# BIKEWAY-GREENWAY PLAN

## PURPOSE OF THE PLAN

Bicycling is becoming an important mode of transportation in Johnson City and is available to people of all ages and socio-economic levels. Bicycling is a particularly efficient and convenient form of transportation and exercise in urban areas. Like the automobile, bicycling provides a high degree of independence, flexibility, and freedom of choice relative to schedule and destination.

Johnson City has committed to creating a comprehensive multi-modal strategy that includes bicycling and walking as integral parts of the transportation infrastructure. Johnson City's vision seeks to take advantage of the benefits that bicycling can offer to the city, such as greater mobility, lower transportation cost, safer streets, cleaner air, less traffic congestion, increased daily exercise, lower healthcare costs, and a greater quality of life. The Johnson City Bikeway-Greenway Plan is intended to help turn this vision into reality.

This plan serves to update and supersede the 1994 Bicycle Plan for Johnson City. It identifies on-street bicycle facility (generally bike lanes/paved shoulders) needs, recommends off-street paths/trails, and bicycle routes for the Johnson City urban area and rural Washington and Carter counties. This information was used to identify on-street bicycle facility needs and in particular, travel corridors that serve as barriers to bicyclists' mobility due to their low compatibility for bicycling and the lack of reasonably direct alternative routes.

Along with adding bicycle facilities, education and promotion are important elements in increasing bicycling while also improving safety. Together, they can improve the skills and confidence of bicyclists to ride safely in traffic, which is critical for increasing their effective mobility. This plan makes recommendations for building upon current education and promotion activities.

The main purpose of this plan is to provide the city with a guide to its actions and decisions concerning:

- Providing safe, convenient bicycle facilities;
- Institutionalizing bicycling within all aspects of the community;
- Making bicycling an attractive option;
- Ensuring that growth occurs in a manner that is conducive to cycling;
- Maintaining existing bicycle facilities;
- Monitoring progress in the development of bikeways; and
- Assuring funding for bicycle facilities and programs.

## BENFITS OF WALKING AND BICYCLING

An alarming number of Americans are becoming more sedentary, obese, and consequently risking their lives, reports the Center for Disease Control[5]. "Obesity is an epidemic and should be taken as seriously as any disease epidemic," warns CDC director Jeffrey Kaplan.

In recent studies, the CDC found that as a result of the American lifestyle of convenience and inactivity, cycling and walking have been replaced by automobile travel for all but the shortest distances.

Even a small increase to moderate physical activity will produce dramatic benefits among those who are least active. They can cycle for pleasure, and integrate bicycling for: a trip to the store; to a sporting event or party; to a concert; or to a friend's house. Cycling to work once a month, and then once a week may lead to cycling more frequently and, as a result, a healthier lifestyle.

Daily physical activities will help reduce the risk of coronary heart disease, stroke, and other chronic and life-threatening illnesses. It will also help lower health care costs, help enhance physical health, improve a person's mental outlook, and the overall quality of life.

Regular exercise also provides a myriad of health benefits for senior adults including a stronger heart, a positive mental outlook, and an increased chance of remaining independent - a benefit that will become increasingly important as our population ages in the coming years.

### 1. Childhood Obesity

In the 20th century, children represented the largest cycling population. But, thanks to a number of contributing factors - among them, unsafe neighborhoods, heavy traffic, and a de-emphasis on physical activity, few American children now cycle frequently. And, children who cycle infrequently grow up to be adults who cycle less or not at all.

Promoting and encouraging physical activity at a young age will have numerous health, economic, environmental, and social benefits. Of particular concern, is the problem of childhood obesity. Today, 1 in 5 children is overweight or obese[6]. Childhood obesity is likely to persist into adult life and puts individuals at risk for stroke, hypertension, diabetes, and other chronic diseases. The magnitude of obesity is far-reaching:

- Approximately one in five children in the United States is now overweight;

[5] Center for Disease Control /www.cdc.gov
[6] Center for Nutrition Policy and Promotion, October 27, 1998

- Overweight during childhood and adolescence is associated with overweight during adulthood;
- Parental obesity more than doubles the risk of adult obesity among both obese and non-obese children under 10 years of age; and
- Over $68 billion are spent each year on direct health care related to obesity, representing 6 percent of total U.S. health care expenditures.
- The number of overweight children 6 to 17 years of age has doubled within three decades; and
- The prevalence of overweight children has increased from 7.6 to 10.9 percent for children age 6 to 11 years and from 5.7 to 10.8 percent for adolescents age 12 to 19 years between 1976-80 and 1988-91.
- Fewer than 50 percent of school children received daily physical education, with games and competitive sports being the mainstays of existing programs; and
- For physical education programs to contribute to the public health goal of lifelong activity, they should include activities of moderate intensity and should not focus exclusively on team-oriented sports activities.

An increasing amount of evidence demonstrates that the places in which we live and work affect our health. The built environment encompasses those aspects of our environment that are human-modified, such as homes, schools, workplaces, parks, industrial areas, farms, and highways. Availability and accessibility of bicycle and walking paths, exercise facilities, and overall safety and aesthetics of an environment play a major role in determining the type and amount of physical activity in which people engage.

## 2. Economic Benefits

Bicycling and walking are inexpensive means of transportation. Walking is essentially free, and bicycles are readily available to most Johnson City residents. In contrast, owning and maintaining an automobile is very expensive. The average cost of operating an automobile for one year is about $5,170; and families, on average, spend 18 percent of their income on owning and maintaining a single automobile.[7] The average family makes ten trips by automobile every day, and the average American spends the equivalent of 55 eight-hour workdays behind the wheel of a vehicle every year.[8] Estimates by the U.S. General Accounting Office cite that highway congestion results in national productivity losses of more than $100 billion a year.[9] Johnson City's low density pattern of development is such that an automobile is a practical necessity for almost every family. Nevertheless, policies and

[7] www.bicyclinginfo.org/pp/benefits/econoben

[8] Benfield, F. Kaid; Raimi, Matthew D.; and Donald Chen. Once There Were Greenfields. New York: National Resources Defense Council, 1999. 36

[9] Kunstler, James Howard. "Car Crazy: We can no longer afford a car dominated world." Forum for Applied Research and Public Policy Winter 1998: v13 i4 p108(7) Online. Infotrac. 20 February 2002.

improvements that make walking and bicycling more attractive can reduce the number of trips and can, in many instances, eliminate the need for a second vehicle.

Converting an abandoned rail line to a trail can also be an economically feasible decision. According to the Rails-to-Trails Conservancy, cities and towns across America are finding that converting abandoned rail corridors is an economically wise choice. Rail-trails often bring job growth in construction and maintenance, as well as in tourism-related businesses, i.e. bike shops, restaurants, and lodging. A National Park Service study revealed the total economic impact of a trail involves a combination of new trail-related jobs and the expansion of existing businesses related to travel, equipment, clothes, food, souvenirs, and maps. For example, the Virginia Creeper Trail in Damascus, Virginia and related tourism has bolstered the local economy by 70 percent.

Trails can also have a direct impact on a community's ability to attract jobs - many companies seeking to relocate or establish a corporate headquarters have cited the availability of trails as a significant factor in their decision to choose one location over another. After considering several cities, Ruby Tuesday, Inc., moved its Restaurant Support Center to a site adjacent to the Greenway Trail in Maryville, Tennessee. Samuel E. Beall, III, chairman and CEO, stated, "I was very impressed with the beauty of the park, which helps provide a sense of community to this area, as well as the many benefits it provides to our more than 300 employees."

### 3. Environmental Benefits

Walking and bicycling are pollution free modes of transportation. Motor vehicles, on the other hand, are not. Reports show that motor vehicle emissions account for 31 percent of total carbon dioxide, 81 percent of carbon monoxide, and 49 percent of nitrogen oxides released into the atmosphere in the United States. Furthermore, studies indicate that short trips are disproportionately high polluting because pollution control devices do not have time to begin working effectively.[10] Encouraging people to walk or bicycle when making short trips will help reduce harmful auto emissions. In fact, substituting a four-mile round trip by bicycle or foot decreases the amount of pollutants in the atmosphere by approximately 15 pounds per year.[11] Decreasing the number of trips people make by automobile will also result in less wear and tear on the automobile and the need for replacement of both parts and the vehicle itself. Reduced traffic levels also reduce noise pollution.

### 4. Social Benefits

The social benefits of enhanced pedestrian and bicycle activity, though more subjective, are no less compelling. In a community where the only option for

[10] www.bicyclinginfo.org/pp/benefits/environben/index.htm
[11] www.bicyclinginfo.org/pp/benefits/enviroben/index.htm

transportation is the private automobile, contact between friends and neighbors is often limited to a wave through the windshield. Increased walking and biking can also help people gain a deeper understanding and appreciation of the city's built and natural environment. When driving, people often fail to notice many of the subtleties that make Johnson City so charming.

## HISTORY OF BICYCLE PLANNING IN JOHNSON CITY

Past efforts have been completed to make walking and bicycling more integral components of Johnson City's transportation system. In the early 1990s the construction of the State of Franklin Bikeway began, a 2.3 mile bikeway which runs parallel to State of Franklin Road. In 1996, a one-mile section was added; extending the bikeway to approximately 3.3 miles connecting north Johnson City to West Market Street. In 1994, the Bikeway/Greenway Committee was charged with recommending a comprehensive plan for the development of bikeways and greenways in Johnson City. A Master Plan was completed by the committee in 1995. The plan contributors were professional planners, avid bicyclists, and members of the community. The Bikeway & Greenway Advisory Council since it's founding in 1994 holds monthly meetings and has continued to add supportive insight to the needs and implementation of bicycle facilities in Johnson City.

### Existing Bicycle Facilities

As with pedestrian facilities, the presence of well-designed bicycle facilities also influences decisions to bicycle for transportation. According to the *National Personal Transportation Survey*, 40 percent of all trips are less than two miles in length.[12] This is a practical distance for bicycling when well-designed and continuous bicycle facilities exist.


**Bike Lane on Boones Creek Road**

When riding in the street, bicyclists need sufficient space to operate comfortably. This usually means wider-than typical travel lanes or bike lanes and the absence of hazards.

Like many American cities, bicycles have not historically been a focus in Johnson City's transportation planning. As a result, bicycle facilities are limited within the community. Although the existing facilities are sparse, once connected they will provide effective bicycle access for localized areas and offer a foundation for future bikeway improvements (See Map 2: Existing Trails). Each of these facilities receives use by the

[12]www.bicyclinginfo.org/pp/benefits/tranben/index.htm

public and exemplifies how bicycle facilities can co-exist with the existing transportation network. Facilities on Oakland Avenue and Boones Creek Road comprise the approximately 2.5 miles of on-street bikeways that exist. These bike lanes were retrofitted into the existing streets as road improvements were made to the corridors. The State of Franklin Multi-Purpose Trail is a separated trail that runs parallel to the road for 3.3 miles from West Market Street to the Johnson City Crossing shopping center, positioned in a North-South orientation.

**Existing Roadway Network**

More than any other public space, the roadway network impacts Johnson City's citizens each and every day. Everyone is reliant on the network, in one form or another, as they engage in daily activities. Like many other U.S. cities, Johnson City's roadway network has been designed primarily to efficiently move motor vehicles through the community. Accommodating pedestrian and bicycle traffic has, until recently, been much less of a priority. Bicycle accommodations, such as bike lanes and traffic signals that detect bicycles, are conspicuously absent.

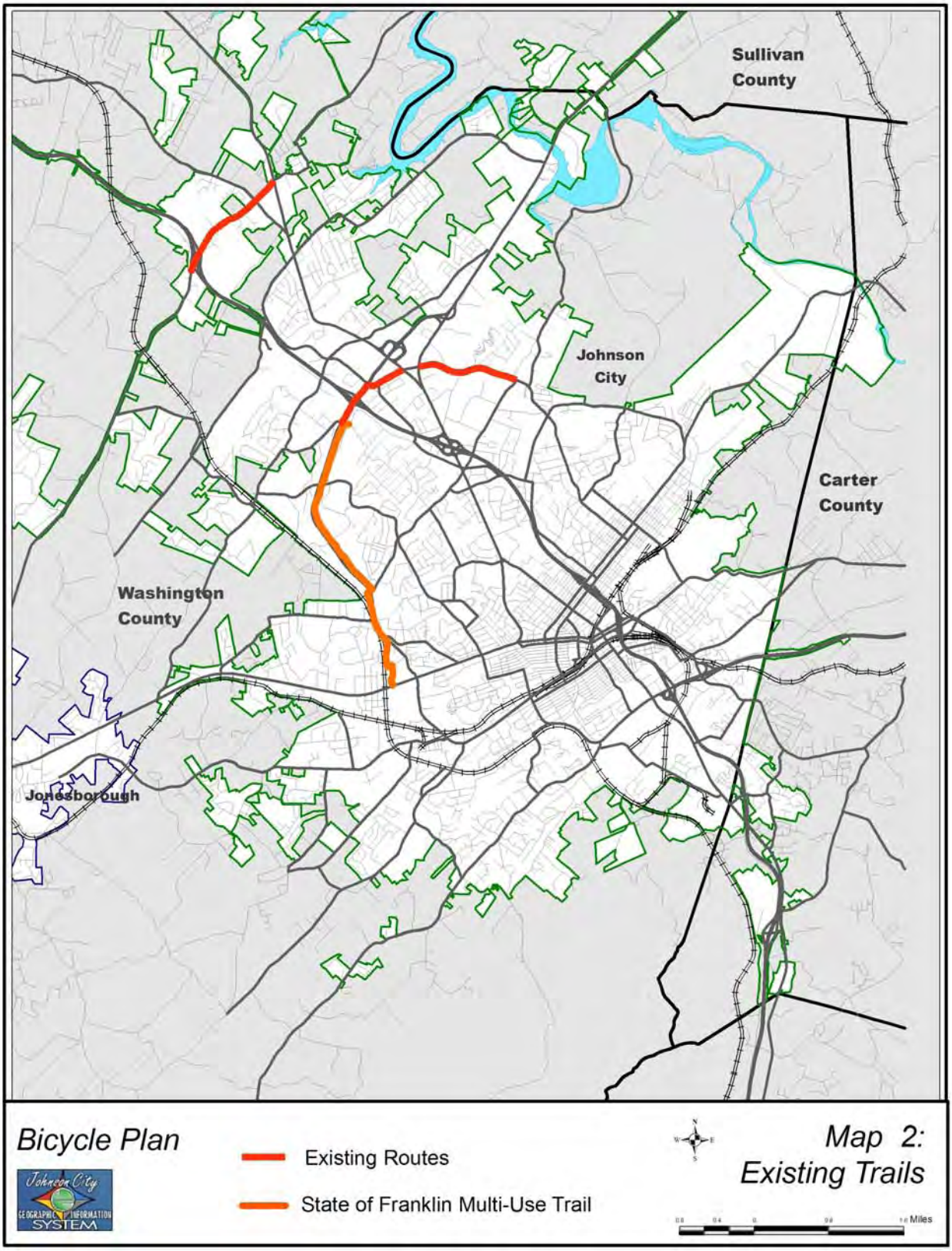
**STREET HIERARCHY**

A well-designed city street system should consist of a street network designed to efficiently serve different functions and types of traffic. It is imperative that the volume and composition of vehicular traffic be compatible with adjoining land uses to alleviate potential safety and zoning problems.

The hierarchy of streets includes local, collector, arterial, and expressways/freeways, with the function of each changing as one moves up the hierarchy. The function changes from a low volume, unrestricted access street serving adjacent land uses exclusively to a high volume, limited access street whose primary function is to move through traffic.

***Local*** **-** The primary function of local streets is to provide access to adjacent land uses. Through traffic should be discouraged from using these streets. On-street parking may be permitted where demand exists. These streets make-up the largest percentage of roadways in the city. However, individually they carry only a small proportion of the total vehicle traffic. Each local residential street generally carries less than 1,000 vehicle trips per day (VTPD).

***Collector*** **–** These streets are designed to collect local street traffic and direct it to major streets, but they also provide access to abutting land uses. Collector streets are generally not lengthy and do not handle long through trips.


Sullivan County
Johnson City
Carter County
Washington County
Jonesborough
Bicycle Plan
Existing Routes
State of Franklin Multi-Use Trail
Map 2:
Existing Trails
Miles

***Arterial*** **-** This class of roadway is designed to carry large volumes of through-traffic. Arterials connect the principal traffic generators within the city as well as important rural routes, moving traffic between communities and activity centers. They generally carry 10,000 to 25,000 trips per day and arterials may handle up to 40,000 trips per day. As the volumes increase, the primary function of the roadway changes from serving the adjacent land uses to moving traffic through the city.

***Expressways/freeways*** **-** This class of street is devoted entirely to traffic movement with little regard to access to adjacent land uses. In all cases, freeways are limited access roadways. Freeways such as Interstate 26 serve large volumes of higher speed traffic on longer through trips, with traffic volumes generally ranging over 25,000 trips per day.

## PEER CITIES REVIEW

A review of bicycle planning and facilities in other selected cities provides a useful context for Johnson City's own initiatives and aspirations. Comparisons were made with cities predominantly in Tennessee, with the exception of Asheville, North Carolina and Abingdon, Virginia. The cities range in size of population with Abingdon being the smallest at 7,938 and Chattanooga the largest at 155,554. Although Chattanooga is significantly larger than Johnson City, it was chosen as a comparison for two reasons; one, a large city such as Chattanooga has urban densities that support alternative forms of transportation, and two, because of its progressive initiatives on bikeways. However, for the most part, selected cities are comparable to Johnson City's population.

With the exception of Oak Ridge, Tennessee, all of the cities reviewed had or were developing a bicycle plan. The plans provide direction and focus for planning efforts, and they provide a means of communicating the vision of the community to the decision-makers. Typically, without a plan, bicycling planning efforts result in ad hoc decisions that only provide single independent facilities rather than a comprehensive network.

Design standards were established within each city reviewed. The cities either used standards published by the Association of State Highway and Transportation Officials (AASHTO), American Disability Association (ADA), or their state highway design standards (TDOT, VDOT, NCDOT). Design standards assure that all bicycle facilities will be built in a consistent manner.

The only two cities to have bicycle racks on buses were Asheville, North Carolina and Chattanooga, Tennessee. Both cities are larger cities in the comparison, and also very progressive towards promoting bicycling. This provision greatly expands a cyclist's travel options. Such an option should be incorporated on all city buses to encourage and expand cycling throughout Johnson City.

Approximately, one-half of the cities reviewed have created some form of bicycle/pedestrian coordinator position. This position facilitates the delivery of information, the coordination of programs, and the review of development policies.

Education programs vary from place to place, and most provide educational materials and bicycle workshops. Often, city staff works closely with bicycle clubs to provide education and encouragement programs. Other ideas included:

- Bike mentoring programs
- Advertisement
- Bicycle Rodeos
- Bike to Work Programs
- Safety courses

In order to enhance the safety of the cyclist using the bicycle facilities, many cities have instituted bicycle facility maintenance programs. Often these involve spot maintenance[13] crews that respond to cyclists who submit spot maintenance forms. Many cities also assured that street sweeping was conducted on streets with bicycle facilities.

All cities in the comparison have some form of bike trail, shared roadway, path, or greenway. Most cities have multiple types of recreational trails and bicycle friendly roadways that provide transportation opportunities. Insight into successful, city-specific bicycle programs, design guidelines, and other details can be useful in evaluating the most appropriate strategies for Johnson City. Table 6 summarizes the characteristics of each city.

[13] Appendix B. 8: Maintenance, Section E. Spot Improvements Program

## Table 6: Peer Cities Review

| | Bike Plan | Design Standards | Bike racks on buses | Bike/Pedestrian Coordinator | Education Program | Maintenance Program | Mileage |
|---|---|---|---|---|---|---|---|
| Abingdon, VA | Yes | VDOT | No | Partial | Yes, Non-profit group | Yes (Public/Private partnership) | Virginia Creeper Trail 34 miles |
| Asheville, NC | Yes | NCDOT standards | Yes | Yes, Partial | Yes | Yes, Limited | 5 mi. bike lanes; 60+ mi. shared; 10 mi. trails |
| Bristol, TN | Yes | TDOT standards | No | Yes, Partial | Yes | Yes | 2 mi. shared road;10 mi. mountain bike trails; 8 mi. bike lanes |
| Chattanooga, TN | Yes | TDOT ASHTO | Yes | Proposed | Yes | Yes | 140 miles existing and previously planned |
| Clarksville, TN | Yes | TDOT | No | No | No | No | 1.7 mi. Rails-Trails (1999) |
| Elizabethton, TN | Yes | TDOT | No | Yes, partial | Yes | Yes, Parks & Recreation | 4 miles multi-use trail; 2 miles planned |
| Johnson City, TN | Yes | TDOT | No | Yes, partial | Yes, Police Department (Bike Rodeo) | Yes, Streets Division | 3.3 mi. multi-use trail; 2.5 mi. bike lanes; 2.3 mi. bike lanes currently under const. |
| Kingsport, TN | Yes | TDOT | No | Partial | No | Yes | 7 mi. greenway |
| Maryville, TN | In progress | TDOT, ADA | No | No | Police Department | Yes, built in budget | 14 mi. of trail (connects Maryville to Alcoa) |
| Morristown, TN | In progress | TDOT | No | No | No | Yes | 10 mi. bike trail; 2 phases under construction (approx. 15 miles) |
| Murfreesboro, TN | Yes | TDOT ASHTO | No | Part-time | No | Yes (Rec. Department handles trails in park, Street division handles road) | 5 mi. bike trail; 11.3 separated trail; 4 mi. shared road, 6 mi. under design |
| Oak Ridge, TN | No | TDOT | No | No | No | No | 2 mi. shared roadway |

**Source: Johnson City Planning Department, 2005**

## BICYCLE USER AND FACILITY TYPES

The recommended facility network provides a comprehensive multi-jurisdictional network of facilities that accommodates cyclists of various skill levels.

### User Types

The plan provides facilities for all user types and offers options for differing skill levels. User types include the following:


- Class A: Expert
- Class B: Casual
- Class C: Inexperienced

*Class A* includes expert or experienced riders. Expert riders generally use their bicycles as transportation and desire direct connections to destinations with minimal delay. These riders are typically confident riding their bicycles alongside motor vehicles and are able to negotiate high speed roadways without special bicycle facilities. In designing facilities for expert riders, adequate space should be provided so that the cyclist and motorist can pass comfortably without shifting positions (Picture: cyclist on Boones Creek Road).

*Class B* includes casual or less confident riders. Most of these adult riders prefer to use roadways with fewer motor vehicles and more operating space. These casual riders also use their bicycles for transportation, but wish to avoid heavy, high-speed traffic. They prefer neighborhood streets and multi-use paths separated from roadways. Busier streets should include a designated bike lane or wide shoulder to accommodate casual riders. (Picture: example of casual cyclist)

*Class C* includes inexperienced riders, including children. Children are often confident riders with skilled bicycle handling abilities, but they lack the "traffic sense" and experience of maneuvering in high volume/speed motor traffic. For these riders, connections are necessary to destinations including schools, convenience stores, and recreational areas. Multi-use paths linking these facilities, in combination with neighborhood bike lanes can accommodate this group. (Picture: children/inexperienced riders)

## Facility Types

The following types of bicycle facilities are recommended for use in Johnson City:

- Class I: Multi-Use Paths
- Class II: Bike Lanes
- Class III: Bike Routes
- End Trip Facilities

***Class I Facilities*** include multi-use paths, more popularly known as greenways. Greenways do not allow motor vehicle traffic, but they do permit a range of non-motorized travel including bicycling, walking, running, and in-line skating. Although typically constructed in an independent right-of-way, park, or easement, greenways may also be located within road rights-of-way, separated from motor vehicle traffic by open space or a structural barrier.

Greenways primarily attract recreational users, but because they typically meander through a community and connect destinations, they also offer an excellent opportunity to function as non-motorized transportation routes. They sometimes offer a more direct route to destinations than the roadway network. For children, or any cyclist uncomfortable with sharing the roads with cars, trails may be the preferred facility. Greenways are an excellent training facility for increasing the skills to ride on the road (Picture: State of Franklin Multi-Use Trail).

***Class II Facilities*** include bicycle lanes and shouldered bikeways. A bicycle lane is a portion of the roadway separated from conventional travel lanes with a stripe, and designated for exclusive or preferential use by bicyclists. They are one-way facilities placed on both sides of a street in order to carry bicyclists in the same direction as motor vehicle traffic. Bike lanes also help to increase the total capacity of roadways by segregating users. In addition to lane striping, pavement markings and signage identify bike lanes.

Shouldered bikeways are paved shoulders separated from travel lanes with a lane stripe, and are typical for rural roadways without curbs

and gutters. Pavement markings are not typically used on shouldered bikeways, since they can also be used for other functions, such as for vehicle breakdowns (Picture: bike lane on Boones Creek Road).

***Class III Facilities*** include bike routes. On a bike route, bicyclists and motorists share the same travel lanes. Except in cases where wide outside lanes are provided, motorists will typically have to move into the adjacent lane in order to safely pass a bicyclist. Bike routes function well on local and minor collector streets, where traffic volumes and speeds are typically lower than on major collector and arterial streets. There are three types of shared roadways: Wide Outside Lanes (WOLs), Shared Signed Roadways (SSRs) and Local Streets (Picture: example of Wide Outside Lane).

On major collector and arterial streets, where severe physical constraints preclude bike lanes, WOLs are a desirable alternative. Because they provide less operating space than bike lanes, and are not designated for exclusive bicycle use, some cyclists will be uncomfortable using WOLs. However, WOLs allow most motor vehicles to pass bicyclists without weaving into the adjacent lane and provide a greater degree of comfort to cyclists than the typical 11-foot or 12-foot lane.

SSRs are arterial or collector streets where bicycle traffic or demand are high but bike lanes or wide outside lanes cannot be provided due to severe physical constraints. SSRs are posted with appropriate speed limits and rely on signage to encourage both drivers and cyclists to be alert for all roadway users. In many cases, SSRs are a temporary solution, and are applied until a design solution that incorporates more appropriate bicycle facilities can be implemented.

Local streets should be able to safely accommodate bicyclists without any special treatment. Signage may be used to identify a through-bike route that follows a local street. In cases where local streets carry more traffic at greater speeds than they were designed for, traffic calming techniques such as speed humps and pedestrian bulbs may be implemented to help ensure that bicycle and motor vehicle traffic operates compatibly.

**End of trip facilities**

Cyclists are often discouraged from using their bicycles as transportation because they have no place to park their bicycle at their destination. End of trip facilities are provisions which are intended to increase convenience and safety for the user. Types of end of trip facilities include bicycle parking and shower and changing facilities.

Bicycle parking can be addressed by the provision of bike racks or bike lockers. Bike racks come in a range of shapes, sizes, materials, and colors. Bike racks are intended to provide a short-term parking solution. While bicycles are intended to be locked to the rack, the possibility of theft or vandalism still exists. Bicycles often have to be partially dismantled (wheels, pump, light, etc.) and each part locked separately or taken with the rider in order to be completely secured when locked to a rack. Additionally, bicycles stored at outdoor racks are exposed to damage from inclement weather conditions.

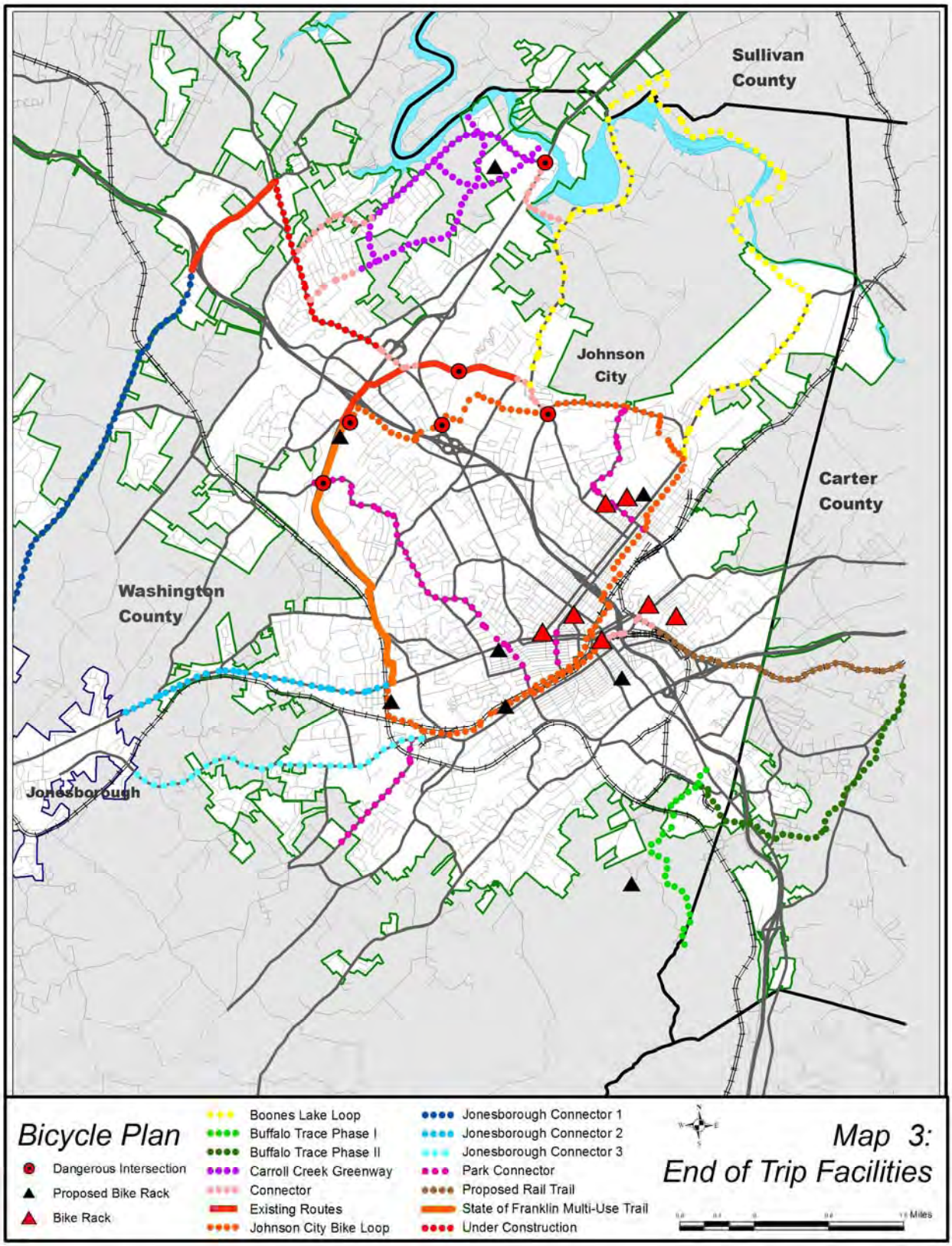
Another type of bicycle storage is the bike locker. Bike lockers are containers designed to store bicycles without dismantling. A rider can also store gear in the locker. The bicycle is completely enclosed and secure from impact. These types of facilities are recommended where parking is for longer periods.

Showers and changing facilities are especially important for riders commuting to work. Many commuters are discouraged from using their bicycles to travel to work due to the lack of these facilities. Many bicycle-friendly cities have included shower facilities in their commercial development codes. The codes are often based on location, square footage and/or number of employees.

**End of Trip Facilities Recommendations**

Bicycle parking is a critical component of the plan because it assures that cyclists will have a place to secure their bikes once they have reached a destination. It is recommended that bicycle parking be provided at public facilities, especially public facilities that will be in close proximity to identified bicycle routes. Over time, the city should develop bicycle parking requirements as a part of its development codes; however, until then, bicycle racks should be encouraged to be placed at strategic locations along bicycle routes.

Currently, identified in the Johnson City Zoning Ordinance in Article XI of the Parking Regulations, the city provides parking provisions to encourage new developments to add bicycle racks in parking lots. Under Section 11.2.6 “Parking requirements may be reduced per the following formula: one (1) space per one (1) bike locker, or one (1) space per ribbon rack provided parking reduction does not exceed ten (10) percent of the required total.” This provision will encourage developers to reduce the size of the parking lot. Reduction of parking and inclusion of bike racks will benefit the developer’s bottom line and encourage other modes of transportation.

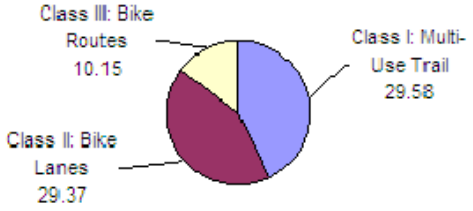

Sullivan County
Johnson City
Carter County
Washington County
Jonesborough
Bicycle Plan
Dangerous Intersection
Proposed Bike Rack
Bike Rack
Boones Lake Loop
Buffalo Trace Phase I
Buffalo Trace Phase II
Carroll Creek Greenway
Connector
Existing Routes
Johnson City Bike Loop
Jonesborough Connector 1
Jonesborough Connector 2
Jonesborough Connector 3
Park Connector
Proposed Rail Trail
State of Franklin Multi-Use Trail
Under Construction
Map 3:
End of Trip Facilities
Miles

## The Bicycle Facility Network

The recommended bicycle facilities network illustrated on Map 4 totals 69.1 miles. The proposed network is made up of the following facility types:

- Class I: Multi-Use Paths – 29.58 miles
- Class II: Bike Lanes – 29.37 miles
- Class III: Bike Routes – 10.15 miles

Figure 3: Distribution of Recommended Bicycle Facilities (miles)

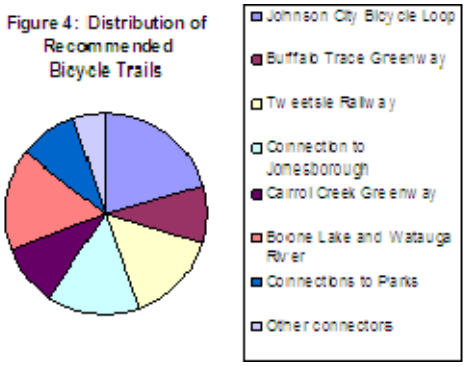



Source: Johnson City Planning Department

The plan consists of bicycling facilities that connect many destinations and land uses. These routes provide north-south and east-west links throughout the city and provide regional connections. The major focus of the plan will be the development of the Johnson City Bicycle Loop. The primary purpose of the loop is to create a complete connection around Johnson City that is useable for transportation purposes and that will aid in connecting future bicycle facilities.

The remaining proposed bicycle facilities are connections to destinations, links inside the loop, and connections to parks or recreational uses that are all joined to the Johnson City Bicycle Loop.

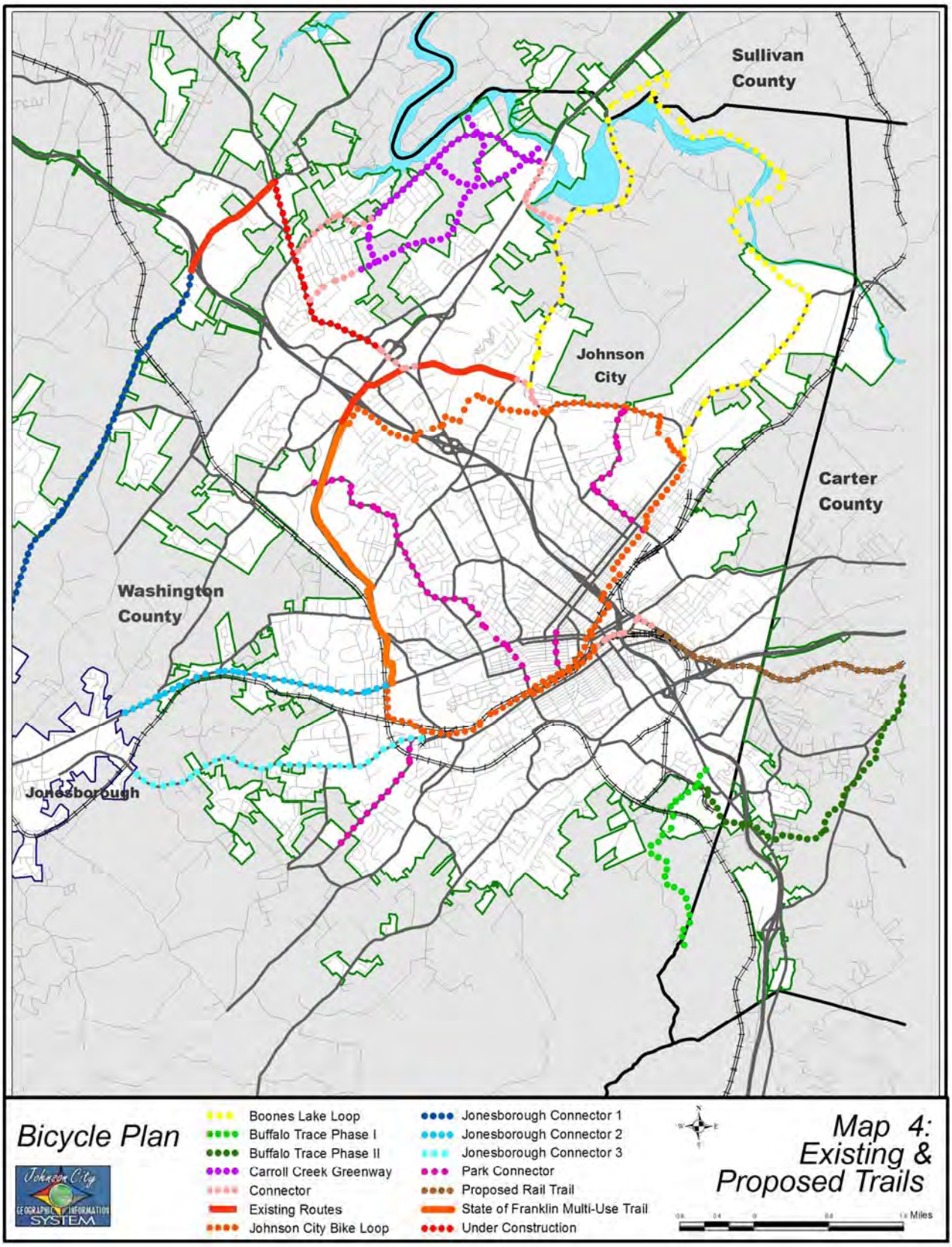
Figure 4: Distribution of Recommended Bicycle Trails




Source: Johnson City Planning Department

Bicycle facilities provide transportation and recreation routes for all types of users. Some of these facilities are constructed upon existing trails and connections. In general, the identified corridors were selected because they are located within the central city which has the land development patterns and densities that most strongly support bicycle transportation. Specific corridors were selected, based on the following criteria:

- They provide connectivity between major origins and destinations, such as downtown Johnson City, ETSU, Med Tech corridor, and other destinations;
- They are corridors on which concentrations of attractors are located;
- They are direct routes; and
- They extend in each major direction from downtown Johnson City.


Sullivan County
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Connector
Existing Routes
Johnson City Bike Loop
Jonesborough Connector 1
Jonesborough Connector 2
Jonesborough Connector 3
Park Connector
Proposed Rail Trail
State of Franklin Multi-Use Trail
Under Construction
Map 4: Existing & Proposed Trails
Miles

## GOAL, OBJECTIVES, AND POLICIES

The most important step in developing any plan is to clearly identify what are the desired goals and objectives to be accomplished.

### Goal

**SAFELY INCREASE THE LEVEL OF BICYCLING AND WALKING WITHIN THE CITY FOR RECREATIONAL TRIPS AND FOR DESTINATION-ORIENTED TRIPS.**

### Objectives

1. Create a network of bikeways and greenways capable of supporting multiple users for transportation and recreation opportunities. This includes connections for bikeways and pedestrians in new subdivisions (where feasible).
2. Provide for safe non-motorized transportation on existing streets.
3. Incorporate bikeways and sidewalks into the design of all new and reconstructed roads along with the appropriate signage.
4. Connect all areas of the city to high-use areas and destination points with safe bikeways and greenways.
5. Eliminate barriers to non-motorized transportation and recreation—barriers include intersections which can be mitigated with crosswalks, signals, and sensors.
6. Connect Johnson City bikeways and greenways with existing and future routes in the region.
7. Create a bikeway loop for non-motorized transportation and recreation around Johnson City.
8. Incorporate bicycle facilities into the design and renovation of all new and existing city parks—bike facilities at parks should include parking facilities.
9. Create a comprehensive bicycle network that links parks in Johnson City.
10. Provide secure storage facilities at destination points—bike parking included in all new city buildings.
11. Provide adequate landscaping around greenways for improved aesthetic appearance.

*Education, Safety, & Public Awareness*

12. Develop public information programs to promote the awareness and use of a bikeway and greenway network.
13. Promote the safe operation of bicycles and vehicles—share the road campaign.

14. Provide educational programs for all school levels and the public at large to increase the safety of bicycling and walking.

15. Promote increased respect between and proper use by motorized and non-motorized users of roads, bikeways, and greenways—share the road campaign.

16. Increase protection for individuals on bikeways and greenways through lighting improvements and increased signage.

*Participation*

17. Enlist the help of individuals, businesses, and civic clubs in the development, promotion, and maintenance of bikeways and greenways.

18. Promote tourist use of the bikeway and greenway network—brochures/guides to hotels, Chamber of Commerce, and display racks at restaurants.

19. Promote family use of the bikeway and greenway network—send information/brochures to schools.

*Environment*

20. Establish a bikeway and greenway network that enhances the environment through reduced auto emissions, better storm water management, and land conservation—encourage trails in floodplains, and conservation areas.

21. Ensure perpetual maintenance of bikeways and greenways and related facilities.

*Funding*

22. Adequately fund the creation, maintenance, and expansion of a network of bikeways and greenways in Johnson City through all available public and private sources.

**Policies**

**Policy 3.3.1:** It is the policy of the city to retrofit designated existing streets to support safe, non-motorized transportation.

**Policy 3.3.2:** It is the policy of the city to incorporate safe and convenient bikeways into the design of all new and reconstructed collector and arterial streets within the city.

**Policy 3.3.3:** It is the policy of the city to ensure that its bikeway and greenway network connects high-use areas and destination points and is accessible to all areas of the city.

**Policy 3.3.4:** It is the policy of the city to utilize abandoned railroad tracks in the development of bicycle/pedestrian multi-use trails.

**Policy 3.3.5:** It is the policy of the city to eliminate barriers to non-motorized transportation and recreation.

**Policy 3.3.6:** It is the policy of the city to connect the city's bikeway and greenway network with routes throughout the region, both existing and future.

**Policy 3.3.7:** It is the policy of the city to develop a bicycle loop for non-motorized transportation and recreation around the city.

**Policy 3.3.8:** It is the policy of the city to incorporate bicycle facilities into the design and renovation of new and existing city parks.

**Policy 3.3.9:** It is the policy of the city to promote the safe operation of bicycles and motorized vehicles through educational programs for motorists and for all school children, with special consideration given to the program developed by the League of American Bicyclists.

**Policy 3.3.10:** It is the policy of the city to evaluate the economic impact of bikeway and greenway usage in the hopes that future funding sources can be identified and justified.

**Policy 3.3.11**: It is the policy of the city to ensure that signage is properly placed and maintained along all designated bikeway/greenway routes.

## MAJOR THOROUGHFARE PLAN

The Major Thoroughfare Plan is the official statement of the Planning Commission and the Board of Commissioners regarding the city's major street system. The Major Thoroughfare Plan, Urban Growth and Services Element, and the Land Use Element constitute the foundation for development policies endorsed by the city. In addition, they form the basis for other, more specific Comprehensive Plan Elements dealing with such concerns as housing, parks, schools, and utilities.

The process of planning street improvements in Johnson City has evolved over the past 30 years. Today, it is common to utilize multiple planning tools to identify the proper type of improvement for an existing street or to develop the alignment for a new street. The balance between supporting and preserving the character of existing neighborhoods and guiding economic development within the business community must also be carefully observed. Two basic tools that can help keep this balance are transportation and land use planning. These two planning disciplines must be coordinated into a single process that will produce recommendations for transportation projects and proposed land use patterns that are compatible and support each other.

The four basic classifications of streets are: *local, collector, arterial, and freeways*. Each street type performs a different function. Efficient and safe operation of the street system requires that specific facilities be designed to serve the specific purpose within this classification of streets. Local streets, for example, should be designed to serve the adjacent land uses and arterial streets should be designed to move traffic throughout the city. It is important to design streets that allow traffic to move freely; however, it is equally important to design the street to be functional with the desired land use along the corridor.

Any approach used in the design of street improvements should include a component for community input. People who are most impacted by the project should have an opportunity to have input into what is designed. The Tennessee Department of Transportation (TDOT) has recently developed a process called Context Sensitive Solutions (CSS). CSS is a process that involves all stakeholders in developing a transportation facility that fits its physical setting. It is based on the following principles:

- Safety
- Accessibility and Mobility
- Community Values and Impacts
- Aesthetics and Scenic Preservation
- Natural and Human Environment

TDOT meets with all of the stakeholders before it begins its design. This allows them to balance the stakeholders' needs with the transportation objectives. The city should include a similar procedure in its project design process.

## TRAFFIC GROWTH

As Johnson City's population continues to grow there will be an increased impact on the city's street system. Traffic counts provide a good indicator of how and where the city is growing. Four of the top five growth street segments were located in the northern area of the city. This is reflective of the growth in the north. Boones Creek Road recorded the greatest growth between 1985 and 2005 increasing from 3,560 average trips per day to 15,917 trips, an increase of over 347 percent. Segments of Carroll Creek Road also experienced growth of 276 percent as this former farm road is impacted by the new subdivisions which are developing along its corridor. Interstate 26, between Boones Creek Road and Suncrest Dr. (SR-75) has also experienced tremendous growth (179 percent) due to the residential growth in the northern part of the city and due to the increase in interstate traffic created by the opening of I-26 between Ashville, NC and the Tennessee state line.

**Table 7. Growth Segments, 1985-2005**

| Station # | Location | Trips/day 2005 | Trips/day 1995 | Trips/day 1985 | % Change 20 Years |
|---|---|---|---|---|---|
| 101 | Boones Creek Rd Between Christian Church & I-26 | 15,917 | 8,577 | 3,560 | +347.11% |
| 130 | Carroll Creek Rd Between Oliver & Bristol Highway | 3,460 | 1,806 | 920 | +276.09% |
| 129 | Carroll Creek Rd Between North Roan and Bradford | 6,590 | 3,711 | 2,290 | +187.77% |
| 111 | I-26 Between Boones Creek & Bobby Hicks Hwy | 45,449 | 32,798 | 16,270 | +179.34% |
| 158 | West Lakeview Between Oakland & Parkwood | 4,070 | 2,934 | 1,860 | +118.82% |

**Source: Tennessee Department of Transportation**

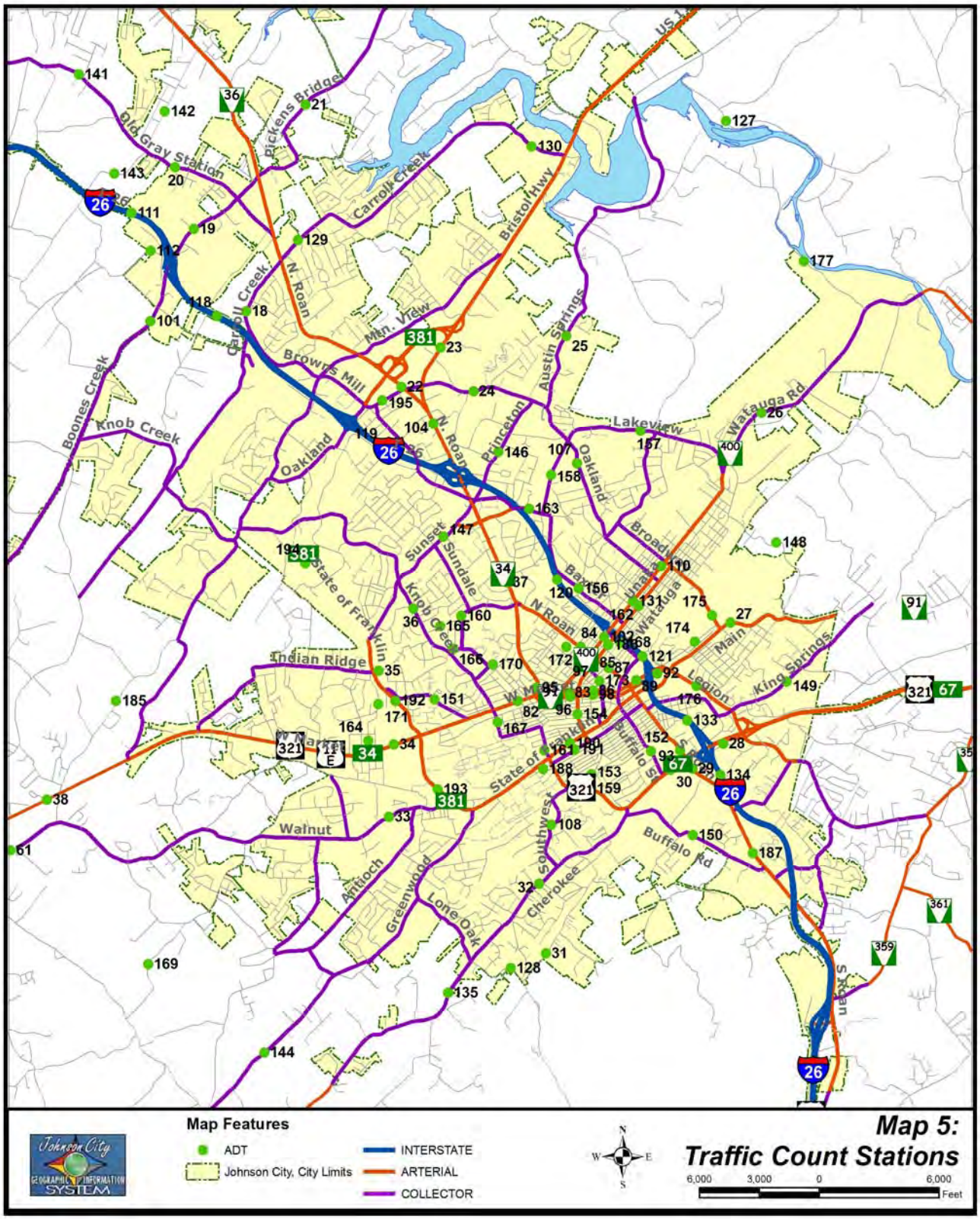
Not all of Johnson City's road segments experienced growth. In fact, several street segments actually lost traffic volume as land use and traffic patterns change. Traffic along East Main Street, east of Broadway has declined significantly (42.91 percent). This is primarily due to the construction of the Elizabethan Highway (SR 321) and motorists changing their driving pattern to utilize this improved roadway. Traffic along South Roan Street has also experienced reductions in traffic volume and this is also primarily due to changing traffic patterns caused by the opening of a new section of I-26 (formerly US 23) in the mid to late 1980s.

**Table 8. Declining Segments, 1985-2005**

| Station # | Location | Trips/day 2005 | Trips/day 1995 | Trips/day 1985 | % Change 20 Years |
|---|---|---|---|---|---|
| 27 | Main St Between Broadway & Topeka (SR-91) | 9,397 | 9,648 | 16,460 | -42.91% |
| 151 | Indian Ridge Rd Between Carter & Lincoln | 1,860 | 2,900 | 2,890 | -35.64% |
| 93 | South Roan St Between Highland & University Parkway | 6,780 | 8,791 | 8,920 | -23.99% |
| 110 | East Unaka Ave Between Center & Broadway (SR-400) | 5,860 | 5,219 | 7,710 | -23.99% |
| 29 | South Roan Between University Parkway & Lafe Cox | 14,460 | 11,387 | 17,470 | -17.23% |

**Source: Tennessee Department of Transportation**

## Map 5. Traffic Count Stations



## Commuter Traffic Flow

Approximately 21,000 commuters travel into Washington County to work every day. Of this total, 9,688 commuters travel from Carter County and 7,171 commuters travel from Sullivan County. Approximately, 10,000 Washington County residents travel to work outside of the county each day. Of this, 7,211 residents travel to Sullivan County and 1,217 residents travel to Carter County. (See Table 9)

**Table 9. Tri-Cities Region County-by-County Commuter Flow, 2000**

| | Place of Work | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Residence | Carter County | Hawkins County | Sullivan County | Unicoi County | Washington County, TN | Scott County | Washington County, VA | Other |
| Carter Co., TN | 10,899 | 24 | 1,860 | 414 | 9,688 | 0 | 123 | 2,035 |
| Hawkins Co, TN | 39 | 11,434 | 5,953 | 8 | 741 | 179 | 42 | 3,771 |
| Sullivan Co., TN | 921 | 1,494 | 48,100 | 83 | 7,171 | 4,233 | 6,763 | 2,111 |
| Unicoi County, TN | 244 | 14 | 370 | 4,042 | 2,320 | 0 | 10 | 472 |
| Washington Co., TN | 1,217 | 174 | 7,211 | 933 | 37,367 | 301 | 29 | 198 |
| Scott Co., VA | 0 | 314 | 3,625 | 11 | 352 | 3,589 | 239 | 935 |
| Washington Co., VA | 47 | 2 | 2,471 | 0 | 240 | 40 | 13,844 | 3,262 |

**Source: Census Transportation Planning Package 2000**

## Description of Levels of Service (LOS)[14]

Levels of service represent reasonable ranges of traffic volumes based on three critical flow variables: speed, density, and service flow rate. General descriptions of operating conditions for each of the levels of service are as follows:

**LOS A** describes primarily free-flow operations. Average operating speeds at the free-flow speed generally prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. Even at the maximum density for LOS A, the average spacing between vehicles is about 528 feet, or 26 car lengths, which affords the motorist with a high level of physical and psychological comfort. The effects of incidents or point breakdowns are easily absorbed at this level.

**LOS B** also represents reasonably free flow, and speeds at the free-flow speed are generally maintained. The lowest average spacing between vehicles is about 330 feet, or 18 car lengths. The ability to maneuver within the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers

[14] Highway Capacity Manual, 2000

remains high. The effects of minor incidents and point breakdowns are still easily absorbed, though local deterioration in service may be more severe than LOS A.

**LOS C** provides for flow with speeds still at or near the free flow speed of the freeway. Freedom to maneuver within the traffic stream is noticeably restricted at LOS C, and lane changes require more vigilance on the part of the driver. Minimum average spacing is in the range of 220 feet, or 11 car lengths. Minor incidents are absorbed, but the local deterioration in service will be substantial. Queues may be expected to form behind any significant blockage. The driver now experiences a noticeable increase in tension because of the additional vigilance required for safe operation.

**LOS D** is the level at which speeds begin to decline slightly with increasing flows. In this range, density begins to deteriorate somewhat more quickly with increasing flow. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort levels. Even minor incidents can be expected to create queuing, because the traffic stream has little space to absorb disruptions. At the limit, vehicles are spaced at about 165 feet, or nine car lengths.

**LOS E** describes operation at maximum capacity. Operations in this level are volatile, because there are virtually no useable gaps in the traffic stream. Vehicles are spaced at approximately six car lengths, leaving little room to maneuver within the traffic stream. Vehicles entering from a ramp or a vehicle changing lanes, can cause following vehicles to give way to admit the vehicle. This can establish a disruption wave that continues throughout the upstream traffic flow. At capacity, the traffic flow has no ability to dissipate even the most minor disruptions, and any incident can be expected to produce an extensive queuing. Maneuverability within the traffic stream is extremely limited, and the level of physical and psychological comfort afforded the driver is extremely poor.

**LOS F** describes breakdowns in vehicular flow. Such conditions generally exist within queues forming behind breakdown points. Such breakdowns occur for a number of reasons:

a. Traffic incidents cause a temporary reduction in the capacity of a short segment, such that the number of vehicles arriving at the point is greater than the number of vehicles that can traverse it.
b. Recurring points of congestion exist, such as merge or weaving areas, where the number of vehicles arriving is greater than the number of vehicles discharged.
c. In forecasting situations, any location presents a problem when the projected peak hour (or other) flow rate exceeds the estimated capacity of the location.

## PRIORITIES

The Johnson City Metropolitan Transportation Planning Organization (MTPO), as part of its long-range transportation planning process, contracted with Wilbur Smith Transportation Engineers to develop its traffic-modeling program (TransCad). TransCAD is a GIS based transportation modeling program that uses future land use projections, projected residential densities, and carrying capacities to project future traffic volumes. This allows the MTPO and the city to anticipate and plan for needed road projects before the service level of the roadway begins to fail.

### Locally-Funded

Based on the results of this computing modeling, knowledge about current growth trends, and road projects identified as necessary for economic development, the following has been identified as a list of top priorities for locally-funded projects:

### Phase I (2007- 2012)

1. **Tennessee Street Extension from Lamont Street to John Exum Parkway**. Completing this .32 mile, 4-lane collector street will improve traffic throughout the area of the city by providing another north/south connection which will further improve the overall street network and help alleviate traffic congestion along State of Franklin Road. The 2007 estimated cost of construction is $6 million ($500,000 funded in FY 2007).

2. **Sunset Drive.** Improve Sunset Drive from Knob Creek Road to North Roan Street to a 5-lane road with sidewalks. The 2007 estimated cost of construction is $2 million ($500,000 funded in FY 2007).

3. **Indian Ridge Road/State of Franklin Road Intersection.** Reconstruct this intersection to better accommodate traffic flow. Without any improvements, this section of roadway is expected to operate at a Level of Service E by the year 2030. The 2007 estimated cost of construction is $3 million.

4. **Knob Creek Road Overpass**. Improve Knob Creek Road to five lanes from State of Franklin Road to Redstone Road. Construct a bridge over the railroad to better

facilitate traffic flow. The 2007 estimated cost of construction is $12 million ($4.2 million funded through federal appropriations).

5. **Lone Oak Road Extension**. Extend Lone Oak Road 1.7 miles from Greenwood Drive to West Market Street using Carter Sell Road. This would provide another north/south connection and improve the area street network. The estimated 2007 cost of construction is $13 million.

6. **Swadley Road from Plymouth Road to the Milligan Highway**. Improve the roadway to better accommodate existing traffic volumes. The 2007 estimated cost of construction is $1 million.

7. **Hopper Road Extension**. Extend Hopper Road from Indian Ridge Road to Claude Simmons in order to improve the street network and provide better access to the north. Indian Ridge Road is already experiencing severe traffic congestion at peak times and this improvement should help alleviate this congestion. The 2007 estimated cost of construction is $2 million.

8. **East Oakland Avenue**. Widen East Oakland Avenue from Princeton Road to Unaka Avenue to two or three lanes with sidewalks. Without road improvements, segments of this roadway are expected to operate at a Level of Service E by the year 2030. The 2007 estimated cost of construction is $3 million.

9. **East Main Street/Broadway Avenue Intersection.** Reconstruct this intersection to better accommodate traffic flow. The 2007 estimated cost of construction is $500,000.

10. **West Walnut Street/State of Franklin Road Intersection.** Reconstruct this intersection to better accommodate traffic flow. Without any improvements, this intersection is expected to operate at a Level of Service F. The 2007 estimated cost of construction is $1 million.

11. **Highland Church Road.** Improve this roadway by realigning with Knob Creek Road and upgrading by widening and adding sidewalks to Haretown Road. The 2007 estimated cost of construction is $4 million.

12. **Milligan Highway**. Improve Milligan Highway from SR-67 to the city limits. The 2007 estimated cost of construction is $2.5 million.

**Phase II. (2013-2020)**

13. **Lone Oak Road from Cherokee to Greenwood Drive.** Improve two lanes with sidewalks and turn lanes at intersections to facilitate traffic and improve safety. The 2007 estimated cost of construction is $3 million.

14. **Indian Ridge Road from Baldridge Drive to State of Franklin Road**. Improve two lanes to improve safety. The 2007 estimated cost of construction is $2 million.

15. **Carroll Creek Road**. Reconstruct Carroll Creek Road from Browns Mill Road four miles to the Bristol Highway to an improved 2-lane divided/undivided roadway with sidewalks. There are segments of road that have experienced over 200 percent growth in traffic volume over the past ten years and this growth is expected to continue as this corridor continues to develop. The 2007 estimated cost of construction is $20 million.

16. **West Walnut Street**. Upgrade roadway, primarily the intersections from State of Franklin Road to the city limits. The 2007 estimated cost of construction is $1 million.

17. **Knob Creek Road.** Improve the 1.65-mile section of roadway from the proposed railroad overpass near Redstone Road to Boones Creek Road. This is necessary to improve hazardous conditions and better accommodate future traffic flow. Improve this roadway to four lanes with a median, bike lanes, and a sidewalk. The 2007 estimated cost of construction is $9 million.

18. **West Mountainview Road.** Widen pavement and improve this existing 2-lane, 1.8- mile road from North Roan Street to Knob Creek Road. Without any improvements, segments of this roadway are expected to operate at a Level of Service E and F by the year 2030. The 2007 estimated cost of construction is $5 million.

## Economic Development Initiatives

The timing of these road projects are dependent upon the city's growth or the impact from major commercial or industrial developments. In these instances, the developer can be expected to fund some or all of the road improvements or the proposed development is expected to generate sufficient revenue through property and sales tax to justify the improvements.

**West Oakland Avenue**. Widen West Oakland Avenue from Hanover Road to Knob Creek Road to five lanes with sidewalks. Without any improvements, this segment of road is projected to have significant congestion by the year 2030. This project is also viewed as needed for economic development of the surrounding area.

**Innovation Park Drive.** Construct a street from McKinley Road to West Market Street through the proposed Innovation Park. This would be an economic development incentive to help develop the med-tech corridor middle anchor. The estimated 2007 cost of construction is $3 million.

**Mall Street Improvements and realignment**. The Mall, beginning the construction of a 300,000 square-foot expansion, is expected to experience an increase in traffic. The traffic circulation around The Mall will need to be improved to accommodate this increase ($500,000 funded in FY 2007).

**Browns Mill Road Extension**. Extend Browns Mill Road .9 miles from Carroll Creek Road to Boones Creek Road. Construct a non-residential street with two lanes, a sidewalk, and multi-purpose trail. This project is viewed as a catalyst for economic development in the Boones Creek area and would provide a link in the development of a frontage road system along I-26.

**West Walnut Street from Buffalo Street to University Parkway**. This would include primarily streetscaping and sidewalks to help encourage redevelopment along this corridor.

**State of Franklin Frontage Roads**. Construct a pair of frontage roads. These roads would connect Med-Tech Parkway to Oakdell Court on the east and Market Place Boulevard and Sunset Drive on the west and provide access to several land-locked parcels.

**Maranatha Way Extension**. Extend Maranatha Way .9 miles from West Mountainview Road to Carroll Creek Road to provide another north/south connector street paralleling I-26.

**Chase Drive/Sam's Club From Chase Drive to West Mountainview Road**. Construct a non-residential street with two lanes, a sidewalk, and multi-purpose trail.

**State and Federal Priorities**

In addition to the locally-funded projects, the following is a proposed list of state and federal roadway priorities:

**State-Funded Priorities**

1. **North Roan Street/Kingsport Highway from Boones Creek Road to Bobby Hicks Highway (SR 75).** In order to accommodate the projected traffic growth, expand this 4.1-mile section of roadway to four lanes with a center turning lane. Without any improvements, this roadway is expected to operate at a Level of Service F by the year 2030.

2. **Bristol Highway from High Point Drive to SR 381**. Widen to five lanes in order to have a continuous 5-lane roadway which would facilitate traffic flow.

3. **Veterans Administration Access Road.** Construct a new entrance into the VA from the intersection of West Market Street and Indian Ridge Road. The proposed road would be two lanes with sidewalks along both sides.

4. **SR-75**. In order to accommodate the projected traffic growth, expand this 4.1-mile roadway to four lanes with a center turning lane from the Kingsport Highway SR-36 to the Tri-Cities Regional Airport. Without any improvements, this roadway is expected to operate at a Level of Service F by the year 2030.

5. **Triangle Intersection (North Roan Street, Browns Mill Road, Princeton Road, Broyles Drive).** Realign intersection to provide greater separation with the traffic signals and improve traffic flow. Without improvement this segment of road is expected to operate at a Level of Service F in 2030.

6. **Watauga Road from Broadway east to the city limits**. In 2030, sections of this road are expected to operate between a Level of Service E and F. Improving this 3.65-mile section of roadway is also necessary to accommodate existing and projected commercial/industrial traffic.

7. **Boones Creek Road (SR 354) from I-26 to Jonesborough's city limits.** Improve this 6.3-mile roadway to four lanes with a median, bike lanes, and a sidewalk. Sections of this roadway have experienced growth of traffic volumes of over 300 percent over the past ten years, and without improvements, major segments of this roadway are expected to operate at a Level of Service F by the year 2030.

8. **Okolona Road Realignment.** In order to improve traffic flow and to facilitate economic development realign the intersection of Okolona Road with the I-26 off ramp at Exit 28.

**Federally-Funded Priorities**

9. **Interstate 26 from University Parkway to the Sullivan County line**. Widen to six lanes to better accommodate anticipated traffic growth. . Without any improvements, the interstate was projected by Wilbur Smith to operate between a Level of Service E and F by the year 2030.

**Boones Creek/I-26 Interchange Improvements.** This rural interchange needs to be upgraded in order to handle the commercial traffic developing around the interchange. Without any improvements, this interchange is expected to operate at a Level of Service F by the year 2030.

**Suncrest Drive/I-26 Interchange Improvements**. This rural interchange needs to be upgraded in order to better accommodate the traffic developing around the interchange. Without any improvements, this interchange is expected to operate at a Level of Service F by the year 2030.

**University Parkway/I-26 Interchange**. Reconstruct the interchange to an urban diamond or free flow clover leaf intersection to accommodate existing and future traffic. Without any improvements, this interchange is expected to operate at a Level of Service F by the year 2030.

**Downtown/State of Franklin Road Interchange.** Relocate the current Main Street/Market Street interchange to align with State of Franklin Road. This will improve traffic flow through the downtown.

**Ford Creek Road/I-26 Interchange**. In order to facilitate the development of industrial land along Ford Creek Road and to help alleviate traffic generated by such development construct a full interchange.

## OTHER LONG-TERM IMPROVEMENTS

The following is a list of public and private road improvements necessary to correct hazardous conditions, alleviate existing and future traffic problems, improve the street network, and to meet long-term growth needs. The timing of these projects is dependent upon from the impacts of development along these roadways.

**South Roan Street**. Widen South Roan Street to three lanes with sidewalks 2.4 miles from the railroad overpass to the city limits.

**Buffalo Road**. Widen Buffalo Road from Lafe Cox Drive to South Roan Street to better accommodate existing traffic volumes.

**I-26 Frontage Road**. Construct a frontage road paralleling I-26 from Ford Creek Road to Ford Lane.

**I-26 Frontage Road**. Construct a frontage road paralleling I-26 from Suncrest Drive to Ford Old Stage Road. Construct a non-residential street with two lanes, a sidewalk, and multi-purpose trail.

**Hopper Road Improvement.** Reconstruct Hopper Road from West Market Street to Indian Ridge Road to an improved 2-lane road with sidewalks.

**McInturff Lane**. Extend McInturff Lane to connect with the new Hopper Road extension.

**Timberlake Road**. Reconstruct Timberlake Road from the Bristol Highway to Carroll Creek Road to improve hazardous conditions and improve traffic flow.

**Claude Simmons Road from Knob Creek Road to Market Street and Headtown Road from Claude Simmons Road to Market Street (Jackson Blvd.).** Improve the two lane road to address traffic and safety

**College Heights Drive/Seminole Drive.** Widen pavement and improve this existing 2-lane roadway to include sidewalks on one side.

**Pickens Bridge Road/Piney Flats Road**. Improve Pickens Bridge Road from North Roan Street to the Bristol Highway. Improve Piney Flats Road from the Bristol Highway to Watauga Road. This would create a beltway from North Roan Street to Watauga Road which would better accommodate traffic in this developing area and create an improved street network.

## OTHER NEEDED IMPROVEMENTS

The following is a list of public and private road improvements necessary to correct hazardous conditions, to alleviate existing traffic problems, and to meet future growth needs.

1. **North State of Franklin Road (SR 381) from I-26 to Sunset Drive**. Improve the traffic management system by installing improved signalization and fiber optic upgrades.

2. **Knob Creek Road/Underpass**. Improve Knob Creek Road from State of Franklin Road to Claude Simmons Road. Reconstruct railroad tunnel or build a bridge over railway to facilitate traffic flow.

3. **West Market Street from John Exum Parkway west to the city limits**. Improve the traffic management system by installing improved signalization and fiber optic upgrades. Without improvements, major segments of this roadway are expected to operate at a Level of Service F by the year 2030.

4. **Boones Creek Road (SR 354) from I-26 to Jonesborough's city limits.** Improve this 6.3-mile roadway to four lanes with a median, bike lanes, and a sidewalk. Sections of this roadway have experienced growth of traffic volumes of over 300 percent over the past ten years, and without improvements major segments of this roadway are expected to operate at a Level of Service F by the year 2030.

5. **State of Franklin Road Frontage Roads**. Construct a pair of frontage roads. These roads would connect Med-Tech Parkway to Oakdell Court on the east and Market Place Boulevard and Sunset Drive on the west and provide access to several land-locked parcels.

6. **Downtown Loop.** Install landscape medians and on-street parking along the Downtown Loop from State of Franklin Road .3 miles to North Roan Street.

7. **Fairridge Road Tunnel Replacement**. Reconstruct railroad tunnel to facilitate traffic flow in this developing area and to better accommodate fire safety vehicles.

8. **Carroll Creek Road Tunnel Replacement**. Reconstruct railroad tunnel to facilitate traffic flow in this developing area and to better accommodate fire safety vehicles.

9. **Plymouth Road.** Widen Plymouth Road from Rocky Top Road to Pilgrim Court to two or three lanes with sidewalks.

10. **Old Gray Station Road.** Widen pavement and improve hazardous intersection from Bobby Hicks Highway to North Roan Street.

11. **Shadden Road**. Widen pavement and improve hazardous intersection from Suncrest Drive to Highland Church Road.

12. **Hopper Road Improvement.** Reconstruct Hopper Road from West Market Street to Indian Ridge Road to an improved 2-lane road with sidewalks.

13. **Cherokee Road from Lone Oak Road southwest to the city limits**. Improve roadway to better accommodate existing and projected traffic volumes.

14. **Greenwood Drive from Jack Vest to Lone Oak Road.** Improve to 2 lanes with turn lanes at intersections and major developments

15. **Main Street from State of Franklin Road to Iris Glen**. Improve to 2 lanes with turn lanes at intersections and reconstruct the Broadway intersection to improve safety and traffic flow.

## GOAL, POLICIES, AND ACTIONS

**GOAL**

PROMOTE SAFE AND EFFICIENT TRAFFIC FLOW IN AND AROUND JOHNSON CITY

**POLICIES, AND ACTIONS**

**Policy 3.4.1:** It is the policy of the city to classify streets according to their function so that streets are designed according to their intended use.

**Policy 3.4.2:** It is the policy of the city to create a street network to better disperse traffic throughout the city. This network shall consist of freeways, arterials, collectors, and major local streets.

**Policy 3.4.3:** It is the policy of the city to construct and maintain an arterial street system to improve major cross-town traffic flow and the flow into and out of the major commercial corridors.

**Policy 3.4.4:** It is the policy of the city to construct and maintain a collector street system to provide improved access within major residential areas and to the arterial street system.

**Policy 3.4.5:** It is the policy of the city to construct and maintain a highway network to improve traffic circulation in and through the city and region.

**Policy 3.4.6:** It is the policy of the city to construct and maintain a residential street system designed to promote safety and convenience for those living along these streets.

**Policy 3.4.7:** It is the policy of the city to require future arterial and collector streets to be designed with crosswalks and sidewalks for pedestrian use and safety.

**Policy 3.4.8:** It is the policy of the city to identify hazardous street segments or intersections, rank them in priority for improvement, and provide improvements within the limits of financial resources.

**Policy 3.4.9:** It is the policy of the city to establish criteria identifying the location and design of private drives and public streets.

**Policy 3.4.10:** It is the policy of the city to participate in a context sensitive solution process to involve the public in the design of new roads or the major road redesign or improvement of existing roads in order to ensure a high quality and safe roadway which meets the desires of the community.

**Policy 3.4.11:** It is the policy of the city to review site plans and subdivision plats to ensure logical street extensions through the provision of street stubs.

**Policy 3.4.12:** It is the policy of the city to protect the capacity of major roadways by controlling access.

**Actions**

- Regulate the number of curb cuts to properties along collector and arterial streets in order to protect the street's function and safety.
- Require the construction of de-acceleration lanes to enter multi-family, commercial, and industrial properties along collector and arterial streets.

**Policy 3.4.13:** It is the policy of the city to construct sidewalks along new streets and when major improvements occur.

**Actions**

- Construct new sidewalks as part of any major street improvement.
- Require sidewalks as part of all new street construction projects.

**Policy 3.4.14:** It is the policy of the city to maintain continual coordination between the Transportation Element and other elements of the Comprehensive Plan to aid in proper planning, and coordinated capital improvements programming.

**Policy 3.4.15:** It is the policy of the city to monitor traffic volumes, levels of service, safety, and land platting on an on-going basis in order to anticipate needed improvements to the local transportation system.

**Policy 3.4.16:** It is the policy of the city to maintain close communication with county, regional, state, and neighboring local units of government in order to promote roadway system continuity and uniformity across and beyond its boundaries.

**Policy 3.4.17:** It is the policy of the city to work closely with the Johnson City Metropolitan Transportation Planning Organization to secure and coordinate the allocation of state and federal funding in the area.

**Policy 3.4.17:** It is the policy of the city to investigate the development and implementation of impact fees to help defray the cost of needed traffic improvements.