

Theme 4: Transportation

Mission

Roads within the Town will serve the needs of our residents and businesses first, and interstate commerce second. We will build a vehicular grid system to provide multiple transport routes for intra-town trips. All in-town roads will be constructed or upgraded using the following policy guidelines:

- Pedestrian-friendly
- Low speed
- Intra-town focus
- Grid designed
- Rural scale

We will create new walking, biking, and alternative powered (scooter, motorized wheelchair) systems to interconnect the entire Town and nearby tourist and employment destinations in the County. A new Orange Train Station will provide rail commuter access to major destination centers.

Poplar Forest Drive



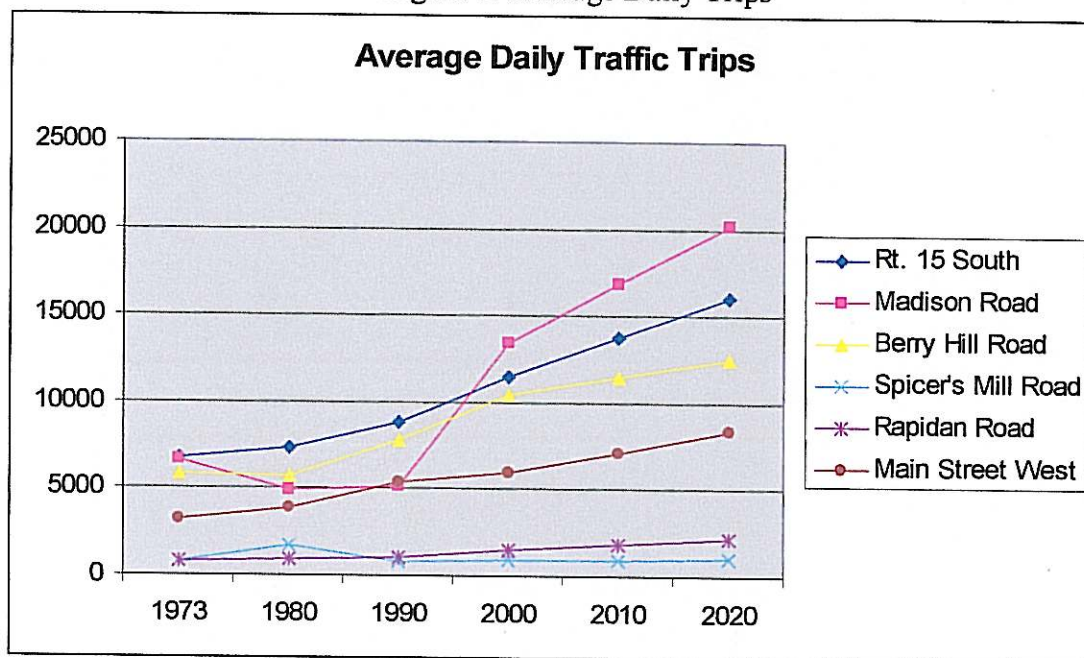
Goal T1: Create an expanded grid vehicular transportation system consistent with Transportation Vision.

Analysis:

Background

Madison Road is projected to experience the greatest growth in average daily traffic (from approximately 10,000 vehicle trips per day (vtd) (1990-2000) to approximately 20,000 vtd (2020).

Figure 5: Average Daily Trips



Town of Orange 2020 Transportation Plan

The Town of Orange 2020 Transportation Plan (<http://www.virginiadot.org/projects/urbanplans/orange.htm>) was approved by Town Council in 2002. This Plan considers recommendations found in the Plan and proposes changes to better reflect the Vision and Goals found in the Plan. The following 2 maps show transportation improvements currently planned by the Town.

These improvements and others under development will be included in a revised 2030 VDOT small areas plan underway in 2006 as a cooperative project between the Town and VDOT.

The Town asks the Commonwealth Transportation Board to consider the following two maps combined as the “Official Map” for the Town stipulated in 15.2-2233 of the Code of Virginia, until such time as the Town, VDOT, and Orange County complete the revised small area plan.

Figure 6: Transportation Official Map A

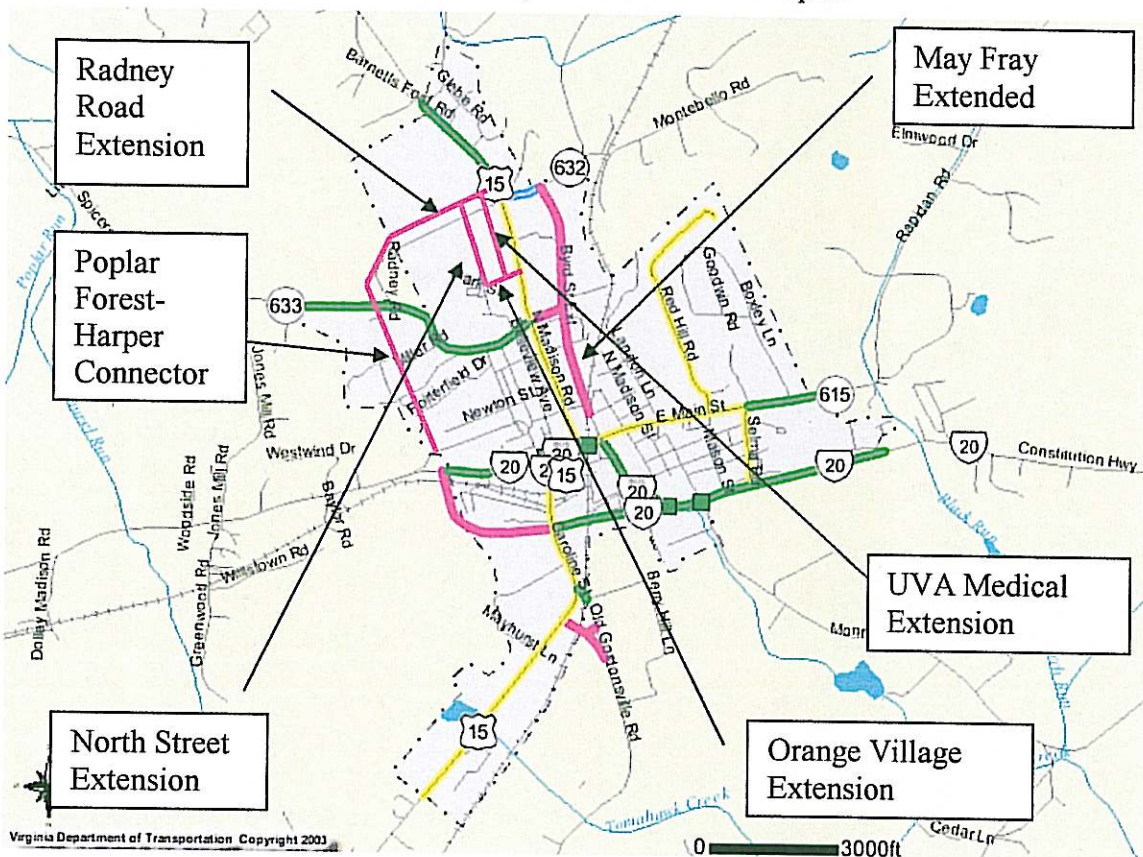
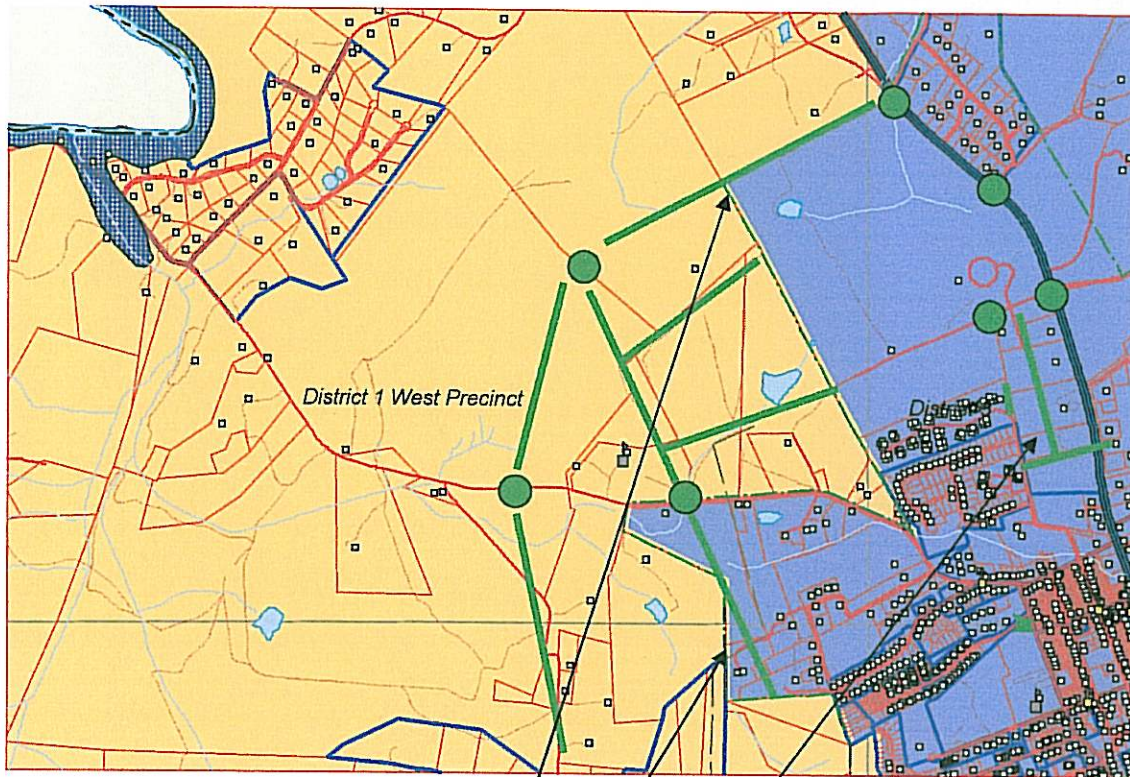


Figure 7: Transportation Official Map B



Proposed new streets to connect
new development in the Town
to the west and south

On Figure 6, Map A, the first map, new Roads are shown in pink. Reconstruction of existing roads is shown in green. Green squares are intersection improvements. The North Street Extension, Orange Village Extension, UVA Medical Extension are new roads proposed in this Plan and are not included in the 2020 Plan.

On Figure 7, Map B, new street are shown in green. Intersection improvements are shown as green circles.

The Virginia Commonwealth Transportation Board (CTB) has updated the Virginia Transportation Six-Year Improvement Program for Fiscal Years 2005-2010 and has requested construction projects from localities in the Commonwealth. In March, 2005, the Town submitted the Byrd Street Extended project for funding. Also in 2005, the Rappahannock-Rapidan Regional Commission submitted a Transportation and Mobility Planning grant on behalf of the Town for the same project. The planning grant will fund planning and preliminary engineering studies for this new road.

Another new road construction project discussed, but not submitted, was the Harper-Miller-Hilltop Roads Connection. This project, once completed, will connect Spicer's Mill Road to Rt. 20 (Main Street West). This road is attractive for the following reasons:

- Most of the road has already been constructed.
- As the northern and western portions of Town develop, this road will provide a north-south alternative to Madison Road.

As the road was not included in the 2020 Plan, it was not eligible for submission as a 2005 request.

In early 2006, VDOT began working with the Town on an overhaul of the 2020 Transportation Plan for the Town. Consistent with this Comprehensive Plan, the emphasis of the new VDOT plan will be on connecting existing streets rather than construction of arterials around Town. An area that will receive particular scrutiny is the western portion of Town, where the existing street network needs connection.

Scale of Town Roads

Among the types of infrastructure that influence the quality of life of the Town of Orange, none has greater impact than transportation. For the last fifty years, the Commonwealth of Virginia has generally used a "one-size fits all" transportation design concept. On the positive side, Virginia historically has had one of the finest vehicular transportation systems in the U.S. However, this same concept has generally led to excessively wide streets and highways, hostile environments to pedestrians, severe storm water impacts, and loss of commerce to small towns and villages. This Plan proposes new design intentions consistent with the small town vision for the following four transportation features.

- Connectivity

- Curb and Gutter
- Street Widths
- Intersections
- Speed

Connectivity

Street design details are a direct result of a community's "connectivity vision". In general, there are two visions from which to choose:

- Low connectivity: Vehicle trips channeled to progressively larger roads using cul de sacs and spine connectors.
- High connectivity: Vehicle trips distributed through a two dimensional network.

The high connectivity model is best suited for small towns and forms the basis for transportation recommendations found in this Plan. Design details discussed below are based on this model.

Curb and Gutter

Current zoning laws require curb and gutter for all new streets in Town. Reasons for this include long-term maintenance cost and neat appearance of edge of roadway. From an environmental and quality of life perspective, however, this requirement may not always be the best option. A grass-lined "ditch section" may be more consistent with a small town quality of life in the following contexts:

- Entrance corridors
- Low density residential development (less than 4 du/acre).

Street Widths

Based on the high connectivity model, street widths are more narrow than otherwise designed. Greater street width needed for turn lanes and wide travel lanes is reduced or eliminated. Studies by the Federal Highways and Transportation Administration, see below, have shown that street widths, when combined with roundabouts, can be reduced.

Intersections

An expanded grid system will create more intersections. The Town will need to choose appropriate intersection improvements to match its small town vision. Because Orange is an old town, traditional measures such as stop signs will likely be needed. The use of stoplights, however, as a default constructed solution to traffic congestion, is inconsistent with the Town's vision, and should only be used in existing areas where there are inadequate setbacks for "roundabouts".

A recent study by the U.S. Department of Transportation proves that roundabouts, or modern traffic circles, are in many instances, safer and more efficient than signalized intersections:

Traffic circles have been part of the transportation system in the United States since 1905, when the Columbus Circle designed by William Phelps Eno opened in New York City. Subsequently, many large circles or rotaries were built in the United States. The prevailing designs enabled high-speed merging and weaving of vehicles. Priority was given to entering vehicles, facilitating high-speed entries. High crash experience and congestion in the circles led to rotaries falling out of favor in America after the mid-1950's. Internationally, the experience with traffic circles was equally negative, with many countries experiencing circles that locked up as traffic volumes increased.

The modern roundabout was developed in the United Kingdom to rectify problems associated with these traffic circles. In 1966, the United Kingdom adopted a mandatory "give-way" rule at all circular intersections, which required entering traffic to give way, or yield, to circulating traffic. This rule prevented circular intersections from locking up, by not allowing vehicles to enter the intersection until there were sufficient gaps in circulating traffic. In addition, smaller circular intersections were proposed that required adequate horizontal curvature of vehicle paths to achieve slower entry and circulating speeds. These changes improved the safety characteristics of the circular intersections by reducing the number and particularly the severity of collisions. Thus, the resultant modern roundabout is significantly different from the older style traffic circle both in how it operates and in how it is designed. The modern roundabout represents a substantial improvement, in terms of operations and safety, when compared with older rotaries and traffic circles. Therefore, many countries have adopted them as a common intersection form and some have developed extensive design guides and methods to evaluate the operational performance of modern roundabouts.

On a planning level, it can be assumed that roundabouts will provide higher capacity and lower delays than all-way stop control, but less than two-way stop control if the minor movements are not experiencing operational problems. A single-lane roundabout may be assumed to operate within its capacity at any intersection that does not exceed the peak-hour volume warranted for signals. A roundabout that operates within its capacity will generally produce lower delays than a signalized intersection operating with the same traffic volumes and right-of-way limitations.

Appleton, Wisconsin Roundabout

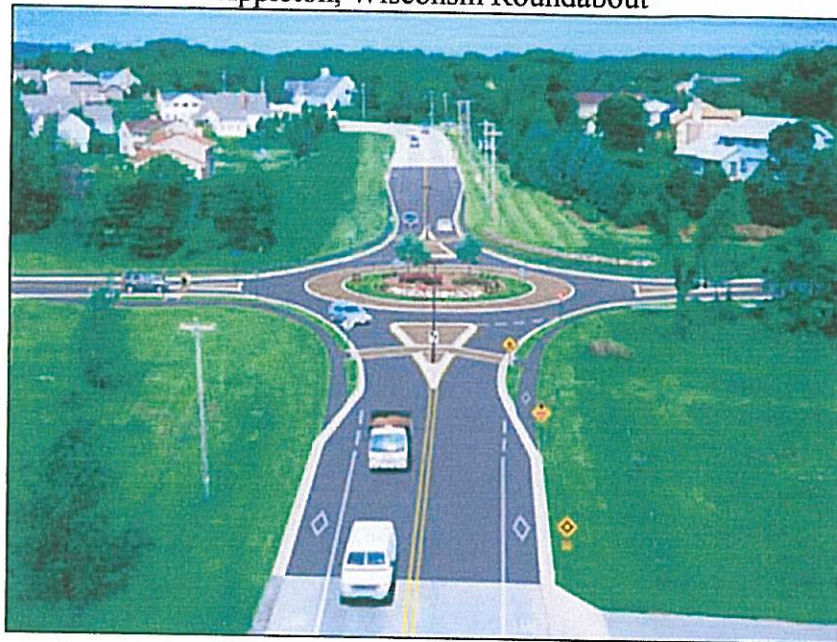


Figure 8: Average annual crash frequencies at 11 U.S. intersections converted to roundabouts

Type of roundabout	Sites	Before roundabout			Roundabout			Percent change		
		Total	Inj. ³	PDO ⁴	Total	Inj.	PDO	Total	Inj.	PDO
Single-Lane ¹	8	4.8	2.0	2.4	2.4	0.5	1.6	-51%	-73%	-32%
Multilane ²	3	21.5	5.8	15.7	15.3	4.0	11.3	-29%	-31%	-10%
Total	11	9.3	3.0	6.0	5.9	1.5	4.2	-37%	-51%	-29%

Notes:

1. Mostly single-lane roundabouts with an inscribed circle diameter of 30 to 35 m (100 to 115 ft).

2. Multilane roundabouts with an inscribed circle diameter greater than 50 m (165 ft).

3. Inj. = Injury crashes.

4. PDO = Property Damage Only crashes.

Source: (3)

<http://roundabout.kittelson.com/>

The consideration of the use of roundabouts in Town, and particularly on major roads leading into Town will be controversial. Nevertheless, based on this data, and their growing use in other localities throughout the country, they should be considered in Orange.

Speed

More future intersections will likely mean lower speeds on the Town's streets. Lower speeds will improve pedestrian and vehicular safety.

Action T1.1: Create public-private partnerships to build new roads in the Town.
These include:

- Spicer's Mill Extended
- May Fray (Byrd Street) Extended
- Harper-Miller-Hilltop Connector
- Berry Hill Road Extended
- Byrd Street-Berry Hill Road-Monrovia Road Intersection
- UVA Extension
- Orange Village Extension
- North Street Extension
- Rt. 15 north-Spicer's Mill connector

Analysis:

Funds available from the state for new road construction are increasingly limited. To meet the needs for new roads in the town, this Plan proposes the creation of public-private partnerships to complete many of the projects.

Indicator T1.1.1:

Benchmark T1.1.1:

May Fray Extended Partnership

Signed agreement among property owners
and the Town

Progress T1.1.1:



Responsible Party T1.1.1:

Town Planner
Town Manager
Town Council
Area Landowners
2008-2010

Indicator T1.1.2

Benchmark T1.1.2:

Spicer's Mill Extended Partnership

Signed agreement among property owners
and the Town

Progress T1.1.2:



Responsible Party T1.1.2:

Town Planner
Town Manager
Town Council
Area Landowners
2008-2010

Implementation T1.1.2:

Indicator T1.1.3
Benchmark T1.1.3:

Harper-Miller-Hilltop Connector Partnership
Signed agreement among property owners
and the Town

Progress T1.1.3:



Responsible Party T1.1.3:

Town Planner
Town Manager
Town Council
Area Landowners
2008-2010

Implementation T1.1.3:

Indicator T1.1.4

Benchmark T1.1.4:

Orange Villlage Shopping Center
Partnership
Signed agreement among property owners
and the Town

Progress T1.1.4:



Responsible Party T1.1.4:

Town Planner
Town Manager
Town Council
Area Landowners
2008-2010

Implementation T1.1.4:

Indicator T1.1.5
Benchmark T1.1.5:

North Street Extended Partnership
Signed agreement among property owners
and the Town

Progress T1.1.5:



Responsible Party T1.1.5:

Town Planner
Town Manager
Town Council
Area Landowners
2008-2010

Implementation T1.1.5:

Indicator T1.1.6

UVA Medical Extended Partnership

Benchmark T1.1.6: Signed agreement among property owners and the Town



Progress T1.1.6:

Responsible Party T1.1.6: Town Planner
Town Manager
Town Council
Area Landowners

Implementation T1.1.6: 2008-2010

Indicator T1.1.7
Benchmark T1.1.7: Rt. 15 North-Spicer's Mill Connector
Signed agreement among property owners and the Town and County



Progress T1.1.7:

Responsible Party T1.1.7: Town Planner
Town Manager
Town Council
Area Landowners

Implementation T1.1.7: Orange County
2006

Action T1.2: Construct Byrd Street Extended (May Fray) and Spicer's Mill Extended roads using the following design criteria.

- Pedestrian friendly (sidewalks and canopy trees)
- Tractor-trailer friendly (wide turning radius and adequate pavement widths)
- Not designed for bicycles and scooter use

Analysis:

This Plan proposes the creation of a special route for materials and goods tractor trailer transport. There are two portions of the proposed project; extension of May Fray Road to Montebello Road and extension of Spicers Mill Road from the Rt. 15 intersection to May Fray Extended. Montebello Road would also need to be upgraded to accommodate extra traffic.

VDOT is slated to begin the "scoping" study for the May Fray extension in the late spring of 2006.

Indicator T1.2.1: Preliminary Design
Benchmark T1.2.1: Completion of Preliminary Design

Progress T1.2.1:



Responsible Party T1.2.1: Town Engineer
Town Planner
VDOT
Transportation Consultant
Implementation T1.2.1: 2008-2010

Indicator T1.2.2: Spicer's Mill Extended and May Fray Extended
roads (Capital Item 2006 CIP)
Benchmark T1.2.2: Completion of Construction

Progress T1.2.2:



Responsible Party T1.2.2: Town Engineer
Town Planner
VDOT
Transportation Consultant
Business owners in area along the road
Implementation T1.2.2: 2008-2010

Action T1.3: Extend Harper-Miller-Hilltop Roads to Spicer's Mill Road (Capital Item 2006 CIP).

Indicator T1.3.1: Preliminary Design
Benchmark T1.3.1: Completion of Preliminary Design

Progress T1.3.1:



Responsible Party T1.3.1: Town Engineer
Town Planner
VDOT
Implementation T1.3.1: 2008-2010

Indicator T1.3.2: Hilltop Drive-Harper Drive Extended
Benchmark T1.3.2: Completion of Construction

Progress T1.3.2:



Responsible Party T1.3.2: Town Engineer
VDOT
Private contractor
Landowners along road
Implementation T1.3.2: 2008-2010

Action T1.4: Connect new development in the western portion of Town to Rt. 20.

Indicator T1.4.1: Poplar Forest Drive
Benchmark T1.4.1: Completion of Construction



Progress T1.4.1:

Responsible Party T1.4.1: Town Engineer
VDOT
Poplar Forest Developer
Implementation T1.4.1: 2006-2007

Action T1.5: Extend Berry Hill Road to Rt. 20 west.

Analysis:

The project extends Berry Hill Road to intersect with West Main Street just west of the corporate limits. A bridge will be needed to cross the ravine south of Main Street. This recommendation is expected to improve traffic flow on Caroline Street and through the intersection of Main Street and Caroline Street.

Indicator T1.5.1: Preliminary Design
Benchmark T1.5.1: Completion of Preliminary Design



Progress T1.5.1:

Responsible Party T1.5.1: Town Engineer
Town Planner
VDOT
Implementation T1.5.1: 2011 and beyond

Indicator T1.5.2: Berry Hill Road Extended
Benchmark T1.5.2: Completion of construction



Progress T1.5.2:

Responsible Party T1.5.2: Town Engineer
VDOT
Private contractor
Landowners along road
Implementation T1.5.2: 2011 and beyond

Action T1.6: Reconstruct Byrd Street-Berry Hill Road- Monrovia Road intersections (Capital Item 2006 CIP).

Analysis:

Redesign and construction of these intersections is included in the 2020 Plan. These two projects need careful consideration due to the following emerging trends:

- Monrovia Road traffic.
- Increase in truck traffic from construction of Byrd Street Extended.

Although much of the intersection is already developed, a roundabout should be considered as a possible design option.

Indicator T1.6.1: Preliminary Design of intersections
Benchmark T1.6.1: Completion of Preliminary Designs



Progress T1.6.1:

Responsible Party T1.6.1: Town Engineer
Town Planner
VDOT
Implementation T1.6.1: 2008-2010

Indicator T1.6.2: Reconstructed Byrd Street-Berry Hill Road-
Monrovia Road intersection
Benchmark T1.6.2: Completion of construction



Progress T1.6.2:

Responsible Party T1.6.2: Town Engineer

VDOT
Private contractor
Landowners along intersection
Implementation T1.6.2: 2008-2010

Action T1.7: Extend Radney Road to Spicer's Mill Road (Capital Item 2006 CIP).

Indicator T1.7.1: Preliminary Design
Benchmark T1.7.1: Completion of Preliminary Design

Progress T1.7.1:



Responsible Party T1.7.1: Town Engineer
Town Planner
VDOT
Area landowners
Implementation T1.7.1: 2008-2010

Indicator T1.7.2: Radney Road Extended
Benchmark T1.7.2: Completion of construction

Progress T1.7.2:



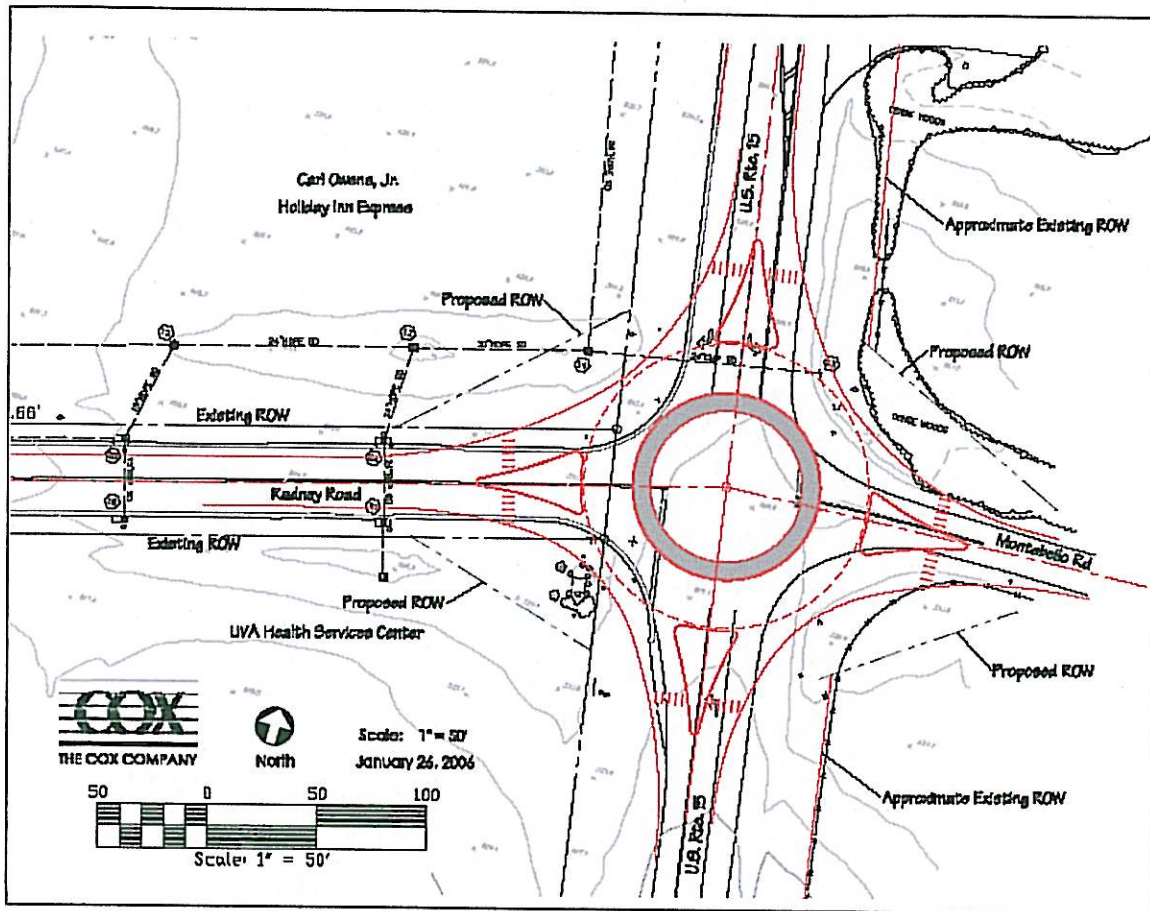
Responsible Party T1.7.2: Town Engineer
VDOT
Area landowners
Implementation T1.7.2: 2008-2010

Action T1.8: Construct (2) Roundabouts at intersection of Radney Road and Rt. 15 and at intersection of new street to be constructed with proposed Round Hill Farm project and Rt. 15 north of the Holiday Inn Express.

Analysis:

In early 2006, the Cox Company offered a draft design for a roundabout to be constructed at Radney Road and Rt. 15. This design was forwarded to VDOT staff for their preliminary review. Staff noted that the construction of a roundabout at both of the proposed intersections has merits. The proposed design for the Rt. 15 intersection is shown below:

Figure 8: Proposed Radney Road Roundabout



Indicator T1.8.1: (2) Roundabouts
Benchmark T1.8.1: Roundabouts constructed

Progress T1.8.1:



Responsible Party T1.8.1: Town Planner
VDOT
Area landowners

Implementation T1.8.1: 2009-2011

Action T1.9: Extend Mayhurst Drive to meet Rt. 20 Extension (item added to 2006 CIP).

Indicator T1.9.1: Preliminary Design
Benchmark T1.9.1: Completion of Preliminary Design



Progress T1.9.1:

Responsible Party T1.9.1: Town Engineer
Town Planner
Implementation T1.9.1: 2011 and beyond

Indicator T1.9.2: May Hurst Drive Extended Road
Benchmark T1.9.2: Completion of construction



Progress T1.9.2:

Responsible Party T1.9.2: Town Engineer
Implementation T1.9.2: 2011 and beyond

Action T1.10: Create road design policy to meet multiple transportation Goals and Actions consistent with Future Land Use map and future neighborhood Master Plans.

Analysis:

Currently, the Town's ordinances require the same transportation infrastructure throughout Town. A vehicle is needed that allows more sensitive transportation infrastructure minimum standards, until Neighborhood Master Plans are completed at some point in the future.

Indicator T1.10.1: Flexible transportation infrastructure design standards
Benchmark T1.10.1: Amendment of Zoning Code to allow appropriate infrastructure



Progress T1.10.1:

Responsible Party T1.10.1: Town Planner
Town Engineer
Director of Public Works
Planning Commission
Town Council
Implementation T1.10.1: 2006

Action T1.11: Extend UVA Medical Road to meet Orange Village Shopping Center Extension.

Indicator T1.11.1: Preliminary Design
Benchmark T1.11.1: Completion of Preliminary Design

Progress T1.11.1:



Responsible Party T1.11.1: Town Engineer
Town Planner
Implementation T1.11.1: 2011 and beyond

Indicator T1.11.2: UVA Medical Road Extended
Benchmark T1.11.2: Completion of construction

Progress T1.11.2:



Responsible Party T1.11.2: Town Engineer
Implementation T1.11.2: 2011 and beyond

Action T1.12: Extend Orange Village Shopping Center Exit to meet UVA Medical Extension.

Indicator T1.12.1: Preliminary Design
Benchmark T1.12.1: Completion of Preliminary Design

Progress T1.12.1:



Responsible Party T1.12.1: Town Engineer
Town Planner
Implementation T1.12.1: 2011 and beyond

Indicator T1.12.2: Orange Villlage Shopping Extended
Benchmark T1.12.2: Completion of construction

Progress T1.12.2:



Responsible Party T1.12.2: Town Engineer
Implementation T1.12.2: 2011 and beyond

Action T1.13: Extend North Street to meet Radney Road (Capital Item 2006 CIP).

Indicator T1.13.1: Preliminary Design
Benchmark T1.13.1: Completion of Preliminary Design

Progress T1.13.1:



Responsible Party T1.13.1: Town Engineer
Town Planner
Implementation T1.13.1: 2011 and beyond

Indicator T1.13.2: North Street Extended
Benchmark T1.13.2: Completion of construction

Progress T1.13.2:



Responsible Party T1.13.2: Town Engineer
Implementation T1.13.2: 2011 and beyond

Action T1.14: Construct intersection improvement at Madison Road and Woodmark Drive (Capital Item 2006 CIP).

Indicator T1.14.1: Improvement
Benchmark T1.14.1: Improvement constructed

Progress T1.14.1:



Responsible Party T1.14.1: Town Engineer
Town Planner
Implementation T1.14.1: 2009-2011

Goal T2: Improve existing roads and transportation systems in a manner consistent with the Transportation Vision.

Analysis:

Road width, geometry, and signalization have a significant impact on a community's quality of life. Road improvements should be sensitive to all the relevant goals of this Plan and to the neighborhoods and businesses the road is to serve.

Action T2.1: Coordinate signal phasing in the downtown to coincide with the railroad crossing.

Indicator T2.1.1: Signals coordinated with train movement
Benchmark T2.1.1: Signalization changes completed

Progress T2.1.1:



Responsible Party T2.1.1.: VDOT
Implementation T2.1.1.: 2011 and beyond

Action T2.2: Reconstruct Spicer's Mill Road from the west corporate limits to North Madison Road (see Analysis).

Analysis:

Spicer's Mill Road should be upgraded to a standard two-lane roadway with a minimum pavement width of 30 feet from Madison Road to Miller Road using ditch section with sidewalks for areas not already constructed with curb and gutter. Road widths should not be increased from Miller Road to corporate limits. Ditches and sidewalks should be improved where necessary.

Indicator T2.2.1: Improved Spicer's Mill Preliminary Road Design
Benchmark T2.2.1: Completed preliminary design

Progress T2.2.1:



Responsible Party T2.2.1.: VDOT
Town Engineer
Implementation T2.2.1.: 2011 and beyond

Indicator T2.2.2: Improved Spicer's Mill Road
Benchmark T2.2.2: Completed road construction

Progress T2.2.2:



Responsible Party T2.2.2.: VDOT
Town Engineer
Private Contractor
Implementation T2.2.2.: 2011 and beyond

Action T2.3: Upgrade Byrd Street from East Main Street to Berry Hill Road (Capital Item 2006 CIP).

Analysis:

To facilitate the efficient movement of tractor trailer and truck traffic in Town, the upgrade of Byrd Street is proposed. This includes increase in pavement width to 30 feet, and the addition of curb, gutter, and sidewalks. Transportation Enhancement Act (TEA-21) funds have recently been awarded to the Town for a portion of this project.

Indicator T2.3.1: Byrd Street Upgrade Preliminary Design
Benchmark T2.3.1: Completion of design



Progress T2.3.1:

Responsible Party T2.3.1: VDOT
Town Engineer
Implementation T2.3.1: 2011 and beyond

Indicator T2.3.2: Byrd Street Upgrade
Benchmark T2.3.2: Completion of construction



Progress T2.3.2:

Responsible Party T2.3.2: VDOT
Town Engineer
Private contractor
Implementation T2.3.2: 2011 and beyond

Action T2.4: Upgrade Berry Hill Road from Caroline Street to Byrd Street.

Analysis:

The project includes the reconstruction of Berry Hill Road from Caroline Street to Byrd Street to a standard two-lane urban roadway with a minimum pavement width of 30 feet with curb, gutter, and sidewalks on both sides of the road.

Indicator T2.4.1: Berry Hill Upgrade Preliminary Design
Benchmark T2.4.1: Completion of design



Progress T2.4.1:

Responsible Party T2.4.1: VDOT

Implementation T2.4.1:	Town Engineer 2011 and beyond
Indicator T2.4.2:	Berry Hill Upgrade construction
Benchmark T2.4.2:	Completion of road
Progress T2.4.2:	
Responsible Party T2.4.2:	VDOT Town Engineer Private contractor
Implementation T2.4.2:	2011 and beyond

Action T2.5: Upgrade Berry Hill Road from Byrd Street to east corporate limits.

Analysis:

Due to truck traffic from Byrd Street, and due to the railroad overpass, design considerations for the portion of Berry Hill Road east of the intersection are different than west of the intersection (assuming that much of the truck traffic is eastbound on Rt. 20). This consideration, combined with bus traffic to and from Orange County High School, are critical factors upon which redesign of the road should be based on.

The road should be expanded to two lanes with center turn lane to the intersection with Selma. From Selma east, the road should revert back to two lanes, with shoulder, sidewalks on both sides of the road, and ditch section.

Curb and gutter should be extended east no further than Monrovia Road. Sidewalks, however should extend to the edge of Town. The Town and County should cooperate to construct a walking-jogging trail beginning at Chatter Island and extending to the Town-Country Pool.

Indicator T2.5.1:	Berry Hill Road to east end of Town Preliminary Design
Benchmark T2.5.1:	Completion of design
Progress T2.5.1:	
Responsible Party T2.5.1:	VDOT Town Engineer
Implementation T2.5.1:	2011 and beyond
Indicator T2.5.2:	Berry Hill Road to east end of Town construction

Benchmark T2.5.2: Completion of construction



Progress T2.5.2:

Responsible Party T2.5.2: VDOT
Town Engineer
Private contractor
Implementation T2.5.2: 2011 and beyond

Action T2.6: Slightly widen Houseworth Street pavement to minimum 14' at critical areas, clean drainage ditches, and prohibit on-street parking.

Analysis:

Houseworth street width ranges from 14-12 feet. There are no shoulders. Drainage swales have been filled in certain areas. Residents are forced to back into drainage areas when pulling their vehicles out of driveway. Short-term improvements are needed to provide residents adequate pavement width to back out of driveway and to pass in the street. In the long-term, the entire road needs to be widened to a range of 16'-20'.

Indicator T2.6.1: Short-term road and drainage improvements.
Benchmark T2.6.1: Improvements designed by Town Staff



Progress T2.6.1:

Responsible Party T2.6.1: Town Planner
Director of Public Works
Town Engineer
Implementation T2.6.1: 2006-2007

Action T2.6.2: Complete engineering to widen all of Houseworth Street to rural ditch section standards.

Indicator T2.6.2: Staff engineering drawings.
Benchmark T2.6.2: Design completed.



Progress T2.6.2:

Responsible Party T2.6.2: Town Planner
VDOT
Town Engineer
Implementation T2.6.2: 2008-2010

Action T2.6.3: Complete Houseworth Street road improvement.

Indicator T2.6.3: Houseworth Street construction
Benchmark T2.6.3: Construction completed.

Progress T2.6.3:



Responsible Party T2.6.3: Town Planner
VDOT
Town Engineer
Implementation T2.6.3: 2011 and beyond

Action T2.7 Reconstruct Rapidan Road (Capital Item 2006 CIP).

Indicator T2.7.1: Road reconstruction and resurfacing
Benchmark T2.7.1: Improvements completed

Progress T2.7.1:



Responsible Party T2.7.1: Town Planner
Director of Public Works
Town Engineer
Implementation T2.7.1: 2009-2011

Action T2.8: Mill and repair Belleview, Kean, and North Streets to 30' section with sidewalks.

Indicator T2.8.1: Road reconstruction and resurfacing
Benchmark T2.8.1: Improvements completed

Progress T2.8.1:



Responsible Party T2.8.1: Town Planner
Director of Public Works
Town Engineer
Implementation T2.8.1: 2007-2008

Goal T3: Promote safer and more efficient truck access to in-Town industrial sites.

See:

Action T1.2: Extend Spicer's Mill Road and May Fray to Montebello Road.

- Action T2.3: Upgrade Byrd Street from East Main Street to Berry Hill Road
Action T2.5: Upgrade Berry Hill Road from Byrd Street to east corporate limits.

Goal T4: Encourage alternatives to vehicular use to increase pedestrian-friendliness of Orange.

Analysis:

Creation of a pedestrian and bicycling network in and around Town is a quality of life amenity attractive to families, retirees, and businesses. Pedestrian infrastructure such as sidewalks can be standardized to a large degree, and thus are conceptually easy to plan for and design. Bicycling infrastructure, on the other hand, must be sensitive to differences in road widths, geometry, and parking, and thus, is more difficult to plan for and design. Actual bike lanes may be needed on wide, high speed roads. On the other hand, narrow, low-speed roads may not need separate, striped lanes. The conversion of Orange into a bike and walk-friendly community will require planning and education involving many stakeholders.

Action T4.1: Complete a bike and pedestrian plan.

Indicator T4.1.1:
Benchmark T4.1.1

Bike and Pedestrian Plan
Amendment of Comp. Plan to include bike
pedestrian Plan

Progress T4.1.1:



Responsible Party T4.1.1:
Implementation T4.1.1:

Town Planner
2006

Action T4.2: Construct biking and pedestrian infrastructure in existing (already developed) parts of Town.

Landon Lane New Sidewalk



Indicator T4.2.1:	Linear feet of road made bike-friendly
Benchmark T4.2.1:	50% of total linear feet identified in bike-pedestrian plan

Progress T4.2.1:



Responsible Party T4.2.1:	Town of Orange Public Works
Implementation T4.2.1:	2008-2010

Indicator T4.2.2:	Linear feet of sidewalk
Benchmark T4.2.2:	25% of total linear feet identified in bike-pedestrian plan to be newly constructed or repaired

Progress T4.2.2:



Responsible Party T4.2.2:	Town of Orange Public Works
Implementation T4.2.2:	2008-2010

Indicator T4.2.3: Other pedestrian improvements, i.e., crosswalks

Analysis:

Additional crosswalks may be needed at the following areas in Town:

- Macon Road and Caroline Street
- Madison Road at the new Courthouse Entrance
- Additional crosswalk on Main Street at the Gordon Building
- Madison Road near Nelson Street
- Diagonal crosswalks at intersection of Main and Madison
- Crosswalks at the intersection of Spicer's Mill Road @ Belleview and Peliso.

These could be constructed prior to completion of Pedestrian Plan.

Benchmark T4.2.3 50% of listed other improvements in bike-pedestrian plan



Progress T4.2.3:

Responsible Party T4.2.3: Town of Orange Public Works
Implementation T4.2.3: 2008-2010

Action T4.3: Construct biking and pedestrian infrastructure in new residential, commercial, and planned unit development communities.

Indicator T4.3.1: Bike and pedestrian improvements included in site plans

Benchmark T4.3.1: Inclusion in appropriate site plan



Progress T4.3.1:

Responsible Party T4.3.1: Town Planner
Project Landowners
Implementation T4.3.1: 2005

Action T4.4: Build a bicycle/jogging trail from Orange to Montpelier along Rt. 20.

Indicator T4.4.1: Montpelier Trail Committee

Benchmark T4.4.1: Appointment of members by Town Council,
Board of Supervisors, and Montpelier

Progress T4.4.1:



Responsible Party T4.4.1: Town Council
Board of Supervisors
Town Planner
County Planner
Chamber of Commerce
Montpelier Staff

Implementation T4.4.1: 2005

Indicator T4.4.2: Trail design
Benchmark T4.4.2: Completion of design

Progress T4.4.2:



Responsible Party T4.4.2: Town Planner
County Planner
Chamber of Commerce
Montpelier Staff
Landscape consultant

Implementation T4.4.2: 2006-2007

Indicator T4.4.3: Trail funding
Benchmark T4.4.3: 50%

Progress T4.4.3:



Responsible Party T4.4.3: Town Council
Board of Supervisors
Town Planner
County Planner
Chamber of Commerce
Montpelier Staff
Funding entities

Implementation T4.4.3: 2008-2010

Indicator T4.4.4: Construct Trail
Benchmark T4.4.4: 50% trail constructed



Progress T4.4.4:

Responsible Party T4.4.4: Private contractor

Implementation T4.4.4: 2008-2010

Goal T5: Create safe streets.

Analysis:

Safe streets should be the priority of every community. In the context of transportation, this includes the safety of pedestrians, cyclists, and individuals traveling in cars and trucks. In some places, safety concerns become the dominant community design criteria and can lead to excessively wide streets, elimination of on-street parking, removal of street trees, etc.

“Traffic calming” has been defined by Montgomery County, Maryland as:

...operational measures such as enhanced police enforcement, speed displays, and a community speed watch program, as well as such physical measures as edgelines, chokers, chicanes, traffic circles, and (for the past four years) speed humps and raised crosswalks.

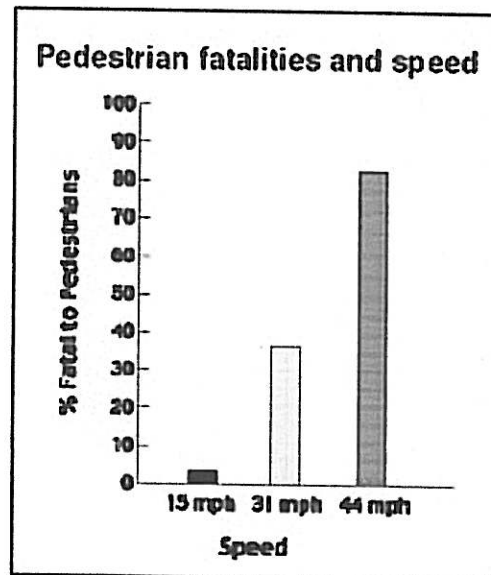
Traffic calming measures should be considered for new “Neighborhood Plans” created in future years (see Theme 12: Neighborhoods). Until these plans are completed, the Town should convene Traffic Calming Design Charettes, on an ad-hoc basis, as concerns about street safety arise (see <http://www.trafficcalming.org/>).

Correlation between pedestrian safety and street speed, widths, and intersection type

Meticulous studies of motorist behavior and accident rates are being amassed. Such studies are essential. Without them, engineers will remain fearful about potential lawsuits on behalf of people injured or killed on roads not built to conventional standards.

One of those studies is Swift’s examination of 20,000 accident reports between 1989 and 1997 in Longmont, a city of 76,000. Swift looked into the links between vehicle crashes and 12 factors, including tree density, parking density, and street width. He found that only one factor was significantly linked to injury-causing accidents — the width of the street. A two-foot increase in street width correlates with a 35 to 50 percent rise in injury accidents, he discovered. When the street was 36 feet wide instead of 24 feet, injury-causing accidents jumped 485 percent.

Other studies have shown a dramatic improvement in pedestrian well-being when speeds are kept low. If a person on foot is hit by a vehicle traveling 20 mph or slower, "there's usually not a permanently disabling injury to the pedestrian," Hall says. "In contrast, if that vehicle is moving 36-37 mph or above, the pedestrian is usually killed." A study in the ITE Journal in February 2000 said the risk of injury to pedestrians multiplied 7.6 times when the average speed rose to



30 mph from 20 mph.

Figure 9: Impact of Increasing Speed on Pedestrian Fatalities

"One of the most effective types of intersections that is context-sensitive in terms of nonmotorist activity is the roundabout," Swift says. Roundabouts should have a design speed "between 15 and 20 mph, maybe 23 mph absolute maximum," he notes. Low speeds allow individuals on foot to establish eye contact with drivers. They also make it possible for bicyclists to mix with motor vehicle traffic. In Golden, Colorado, after four two-lane roundabouts were built in an area close to big-box stores, Swift noticed "families pushing baby buggies and moving through the roundabout safely and actually walking to the big-box stores."

Studies show that some of the techniques that are good for pedestrians and community character are also good for motorist safety and traffic flow. According to Chellman and Swift, when intersections employ roundabouts instead of traffic signals, they can reduce the accident frequency and improve traffic flow by two levels of service.

Fehr & Peers, a Lafayette, California-based firm active in context-sensitive design, has found that when on-street parking density rises, speeds diminish, which enhances safety.

Swift emphasizes that when subdivisions are developed with narrow streets, there should be a place where fire trucks can park when responding to an emergency. He recommends establishing "mid-block red zones" — areas about 40 feet long where the curb is painted red and signs prohibit parking.

From June, 2003 Edition of New Urban News
<http://www.newurbannews.com/Context-DrivenDesign.html>

Action T5.1: Identify traffic calming measures needed at intersection of Bellevue and Main Street.

Analysis:

The ODA Urban Design Committee is a pre-existing entity that combines Town and County interests. The Committee would be the best forum to hold Design Charettes for specific concerns in specific areas of Town. Identification of measures could be the result of focused energy by members of the Committee facilitated by local architects and planners. Funding to pay for this assistance could come from local, state, or federal grants.

Indicator T5.1.1:	Bellevue-Main Street Design Charette
Benchmark T5.1.1:	Measures identified Charette completed

Progress T5.1.1:



Responsible Party T5.1.1:	Town Planner Chief of Police Director of Public Works
Implementation T5.1.1:	2005

Indicator T5.1.2:	Construct measures
Benchmark T5.1.2:	50% of measures constructed

Progress T5.1.2:



Responsible Party T5.1.2:	Town Planner Director of Public Works
Implementation T5.1.2:	2006-2007

Action T5.2: Until charette is held, construct three-way stop sign at intersection of Main and Caroline Street.

Indicator T5.2.1:
Benchmark T5.2.1:

Construct temporary signage
Construction complete



Progress T5.2.1:

Responsible Party T5.2.1:

Police Chief
Director of Public Works
2005

Implementation T5.2.1:

Action T5.3: Study use of no left hand turns at busy times of day.

Indicator T5.3.1:

Discussion and research on no left hand
turns

Benchmark T5.3.1:

ODA recommendation forwarded to Town
Council



Progress T5.3.1:

Responsible Party T5.3.1:

Town Planner
ODA Parking Committee
Director of Public Works
2006-2007

Implementation T5.3.1:

Action T5.4: Review crosswalk timing at intersections on Main Street.

Analysis:

Crosswalk timing might be changed to facilitate more efficient pedestrian
movement, particularly at the intersection of Madison Road and Main Street.

Indicator T5.4.1:

Timing signal review

Benchmark T5.4.1:

Completion of review of timing options



Progress T5.4.1:

Responsible Party T5.4.1:

Town Planner
ODA Parking Committee
Director of Public Works
2006-2007

Implementation T5.4.1:

Goal T6: Maintain or improve current transportation Levels of Service (LOS).

Analysis:

The Town's relatively low traffic volume, as compared to nearby areas such as Fredericksburg and Charlottesville, can be considered a quality of life "asset" that is becoming increasingly scarce. Proposed in this Plan is protection of the Town's transportation mobility that directly facilitates economic competitiveness as described in Theme 3: Economy. Also proposed in this Plan is the concept that transportation LOS, currently for most of Town at an "A" or "B" level, will be maintained, as the Town grows.

Levels of service (LOS) are qualitative descriptions of traffic operating conditions. These levels of service are designated with letters ranging from LOS A, which is indicative of good operating conditions with little or no delay, to LOS F, which is indicative of stop-and-go conditions with frequent and lengthy delays.

Level of service for signalized intersections is defined in terms of delay. Delay can be a cause of driver discomfort, frustration, inefficient fuel consumption, and lost travel time. Specifically, level-of-service criteria are stated in terms of the average delay per vehicle in seconds. Delay is a complex measure and is dependent on a number of variables including: the quality of progression, cycle length, green ratio, and a volume-to-capacity ratio for the lane group or approach in question. Level of service criteria for signalized intersections from the *Highway Capacity Manual* (Transportation Research Board, 2000) are shown below:

Levels of Service for Signalized Intersections

Level of Service	Average Delay Per Vehicle	General Description
A	Less than 10.0 Seconds	Free flow
B	10.1 to 20.0 seconds	Stable flow (slight delays)
C	20.1 to 35.0 seconds	Stable flow (acceptable)
D	35.1 to 55.0 seconds	Approaching unstable flow
E	55.1 to 80.0 seconds	Nearly intolerable delay
F	Greater than 80.0 seconds	Forced flow (jammed)

Source: **Transportation Research Board, Highway Capacity Manual, 2000.**
(<http://www4.nationalacademies.org/trb/HomePage.nsf/238912d6ec6e95b4852566f2006da6f5/766e6535f70c2e72852569c9006cef48?OpenDocument>)

For unsignalized intersections, level of service is based on the average delay per vehicle for each turning movement. The level of service for a two-way, stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. Delay is related to the availability of gaps in the main street's traffic flow, and the ability of a driver to enter or pass through those gaps. Levels of

service criteria for unsignalized intersections from the *Highway Capacity Manual* are shown below:

Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Delay (seconds per vehicle)
A	Less than 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.0

Action T6.1: Complete a build-out traffic mobility study, to determine detailed transportation improvements, policies, and development codes necessary to maintain or improve current Levels of Service.

Indicator T6.1.1:	Traffic mobility study
Benchmark T6.1.1:	Study completed

Progress T6.1.1:



Responsible Party T6.1.1:

Town Planner
Director of Public Works
Transportation Consultant
Rappahannock Rapidan Regional
Commission
Non-profit service organization, such as
scouts, or school group, etc.
2006-2007

Implementation T6.1.1:

Action T6.2: Adopt codes and policies to ensure that new development mitigates transportation impacts to maintain "A" or "B" Level of Service in areas of Town reasonably affected.

Indicator T6.2.1:	Development impact codes and policies
Benchmark T6.2.1:	Codes and policies adopted by Council

Progress T6.2.1:



Responsible Party T6.2.1:

Town Planner
Director of Public Works
Transportation Consultant
Town Council

Implementation T6.2.1: Planning Commission
2006-2007

Action T6.3: Monitor mobility performance measures.

Indicator T6.3.1: 5:00 p.m. drive from Marshall Heights water
tower to Faulconer's Hardware
Benchmark T6.3.1: 3 minutes

Progress T6.3.1:



Responsible Party T6.3.1: Entire Community, public, private, and non-
profit sectors
Implementation T6.3.1: 2012 and beyond

Indicator T6.1.3.2: 5:00 p.m. drive from Food Lion to Boxley
Road
Benchmark T6.3.2: 5 minutes

Progress T6.3.2:



Responsible Party T6.3.2: Entire Community, public, private, and non-
profit sectors
Implementation T6.3.2: 2005

Indicator T6.3.3: 5:00 wait time at Intersection of Spicer's
Mill and Madison Road

Analysis: Data needs to be collected at this
intersection.

Benchmark T6.3.3: A or B LOS

Progress T6.3.3:



Responsible Party T63.3.3: Department of Public Works
Implementation T6.3.3: 2005

Action T6.4: Create "right on red except for pedestrian" at all intersections in
Town except for Main and Madison.

Indicator T6.4.1: Right on red signage

Benchmark T6.4.1: Installed throughout Town

Progress T6.4.1:



Responsible Party T6.4.1: Town Planner
Director of Public Works
Implementation T6.4.1: 2006-2007

Action T6.5: Study right and left hand turn options within existing road width at Main and Caroline and at Main and Byrd Street Extended and Main and Belleview (see Goal T5).

Indicator T6.5.1: Turn lane mini-study
Benchmark T6.5.1: Study completed

Progress T6.5.1:



Responsible Party T6.5.1: Town Planner
Director of Public Works
Implementation T6.5.1: 2006-2007

Action T6.6: Require 2-dimensional connectivity (east-west and north-south) for all new streets and in the Joint Planning Area (see Theme 7: Town and County Partnerships).

Analysis:

The Town's Subdivision Ordinance allows the Zoning Administrator to require connections to future roads in new subdivisions. This is a difficult task to implement when there is no transportation study that plans out new roads. The above mentioned mobility will provide the design information for property developers to know how to connect to future streets.

Indicator T6.6.1: % of approved subdivisions with east-west
and north-south street connections
Benchmark T6.6.1: 100%

Progress T6.6.1:



Responsible Party T6.6.1: Town Planner
Planning Commission
Implementation T6.6.1: 2005

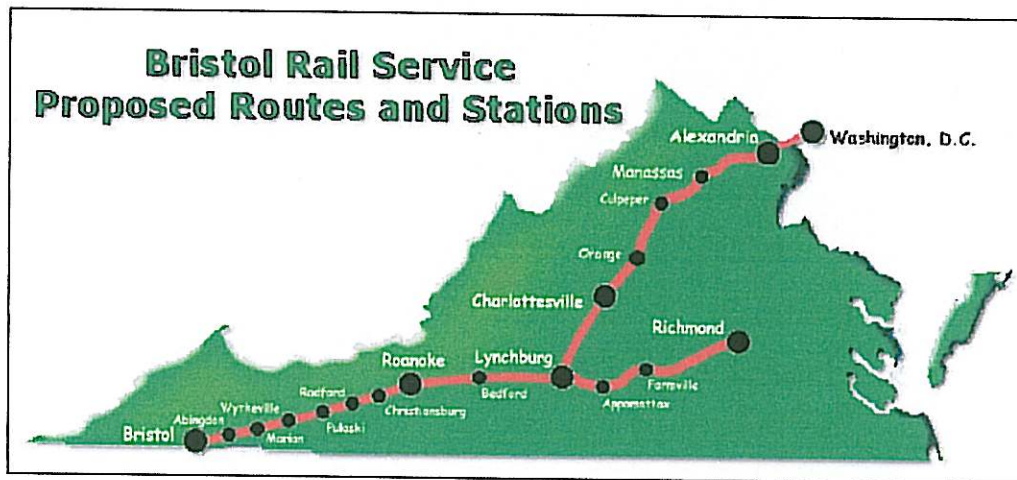
Goal T7: Begin passenger rail service at Orange.

Analysis:

According to the Bristol Rail Study Final Report (<http://www.drpt.state.va.us/projects/previous/bristol.aspx>), it is recommended that passenger rail service be implemented to connect Bristol with both Richmond and Washington, D.C. All stations would be served by four round trips per day. Trains leaving Bristol would travel through the New River Valley and Roanoke to Lynchburg where the line would split, with one train continuing north to Charlottesville and on to Alexandria and Washington, D.C., while the other line goes east through Farmville to Richmond. These trains would operate on existing tracks owned by Norfolk Southern Corporation, with the exception of the CSX, Conrail and Amtrak owned tracks that provide access from Alexandria to Washington Union Station, and a short segment of CSX track which accesses Richmond's Main Street Station.

A total of 19 stations would be served. Eight of these stations are currently served by Amtrak passenger trains. The remainder are not currently served, but all except

Figure 10: Bristol Rail Proposed Routes



for Wytheville and Radford have a historic passenger station which can be used for the Bristol service. Seven stations would be staffed with personnel who would sell tickets and provide other services; the other stations would be unmanned.

Staffed stations:

- Bristol
- Roanoke
- *Lynchburg*
- *Richmond*
- *Charlottesville*
- *Alexandria*
- *Washington, D.C.*

Unstaffed stations:

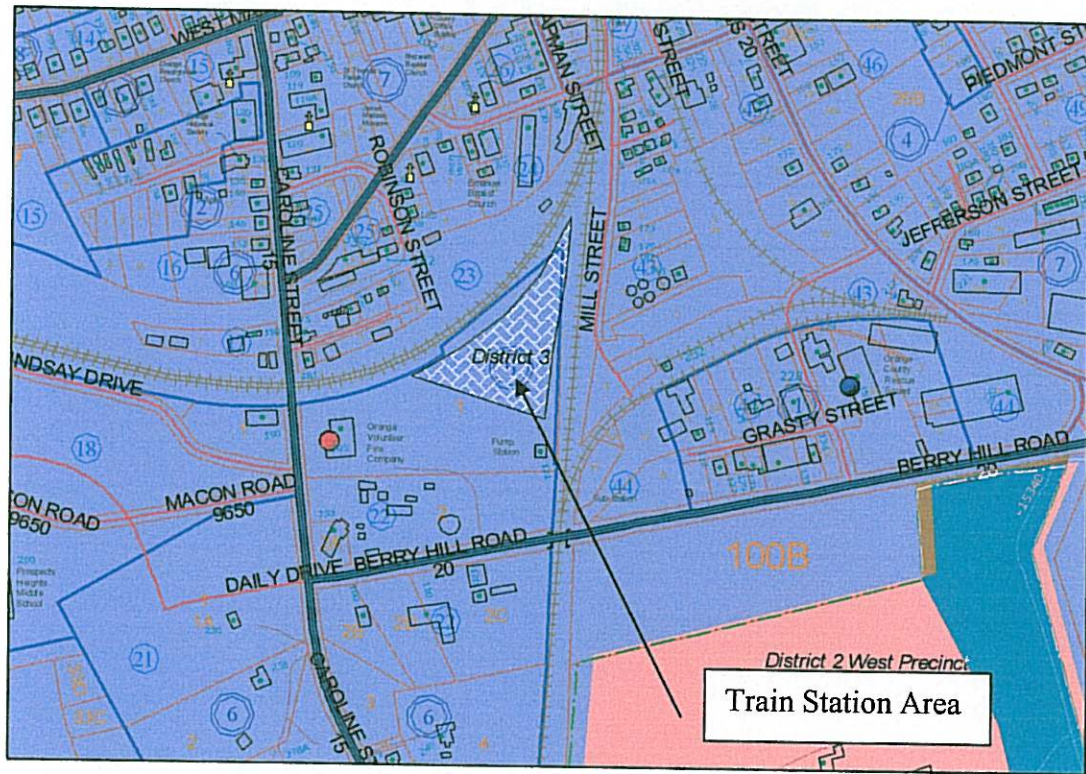
- Abingdon
- Marion
- Wytheville
- Pulaski
- Radford
- Christiansburg
- Bedford
- Appomattox
- Farmville
- Orange
- *Culpeper*
- *Manassas*

Stations in Italics are currently served by Amtrak

Currently, passenger trains serve stations in Alexandria, Manassas, Culpeper, Charlottesville, and Lynchburg. Amtrak and Virginia Railway Express (VRE) operate out of Union Station in Washington, DC, a major passenger rail terminal on the Northeast Corridor. Amtrak operates passenger service out of the Staples Mill Road Station in Richmond on the CSX Richmond-Washington line. Work is currently under way to renovate the Main Street station in downtown Richmond. Lynchburg and Charlottesville have undertaken a study of improvements to the their stations that would better serve Amtrak passengers and benefit passengers of the proposed Bristol service. Roanoke and Bristol have a desire to renovate not only the train stations in those cities but also the surrounding downtown areas to create an economically viable center and area attractive to tourists and other visitors.

Continued discussions about rail passenger service in Orange has led to concerns about the viability of the Orange Train Depot as a functional train stop. Proposed in this Plan is the construction of a new train station located across the tracks from the Town of Orange Public Works Shop, currently owned by the Orange Volunteer Fire Company.

Figure 11: Proposed New Train Station Location



Action T7.1: Complete Preliminary Engineering Report (PER) on new train station location.

Indicator T7.1.1.1:

Passenger rail feasibility study

Benchmark T7.1.1.1:

Study completion

Progress T7.1.1:



Responsible Party T7.1.1:

Town of Orange
Commonwealth of Virginia
Virginia Department of Rail and Public
Transportation

Implementation T7.1.1:

2008-2010

Goal T8: Consider the benefits and costs of commuter rail service in Orange.

Analysis:

The Rappahannock Rapidan Regional Commission is now conducting a study on expansion of VRE service from Manassas through Fauquier, Culpeper, Orange and south to Charlottesville. Currently, commuter rail extends from D.C. south to Fredericksburg and Manassas (<http://www.vre.org/service/newrider.htm>). The study appears to be geared more toward planning for commuter rail best practices and less toward determination of whether commuter rail is in the best interests of the localities considering their land use plans and zoning.

Action T8.1: Conduct community dialogues on commuter rail service to Orange.

Indicator T8.1.1.1:	Commuter rail dialogues convened by Leadership Orange
Benchmark T8.1.1.1:	Findings presented to Town Council and Board of Supervisors

Progress T8.1.1:



Responsible Party T8.1.1:	Leadership Orange Town residents County residents
Implementation T8.1.1:	2006-2007

Action T8.2: Orange Town Council and Orange County Board of Supervisors create policy on rail service to the Town.

Indicator T8.2.1.1:	Local government commuter rail resolutions
Benchmark T8.2.1.1:	Resolutions passed by Town Council and Board of Supervisors

Progress T8.2.1:



Responsible Party T8.2.1:	Orange Town Council Orange County Board of Supervisors Town Manager County Administrator
Implementation T8.2.1:	2006-2007

Goal T9: Reconstruct Spicer's Mill Road over Baylor Creek.

Analysis:

Spicer's Mill Road at the Baylor Creek culvert is inundated with storm water on a more frequent basis. This is due to historic and increasing urbanization of the Baylor Creek watershed. Preliminary engineering analyses shows that the culvert is inadequate for 2 year storm events (see Theme 6: Environmental Assets). The Town needs to immediately begin to accumulate funds for reconstruction of this culvert and raising of the road.

Action T9.1:	Design culvert expansion and road reconstruction at Miller Creek.
Indicator T9.1.1.1:	Final Engineering
Benchmark T9.1.1.1:	Design completed
Progress T9.1.1.1:	
Responsible Party T9.1.1:	Orange Town Council Orange County Board of Supervisors Town Manager County Administrator
Implementation T9.1.1:	2006-2007

Goal T10: Expand TOOT services to meet demand.

Analysis:

Small towns such as Orange are increasingly attractive to empty nesters and retirees. Services needed for this age group include transportation for trips within and outside of the Town. The Town of Orange operates the TOOT bus (<http://www.townoforangeva.org/living/toot.htm>) for trips throughout Town. TOOT buses are owned by the Town but operated by Virginia Regional Transit (<http://www.transitservices.org>), which also operates services in Culpeper, Warrenton, and Front Royal. According to staff at Virginia Regional Transit, Orange TOOT ridership is strong and at times there is standing room only. Demand may be sufficient for a larger bus.

As residential development continues, the need for "demand response" service to the County, will grow.

Action T10.1:	Study need for TOOT expansion.
Indicator T10.1.1.1:	TOOT ridership study
Benchmark T10.1.1:	Study complete



Progress T10.1.1:

Responsible Party T10.1:

Orange Town Council
Orange County Board of Supervisors
Town Manager
County Administrator
Consultant

Implementation T10.1.1:

2011 and beyond

Goal T11: Reflect transportation Vision found in the Town's Comprehensive Plan in all VDOT documents that affect the Town's transportation system.

Action T11.1:

Amend revised Town of Orange 2030 transportation study to make consistent with Town's transportation vision.

Indicator T11.1.1:

2030 revised plan

Benchmark T11.1.1:

Plan that reflects Town Comp. Plan



Progress T11.1.1:

Responsible Party T11.1.1:

Orange Town Manager
Orange Town Council
Orange Town Planner
Orange County Board of Supervisors
VDOT staff

Implementation T11.1.1:

2011 and beyond

Goal 12: Encourage construction of public, rather than private streets for major streets in new development.