E	Rt. 617	12,610	22,460	78%	30,520	36%
Rt. 360	Rt.17/360	Rich Co. Ln.	7,585	13,640	80%	18,140	33%

(1) Virginia Statewide Highway Plan, Fredericksburg District
(2) Rt. 17 and 360 Corridor Study, VDOT 1988
(3) Summary of Accident Data, VDOT 1982

Redman/Johnston Associates, Ltd.

CAPACITY ANALYSIS

"Level of service" (LOS) is often used as a measure of system performance in transportation planning analysis and to define public policy concerning highway performance. (See Appendix A for a definition of level of service descriptors.) They are also used in traffic impact analysis to determine local traffic impacts of proposed developments. Definitions of level of service differ for intersections and roadway segments, for city streets, and for controlled access highways. In urban and suburban areas, where intersections are closely spaced, traffic signals usually govern arterial and street capacity. U.S. 17 through Tappahannock is an example of this situation. Thus, in urban and suburban locations roadway adequacy is assessed at intersections in the traffic impact analysis process. Another related measure of highway capacity is the volume to service volume (VSV) or volume to capacity ratio as used in Table 4-5.

Intersection level of service is on a six-level scale with "A" being the highest, and "F" being total gridlock or complete failure. The overall level of service for the intersections in the Town is currently LOS B. Level of service B means the average delay per vehicle stopped at an intersection ranges between 5.1 and 15 seconds. Normally, intersections with a level of service less than "D" in the peak hour are considered deficient. All of the intersections in Tappahannock are considered adequate by VDOT standards; however, the time/delay runs were averaged over peak and non-peak hour operation (2 p.m. to 6 p.m.) and may not reflect the peak hour of use operations. With this in mind, the time and delay studies reveal a northbound through trip from corporate limits to corporate limits to be 5 minutes and 15 seconds in duration. A southbound trip of the same distance takes 5 minutes and 10 seconds on average during this four-hour period. Major causes for delay were determined to be left turning vehicles and traffic signals. Additional signalization has been installed since this study.

The intersection of 360/17, Dangerfield Street and T-1007, Earl Street, would appear to warrant a traffic study in that the residents of the Dangerfield area must travel a circuitous route in order

to access U.S. 17 in the morning peak hour; however, none of the volumes standards are met, and the intersection does not have an abnormal accident rate.

Traffic projections made by the Virginia Department of Transportation (VDOT) indicate that the average daily traffic on U.S. 17 through Town will increase from its current level of 22,000 vehicles per day to 33,900 vehicles per day by 2015, assuming no alternative route is built. This would indicate the need for additional capacity on the Town's arterial system. In addition, it is clear that the Town needs to make judicious use of the existing highway systems to ensure that the remaining capacity is not prematurely depleted as a result of poor access control, particularly along the major arterial corridors.

Based on the Roadway Inventory contained in the Virginia Statewide Highway Plan, the Town's highway system generally contains excess capacity to accommodate future growth. However, current and projected volume to service volume (VSV) ratios indicate that U.S. 17 requires close monitoring, particularly if a bypass is not constructed on schedule. Table 4-4 lists key highway sections with the existing VSV and projected year 2010 VSV. Rt 17 is projected to exceed its design capacity within the planning horizon if a bypass is not built. Route 627 (Airport Rd.) is currently operating at its design capacity and is projected by VDOT to be at a VSV ratio of 1.2 within the next 20 years even if the bypass is built.

Table 4-4
Projected Capacity on Key Highways Without By-Pass

Route	From	To	DSV(3)	1988(2)	PVSV(4)	2010(1)	FVSV(5)
Rt. 17	Rt. 360E	NCL Tapp.	24,000	15,230	0.63	21,790	0.91
Rt. 17	Rt. 360E	Rt. 617	24,000	22,460	0.94	30,520	1.27
Rt. 360	Rt.17/360	Rich Co. Ln.	32,463	13,640	0.42	18,140	0.56
With By-Pass							
Route	From	To	DSV(3)	1988(2)	PVSV(4)	2010(1)	FVSV(5)
Rt. 17	Rt. 360E	NCL Tapp.	24,000	15,230	0.63	9,360	0.39
Rt. 17	Rt. 360E	Rt. 617	24,000	22,460	0.94	16,020	0.67
Rt. 360	Rt.17/360	Rich Co. Ln.	32,463	13,640	0.42	18,140	0.56

1) Virginia Statewide Highway Plan, Fredericksburg District
(2) Rt. 17 and 360 Corridor Study, VDOT 1988
(3) Summary of Accident Data, VDOT 1982
(4) Present Volume to Service Volume Ratio
(5) Future Volume to Service Volume Ratio
RJA, Ltd.

Safety

Annually, the Traffic Engineering Division of VDOT monitors and summarizes motor vehicle accidents that occur along various road sections. The accident, injury and death rates are calculated by dividing the total number of accidents, people injured, or people killed by the annual vehicle miles of travel at a location. Rates are expressed per 100-million vehicle miles of travel. The accident rates for "high accident" primary and secondary highways in the Town are shown on Tables 4-6. The accident rate is used for establishing priorities only and not for comparing the safety performance of different intersection and road design types.

High accident road sections, for the purpose of this analysis, will include those road sections that exceed the State average accident and injury rates. The highest accident and injury rates on a Primary Road in the County occur on the U.S. 17 corridor in Tappahannock. These sites deserve a closer analysis to determine if there is a definable pattern or cause for the accidents that may be addressed through design modification or increased capacity.

Using 1995 statewide averages of 4-lane divided urban highways, the Town of Tappahannock has a motor vehicle accident rate that is within expected values. For the period January 1, 1992 through August 31, 1996, the calculated accident rate for the 4-lane divided highway section of Route 17/360 through the town of Tappahannock was 333 accidents per hundred million vehicle miles of travel (HMVM), compared to 390 accidents/HMVM of Culpepper, 368 accidents/HMVM of Northern Virginia, and 430 accidents/HMVM of Lynchburg.

According to a study of accidents between 2001 and 2003 throughout the Middle Peninsula, two of the top sites of motor vehicle accidents were in the Tappahannock Area. The intersection of Tappahannock Boulevard and Winston Road had 29 accidents. There were 20 accidents during the same period at the intersection of Tappahannock Boulevard and White Oak Drive. A traffic signal has since been added to this intersection. The top six accident sites in Essex County were within Town Limits. Three other sites, each with nineteen accidents were Church Lane and Queen Street, Tappahannock Boulevard and Hobbs Hole Drive, and Tappahannock Boulevard and Elm Street. The intersection of Tappahannock Boulevard and Richmond Beach Road had 18 accidents during the three year period. Of the top eleven sites for vehicle crashes in Essex County, eight were within Town Limits.

Seventy percent of the motor vehicle accidents within the town of Tappahannock are minor "fender bender" incidents. The actual severity of the accidents is not worse than the statewide average; however, even a minor accident can seriously impede traffic flow during peak hour demand periods.

There are concerns that the Hurricane Evacuation Route that is currently planned to follow Route 17 up through Essex County and the Town of Tappahannock will not provide a safe route for people to escape an oncoming natural disaster. There are areas along this route that are known to flood in strong storms, such as Tickner's Creek by June Parker Marina. If flooding were to occur during an evacuation, the traffic directed up this highway would have to be rerouted along secondary roadways. There are concerns that secondary roads do not have the traffic volume capacity to handle a hurricane evacuation, and the safety personnel in the area would be

overwhelmed. U.S. Route 17 has been designated as a "Hurricane Evacuation Route" for not only the residents of the Middle Peninsula Region, but some of the Hampton Roads area as well.

Speed limits on Routes 360/17 within the town limits are as follows:

Location	**Posted Speed**
South corporate limit to Days Inn Hotel	45 mph
Days Inn Hotel to Wright Street	35 mph
Wright Street to Marsh Street	25 mph
Marsh Street to north corporate limit	45 mph

The recent traffic engineering study by the VDOT Fredericksburg District traffic engineer reveals that the posted speed limits are exceeded by 85 percent of the motorists by an average of 5-7 miles per hour. An opportunity for revenue enhancement exists through increased law enforcement efforts. Other town speed limits are 25 mph except where otherwise posted. This creates a safety hazard, particularly in the downtown area.

Highway Improvements

Through its Six Year Improvement Program, VDOT sets priorities for the funding and construction of improvements to the Primary and Urban Highway Systems in Tappahannock. The FY 07 Thru 12 Program has identified no funding for projects within the corporate limits of Tappahannock.

The town and the state have jointly developed a Capital Improvement Program for the Secondary Highway System. Proposed funding for this six year program includes the widening and construction of curb and gutter on Marsh Street (Route 657) west of Markham Terrace (Route 1019).

Other Transportation Facilities and Services

Bus Service

Bus service is no longer available in Tappahannock; however, tour buses frequently pass through en route to other destinations. Without a fixed route public bus service available there are meager transportation opportunities for low-to-moderate income groups, as well as other transportation dependent groups such as the elderly and handicapped. On demand public transportation services are available through Bay Transit and cab service through an independent operation is also available on a limited basis.

Rail Transportation

No rail service is available for the Town of Tappahannock. As might be expected the 1990 Virginia Statewide Rail Plan lists no proposed extension of rail service to Tappahannock. The nearest rail services are those offered in Richmond, Ashland, or Quantico. Direct access is not available in Tappahannock.

Air Transportation

The Tappahannock Municipal Airport is located approximately one mile west of the Tappahannock. It has 2156 square feet of terminal space, 30 patron parking spaces, and is home base to nine single-engine aircraft and 1 multi-engine aircraft. Tappahannock's airport engages 5,675 operations per year (Virginia Department of Aviation, 1996), and is owned by the Town of Tappahannock. Nearly all of Essex County is currently within a 30-minute drive to an airport of some type. The Tappahannock Municipal Airport is one of 50 local service airports throughout Virginia. A local service airport is one with "known forecasted development limitations or expansion constraints." These limitations or constraints include environmental, air, space, topography, proximity of similar services, land use incompatibility, ownership status, financial infeasibility, conflicts with surrounding development, and low activity projections. The Tappahannock Municipal Airport has a relatively short runway and narrow width (2785 feet by 75 feet) and has electronic navigational aids.

The Virginia General Assembly passed legislation creating the Tappahannock-Essex County Airport Authority. This Authority is charged with overseeing the development and operation of a new airport. A site has been located along Route 360 4 miles outside the Town limits and is currently under construction. Upon the completion of the new facility the current location in Town will be closed.

There is a heliport located at Riverside Hospital in Essex County and services a medical facility.

Water Transportation

Presently, water navigation on the Rappahannock is predominantly private pleasure craft. Public ramps are maintained at Dock and Prince Streets. Commercial transport to Newport News from Tappahannock is limited to some light barge activity, although potential exists for the expanded use of this waterway for transport. The Town is currently exploring funding opportunities for a waterfront park which would also allow water access and is exploring other opportunities as a member of the Middle Peninsula Chesapeake Bay Public Access Authority.

Pedestrian Access

Pedestrian access in town is marred by the location and condition of the sidewalks. Sidewalks are located directly adjacent to the Route 360/17 roadway, and given the high traffic volumes on the facility, create an unsafe condition for pedestrians. Most of the sidewalks are found in the area of Town between Queen Street and Hoskins Creek and safer access is needed to connect pedestrians to destinations in other parts of Town such as schools, the library, recreational facilities, and shopping. While many of the sidewalks are in poor condition, most intersections

do provide curb cut ramps for persons with physical disabilities. Many of the side streets do not have sidewalks, or if they do, they too are directly adjacent to the roadway. Although modem pedestrian crossway signalization has been installed at the intersection of 360/17 and Route T-1005, Prince Street, much could be done to improve access for foot traffic. Additionally, signalization and cross walks are needed at several intersections. Town staff has identified intersections in need of cross walks and signalizations. Few well-marked crosswalks exist in Tappahannock. A problem area for sidewalks is on the East side of Route 17 running north for two blocks. Staff from the Middle Peninsula Planning District Commission will advise town staff of funding opportunities for a comprehensive pedestrian flow study.

Bicycle Access

The Middle Peninsula Regional Bicycle Facility Plan adopted in 1998 shows Church Lane/Tappahannock Boulevard, Airport Road, DeSha Road, and along Queen Street east of Church Lane. While these routes are contained in the plan, most are not adequate to serve heavy bicycle traffic. Roadway widths need to be increased to accommodate multiple users of the roadway. The Town may also want to designate some local routes which will pull separate bicycle traffic from more heavily traveled roads. At the Towns suggestion, MPPDC staff will seek grant funds for a comprehensive study of sidewalk and bikeway enhancements.

Thoroughfare Roads

The 2025 Statewide Highway Plan from VDOT indicates a corridor for a bypass route to relieve traffic on Route 360/17. The recommended alternative would run about three miles originating at Rt. 360 and 715 south of Town and terminate at Rt. 17 north of the Town Limits. The alignment would utilize the existing bridge channeling through traffic around the central business district and industrial park, therefore, providing much needed access between the four corners of the town. A bypass study has been completed recognizing issues such as the alternative truck route. Additionally, the Planning Commission recognizes any HAZMAT related incident within town limits could be harmful to health and welfare of Town residents. An updated bypass study is needed and should recognize HAZMAT related concerns within the Town.

The possible elimination of heavy truck traffic in the Central Business District (CBD) has given the bypass proposal unusual citizen support. The presence of and growth in heavy truck traffic is substantiated by both the District produced Traffic Engineering Study, and the 360 /17 Corridor Study technical documents. This type of citizen support must continue throughout the preliminary engineering and construction phases, as well as the initial planning phase. It is not uncommon for bypasses and other projects of this nature to drag on for several decades, particularly when there is heavy citizen opposition. Wetlands issues, such as mitigation, may cause problems for the bypass project. With the adoption of the new Chesapeake Bay Preservation Act, the cost of constructing any roadway east of Interstate 95 has suddenly skyrocketed.

GOALS AND OBJECTIVES

Overall Goal: The Town's transportation network should be made adequate to serve residents and through traffic.

Highways

Goal: Relieve congestion, reduce noise, and increase safety on the Tappahannock street system.

- Objectives: Reduce the duration of through traffic on Route 360/17 in Tappahannock by routing it around the commercial strip area instead of through the heart of the town.

- Reduce through heavy truck traffic in the central business district by the creation of alternative routing.

- A bypass alignment study needs to be initiated to examine alternate routes.

Internal Circulation

Goal: Improve internal circulation for the local residents of Tappahannock.

Objectives:

- Decrease traffic on the 360/17 corridor.

- Improve access to major local destinations in different areas of the Town.

- Improve emergency service and hospital access for the Town, especially the industrial park area.

- The Town should identify and make recommendations on necessary improvements and expansions to the road network.

- All new streets in proposed developments should comply with and, as appropriate, include sections of roads, streets, and intersection improvements shown in the Tappahannock Transportation Plan element. Streets and sidewalks necessitated by new subdivisions should be provided by the developer and should meet the minimum standards of the State Department of Highways and Transportation.

- Ensure that the new truck bypass is designed and regulated by VDOT as a limited access facility and that all new development that fronts on the new bypass is required to

construct appropriate frontage roads and/or provide an internal circulation system that minimizes new curb cuts.

- Improve access to and from the Daingerfield area.

Pedestrian

Goal: Improve pedestrian circulation and safety throughout the town.

Objectives:

- Improve existing pedestrian sidewalks and footpaths in the Church Lane/Queen Street intersection, specifically one that connects the corner of Queen St West and Church Lane North to the library.

- Increase pedestrian crossing opportunities across Church Lane (Route 360/17) at such locations as Queen St. Add pedestrian stoplights at the corner of Church Lane North and Queen Street East, at the corner of church Lane South and Queen Street East, and at the corner of Queen Street West and Church Lane North. Add a crosswalk across Queen Street from the corner of Church Lane North and Queen Street East to the corner of Church Lane North and Queen Street West.

- Encourage pedestrian access ways where none currently exist.

Other Modes

Goal: The Town will work with the County to locate and construct an airport facility which is convenient to Town services and serves industry located within the Town.

Goal: The Town should explore mass transportation facilities for its citizens.

Objective:

- To address the lack of public transportation in the County, the Town will work with the County to explore rural transit options for transportation disadvantaged groups such as elderly, handicapped etc.

Future considerations for the Planning Commission:

Goal: Do a comprehensive study of traffic flow, safety, redevelopment, bypass, LOS, and access management

IMPLEMENTATION RECOMMENDATIONS

Implementation is broken into two subsections: the Policy Statement and the Transportation Plan. The Policy Statement provides a framework to strategically adapt the County's transportation system to address specific development problems unique to a given locale. The Transportation Plan identifies both needs and planned improvements in order to create a transportation network that is consistent with the objectives and implementation of the Land Use Plan.

Policy Statement

The transportation plan cannot succeed without proper support and leadership from Town government. The following implementation strategies establish the policy framework from which the Town will create and maintain a functioning transportation system within the context of planned growth in the Town.

- **Preplatting Right-of-Ways** - The Town should begin platting right-of-ways for new roads and streets when the land use patterns allow. The annual Capital Improvements Budget should include funds for the preliminary design of proposed road improvements not included in the State's Six Year Improvement Program so that adequate right-of-ways can be reserved. This will also permit the coordinated completion of the improvement if undertaken by different entities such as private developers. Expansion of the Town street system should be pre-planned based on the Land Use Plan and new developments required to conform to this plan.

- **Increased Coordination of the Land Use/Transportation Planning Process** - More emphasis should be placed on coordination between the Town, VDOT, and MPPDC staff on matters related to planning and programming improvements and transportation systems management. There are several steps that can be taken to improve the current transportation planning process: the State and Town should work very closely together to evaluate the transportation system implications of the Town's new comprehensive plan; elected officials should be major participants in this process; and coordinated State and Town transportation management policy should recognize the need to expand upon the current level of commuter ride sharing in order to reduce single-occupant vehicles. This is particularly important at the intersection of arterial and major collector highways serving adjacent commuter sheds and U.S. 17.

- **Quality of Service/Adequate Public Facilities Standards** - The Town's Level of Service (LOS) policies establish a recognizable basis for evaluating alternative plans and/or policies. LOS policies provide the basis and criteria on which to evaluate alternatives and to determine capital requirements. With establishment of LOS policies, the Town makes a clear statement to developers and reflects the public's expectations about the quality of highway service it expects to achieve or maintain as growth occurs. With level of service established, the Town then has a policy based, quantified capacity measure from which to assess the traffic impacts of new developments. Whether or not a particular development will generate traffic that will exceed the capacity of the road can

be determined from analysis, and the question of road impacts is then no longer subjective.

- **Traffic Impact Analysis** - As part of the Zoning process and implementation of the LOS Policy, the Town should require a traffic impact analysis of all major new projects. This analysis will be used to determine if post-development traffic levels and patterns will be consistent with the Town's Transportation Plan and highway policies and will minimize potential safety and congestion problems. At a minimum, the traffic analyses should include a description of past and present roadway conditions, existing roadway capacity, traffic accidents, existing and projected traffic volumes (ADT and peak a.m. and p.m. traffic), existing and projected levels of service, and existing and proposed sight lines based on facts and reasonable generation factors for the site and the immediately affected road networks and intersections. Where the Town has short-term planned improvements scheduled, it may permit such improvements in the traffic impact analysis. The Town should adopt precise standards for the preparation of these analyses.

- **Access Management** - An access management program should be created, initiated, and supported by appropriate ordinances to ensure that access is not unnecessarily provided along key road links or near major intersections, particularly along the designated Highway Corridor District. There is a specific concern about the dangerous cross traffic around the Shoney's Restaurant.

The following techniques should be considered in managing access to principal corridor roadways.

- Limit the number of conflict points by installing physical barriers, modifying driveways, and installing signals at driveways, etc.

- Separate basic conflict areas by regulating the minimum spacing of driveways, by spacing driveways optimally in the permit authorization stage, by consolidating access for adjacent properties, by buying abutting properties, by denying access to small frontage parcels, and by requiring access via collector streets, i.e. service roads, etc.

- Minimize the need to decelerate in traffic through the geometric designing access points.

- Remove turning volumes or queues from sections of the through lanes by pavement marking alterations, geometric design modifications, right-of-way acquisition (including acquisition for such techniques as constructing a service road or bypass road), or requiring adequate internal site circulation.

- Adopt guidelines for access type and minimum spacing of intersections.

- Zoning and Subdivision provisions should require that development project design minimize left turn movements or conflicts both on the site and in the street.

- Driveways should be designed to achieve clear sight lines based on design speeds as adopted by VDOT. Site access and circulation should conform to the following standards:

- Where reasonable access is available, the vehicular access to the site should be arranged to avoid traffic use of local residential streets situated in or bordered by residential districts.

- The road giving access to the site should have sufficient traffic carrying capacity and be suitably improved to accommodate the amount and type of traffic generated by the proposed development.

- Where necessary to safeguard against hazards to traffic and pedestrians and/or to avoid traffic congestion, the Town should require that provisions are made for turning lanes, traffic directional islands, frontage/service roads, driveways, and traffic controls within the road.

- Access driveways should be designed with sufficient capacity to avoid queuing of entering vehicles on any road or street. Highway Corridor Overlay Zoning - Overlay zoning brings to an area additional requirements and standards above those of the underlying zone. Special transportation related improvements in the Highway Corridor District shown on the Land Use Concept Plan should include access controls and transportation impact analysis for high-volume uses.

  - **Integration of Land Uses** - Integrating housing into overall design of large scale employment centers will help reduce the need to travel. Building homes within or immediately adjacent to the work place not only reduces vehicle miles of travel, but also presents opportunities for workers to walk or bike to work. Flexibility in zoning may be provided to permit such large scale mixed-use development through floating zones. To minimize noontime travel, the types of uses that should be permitted in a mixed-use project should include retail and customer service activities, eateries, convenience retail, financial services, gas stations, photocopy centers and consumer merchandise.

  - **Proffers -** In terms of highways, the Town will indicate the need for dedication of right-of-ways for new roads, for road extensions, and widening of existing highways through the Transportation Plan and Capital Improvements Program. At a minimum, proffers should address these transportation needs.

  - **Fiscal Impact Analysis -** The development of a per-unit fiscal impact of residential and commercial development would provide a rational basis on which to except proffers from developers. It is intended that the fiscal impacts be calculated for roads. Though impact fees are not expressly authorized for Tappahannock, the detailed impact analysis will establish the basis for such fees once the Town is enabled by the State legislature. State enabling legislation does allow for the voluntary funding of off-site road improvements and

reimbursements of advances by the governing body (Section 15.2-2241 - 15.2-2246 of the Code of Virginia). The standards for determining the reimbursement in State law are basically the same as those that govern the development of impact fees. The fiscal impact analysis should be used as a basis for proffering under this statute. An Impact Fee system, requiring developers to pay for area-wide transportation improvements based on the estimated amount of traffic their project will generate should also be evaluated.

- **Right of Way Reservation and New Road Construction -** The Town will preserve right-of-ways for road improvements consistent with the Transportation Plan Map and the State capital improvement programming.

- **Transit Development -** The Town needs to encourage the development of an adequate bus service for the transportation disadvantaged.

- **Transportation Management Strategies -** The Town should encourage innovative mechanisms for addressing transportation issues, including private cooperation, and financial support by developers and the business community. Some of the Town's larger employers who want to reduce the number of employees who drive to work during peak hours, have the option of implementing relatively low-cost transportation management strategies that would reduce the number of peak-period vehicle trips. The industrially designated areas along Airport Rd. and the proposed bypass offer an opportunity for employers to initiate their own transportation programs that would help extend the capacity of U.S. 17 and the intersecting streets.

  Transportation management strategies selected by employers generally provide employees with incentives either to use alternative commute modes or to commute during non-peak hours. These include:

  - instituting flexible or staggered work hours;
  - facilitating car pool and van pool formation;
  - setting aside preferred parking locations for car pools and van pools;
  - providing company-chartered commuter bus service;
  - charging employees for parking;
  - building on-site bicycle paths and safe storage areas; and
  - providing transit passes or other forms of transit subsidy.

Not all businesses will immediately understand how they can benefit from trip reduction. Educating the private sector is an important part of developing and selling the concept of transportation systems management.

Planned Improvements

Map 4-2 summarizes the identified highway deficiencies in the Town in terms of capacity as well as safety. The Transportation Plan Map (Map 4-3) shows the improvements, both planned

and needed, to address the identified deficiencies and other transportation objectives. The following are highlights of the plan map.

- Planned Improvements - The Plan includes transportation improvements already programmed by the State such as Marsh Street work.

- Identified Needs - The Plan identifies transportation improvements that are needed but not already included in the State's Six Year Improvement Program. They include the following:

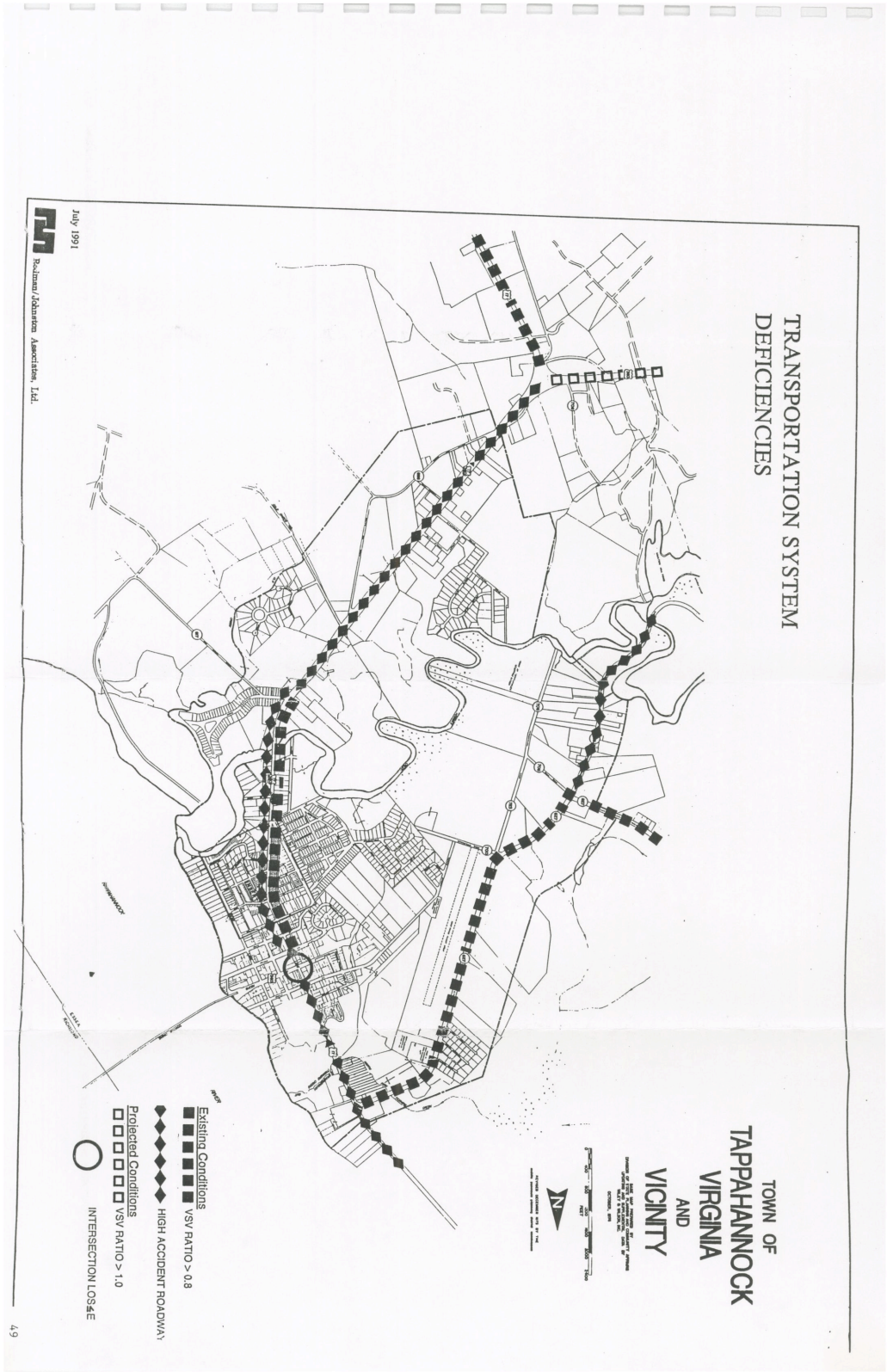
    - U.S. 17 Bypass - To accommodate the anticipated increase in traffic volume on U.S. 17, a bypass facility is indicated. It is envisioned that this would be a controlled access highway primarily for through traffic. The proposed route is derived from the work done by the Fredericksburg Office. It uses elements of each of the Alternatives evaluated. The proposed route is an attempt to balance the Town's economic development and land use objectives with the pure transportation objectives of moving people and goods for the least cost.

    - Airport Road - This road has been identified as being at capacity and will therefore require an upgrade in capacity as an immediate need even if the bypass is built.

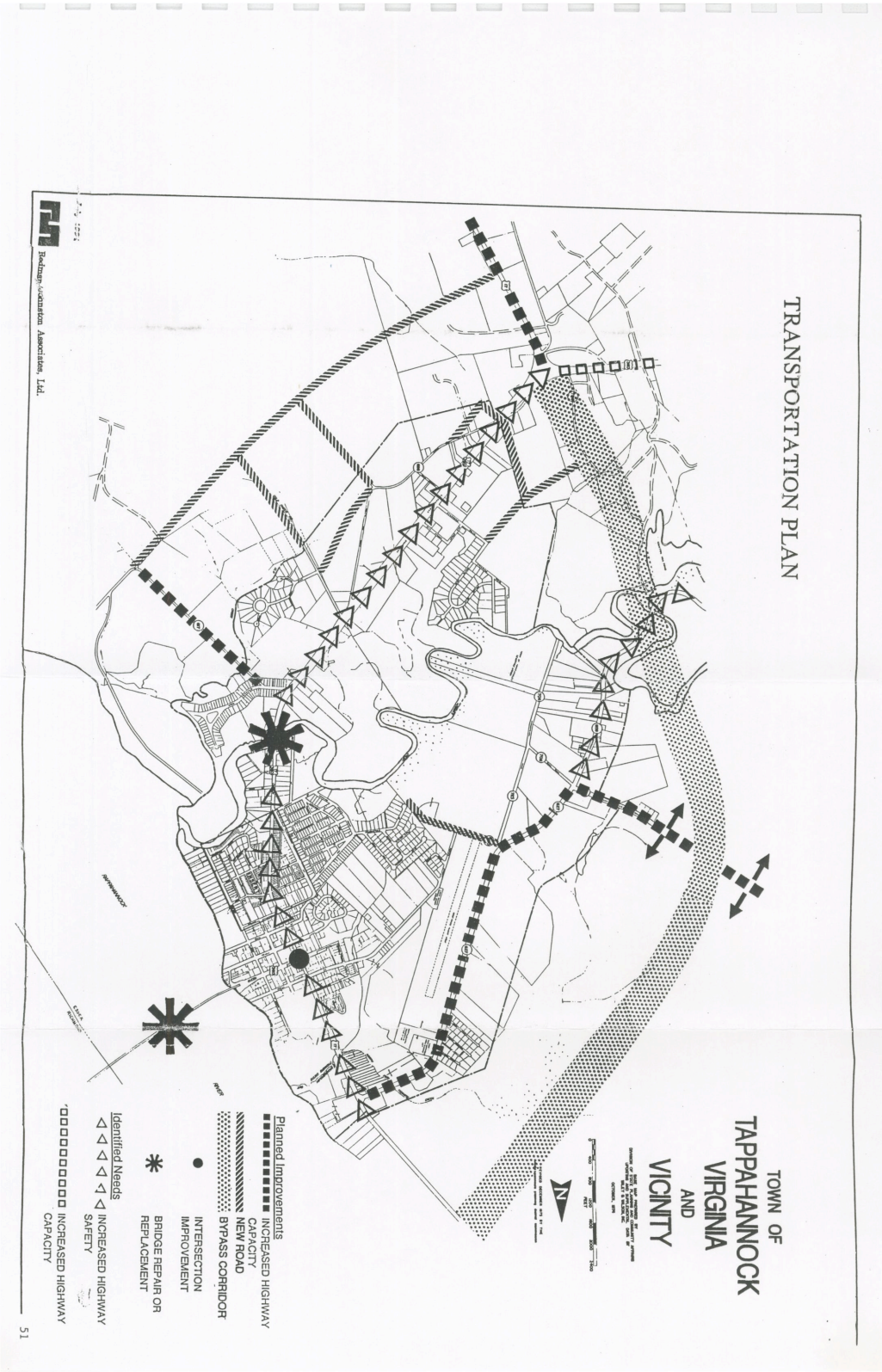
    - Church Lane and Queen Street - Being the critical intersection in Town, it will need continuous monitoring and transportation system management throughout the planning period.

In addition, the Transportation Plan includes intersection and road section improvements that will improve local traffic circulation and extend the Town's block system into outlying areas, e.g., as shown on Hobbs Hole Drive.

MAP 4-2:
Transportation System Deficiencies


TRANSPORTATION SYSTEM
DEFICIENCIES
TOWN OF
TAPPAHANNOCK
VIRGINIA
AND
VICINITY
Existing Conditions
VSV RATIO > 0.8
HIGH ACCIDENT ROADWAY
Projected Conditions
VSV RATIO > 1.0
INTERSECTION LOS≤E
July 1991
Rodman/Johnston Associates, Ltd.
49

MAP 4-3:
Transportation Plan


TRANSPORTATION PLAN
TOWN OF
TAPPAHANNOCK
VIRGINIA
AND
VICINITY
Planned Improvements
INCREASED HIGHWAY CAPACITY
NEW ROAD
BYPASS CORRIDOR
INTERSECTION IMPROVEMENT
BRIDGE REPAIR OR REPLACEMENT
Identified Needs
INCREASED HIGHWAY SAFETY
INCREASED HIGHWAY CAPACITY
Redman-Johnston Associates, Ltd.
51

Proposed Transportation Projects and Estimated Costs

On February 12, 2007, representatives from the Virginia Department of Transportation, the Town of Tappahannock, and the Middle Peninsula Planning District Commission met to discuss the transportation projects identified for the Town's Comprehensive Plan Update. Comments and estimated costs are provided for each of the projects listed below based on the Virginia Department of Transportation's year 2008 project initiation.

1. **Marsh Street** (Route 657) widening and construction of curb and gutter west of Markham Terrace (Route 1019)

(Length)

At the meeting, it was determined that this project has been completed. An improved typical section, widened street with curb, gutter and sidewalk, exists from Route 17 to the school, a distance of approximately 2100 feet. No further action is required on this project.

2. **Comprehensive Pedestrian Flow Study**

It is recommended that this study be combined with other identified studies in the project list into a comprehensive transportation study of the Town. An estimate will be provided for the comprehensive study. Economies of scale are anticipated with the combined study.

3. **Sidewalk and Bikeway enhancement study**

It is recommended that this study be combined with other identified studies in the project list into a comprehensive transportation study of the Town.

4. **Updated Bypass Alignment Study (360/17)**

A Bypass for the Town of Tappahannock has been an item of discussion for several years. A primary consideration for the Bypass is the removal of through truck traffic on Routes 17 and 360 from the older section of Tappahannock. A preliminary assessment of a bypass corridor was presented to the Town by VDOT a few years ago. The assessment indicated impacts to wetland areas were likely unavoidable, but could be minimized and mitigated. The assessment also indicated there would be a challenge in directing Route 360 traffic to and from the bypass at the north end near the Downing Bridge. The estimated cost to perform a planning level conceptual study of the approximate three mile bypass with consultant services, identifying potential alternative corridors and conducting an environmental overview, would be approximately $40,000. VDOT has a competitive grant program that may be able to fund this study, however, the program has been very competitive in the past. In order to develop a specific alignment for the bypass, a preliminary engineering level study would need to be performed. The study would include: development of field survey data, completion of formal NEPA environmental document, and the development of engineered plans. The cost for this level of study

would exceed $1 million. With the current limited availability of construction funding statewide, this level of study is not recommended at this time.

****Goal: Improve Pedestrian circulation and safety throughout the town.****

5. **At the Church Lane/Queen Street Intersection**: Improve existing pedestrian sidewalks and footpaths-specifically one that connects the corner of Queen Street West and Church Lane North to the library.

At the meeting, there was considerable discussion about this project and alternative paths that would meet the objective of completing the pedestrian connection. Three alternatives were identified for further evaluation:

- *Extend sidewalk across north side of Church Lane from Queen Street to school and library and approximate distance of 450 feet. Add pedestrian phase to existing traffic signal. Additional right of way will likely be necessary for this project. The estimated year 2008 cost for approximately 450 feet of sidewalk is $100,000, including purchase of right of way.*
- *Install traffic signal with pedestrian phases at the intersection of Marsh Street and Church Lane, construct sidewalk from Marsh Street to school and library. Impacts of additional right of way are likely less than previous alternative. A signal warrant study will be required. The estimated year 2008 cost for this alternative is $235,000.*
- *Extend sidewalk on north side of Queen Street from Church Lane to Cross Street, and on west side of Cross Street from Queen Street to school and library. Add pedestrian phase to existing traffic signal. It is anticipated that right of way purchase for this alternative would be minimal. The estimated year 2008 cost for 1200 feet of sidewalk is $100,000.*

Further analysis is required to determine the most appropriate alternative.

6. **Church Lane (Route 360/17**): Increase pedestrian opportunities across Church Street at such locations as Queen Street:

a. Add pedestrian stoplights at the corner of Church Lane North and Queen Street East
b. Add pedestrian stoplights at the corner of Church Lane South and Queen Street East
c. Add pedestrian stoplights at the corner of Queen Street West and Church Lane North
d. Add a crosswalk across Queen Street from the corner of Church Lane North and Queen Street East to the corner of Church Lane north and Queen Street West.

- *The cost of adding pedestrian phases to the existing traffic signal at Church Lane and Queen Street and providing a crosswalk is approximately $40,000.*

Airport Connector: Connect a road across the airport for more convenient accessibility to areas of town (Length) *At the meeting, discussion focused on a connector across the*

airport runway that would be open to emergency vehicle access only, rather than general traffic. The extension of Route 700 appears to provide the best opportunity for this connection. A roadway of approximately 1000 feet in length currently exists at this location. If the road is not to be available for travel by the general public, VDOT program funding could not be applied to its improvement. Based on the following assumptions, an estimated cost to construct this improvement is $80,000 to $100,000.

- *the project would consist of pavement widening and strengthening to better accommodate emergency vehicles,*
- *no additional right of way would need to be acquired for the project, and*
- *the project would include the installation of manual gates to prevent general usage of the roadway.*

8. **Comprehensive study of traffic flow**, safety, redevelopment, bypass, LOS, and access management within the Town of Tappahannock.

   It is recommended that this study be combined with other identified studies in the project list into a comprehensive transportation study of the Town.

Comprehensive Transportation Study for the Town of Tappahannock

This project is recommended to combine the individual studies identified in the project list for a Comprehensive Pedestrian Flow Study, a Sidewalk and Bikeway Enhancement Study, and a Comprehensive Study of Traffic Flow. The resultant study would assess travel demand throughout the Town and address transportation needs from a multi-modal perspective. Data collection would include bicycle and pedestrian travel, as well as vehicle traffic volumes, including truck volumes, on major roads and intersections. Counts should be taken twice during the year in order to measure the impact of seasonal traffic during the summer months. Data collected will be used to determine percentages of through and local traffic. Existing and future land use patterns and activity centers would be used in the determination of trip origins and destinations. Improvement needs to better accommodate bicycle, pedestrian, and vehicle traffic would be identified, with cost estimates and service level analysis provided. The application of access management practices will be evaluated to enhance safety and capacity. The study would identify potential funding sources for the improvements and recommend priority projects for implementation. An environmental overview would be provided for the identified projects and alternatives considered during the planning process. An active public outreach program should be incorporated into the planning process. It is recommended that the plan include a transit component to determine the role public transportation can be expected to have in meeting total transportation demand. The plan will address current conditions and have a twenty year horizon to address future conditions within the Town. An estimated cost in 2007 for this comprehensive transportation study performed by consultant services is $115,000.