

# *Springfield - Greene County Comprehensive Plan*

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## *Transportation Plan*

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Adopted by  
Metropolitan Planning Organization June 7, 2001  
Springfield City Council June 11, 2001

**URS**

BRW, Inc.

# Transportation Plan

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# Summary

## Introduction

The Transportation Plan is one component of the Springfield-Greene County Comprehensive Plan and provides guidance for future transportation decisions. Although long-range in scope, the plan provides direction and sets policies for day-to-day decision making. The Springfield Transportation Plan is divided into 13 sections and builds on past transportation planning conducted by the Springfield Area Transportation Study Organization, the area's Metropolitan Planning Organization (MPO). All transportation modes relating to passenger travel and freight are discussed in the document. The plan addresses transportation policies and strategies and assists in prioritizing transportation improvements over the next 20 years.

The population in the Springfield metropolitan area was about 180,000 in 1990. The Greene County population is projected to grow to 285,000 – 300,000 by the year 2020. Over the same time period employment is projected to grow from 100,000 in 1990 to 160,000 in 2020. Eighty-five to ninety percent of the future Greene County population (245,000 to 270,000 people) are expected to live in the Springfield Urbanized area of the county. Where this population resides and works will greatly impact the demand for and the cost of transportation infrastructure. Furthermore, how these land uses relate to each other will greatly affect travel behaviors and the quality of life for all those living in the Springfield area. Therefore, land use and transportation decisions need to be coordinated to maximize the area's quality of life while minimizing the need for expensive infrastructure and other negative impacts.

The transportation system is generally the community's single largest infrastructure investment. Transportation decisions can have a tremendous effect on the community and its neighborhoods, which explains why transportation projects often spark much community discussion and debate. It is not uncommon to have many stakeholders with legitimate and often conflicting values involved with a transportation project. As a result, it is critical to balance the concerns and values of stakeholders with the values and priorities of the community in making transportation decisions.

## Transportation Planning Principles

The *Vision 20/20* Citizens Group and its Transportation Focus Group worked to identify principles and policies for the Springfield-Greene County Transportation Plan. *Vision 20/20* represents the synthesized, collective opinion of hundreds of citizens who participated in its lengthy process. The following transportation planning principles were developed to provide direction for the transportation plan and to ensure that transportation issues and problems in the area are addressed in an effective and timely manner.

### Transportation Planning Principles:

- 1. Economy and Quality of Life:** Direct regional transportation investments and implement the Land Use and Growth Management Plan and strategies to support the economy and quality of life in the Springfield-Greene County urban area.

- 2. Plan Consistency:** Make regional transportation investments consistent with this Transportation Plan.
- 3. Roadway Efficiency:** Ensure that the Springfield-Greene County urban area roadway system is built and designed to maximize system efficiency, serve travel demand, provide for user safety, and integrate and enhance other travel modes.
- 4. Access Control:** Provide an access-controlled roadway system, where necessary and feasible, based on land use, traffic demand, safety and cost.
- 5. Road Right-of Ways:** Define and officially map rights-of-way for planned future highways and arterials within planned corridors, and where necessary, acquire right-of-way prior to development.
- 6. Transit:** Promote the use of transit through incentives.
- 7. Travel Demand:** Reduce the need for additional roadway capacity and maximize energy efficiency during peak hours through ridesharing, conventional transit, pedestrian and bicycle use, improved land use patterns, development site design, and Transportation System and Demand Management (TSM/TDM) strategies.
- 8. Bicycle and Pedestrian Systems:** Develop and maintain safe, high-quality, continuous, barrier-free bicycle and pedestrian systems to function as integral parts of the area's transportation system.
- 9. Freight:** Maintain a competitive freight transportation system including the region's commercial motor carriers, railroads, air cargo carriers, and intermodal connections in order to provide effective linkages to state, national and international markets. Design appropriate roadways to accommodate trucks and encourage the Missouri Legislature and MODOT to improve highway connections to other major cities, especially Kansas City and Memphis. Support airport development and the improvement of rail connections, trucking connections, inter-city bus, and the development of intermodal center.
- 10. Planning Coordination:** The planning decisions and implementation of transportation programs and projects should be consistent with federal, state and regional environmental regulations, standards, programs and policies.
- 11. Public Participation:** Promote public participation in formulating transportation policy and implementing transportation decisions.
- 12. Paratransit:** Encourage the provision of paratransit and not-for-profit transportation services within the Springfield area, particularly to the populations not served by the transit system.

These principles serve as a summary of the transportation values of the community and provided guidance for the development of this document.

## Streets and Highways

The primary mode of transportation in Springfield-Greene County area is the private automobile. Over the past several decades, the growth in the number of vehicles has outpaced population. As a result of the increased reliance on cars, a greater demand is placed on the area's roadway infrastructure.

The goal for planning Springfield area streets and highways is to provide an adequate system of thoroughfares that will ensure logical development of the community, safe and efficient movement of people and goods, and an economical expenditure of public funds. In order to achieve this goal, it is necessary to develop and update the Major Thoroughfare Plan to project and accommodate future roadway needs. The transportation network is classified by the function of each roadway. The roadway classification system is a hierarchical system based on traffic flow and land accessibility. On one end of the spectrum are freeways, which have very good traffic flow characteristics with very little land access. On the other end of the spectrum are local streets, which serve to provide the greatest access to land with very little consideration for traffic flow. Arterials, collectors, and expressways fall in between these classifications.

Street classifications system should regularly be updated to ensure that the system provides an appropriate and acceptable balance between traffic flow and land access. The Metropolitan Planning Organization (MPO), Federal Highway Administration, and Missouri Department of Transportation should work together to regularly update the Functional Classification Map. Furthermore, street classifications should be consistent with the zoning ordinances, subdivision regulations and design standards for the city. In addition, the City of Springfield, Greene County and the Missouri Department of Transportation should be in agreement on the design standards for major streets.

The thoroughfare system needs to be designed to carry not only vehicular traffic, but also public transit, bicycles and pedestrians. Thus, design standards need to be in place to address all transportation considerations. Furthermore, design standards should be consistent for the City of Springfield, Greene County and the Missouri Department of Transportation.

The Major Thoroughfare Plan, developed by the Springfield Area MPO, addresses all major roadway issues for the City of Springfield and the metropolitan area. The plan is intended to provide an overall framework for decision-making on thoroughfare improvements and extensions. Important issues addressed in the plan include roadway alignment preservation, development considerations and relationships, secondary circulation systems, traffic forecasts, and transportation improvements.

The development of a Parkway System is a concept of particular interest for the area. Parkways are linear public infrastructure systems that provide efficient traffic circulation and recreation in a park like setting. Parkways provide roadways with generous landscaping and will include amenities such as bicycle and pedestrian paths and/or on-street bicycle lanes. Facilities to be considered for a parkway treatment may include a new River Bluff Arterial, Pierson Creek Arterial, Bluegrass Arterial, or any other roadways considered appropriate.

Parkways planned in conjunction with greenways would be a tremendous asset to the Springfield area. These "green" corridors would link neighborhoods and parks, provide

gateways to the community, and enhance the community's quality of life. Even though such a parkway system would require decades to complete and a substantial investment, the benefits would be enjoyed for generations.

Springfield's Center City is served exceptionally well by the city's freeway and arterial roadways. However, improving traffic linkages could enhance the connection between Center City's Greater Downtown, Government Plaza, and Commercial Street districts. Furthermore, streetscape and lighting improvements along Boonville-South and Benton-Kimbrough Avenues would help integrate these Center City districts.

## **Transit and Paratransit**

City Utilities (CU) is responsible for providing fixed-route public transit and public paratransit service to the City of Springfield. Fixed-route transit service is an integral mode of transportation in the Springfield area. Currently, there are 13 fixed bus routes serving the city on weekdays with limited evening and weekend service. Many changes were made to the City Utilities transit service based on the findings and recommendations of a 1995 study. Between 1997 and 1999, transit ridership increased by 30 percent. In 1998, CU reported an average of about 4,200 passenger trips per weekday. City Utilities paratransit service provides transportation for the city's disabled population.

In addition, Southwest Missouri State University (SMSU) provides Campus Shuttle service from their park and ride facility to the campus. The Campus Shuttle serves students, faculty and the general public with no fare required.

Land use decisions are critical to the success of fixed-route public transit. When housing is clustered together around transit stops, and employment and commercial development are centrally located in a pedestrian friendly downtown environment, transit will be an attractive alternative to single occupancy driving. In contrast, low density spread-out housing, employment and commercial areas are extremely difficult to serve effectively or efficiently with fixed route transit. Therefore, transit considerations need to be made when making land use decisions.

Approximately, two-thirds of CU's riders are transit dependent (i.e., do not have another means of transportation). Transit provides a critical service to those who are unable to use or purchase an automobile (e.g., youth, elderly, low-income persons). While transit is of critical importance to these customers, by attracting riders who have transportation choices, the system will be in a better situation to serve those who are transit dependent. Public transit systems have high fixed costs; whether a bus is carrying three passengers or thirty-three the cost of operating that bus is the same. By filling more seats with "choice" riders, more revenue from fares become available for increased and/or improved transit services, which benefit transit dependent riders.

In order to understand how the transit system is functioning, a series of system and route performance measures are needed. These performance measures provide standards, which indicate when a change to the system or a specific route is needed. System and route performance measures should be reviewed periodically to determine if they are still appropriate measures of performance.

Guidelines or criteria are also established to assist policy-makers in making decisions that promote transit system goals. Criteria for eliminating service, changing service, or

eliminating service should be in place and reviewed periodically. Because service route changes make the system more confusing to use, transit system changes should never be taken lightly. However, changes in service and marketing that simplify using the system and make it more comfortable to use should be a priority. Therefore, guidelines for Passenger Amenities and Customer Relations were developed.

Paratransit service is provided to ensure that all citizens have access to basic mobility needs. Many persons are unable to use conventional transit service because of a permanent or temporary physical disability. Area residents that meet the Americans with Disabilities Act (ADA) paratransit eligibility standards may request trips from the City Utilities “Access Express” system.

In addition, there are over 20 organizations in the Springfield area that provide not-for-profit van and bus transportation services to the community. Many of these organizations serve special populations or provide unique community services such as therapy trips for the chronically mentally ill, foster grandparent transportation services, or medical transportation services for clients with special needs. Encouraging cooperation and coordination among the various not-for-profit transportation service providers would increase the effectiveness and efficiency of these resources.

The Springfield MPO provides a rideshare-matching program. This program provides travelers with an easy method of locating people interested in carpooling. The area should continue to support the rideshare program and consider enhancing the program by providing assistance to major employers.

## **Bicycles**

The goal of bicycle planning is to improve the safety, comfort and popularity of bicycling in the Springfield area. Several bicycle issues will need to be addressed in the future. First, bicycle facilities for recreation and for transportation need to be coordinated creating bike connections between bike paths, multi-use paths, and on-street bicycle routes. The Metropolitan area should implement a more detailed bicycle plan for addressing how bicyclists will navigate existing barriers, such as freeways and railroads. Furthermore, a plan and funding for maintaining bicycle facilities needs to be in place to ensure that these facilities are safe and useful.

Both off-street and on-street bike facilities should be designed and maintained according to established guidelines. All major streets should provide for bicycle travel whenever possible in order to provide continuous connections from neighborhoods to major employment, commercial and recreational areas. Area jurisdictions should consider modifying their design standards and zoning ordinances to include provisions for bicycles.

## **Pedestrians**

One of the goals established through the *Vision 20/20* comprehensive planning process is to develop a safe, high-quality, continuous, barrier-free pedestrian system that functions as an integral part of Springfield-Greene County transportation system. After decades of ignoring the needs of pedestrians, or at best considering pedestrians as an afterthought, communities throughout the country are realizing the benefits of developing and improving pedestrian access. Not unlike roadways, pedestrian facilities need to be treated

as a system providing connections between residences, schools, recreation, shopping and employment. The pedestrian system is also essential for providing connections to the transit system and parking areas.

Land use and development patterns are a critical factor in determining the viability of walking as a transportation mode. In contrast to post World War II suburban development, traditional neighborhood development provided environments where walking to work, shopping, parks, etc. was not only possible, but expected. Not only were destinations within walking distance, but sidewalks were often buffered from the roadway with a planting strip and street trees creating a more comfortable and pleasant walking environment. By encouraging mixed-use development, clustering housing near retail and employment activities, and using grid patterns streets that provide direct pedestrian connections, walking trips will begin to replace some auto trips.

The City of Springfield Subdivision regulations should require sidewalks on both sides of streets except where housing densities are less than three units per acre or on cul-de-sacs serving less than seven dwelling units. Greene County should consider similar requirements within urbanizing areas. The *Vision 20/20* Transportation Group stressed the importance of sidewalks for the entire street system, regardless of whether it's a city, county or state route. Even though state highways are generally equipped with drainage ditches instead of curbs and gutters, sidewalks should be required along these routes where right-of-way is available.

To create pedestrian facilities that are accessible to everyone, the Americans with Disabilities Act (ADA) standards should be implemented by installing curb depressions, also known as pedestrian ramps, where needed. Ensuring that sidewalks meet the ADA standard helps those with disabilities access the city's public transit system.

Pedestrian improvements, like all transportation decisions, need to be prioritized. Perhaps the most important users of the pedestrian system are school age children. Therefore, the most critical sidewalk and pedestrian system improvements are those deficiencies around schools, parks and recreation areas and their neighborhood connections. Another priority would be providing pedestrian connections in high employment areas.

While sidewalks are the primary component of a good pedestrian system, they are only one component. To encourage walking, the entire pedestrian experience needs to be considered. Thus, sidewalks should be separated from roadways with planting strips and street trees to provide a buffer between pedestrians and traffic. On-street parking can also serve as a barrier separating pedestrians and moving traffic. Adequate and comfortable lighting can increase feelings of safety and security for walkers. Furthermore, by keeping the built environment at a "human" scale, a more comfortable pedestrian environment is created. Smaller full spectrum lighting fixtures, stores with display windows, and slower moving traffic can contribute to creating a more walkable environment.

Because the pedestrian system serves as an important transportation network, and can enhance the city's quality of life. Funding for pedestrian improvements is limited, therefore, alternative and innovative funding sources should be investigated.

## Transportation System and Demand Management

Transportation System Management (TSM) and Transportation Demand Management (TDM) practices include strategies to improve the operation of the transportation system. TSM looks at more cost-effective ways of maximizing capacity of the existing system. These strategies may include strategically placed turning lanes, signal coordination programs, eliminating left turns, or minimizing roadway access points. Transportation Demand Management (TDM), as the name indicates, addresses the demand side of transportation. These strategies may include incentives for using transit or carpooling, encouraging flexible work time to decrease peak hour travel, or promoting mixed land uses that allow people to live within walking distance of work and other activities.

Clearly, current and forecasted funding projections will not cover the costs of expanding the transportation system to accommodate forecasted transportation demand. Therefore, transportation decision-makers need to consider how to best utilize those limited resources to maximize the effectiveness of the current system. Not only can TSM and TDM strategies help to save limited resources, will also improve the livability of the city by reducing or preventing the negative impacts associated with an expanded roadway network.

## Airports

The Springfield-Branson Regional Airport is the main air facility in Southwest Missouri and is an important link to future national and international markets. Springfield/Greene County also has a private aircraft airport, the Downtown Airport, which provides general aviation services. In addition to these two airports, there are two public airports, three privately owned public-use airports, and nine privately owned private-use airports in the area. The goal of airport planning is to provide airport facilities to meet the needs of air carriers, general aviation, and airfreight in a safe and adequate manner.

The Springfield-Branson Regional Airport's Master Plan was last updated December 1990. The airport currently has scheduled passenger service from seven commercial airlines with nonstop flights to St. Louis, Kansas City, Denver, Dallas, Chicago, and Memphis. In 1999, approximately 705,000 passengers flew in and out of the airport. Passenger travel is projected to increase three percent (3%) in 2000. Growing at a substantially greater rate, air freight has increased sixty-six percent (66%) over the last three years.

There are two major land use issues related to airports. First relates to the Airport Zone, which addresses airport safety. The Airport Zone limits the type and size of development within an area extending from each end of the runway.

The other airport land use issue deals with noise. As airport activity increases, so does the airport noise impacting surround land uses. Many cities across the country have spent millions of dollars to mitigate noise impacts on surrounding land uses. A more proactive and efficient approach to addressing noise impacts is to zone potentially impacted areas for compatible uses prior to development or require noise mitigation measures be included in new construction. The City and County should continue present zoning policies within existing and projected noise impacted areas. Rezoning for noise sensitive uses should not be allowed unless a detailed noise analysis is completed and noise mitigation strategies are included in the building or site design.

## Trucking

The trucking industry has a strong presence in Springfield and Greene County. According to a 1999 survey, there are 18 truckload carriers doing business in the Springfield area, 14 are headquartered in the area employing about 2,700 people. Trucking serves a critical economic function in the delivery of both raw materials and finished goods. The goal of planning for trucking is to provide for the safe, efficient movement of trucks through and within Springfield and Greene County. The trucking section of this plan addresses several objectives.

First, in order to maximize transportation system efficiency and minimize wear and tear of roads not designed for heavy truck traffic, truck generating facilities should be located along major roadways or along collector streets with easy and direct access to major roadways. Second, land use decisions and roadway designs should prevent trucks traveling through residential areas. Third, where truck access is required, appropriate loading zones should be established to prevent traffic congestion and increase efficient loading or unloading. Fourth, policies and procedures should continue to be reviewed to ensure that hazardous materials are transported safely. Fifth, intermodal opportunities should be encouraged to promote the efficient movement of goods. Finally, public decision-makers should improve communication with the trucking industry in order to receive input on improving the transportation system.

## Intercity Buses

Three inter-city passenger bus companies, Greyhound, Jefferson Lines, and Show Me Coaches, provide regular connecting service from Springfield to cities throughout the country. City Utilities Bus Route 10 (Kearney) currently serves the intercity bus facility. The Springfield area also has a number of charter bus companies and companies offering bus tours to popular tourist areas in the region. This plan attempts to identify ways of facilitating the movement of intercity buses in the urbanized area.

One way of increasing the efficiency and convenience of using intercity bus service would be to consolidate all intercity bus transportation into a single, modern and conveniently located terminal. Similar to heavy trucks, intercity buses should be encouraged to stay on main roads out of residential areas. Similar to airports, intercity bus terminals should have convenient access and connections to public transit. By encouraging expanded intercity bus service, more traveler options become available.

## Railroads

Although railroad activity is a fraction of what it was in the golden age of railroads, the downward trend in railroading has reversed over the last decade. With innovations such as containerization and trailers on flatbed train cars, railroads are seeing increased activity. Following the merger of the Burlington Northern and Sante Fe railroads, Springfield has also seen a significant increase in train traffic. Continued development of intermodal coordination and connectors should be encouraged. Key planning issues related to trains include land use compatibility near rail lines and safety at railroad crossings.

## **Fiscal Plan**

The fiscal element is a critical component of the transportation plan. Past plans have tended to be “wish lists” with little connection between planned projects and available economic resources. Therefore, today’s planners have to consider the cost of projects

within the constraints of projected funding sources. Clearly, not all transportation improvements that are desired or needed will have available funding. Thus, prioritizing transportation improvements becomes an important element in the planning process.

The fiscal Plan describes existing and potential funding sources. Innovative financing strategies will need to be pursued if some transportation improvements are going to be funded. The Fiscal Plan identifies a fiscally constrained list of transportation improvements based on reasonable funding projections and an unconstrained list of improvements, assuming additional revenues could be obtained.

## **Implementation Program**

The Implementation Program lists the Transportation Plan’s recommended action steps. The actions are prioritized relative to each other for each section of this document. The agency responsible for implementation is identified and those agencies required for coordination efforts are listed.

## **Conclusion**

The Transportation Plan component of the Springfield-Greene County Comprehensive Plan serves to guide future transportation decisions. All modes of passenger and freight transportation were covered in the plan to provide a comprehensive look at the area’s transportation system. Both specific transportation improvements and general transportation policies have been included in order to provide direction for improving transportation and the community over the next 20 years.



# Introduction and Background

## Introduction

The Transportation Plan is one component of the Springfield-Greene County Comprehensive Plan and represents a policy statement for guiding future transportation decisions. Although it is long-range in scope, it also sets forth standards and policies for day-to-day decision-making on development proposals and capital investments.

The Transportation Plan has been a joint undertaking of the transportation stakeholders in the area who are represented on the Springfield Area Transportation Study Organization, the area Metropolitan Planning Organization (hereinafter “MPO”). Membership on the MPO includes all local transportation modes, including roads, airports, rail, trucking, and transit. This plan element supersedes the *Springfield Area Transportation Plan*, published in May 1987 and any amendments thereto. Past planning efforts contained recommendations that helped establish current transportation policy. Many of these recommendations have been incorporated into this plan element update. In addition to the 1987 Transportation Plan, previous transportation planning studies include the following:

- South Springfield Development Plan
- US 65 Corridor Plan
- Highway M-National Avenue Corridor Study
- Northwest Springfield Plan
- South Kansas/West Highway M Study
- South National Avenue Corridor Plan and
- Southwest Springfield Development Plan.

The transportation plan element is organized into 13 major sections. The introduction provides an overview of the plan. The next section explains plan goals, followed by sections on streets and highways, transit, paratransit, bicycles, pedestrians, transportation System Management, airports, trucking, intercity buses, railroads, and fiscal issues. The plan also identifies recommendations on how to implement the goals for each of these transportation modes. Information and data is included throughout the Transportation Plan that provides a broad overview of projected development and travel patterns to the year 2020. The plan also establishes specific project funding recommendations in five-year increments for the next two decades. The MPO will use these recommendations to establish its Transportation Improvement Program (TIP). MPO participants and staff will work together in identifying innovative funding mechanisms for unfunded needs and look to public/private partnerships to help implement recommendations.

## Background

### The Transportation and Land Development Relationship

Transportation is important because it provides the link between different types of activities (i.e., land uses) that enables a city to function as a place for social interaction and the exchange of goods and services. Over the years, it has become increasingly clear that transportation and land uses are interrelated: the use of land generates activities

which create travel demand, while at the same time, the access provided by the transportation system influences how the land is used and developed. Land use and transportation cannot be planned in isolation; they must be considered together. Transportation serves and shapes development.

The form, size and location of the Springfield Urban Area has been strongly influenced by transportation. The railroad lines, proximity to the central railroad station, and access to public transit systems effected urban location and density in the early 1900's. Later, the convenient and ubiquitous access to all areas provided by the automobile allowed people to live, work, and shop in more dispersed locations, creating lower density developments. This lower density land use pattern was further encouraged by requiring greater amounts of space for streets and highways, parking lots and other transportation-related facilities. Furthermore, the construction of streets and highways opened up new areas for development, helping to mold the city's growth. As a result, land use patterns were greatly influenced by transportation, at the same time that the transportation system was accommodating land uses.

The transportation/land use connection is just as relevant today. Travel forecasts are based in large part on current and projected land use policies. Planned transportation improvements are often designed to support those projected land uses. As described, these improvements may in turn alter or reinforce future land use decisions. Therefore, future transportation improvements should consider their impacts on land uses as well as transportation service benefits. As a result, the *Vision 20/20* process calls for a compact urban area, an efficient allocation of scarce financial resources, and support for established neighborhoods. This transportation plan supports this objective.

### **Other Transportation System Effects**

The transportation system impacts many aspects of the community. It is the community's single largest infrastructure investment. Of all public investments, transportation facilities probably have the greatest visible effect on the community. Therefore, transportation improvement or expansion projects are usually of significant public interest and debate. New street locations or widening streets affect community and neighborhood environments, sparking much public discussion. Transportation is also a major consumer of energy and a producer of pollution. In general, the character of an area's transportation system helps to determine the community's long-term quality of life.

### **Balanced Approach Needed**

Transportation planning in the Springfield-Greene County area requires a balance between the different needs and priorities of many elements and stakeholder interests. Businesses are interested in having convenient access to their commercial enterprises. Residents are interested in having an uncongested trip to work and living on a quiet and safe street. Truckers are interested in quick and easy access to the highway network and the freedom to use heavy trucks. Transit-dependent citizens are interested in a bus system that gets them to their destination in a reasonable period of time. All of these interests are important. The transportation plan attempts to balance these interests and provide a guide to improving the Springfield-Greene County transportation system.

As noted, the Transportation Plan is closely related to the Land Use and Growth Management Plan, which establishes parameters to guide future growth based on the recommendations from the Vision 2020 process.

The population within the MPO Transportation Planning Area (TPA) is projected to increase by 28% to 2020. About 180,000 persons lived in the urbanized area in 1990 and over 245,000 persons are projected by the year 2020. During the same period, employment within the TPA is projected to increase by at least 60 percent, from approximately 100,000 jobs in 1990 to over 160,000 by 2020.

In order to forecast future traffic demand, projected population and employment growth is allocated to different portions of the TPA based on the recommendations from the Growth Management and Land Use Plan. The population and employment are distributed to various Transportation Area Zones (TAZ's) within the MPO area. This information is used to develop the transportation demand model that provides important traffic information used to assess future transportation improvements.

The Transportation Plan is not only an attempt to provide for the efficient movement of goods and people, it is also intended to contribute to Springfield's overall quality of life. To this end, the plan includes guidelines for protecting environmental quality and neighborhood integrity as well as improving transportation to ensure that transportation facilities enhance and not detract from the character of the community.

# Transportation Planning Principles

## Introduction

The *Vision 20/20* Citizens Group and its Transportation Focus Group worked to identify principles and policies for the Springfield-Greene County Transportation Plan. Vision 20/20 represents the synthesized, collective opinion of hundreds of citizens who participated in its lengthy process.

The following principles are designed to direct the Springfield-Greene County Urban Area Transportation Plan, a plan that encompasses all modes of transportation. The transportation principles are broad statements developed to ensure that the transportation issues and problems in the area are addressed in an effective and timely manner.

## Transportation Principles

**Principle 1: Economy and Quality of Life.** Direct regional transportation investments and implement the Land Use and Growth Management Plan and strategies, to support the economy and quality of life in the Springfield-Greene County urban area.

This principle expresses the overall philosophy of the Transportation Plan element of the Comprehensive Plan. Transportation improvement and expansion investments should be made wisely to support existing and planned development. Reinvestment in existing developed areas is particularly important. The Growth Management and Land Use Plan should guide new investment. In order to securing funding approval, it is essential that transportation investments be consistent of with the Comprehensive Plan.

This plan serves as a guide and an investment tool toward implementing the future vision for Springfield and Greene County. Workers depend on a reliable transportation system to get to and from work. Industries need to get raw materials to industrial plants and products to market distribution systems. Retailers need to get merchandise delivered, and to provide customers access to their stores. Clearly transportation impacts many facets of quality of life and is a key factor linking together the many parts of the area's economic environment.

**Principle 2: Plan Consistency.** Make regional transportation investments consistent with this Transportation Plan.

Transportation investments should consider the benefits to the entire Metropolitan Transportation Planning Area (TPA) which is designated as the area expected to be urbanized by the year 2020. For example, more growth is anticipated in the southern part of the urban area and investments are being targeted accordingly. Major transportation needs beyond the year 2020 are identified in the Urban Reserve, an area of low-density residential development. These Urban Reserve roadways should be officially mapped and reserved as corridors for future transportation facilities in order to allow for the orderly development of the urbanized area.

Highway system investments should be designed both to ensure the preservation, management and replacement of existing facilities, and to expand facilities in accord with this plan. Safety improvements should be an ever-present priority. The recommendations

contained in this plan should provide the context for investment decisions made annually by the Metropolitan Planning Organization.

**Principle 3: Roadway Efficiency.** Ensure that the Springfield-Greene County urban area roadway system is built and designed to maximize system efficiency, serve travel demand, provide for user safety, and integrate and enhance other travel modes.

All highways and other transportation facilities should be planned and designed to maximize efficiency in accordance with the Major Thoroughfare Plan and be compatible with existing and future land use.

**Principle 4: Access Control.** Provide an access-controlled roadway system where necessary and feasible based on land use, traffic demand, safety and cost.

Access management of the roadway system is key to maintaining easy access through the Springfield-Greene County urban area. Access control is necessary for facility management and can be accomplished by restricting median cuts or crossings, building grade separated interchanges or by restricting land access points. In general, fewer highway access points translate to higher vehicle capacities and lower vehicle accident rates. Freeways, expressways and arterials should be protected from unplanned crossings or access.

**Principle 5: Road Right-of Ways.** Define and officially map rights-of-way for planned future highway arterials within planned corridors, and where necessary, acquire prior to development.

Defining needed right-of-way within each corridor is the first important step in this implementation process. The next step is to place the future arterials on the official map to preserve undeveloped land for future highway use and preventing inordinate expenditures for land already developed.

**Principle 6: Transit.** Promote the use of transit through incentives.

Transit plays an important role in the Springfield-Greene County Urban Area transportation system. It serves as the major transportation means for persons unable to own, operate or otherwise be served by an automobile. This population may include students, low-income, youth, elderly, and disabled persons. Transit is also an alternative for persons with access to other transportation modes. If transit is to survive and thrive as a transportation alternative, it needs focused attention, public investment and supportive land use policies.

**Principle 7: Travel Demand.** Reduce the need for additional roadway capacity and maximize energy efficiency during peak hours through ridesharing, conventional transit, pedestrian and bicycle use, improved land use patterns, development site design, and Transportation System Management (TSM) and Transportation Demand Management (TDM) strategies.

The Springfield-Greene County Urban Area does not have all of the financial resources required to build the roadway lanes necessary to mitigate the congestion caused by increased travel demand. Although improvements and expansions will be made, there will remain a need for a broad range of actions to increase ridesharing, transit use, walking, bicycling and telecommuting. Government and the private sector are needed to

create incentives and supporting programs for such Travel Demand Management techniques. Land use intensities, mix, site layout and site design should be geared toward encouraging use of these alternative transportation modes.

**Principle 8: Bicycle and Pedestrian Systems.** Develop and maintain safe, high-quality, continuous, barrier-free bicycle and pedestrian systems to function as integral parts of the area's transportation system.

The focus groups and other members of the community recognize that the use of these modes can make the transportation system more economical, energy efficient, and environmentally and aesthetically attractive. Especially important are bicycle and pedestrian linkages between residential areas, educational centers, employment centers, and transit opportunities. Since the bicycle and pedestrian infrastructure involves both transportation and recreation interests, special effort should be made to coordinate between agencies and departments with these responsibilities in order to ensure the most efficient use of resources, multi-modal linkages, enhanced environmental quality, and joint transportation/recreation use of facilities.

Linking bicycle and pedestrian facilities to transit has an area-wide benefit. Good sidewalk access to bus stops can encourage travelers to use transit. Bicycle lockers can be provided as transit hubs in major activity centers. Accommodations such as bike-racks or on-board provisions for bicycles on buses could be provided.

When a roadway is improved, retrofitted or constructed, both on- and off-road bikeway/walkway designs should be strongly considered. Special emphasis should be placed on bicycle and pedestrian safety and barrier removal.

**Principle 9: Freight.** Maintain a competitive freight transportation system including the region's commercial motor carriers, railroads, air cargo carriers, and intermodal connections in order to provide effective linkages to state, national and international markets. Design appropriate roadways to accommodate trucks and encourage the Missouri Legislature and MoDOT to improve highway connections to other major cities, especially Kansas City and Memphis. Support airport development and the improvement of rail connections, trucking connections, inter-city bus, and the development of an intermodal center.

The economy of the Springfield-Greene County urban area depends to a great extent on the ability of the transportation system to allow for the efficient movement of freight to serve markets throughout the area. Public investments, coordinated with private sector investments, should provide sufficient access to freight terminals, transportation hubs, business and industrial concentrations, and distribution centers. This includes infrastructure investments in support of freight terminals and intermodal facilities designed to increase freight handling capacity and improve operational efficiency.

**Principle 10: Planning Coordination.** The planning decisions and implementation of transportation programs and projects should be consistent with federal, state and regional environmental regulations, standards, programs and policies.

Special consideration should be given to preserving and enhancing the region's natural and cultural resources. The impacts of transportation improvements should be carefully considered in relation to the natural, scenic, historic, archaeological and cultural environment.

**Principle 11: Public Participation.** Promote public participation in formulating transportation policy and implementing transportation decisions.

Following the very extensive *Vision 20/20* citizen participation process will be additional citizen participation activities and communication to solicit broad public participation in transportation investment decisions. Impacts of major transportation decisions will be communicated to encourage widespread discussion and to educate people on the rationale for good area-wide transportation decisions.

**Principle 12: Paratransit.** Encourage the provision of paratransit and not-for-profit transportation services within the Springfield area, particularly to the populations not served by the transit system.

The goal of the Springfield area paratransit and not-for-profit transportation systems is to ensure that all citizens have access to transit to meet basic mobility needs.

## Environmental Justice

### Introduction

Environmental Justice describes the public policy goal of ensuring that adverse human or environmental effects of governmental activities do not fall disproportionately upon minority or low-income populations. Environmental Justice became federal policy in 1994 when President Clinton signed Executive Order 12898, which directed all major federal agencies to ensure that the spirit of the order is reflected in all of their activities.

History has taught us that clearly not everyone has benefited from the development of the transportation system. Some populations, often low-income and minority populations, have been made worse off by the construction and operation of these facilities. For example, some early interstate highway construction projects created air and noise pollution and divided or displaced poor and minority neighborhoods. In the realm of transportation, Environmental Justice means that transportation system changes such as roadway improvements are studied carefully to determine the nature, extent, and incidence of probable impacts, both positive and negative.

While it is difficult to make any significant change to the transportation system without negatively impacting someone, Environmental Justice focuses on whether those impacts fall disproportionately on low-income and minority populations. Any major transportation system change should first consider whether society will be better off with the change and second, what, if any, are the distributional impacts? The first consideration addresses the economic efficiency of a project (i.e., do the benefits outweigh the costs). The second consideration deals with the equity of who will receive more of the benefits and who will pay more of the costs. This question of equity is the concern of Environmental Justice. If it is determined that a project negatively impacts a population, the project can be rejected or the population impacted can be compensated and attempts made to minimize the negative impacts.

### Federal Transportation Policy

The U.S. Department of Transportation's *Order to Address Environmental Justice in Minority Populations and Low-Income Populations* was issued to ensure that all federally funded transportation-related programs, policies, or activities having the potential to adversely affect human health or the environment involve a process that explicitly considers the impacts on minority and low-income populations. <sup>1</sup> These effects include, but are not limited to:

- Bodily impairment, infirmity, illness, or death;
- Air, noise and water pollution and soil contamination;
- Destruction or disruption of manmade or natural resources;
- Destruction or diminution of aesthetic values;
- Destruction or disruption of community cohesion or a community's economic vitality;
- Destruction or disruption of the availability of public and private facilities and services;
- Vibration;
- Adverse employment effects;

- Displacement of persons, businesses, farms, or nonprofit organizations;
- Increased traffic congestion, isolation, exclusion, or separation of minority or low-income individuals within a given community or from the broader community; and
- Denial of, reductions in or significant delay in the receipt of benefits of U.S. DOT programs, policies or activities. <sup>2</sup>

The focus of environmental justice is on whether adverse impacts are borne primarily by or have greater severity for minority or low-income populations than the general population. For the purposes of environmental justice, the US Department of Transportation defines low-income as “a person whose household income is at or below the Department of Health and Human Services poverty guidelines.” Minority includes persons who are Black, Hispanic, Asian American, American Indian or Alaskan Native. If a disproportionately adverse impact is shown to be affecting these populations, the activity should not be carried out using federal funds unless:

- Alternative approaches or further mitigation measures that would avoid or reduce the disproportionate effect are not practicable, and
- A substantial need exists for the program, policy, or activity, based on the overall public interest and alternative approaches that would have less adverse effects on protected populations either would (1) have other adverse social, economic, environmental, or human health impacts that would be more severe or (2) involve increased costs of extraordinary magnitude.<sup>3</sup>

The US DOT order emphasizes that the public has access to full information concerning human health and environmental impacts and requires four actions early in the development of major programs, policies or activities that includes:

- Identifying and evaluating environmental, public health, and interrelated social and economic effects;
- Proposing measures to avoid, minimize, and/or mitigate disproportionately high and adverse environmental and public health effects and interrelated social and economic effects, offsetting benefits on opportunities should be provided to enhance communities, neighborhoods, and individuals whenever permitted by federal law and policy;
- Considering alternatives when they would enable disproportionately high and adverse impact to be avoided and/or minimized; and
- Eliciting public involvement opportunities, including soliciting input from affected minority and low-income populations in considering alternatives.<sup>4</sup>

To summarize, the US DOT order requires that when minority or low-income populations are adversely impacted by a significant change to the transportation system it must be clearly established that the change is both beneficial and less harmful to these populations than other alternatives. Furthermore, members of the affected populations must be fully consulted.

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<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

## **Local Environmental Justice Assessment**

To assess the potential of adverse impacts to low-income and minority populations created by changes to the transportation system, accurate and detailed demographic data is needed. Data from the U.S. Census at the block and block group level or through the Census Transportation Planning Package (CTPP) provide relatively detailed geographic areas in order to identify concentrations of low-income and minority populations.

Geographic Information Systems (GIS) refer to computer mapping programs that allow data to be assigned to geographic locations. GIS provides a useful tool for mapping population data and overlaying transportation system data to conduct spatial analysis to identify low-income or minority populations that may be disproportionately impacted by a change to the transportation system. Further analysis and study can then be conducted to assess the extent of any adverse impacts and develop strategies for addressing those impacts.

It is essential to establish criteria to determine when the percentage of low-income or minority population signals the need for further impact analysis. MoDOT will prepare guidelines or Environmental Justice criteria. Otherwise, the city will want to develop criteria. For example, if a geographic boundary has a low-income or minority population percentage that is above the low-income or minority population percentages of the community as a whole, further analysis may be required.

Likewise, it must be determined how significant a transportation change needs to be before a project warrants additional environmental justice considerations. Some projects may have a small budget, yet significantly affect a neighborhood. Similarly, a neighborhood not directly adjacent to a project may still be adversely impacted (e.g., diverted traffic from a traffic-calming project).

In summary, using the guidelines developed by the U.S. and Missouri Departments of Transportation, Springfield and Greene County should establish a process and criteria for addressing environmental justice concerns related to major changes proposed to the transportation system.

# Streets and Highways

## Introduction

The primary mode of transportation in the Springfield-Greene County area is the private automobile. **Figure 20-1** illustrates the trend in registered passenger vehicles and registered trucks in Greene County. In 1980 there were 97,548 registered passenger vehicles. By 1995 this number had jumped to 145,008, a 49 percent increase over the fifteen year period. In comparison, population in the same time period increased by only 21 percent, less than half the percentage increase in vehicles.

The number of trucks is increasing at an even faster rate than automobiles. The total number of trucks registered in Greene County grew from 33,317 in 1980 to 58,313 in 1995, a 75 percent increase.

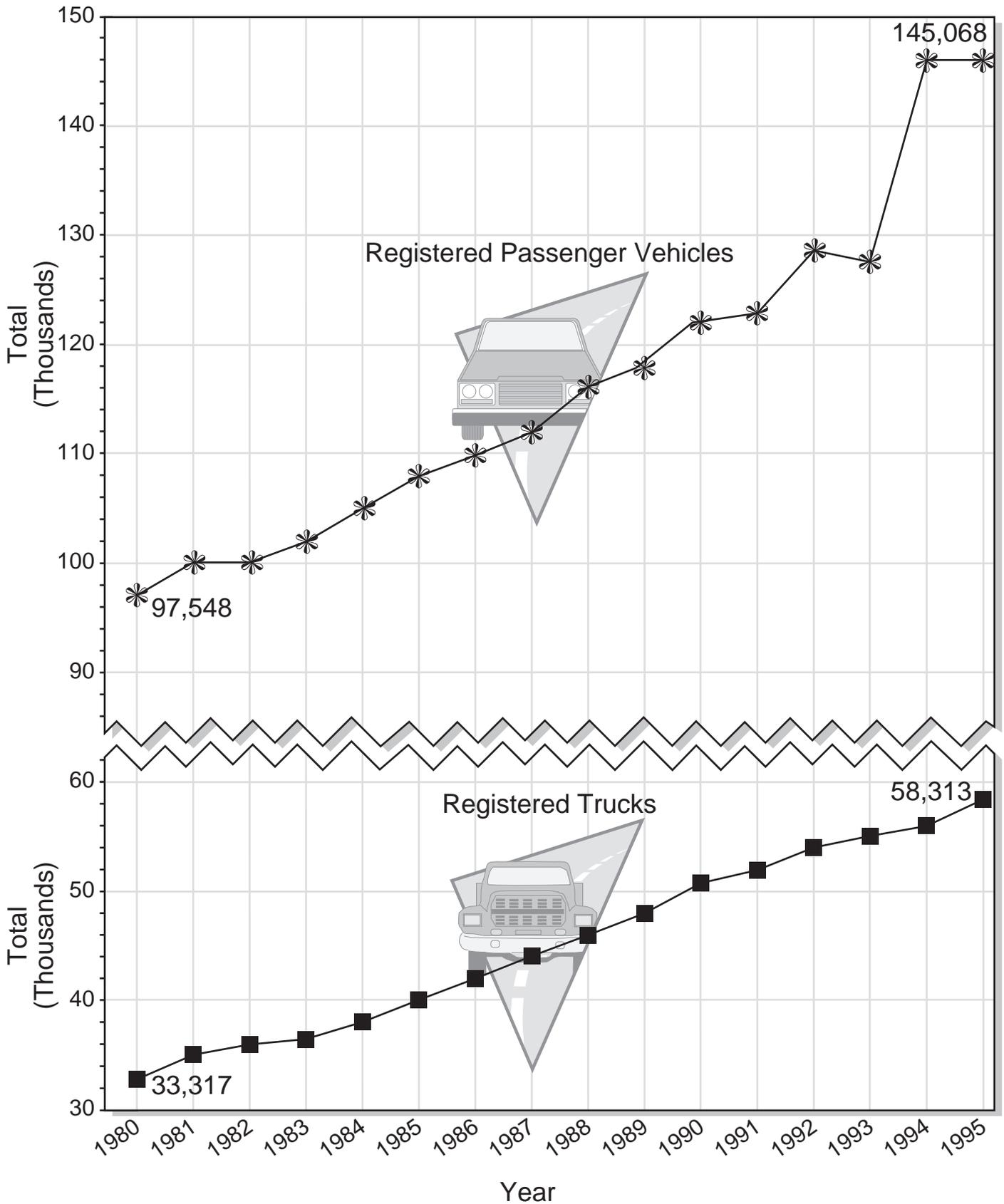
During this same 15-year time period, use of the public transit system steadily declined, especially in recent years. From 1992 to 1993, revenue ridership decreased 11.9 percent; from 1993 to 1996 it decreased another 9 percent. This decrease parallels a general national decline in transit ridership. However, Springfield's transit system has shown an increase in ridership from 1998-2000. The decline in transit use places greater demand on the area's streets and highways.

## Goal and Objectives

**Goal:** Provide an adequate system of thoroughfares that will ensure logical development of the community, safe and efficient movement of people and goods, and economical expenditure of Public Funds.

### Objectives:

- Develop an adequate thoroughfare system that will ensure:
  1. Orderly development of the community,
  2. Safe and efficient movement of people and goods, and
  3. Efficient expenditure of public funds.
- Establish future thoroughfare system that integrates land uses with transportation system needs.
- Recognize and respect a distinct hierarchy of street classification as thoroughfare improvements and development decisions are made.
- Establish a prioritization system for the upgrading of substandard thoroughfares, the replacement of deficient bridges, and the extension of new thoroughfares.



Total Registered Vehicles 1995: 203,381.

December 1997

Springfield-Greene County  
Registered Vehicles  
1980-1995

Figure 20-1

### Objectives Continued:

- Map corridors designated as rights-of-way for future thoroughfares so development can be coordinated with road system.
- Designate major streets to foster desirable community patterns and minimize disruption to neighborhoods.
- Maximize traffic flow by implementing access management principles on arterial and collector streets.
- Minimize potential traffic conflicts by controlling the frequency and location of driveway access to arterial and collector streets.
- Discourage the use of arterial streets for short trips by utilizing secondary circulation systems where appropriate.
- Provide sufficient off-street parking and loading facilities to accommodate vehicle volumes generated by the type and intensity of development.
- Discourage on-street parking along major streets.
- Seek equitable and effective methods of financing street improvements.
- Maximize the efficiency of the existing street system by implementing traffic control measures.

### Street Classifications

A primary task of the Springfield-Greene County *Vision 20/20* process was to develop an updated Major Thoroughfare Plan that projected the area's roadway classification needs to the year 2020 and beyond. The roadway classification system provides guidelines for designing a roadway network for the efficient movement of people throughout the Springfield-Greene County urban area. Roads are placed into categories based on their function or degree to which they provide access to adjacent land or provide mobility to through traffic. Street classifications are generally referred to as functional classification according to guidelines established by the Federal Highway Administration and are used interchangeably in this document.

#### Functional Classification of Streets

**Freeway:** A fully controlled access highway with grade-separated interchanges at major thoroughfares. Intended for high-volume, high-speed traffic movement between cities and across the metropolitan area, and not intended to provide direct access to adjacent land.

**Expressway:** A limited-access highway with some grade crossings and signals at major intersections. Intended for high-volume, moderate to high speed traffic across the metropolitan area with minimal access to adjacent land.

**Primary Arterial:** A street primarily intended to provide for high volume, moderate speed traffic between major activity centers. Access to abutting property is subordinate to major traffic movement and is subject to necessary control of entrances and exits.

**Secondary Arterial:** A street which augments and feeds the principal arterial system and is intended for moderate volume, moderate speed traffic. Access to abutting property is partially controlled.

**Collector:** A street, which collects and distributes traffic to and from local and arterial streets. Intended for low to moderate volume, low speed, and short length trips while also providing access to abutting properties. At the time a collector street is platted, it may be designated as a residential or commercial/industrial collector, depending upon the predominant land use it will serve. A commercial/industrial collector must be constructed to higher standards in order to serve truck traffic.

**Local:** A street for low-volume, low-speed, and short-length trips to and from abutting properties. During the platting process a local street may be designated as an industrial, commercial, high-density residential, normal residential, or low-volume residential street, depending upon the predominant land use it will serve.

The cooperative effort to update the Transportation Planning Area (TPA) thoroughfare system addressed all area roadways, according to their projected function. Many of the Springfield-Greene County thoroughfares are currently functioning at a higher classification than their design. The recommendations included in this chapter of the Transportation Element establish regional action steps for the region to follow that will:

- Ensure that proper road rights-of-way are reserved in the future;
- Require appropriate pavement widths; and,
- Ensure that roadway improvements are planned according to the function of each street.

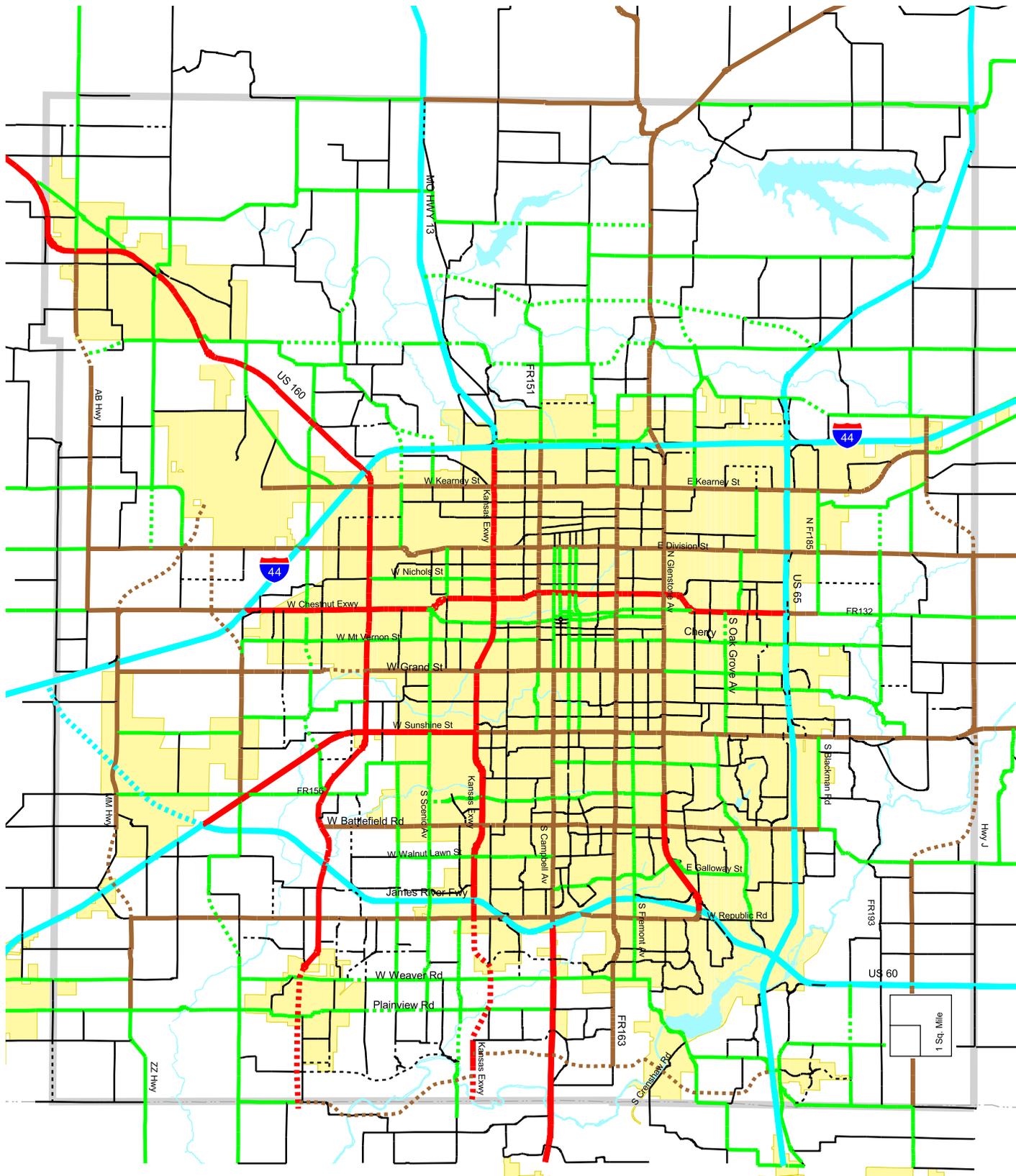
Streets and highways are typically classified in the Major Thoroughfare Plan according to their intended function in providing for traffic movement. These street classifications carry with them a set of design standards consistent with the type of service each facility is intended to perform. Criteria for designation of street and highway facilities include the travel desire of the public, access requirements for adjacent land uses, and continuity of the system.

The City of Springfield and Greene County have established an Urban Service Area Boundary. There is a commitment from both jurisdictions to focus sanitary sewer service and transportation improvements within this designated boundary, thus focusing urban development densities within that boundary. All functional planning conducted by the City and the County is based upon the assumption that the Urban Service Area will ultimately be fully developed to urban densities, and that development outside this area will be predominantly rural in character. The recommended Major Thoroughfare Plan for the Springfield area (**Figure 20-2**) has been developed with this assumption in mind. Within the Urban Service Area a detailed thoroughfare system has been defined to accommodate the travel needs of the area when fully developed. Outside the Urban Service Area only a minimal system of thoroughfares has been delineated to serve a predominantly rural population.

The Major Thoroughfare Plan is intended to provide an overall framework for making decisions on thoroughfare improvements and extensions. The plan identifies the locations of future major transportation corridors and should serve as a general guide for securing street rights-of-way. The thoroughfares are shown in general locations and may vary from the location shown after further detailed location studies are completed.

**Recommendations:**

- The Street Classifications for the Major Thoroughfare Plan should be regularly updated by the Springfield MPO, and subsequently adopted by the Springfield City Council, the Missouri Department of Transportation, and the Greene County Commission, as part of their policies concerning the location and function of all major streets.
- The MPO should work with the Federal Highway Administration and the Missouri Department of Transportation to regularly update the Functional Classification Map to align with the recommendations in the Major Thoroughfare Plan, within the confines of the federal requirements. The Functional Classification Map represents today's roadway function while the Major Thoroughfare Plan represents future function.
- The classifications of street types contained in the Zoning Ordinances, Subdivision Regulations, and design standards of the various political jurisdictions within the Transportation Planning Area should agree with those discussed in this section.



- |  |                    |  |                   |
|--|--------------------|--|-------------------|
|  | COLLECTOR          |  | EXPRESSWAY        |
|  | FUTURE COLLECTOR   |  | FUTURE EXPRESSWAY |
|  | SECONDARY ARTERIAL |  | FREEWAY           |
|  | FUTURE SECONDARY   |  | FUTURE FREEWAY    |
|  | PRIMARY ARTERIAL   |  | MPO Boundary      |
|  | FUTURE ARTERIAL    |  |                   |

Figure 20-2  
Major Thoroughfare Plan

Recommended 6-lane facilities:  
 \* Campbell from JRF to Christian County line  
 \* US 65 from I-44 to Christian County line  
 \* Kansas Expressway connection from I-44 to Christian County line

## Design Standards

The Springfield-Greene County thoroughfare system is designed to carry vehicle traffic while providing for public transportation, bicycle, and pedestrian travel. These facilities serve low-density residential neighborhoods as well as more densely developed corridors. The thoroughfares comprise a network of many street connections, depending on the *Vision 20/20* land-use components they serve. The goal is for collector level roadways and higher to have few if any driveways, sharing driveways whenever possible.

The current design standards and generalized characteristics for each type of street classification are listed in **Table 20-1** and **Table 20-2**. These standards do not in every case adequately address street width for provision of bicycle lanes. Because most of the secondary arterial streets constructed recently in the City of Springfield exceed the standards set forth in these tables, future amendments to the secondary arterial standards should be considered. The City of Springfield, Greene County, the Missouri Department of Transportation, and other jurisdictions in the planning area are encouraged to review the identified potential deficiencies in the current recommended design standards and to maintain their regulations consistent with the standards adopted by the Metropolitan Planning Organization in order to provide consistent requirements throughout the metropolitan area.

### Recommendations:

- The Design Standards for Streets and Highways (**Table 20-1**) and the Generalized Characteristics of Streets by Classification (**Table 20-2**) should be adopted by the City of Springfield, Greene County, the Missouri Department of Transportation, and other metropolitan area jurisdictions in the planning area.
- The Zoning and Subdivision ordinances of the City of Springfield, Greene County, and other metropolitan jurisdictions should be updated to be consistent with the most current Design Standards for Streets and Highways listed in **Table 20-1** and the Generalized Characteristics of Streets by Classification, **Table 20-2**.
- The City of Springfield, Greene County, the Missouri Department of Transportation, and other metropolitan area jurisdictions are encouraged to review potential deficiencies in the current recommended MPO design standards and to work with the MPO in addressing these deficiencies in future plan updates.
- The City of Springfield should work with the Missouri Department of Transportation on the implementation of the recommendations in the Community Physical Image and Character Element of the Comprehensive Plan that address entryways to the City and other transportation system aesthetic concerns.

**Table 20-1: Design Standards for Streets by Classification**

	Street Segment			Intersection			Parking Permitted	Median Control	Median Opening Spacing	Signalized Intersection Spacing	Driveway Spacing	Sidewalks
	Number of Lanes	Right-of-Way	Pavement Width	Number of Lanes	Right-of-Way	Pavement Width						
<b>Freeway</b>	4 to 8	250' or more	2-4 lanes@36' plus shoulders	Ramps as Required	Varies	As Required	None	60' -80' Grass	None	Interchange 1-3 miles	None Permitted	Not Permitted
<b>Expressway</b>	4 to 6	180' + 40' each side for frontage roads	2-3 lanes@36' plus shoulders	6 thru, 2 left and one right	180' plus req'd sight triangles	108' plus median	None	40' Grass	1/4 mile	1/2 mile	None Permitted	Required on Frontage Roads
<b>Primary Arterial</b>	4 to 5	110' for divided street, 100' for undivided street	2 lanes@30' or 70' total	4 thru, 1-2 left and 1 right	120' plus req'd triangles	82'-100'	None	28' or 2-way left turn lane	600'	1/2 mile from Expwy. To 600' from Expwy.	270'	Required both sides
<b>Secondary Arterial</b>	2 to 3	70'	43'	4	80' plus req'd triangles	58'	None	2-way left turn lane	Does not Apply	600'	210'	Required both sides
<b>Collector</b>	2	70' for 3-lane, 60' for 2-lane	41' for 3-lane, 33' for 2-lane	3-4	60'-80' plus req'd triangles	Varies per Street - 43' to 59'	None	None	Does not Apply	500'	160'	Required both sides
<b>Local</b>	2	50'-80'	24'-28'	2	50' plus req'd triangles	27'	Permitted	None	Does not Apply	None req'd	35' edge to edge	Both sides desired

Table 20-2 Streets and Highways Generalized Characteristics by Classification

	Definition/Purpose	Traffic Flow/Access Priority	Facility Spacing	Trip Length	Traffic Volume	Traffic Speed	Pedestrian Provisions	Bicycle Provisions	Fixed Route Transit Provisions	
Freeway	Full access control with continuous traffic flow separated in grade from other facilities. Intended for high-volume high-speed traffic movement between cities and across the metropolitan area. No direct access is provided to adjacent land.	<i>Traffic Flow/Access Priority 99/1</i> Access by grade-separated interchanges at 1-3 mile intervals.	4-8 Miles	Between cities and across metropolitan area (2 or more miles).	20,000-100,000 vehicles per day.	Running: 55-70 mph Average: 55-60 mph.	Pedestrians Prohibited.	Bicycles Prohibited.	No stops, express routes only.	Freeway
Expressway	Partial access control and high priority for traffic flow with at-grade signalized intersections for major streets. Intended for high-volume moderate-to-high speed traffic movement across the metropolitan area with minimal access to adjacent land. <i>May be designed as a highway with separation from adjacent land uses or as a street with controlled access to adjacent land uses.</i>	<i>Traffic Flow/Access Priority 80/20</i> At-grade intersections with arterial and collector streets. Signals are uniformly spaced for optimum traffic flow. Driveway and street intersections designed for maximum of 10 mph speed decrease in through-lane for turning vehicle.	3-5 Miles	Across metropolitan area and between major activity centers (2 or more miles).	20,000-50,000 vehicles per day.	Running: 40-55 mph Average: 30-40 mph.	Highways: Pedestrians discouraged. Streets: Walkways required on both sides.	Highways: None. Streets: Separate path striped lane.	Highways: No stops, express routes only. Streets: Turnouts at major generators.	Expressway
Primary Arterial	Provides for high to moderate-volume moderate-speed traffic movement between and through major activity centers. Access to abutting property is subordinate to traffic flow and is subject to necessary control of entrances and exits.	<i>Traffic Flow/Access Priority 60/40</i> 270' spacing for accesses and additional control as required for traffic flow. Safety and traffic flow are balanced in determining signal spacing.	1-2 Miles	Between and through major activity centers (2-8 miles).	10,000-30,000 vehicles per day.	Running: 35-40 mph Average: 25-30 mph.	Walkways required on both sides.	Paved shoulders 6'. Shared outside lanes. Striped lanes 5'.	Scheduled stops every 1/4 mile.	Primary Arterial
Secondary Arterial	Augments and feeds the primary arterial system and is intended for moderate-volume moderate-speed traffic movement. Access to abutting property is partially controlled.	<i>Traffic Flow/Access Priority 45/55</i> 210' spacing for accesses. Safety is higher priority than traffic flow in determining signal spacing.	1/2-1 Mile	Between and within activity centers (1-4 miles).	6,000-20,000 vehicles per day.	Running: 30-35 mph Average: 20-25 mph.	Walkways required on both sides.	Shared outside lanes. Striped lanes.	Scheduled stops every 1/4 mile.	Secondary Arterial
Collector	Collects and distributes traffic between arterial streets and local streets. Intended for short length trips while also providing access to abutting properties. <i>Design of collector streets varies depending on the character and intensity of traffic generated by adjacent land development.</i>	<i>Traffic Flow/Access Priority 30/70</i> 160' spacing for non-residential accesses.	1/4-1/2 Mile	Local street to arterial street (1/2-2 miles).	1,500-8,000 vehicles per day.	Running: 30 mph Average: 15-20 mph.	Walkways required on both sides.	Shared outside lanes. Striped lanes.	Scheduled service and paratransit.	Collector
Local	Provides direct access to abutting property. Intended for low-speed low-volume traffic movement and for short length trips. <i>Design of local streets varies depending on the character and intensity of traffic generated by adjacent land development.</i>	<i>Traffic Flow/Access Priority 10/90</i> No restrictions. 40' between accesses	As required	Access to individual property parcels (Less than 1/2 mile).	Commercial less than 1,000 residential vehicles per day.	Running: 20-30 mph Average: 10-15 mph.	Walkways required on one side.	Shared outside lanes.	No scheduled service	Local

## Major Thoroughfare Plan

The roadway classification system, as shown on **Figure 20-2** MPO Major Thoroughfare Plan, provides guidelines for designing a roadway network for the efficient movement of people throughout the Springfield metropolitan area. Roads are placed into categories based on the degree to which they provide access to adjacent land or provide mobility to through traffic. A road generally cannot provide both good mobility and good access. Therefore, when the guidelines are not met, traffic problems usually result. The classification system reflects the community's need for both mobility and access.

### Alignment Preservation

A primary purpose of the Metropolitan Planning Organization is to ensure that facilities on the Major Thoroughfare Plan are sufficient for the future needs in the community. It is also critical that the facility needs shown on the Major Thoroughfare Plan Map, **Figure 20-2**, are realistic and can be built. To prevent encroachment of development upon corridors needed for future thoroughfares, each responsible jurisdiction has regulatory tools available to protect the needed right-of-way. There is a need to preserve adequate right-of-way for operation of intersections and interchanges where major thoroughfare corridors intersect.

The development of new or expanded major thoroughfares is a lengthy process involving years of planning, design, environmental studies, securing funding, acquiring right-of-way, and actual construction. Often subdivision development occurs before public investments can be made to protect rights-of-way in advance of actual construction. Thus, the possibility exists that the completion of new thoroughfares may be impeded by intervening developments.

There are several tools available for protecting rights-of-way from development. Some of these tools, and guidelines for their use, are as follows:

**Subdivision:** Dedication of right-of-way through the subdivision process is the normal means of acquiring the needed right-of-way for the thoroughfare system. This procedure can be used to acquire right-of-way whenever land is subdivided – not only for a new street in an outlying area but also in partially-developed areas where additional right-of-way may be needed to widen an existing street. However, it is most useful as a tool for preserving right-of-way when the proposed thoroughfare traverses a large tract of raw land under single ownership, which is unlikely to be developed unless it is subdivided into smaller parcels. The subdivision process is not very useful in acquiring right-of-way in areas that are already subdivided. In addition, land for a freeway or expressway, although it may be shown on a subdivision plat as reserved for a future facility, is not normally dedicated through the subdivision process since the adjoining properties are not usually allowed to have direct access to such a facility. Right-of-way acquisitions are negotiated between the property owner and the jurisdiction in these circumstances.

**Official Mapping:** Under state law, cities and first-class non-charter counties (including Greene County) may adopt an official map of a proposed street and prohibit the issuance of a building permit within the mapped right-of-way. The official map must be based upon an adopted major thoroughfare plan and should be prepared only when there is a firm commitment to construct the proposed facility within a reasonable time frame, and preferably only after a survey has been

conducted to define the precise location of the street. Official mapping is most appropriate when the area in question contains numerous small parcels under fragmented ownership and there is a high probability that development could occur without subdivision. Mapping is generally used to reserve the future right-of-way for major facilities such as freeways, expressways, and arterials, but in certain cases its use may be appropriate for collector streets as well. It can be used to reserve right-of-ways needed for the widening of an existing route, as well as for construction of a new street.

Because official mapping is an exercise of a local government's police power, it can normally be achieved without any compensation to the property owner at the time of mapping. An exception would be a situation where the mapped street would occupy all or most of an individual parcel. In such a case the prohibition of construction within the mapped right-of-way may effectively deprive the owner of any use of the property and might be considered a "taking," or expropriation without just compensation.

To avoid presenting a hardship on the owner, mapping should be effective for a particular time period, after which it may be renewed if necessary.

**Advance Purchase:** Purchase of right-of-way in fee simple is the most effective means of protecting land from development, but it is also the most expensive. Fee-simple, refers to the absolute total interest in real property. Since funds for this purpose are usually limited, right-of-way is not normally purchased until shortly before street construction is scheduled. Purchase of right-of-way several years in advance of construction is appropriate for freeways, expressways, and other facilities where right-of-way cannot be obtained through dedication and would likely be developed if it were not purchased. Advance purchase should also be used when official mapping would result in a hardship to the property owner – for example, the mapped street would occupy most of a parcel and would effectively deprive the owner of any use of the property.

**Less Than Fee Simple Purchase:** Right-of-way may also be reserved through less than fee simple purchase, in which only the development rights to the land are acquired, rather than full title. In this manner the owner is given some compensation for not developing the land needed for right-of-way. This approach is most useful in urban fringe areas, which are not experiencing significant growth pressures. In such cases development rights could be acquired at a relatively low cost. However, in areas that are already fully or partially developed, development rights may be almost as costly as the fee simple title.

**Density Transfer:** Under the density transfer concept, right-of-way for the transportation facility is dedicated by the landowner, and the development density that would have been permitted on that right-of-way is transferred to the remaining portion of the tract. The overall density for the entire tract is unchanged, but a higher net density is permitted on the developed portion in exchange for dedication of the right-of-way.

This technique is most appropriate in the case of freeways and expressways where right-of-ways would normally have to be purchased, rather than dedicated by the property owner. It is an appropriate technique to use when public funds for right-of-way acquisition are limited, because it results in acquisition of the property without

any actual expenditure of public funds. However, density transfer is an option of the landowner, and consequently it is only feasible when the property owner can achieve a greater return from higher densities than from a sale of the right-of-way. In addition, it is feasible only when the landowner could not expect to obtain higher densities through a normal rezoning and would therefore have an incentive to use density transfer. The legal instrument for density transfer is included in the cluster development provisions of the city and county zoning ordinances.

**Recommendation:**

- All MPO jurisdictions should adopt the Major Thoroughfare Plan and they should cooperate together to preserve corridors. Future corridors should be established and adhered to, although some flexibility to determine precise alignments is possible during platting and right-of-way acquisition. All right-of-way preservation techniques should be explored in the effort to preserve street corridors as shown on the Major Thoroughfare Plan.

**Development Considerations**

**Neighborhood Integrity:** A primary objective of the Major Thoroughfare Plan is to have properly located major streets, so as to foster desirable community land use patterns and to minimize any disruptions to neighborhood integrity. The Major Thoroughfare Plan should also ensure the continuity of the arterial, collector, and local street systems while preventing unnecessary traffic through neighborhoods. These properly planned facilities will discourage discontinuity in travel movements that would increase the length of trips, public facility costs, travel costs, energy costs, and air pollution. Traffic calming alternatives should also be considered to prevent unnecessary traffic through neighborhoods.

The function of collector streets is to channel traffic between local and arterial streets, not to bypass the arterial system. Stop signs and other traffic controls should be employed where warranted to ensure that collector streets do not become secondary arterials.

Where practicable, land uses should be developed that are compatible with the classification of the adjoining streets. In general, the more intense land uses should have direct access to major arteries so that the traffic they generate does not intrude upon residential areas. **Table 20-3** Land Use Compatibility by Street Classification, indicates the maximum land use intensities that should be allowed along each type of street. However, the street classification is not the only consideration in the location of land uses; criteria such as compatibility of adjoining land uses must also be considered.

**Recommendation:**

- Metropolitan area jurisdictions should regularly update their adopted Major Thoroughfare Plan, subdivision ordinance, zoning controls, and criteria for the installation of traffic controls. All of these tools should be used to ensure land use compatibility and the preservation of the neighborhood unit.

**Table 20-3: Land Use Compatibility by Street Classification**

Street Classification	Maximum Land Use Intensity Types			
	Residential	Commercial	Office	Industrial
<b>Freeway/Expressway</b>	None	Regional Centers (Over 250,000 Sq. Ft.)	Office Park	Industrial Park
<b>Primary Arterial</b>	High Density (12-30 units/acre)	Community Centers (100,000-250,000 Sq. Ft.)	Office Park	Industrial Park
<b>Secondary Arterials</b>	High Density (12-30 units/acre)	Neighborhood Centers (30,000-100,000 Sq. Ft.)	Office Park	Industrial Park
<b>Collector</b>				
- Commercial/Industrial	High Density **	Neighborhood Serving *	Office Park **	Industrial Park ***
- Residential	High Density (12-30 units/acre) ***	None	None	None
<b>Local</b>				
- Commercial/Industrial	High Density **	Neighborhood Serving *	Other Office ***	Other Industrial
- High Density Residential	High Density ***	None	None	None
- Normal Residential	Medium Density	None	None	None
- Low Volume Residential	Low Density	None	None	None
<p>* At intersection of arterial, with orientation toward the arterial                      ** If it functions as a buffer or transitional use                      *** If easily accessible to a primary or secondary arterial</p>				

## Development Relationships

The Major Thoroughfare Plan serves as a guide to the future function of streets and highways. The Major Thoroughfare Plan provides guidance to jurisdictions for when to require on-site and off-site road improvements, in order to maintain a reasonable level of traffic flow. These road improvements will take into account the traffic generated by the proposed development and the normal traffic growth in the area.

Jurisdictions may also need to delay or prohibit types and densities of land use that cannot be reasonably served by the existing street system, unless provisions are made to improve the system to an adequate level.

In the review of zoning requests that deviate from the established land use pattern of an area, the capacity of the street system should be a major consideration in determining whether the rezoning is approved. If a proposed development would generate traffic volumes that would exceed the design level of service of the existing transportation system or the planned transportation system, the development should be prohibited or delayed unless the developer agrees to make improvements that would enable the system to adequately handle the anticipated traffic. Such improvements may include additional right-of-way, pavement, traffic signals, turning lanes, and internal circulation drives.

A simplified traffic analysis, identifying the number of vehicle trips generated by the proposed development and the impact of these trips on the street network, should be conducted for all rezoning requests. If this analysis indicates that traffic problems may occur, a more detailed study should be conducted to determine the proper course of action. Two situations requiring special consideration may result from such an analysis:

1. The proposed development may be found to generate traffic volumes that would exceed the design level of Service (LOS) standards of not only the existing system but also the planned or programmed system. In this case, the development should be prohibited unless the developer agrees to make on-site or off-site improvements, which will enable the system to adequately handle the anticipated traffic.
2. The development will generate traffic volumes that exceed the design level of service of the existing system but are within the design level of service of the planned or programmed system. In such cases the development should be delayed until the system is upgraded, unless the improvements are scheduled to be made within a reasonable period of time or the developer agrees to provide the needed improvements at his or her own expense.

In general, the developer of the adjacent property should make off-site traffic improvements when it can be shown that the development is primarily responsible for creating a situation that necessitates the improvement. If the improvement is planned and/or programmed, the improvement will ordinarily be provided at public expense. The schedule for planned improvements can sometimes be advanced when the developer agrees to share in the cost or advance the cost of the project to the public agency against future funds.

Specific off-site improvements, that the developer may be required to provide in order to maintain an adequate traffic flow, include the following:

**Right-of-Way:** In all cases, the developer should be required to dedicate the right-of-way needed to achieve the standard for the functional classification of an adjacent street (See **Table 20-1** Design Standards for Streets by Classification).

**Pavement:** Whenever a rezoning occurs along an existing substandard street which does not have the capacity to adequately handle the anticipated additional traffic, the developer of the tract in question should be required to upgrade the adjoining portion of the substandard street to meet standards. If the street is a local or collector street, the developer should be required to upgrade it to the appropriate standard for its functional classification. If the street is an arterial, the developer should be required to upgrade it to collector street standards, provided that it would then have sufficient capacity to handle traffic generated by the development.

When collector street standards would not be sufficient to accommodate the proposed development and improvement of the facility to arterial standards cannot be achieved at public expense in a reasonable and timely manner, the developer should be required to construct an arterial street before the rezoning is granted. In order to encourage developers to proceed with construction of an arterial in order to expedite a development, the jurisdiction may elect to negotiate an agreement that explores a payback procedure that could reimburse the developer a portion of the investment from public funds for the portion of the cost in excess of collector street standards.

For new streets the same conditions should apply. The developer should be required to construct new streets up to collector standards. If an arterial is needed to accommodate the proposed development and it cannot be constructed at public expense, a jurisdiction could negotiate an agreement with the developer if they wish to construct the facility prior to the availability of public funds.

**Traffic Control:** The Manual on Uniform Traffic Control Devices establishes traffic volumes at which traffic signals are deemed to be warranted. When volumes meet warrant levels, typical stop control of approach streets and driveways typically results in undue delay and hazard to motorists. When these warrants are met, the developer should be asked to provide an acceptable traffic operations plan by providing alternative access points, providing signal control at major intersections, or designing the roadway system to provide passive intersection control. The developer is expected to pay a share of traffic control relative to the proportion of traffic contributed by the development to the need for the traffic control device.

**Left-turn lanes:** Left-turn lanes should be located at all signalized intersections, at intersections of collector streets with primary and secondary arterials, at other locations with primary and secondary arterials, and at all other locations where traffic volumes and operating conditions warrant. A developer should be required to provide left-turn lanes at private entrances which meet this standard and at public intersections where the need for the turning lane is directly attributable to the development.

**Right-turn lanes:** Right-turn lanes should be located at the intersection of major arterials streets and expressways with one another. Right turn lanes should be considered at other locations where right turn movements are more than 20 percent of the approach volume, on arterial streets where there are more than 100 vehicles turning right in the peak hour, and on expressways at any intersection. Right turn

lanes should be installed by developers when turning movements to and from their development are projected to warrant the turn lanes.

In addition to the off-site improvements described above, on-site improvements may be required in order to maintain a reasonable level of traffic service and prevent interference with traffic on adjoining streets. Such improvements may include, but not limited to, the following:

**Internal circulation drives:** Internal circulation drives may be required in order to improve traffic flow in parking lots serving major commercial developments. Smaller facilities such as drive-in banks and fast-food restaurants may also require a special circulation pattern in order to avoid disrupting traffic on adjacent thoroughfares. In general, internal circulation systems should be designed so as to allow sufficient space for stacking of entering and exiting vehicles, and to avoid the use of public streets for movement from one part of the site to another. The drives should provide for safe on-site operation of customer vehicles and freight vehicles servicing the site. More specific design requirements should be developed during the review of the driveway permit application, the subdivision, or the site plan, on the basis of the peculiarities of the site and the type and intensity of development.

**Turn-around driveways:** Turn-around driveways permit vehicles (including trucks) to enter and exit a site without having to back into a street. They are generally required whenever residential dwellings or commercial facilities take direct access from an arterial or collector street. Direct access from individual dwelling units to major streets should normally be prevented through the subdivision process, but where such situations are unavoidable because of prior platting patterns a turnaround drive is often the best means of dealing with them.

**Recommendation:**

- Jurisdictions should utilize the above guidelines for off-site and on-site improvements related to development proposals.

**Secondary Circulation Systems**

The use of arterial streets for short trips should be discouraged by utilizing a secondary circulation system where appropriate. The intent of secondary circulation systems is to reduce the number of turning movements to and from the arterial streets, to prevent an overload of the arterial system with vehicles making short trips, and to provide alternative routes to serve facilities having limited access to major arterials. Provision of secondary circulation systems is a major component of access management, discussed as part of Transportation System and Demand Management.

Major developments that generate substantial volumes of traffic, should be served by internal circulation systems or parallel collector streets, to supplement the major thoroughfare system. Such secondary circulation systems function as a “relief valve” by providing alternative paths for vehicles making short trips. They also allow traffic to be more evenly distributed onto adjoining streets and reduce congestion at driveway entrances and exits.

**Recommendation:**

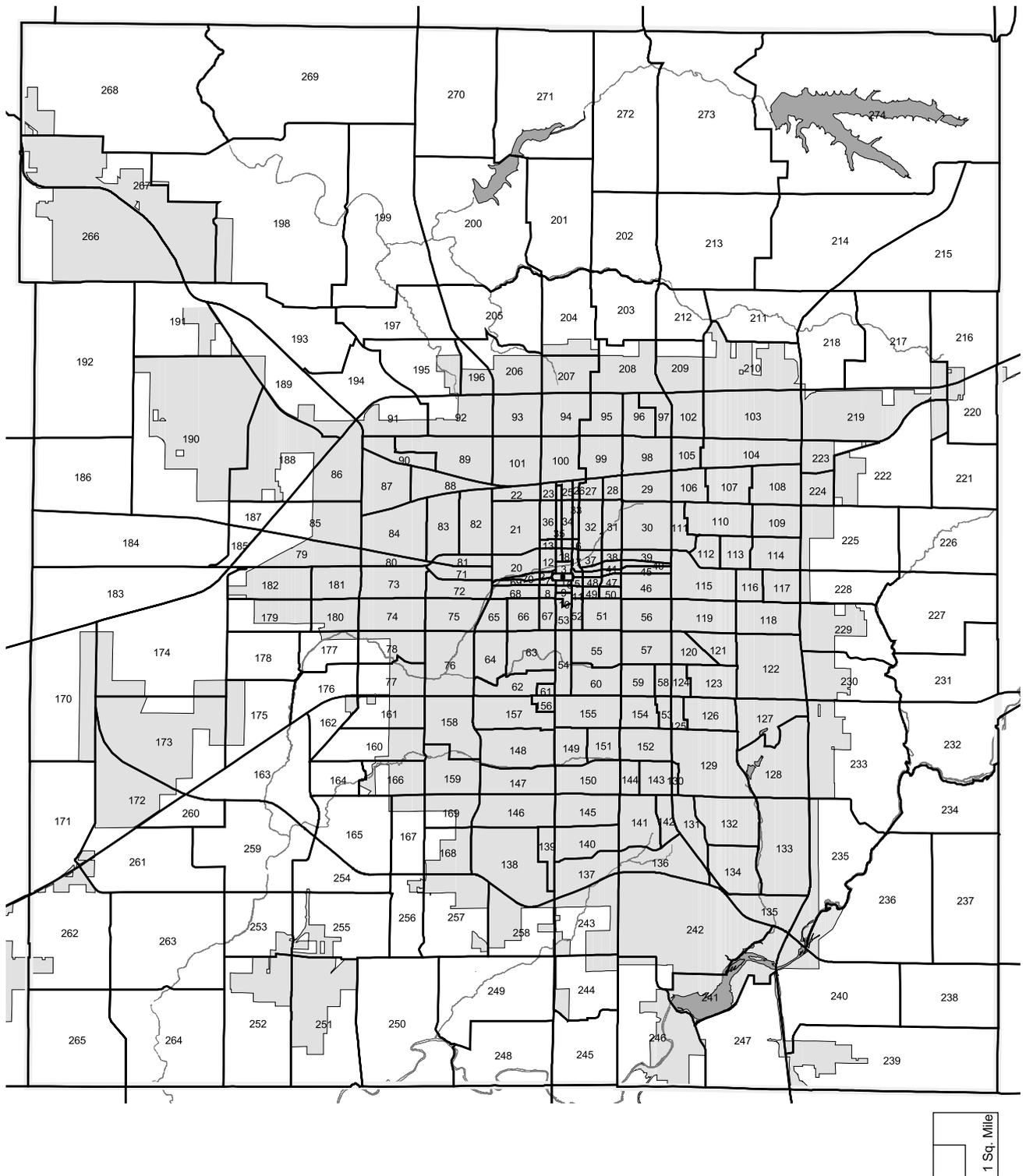
- Metropolitan area jurisdictions should have provisions for secondary circulation systems in their subdivision and zoning ordinances. The application of these provisions should be done on a case-by-case basis, where it applies to the need to improve an existing secondary circulation system or provide a new connection into an existing secondary circulation system.

**Population and Employment Forecast - Background**

**Vision 20/20 Public Involvement:** In order to provide guidance toward improving the quality of life in Springfield and Greene County, the *Vision 20/20* comprehensive planning process included extensive public involvement. Over a period of 18 months, 12 focus groups met to develop a vision for Springfield and Greene County in the year 2020. The Transportation Focus Group primarily looked at transportation although other focus groups also considered transportation issues. All of the initial visions, goals and objectives recommended by the 12 focus groups were presented at Visionfest, an all day community forum attended by roughly 1,000 citizens. In addition, citizens throughout the community were asked to fill-out a survey that asked for their preferences on visual design and landscaping considerations.

**Projection - Initial Analysis**

Population analysis began with a review of the 1990 census population figures for each Transportation Analysis Zone (TAZ) in the Transportation Planning Area (TPA). A map of the current Transportation Planning Area with the updated TAZs used for travel demand modeling purposes is shown on **Figure 20-3**. MPO staff developed a linear growth projection for the year 2020 as an initial step, using the 1990 census figures as a baseline. Following the initial 2020 population projections, staff reviewed a number of data sources to develop revised population and employment numbers to be used in the transportation model.



-  Transportation Study Zones
-  MPO Boundary

Figure 20-3  
 Transportation Analysis Zones  
 (Adopted by MPO August, 1997)

## Population - Future Development Pattern

Essentially, the recommendation of the Land Use and Growth Management Element is for a future development pattern that reflects an increase in the amount of development to the northeast, north, and west of the existing urbanized area, with a majority of future development continuing south, southwest, and southeast. While this reflects existing trends, it also emphasizes the desire for a more balanced distribution of future development.

In addition, there is a strong recommendation for incorporating policies, incentives, etc., aimed at strengthening Center City, including existing neighborhoods, and encouraging infill development.

## Population - Population Distribution

The future development pattern for the Springfield metropolitan area, level of land use intensity, environmental features, open space provisions, and other factors were considered in the subsequent analysis of where employment and residences would locate in the Transportation Planning Area by the year 2020. These projections were used as input to the Travel Demand Model. The model used this input to develop future roadway volume projections for the 2020 Springfield metropolitan area. These roadway volumes provided critical information to the Metropolitan Planning Organization in developing the Major Thoroughfare Plan and determining where the most critical roadway improvements should be focused in the community.

## Traffic Model and Forecast

**Travel Survey:** In early 1995, a home interview survey was conducted to determine the travel behaviors of citizens in Springfield-Greene County. A total of 1,850 households were interviewed and the trip making characteristics of those households were documented. The home interview survey data was also used in the development of the travel demand model.

**Description of Forecasting Process:** The TRANPLAN model is a computer simulation of current and future traffic volumes, placed on a current and future street and highway network. The simulation is developed, through a series of steps, in which development is translated into traffic and vehicle movements throughout the Springfield metropolitan area. The typical steps followed in the travel-forecast process are:

*Network Development* – The process of determining which roadways are to be included in the study area network and identification of the pertinent roadway information to be included.

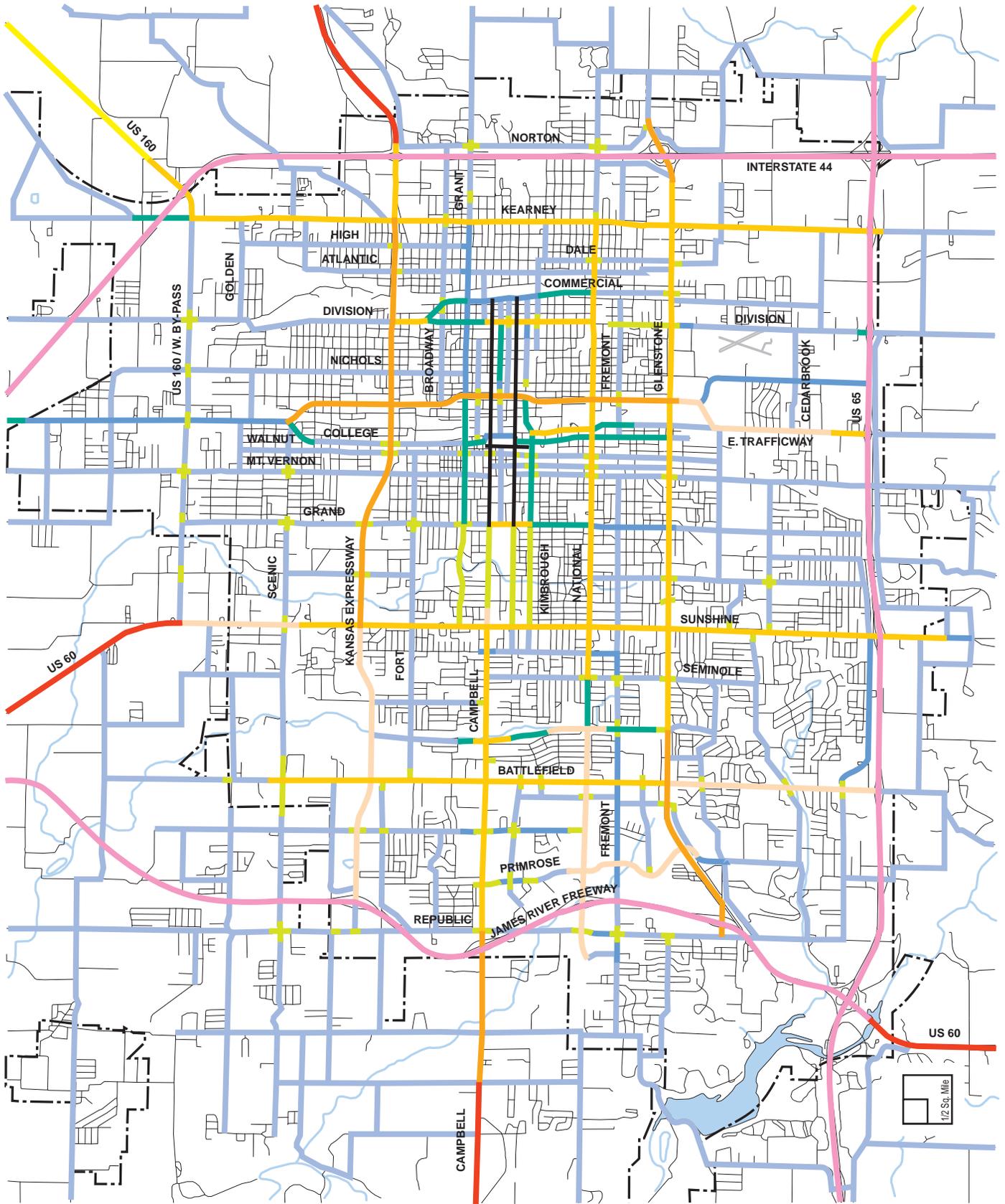
*Socioeconomic Data Definition* – The process of quantifying the type and intensity of current and future demographics in the study area. Demographics are divided into population, households, and employment.

*Trip Generation* – The process of quantifying the number of daily trips associated with the current and proposed levels of demographic development in Springfield and Greene County.

*Trip Distribution* – The process of distributing trips within the study area, by origin and destination.

*Mode Split* – The process of division of trips into three categories of automobile, transit and non-motor vehicle trips.

*Trip Assignment* – The process of placing study area trips on to roadways that represent the travel route between traffic analysis zones.



- Four Lane Freeway
- Four Lane Expressway
- Four Lane Arterial
- Five Lane Streets
- Four Lane Divided Streets
- Four Lane Streets
- Three Lane Streets (2-1 Thru Lane)
- Three Lane Streets (Two Way Left Turn)
- Two Lane Streets (Thoroughfares)
- Two Lane Controlled Access
- Two Lane One Way Streets
- Local Streets

Figure 20-4  
Existing Roadway Geometrics

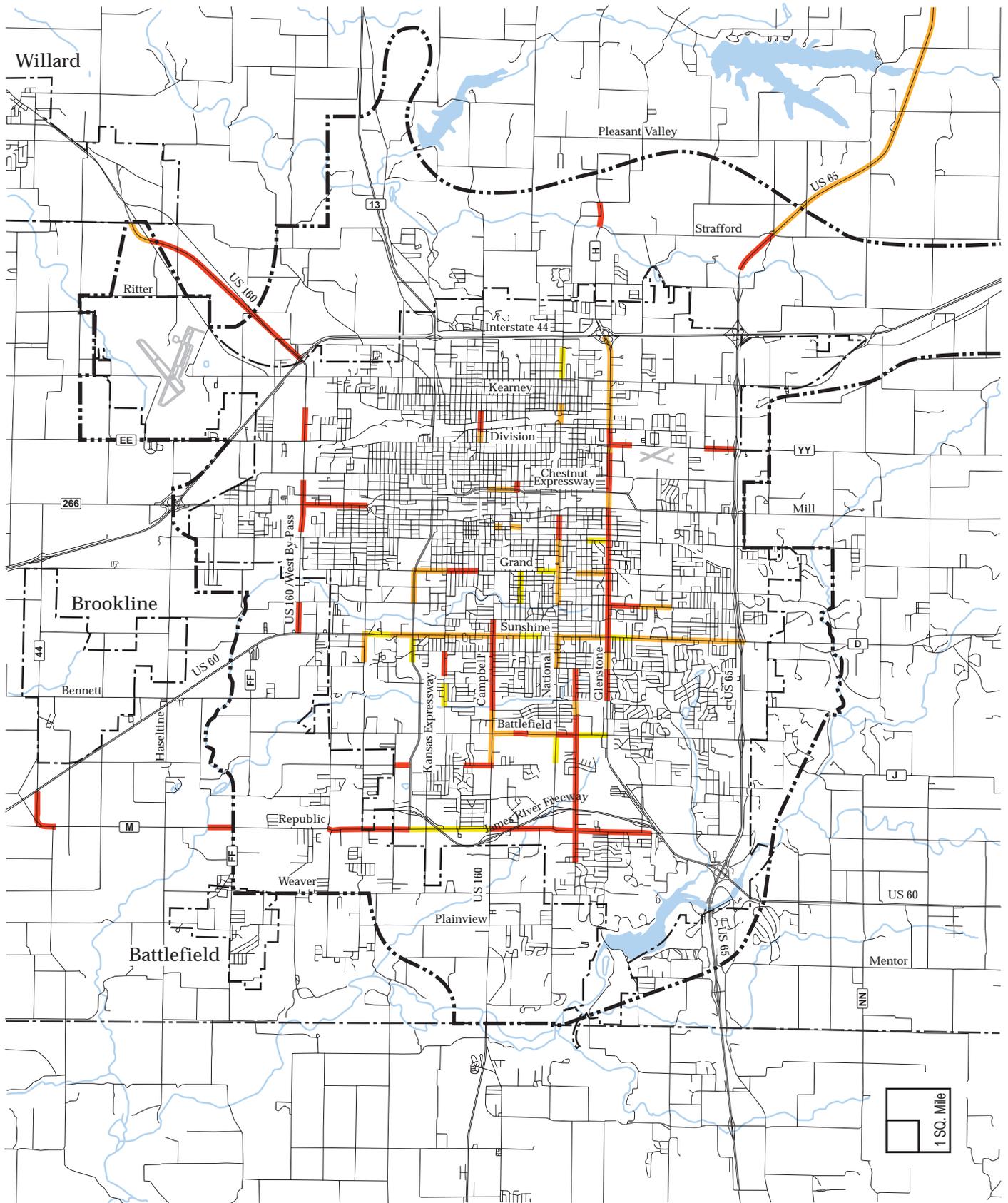
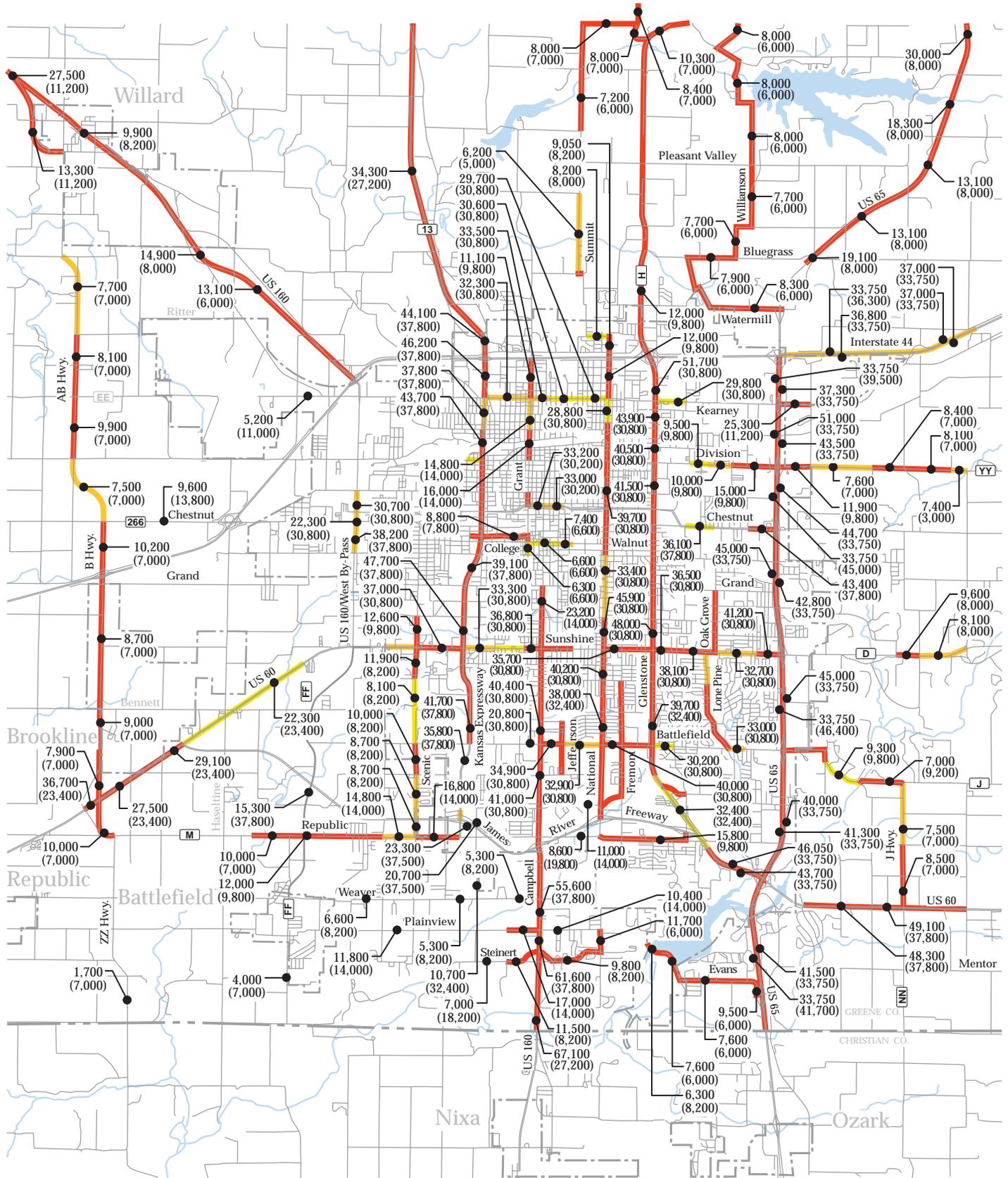


Figure 20-5  
1990 Capacity Deficiencies

- Level of Service
- LOS D
  - LOS E
  - LOS F



Level of Service

- █ LOS D
- █ LOS E
- █ LOS F

XXXX Year 2020 ADT (Average Daily Traffic)

(XXXX) Daily Roadway Capacity

Figure 20-6  
2020 No-Build Capacity Deficiencies

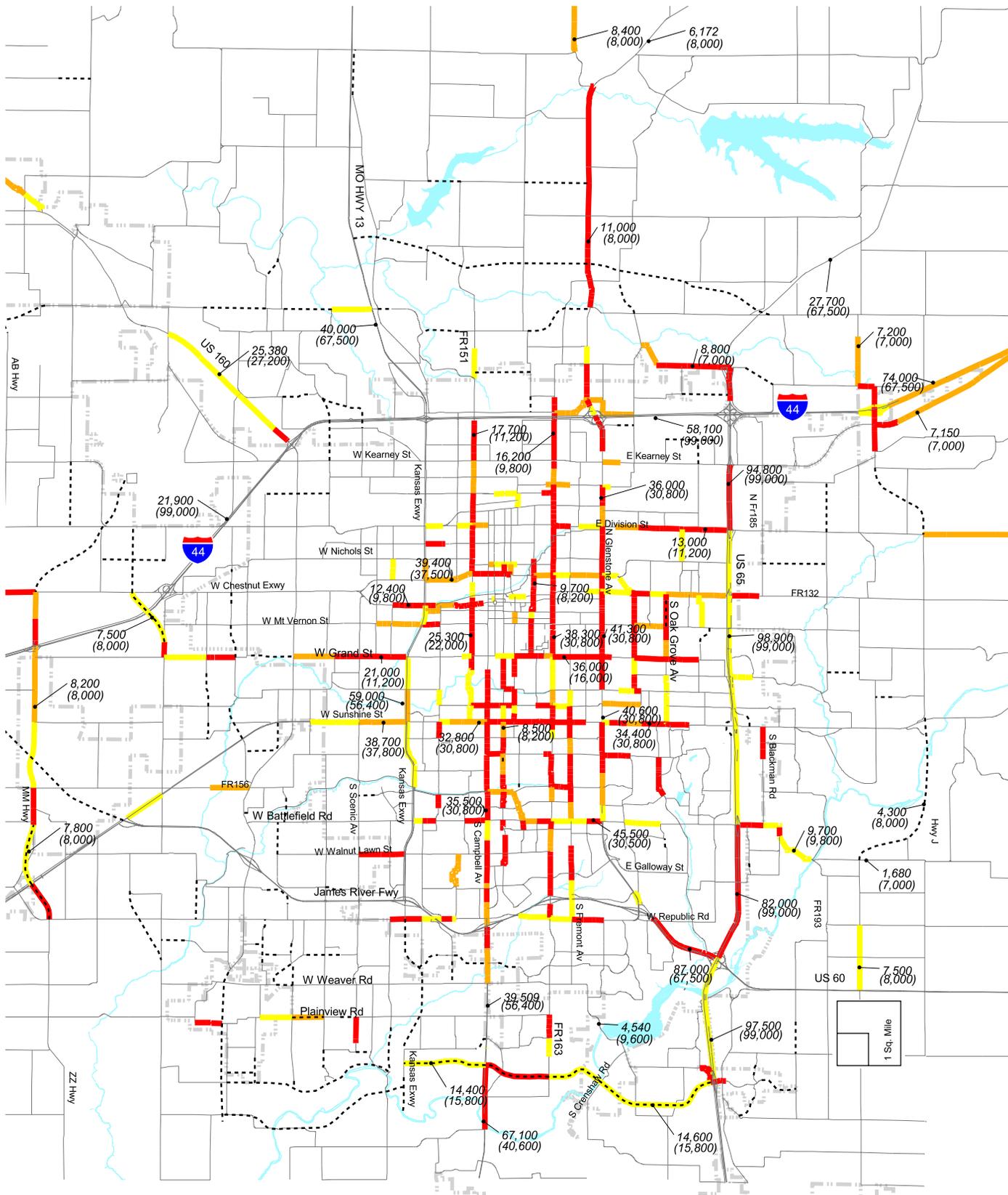


Figure 20-7  
 2020 Major Thoroughfare Plan  
 Capacity Deficiencies

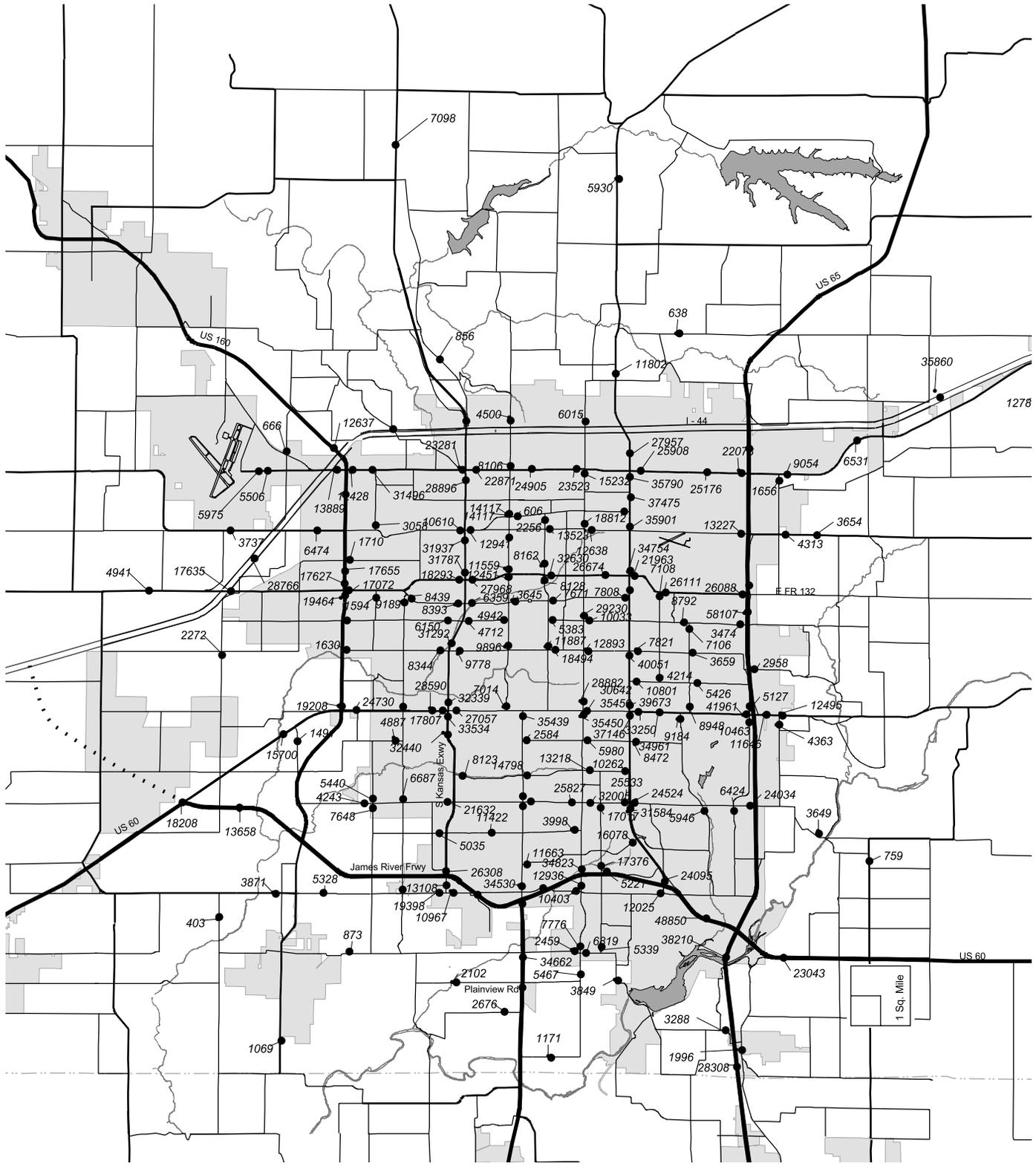
Level of Service

-  LOS D
-  LOS E
-  LOS F

-  Roadways
-  Future Roadways

- xx,xxx Year 2020 ADT  
(Average Daily Traffic)
- (xx,xxx) Daily roadway capacity
-  City Limits





-  State Highway
-  US Highway
-  US Highway - U/C
-  Interstate Highway
-  Within municipal boundaries are city streets  
Outside municipal boundaries are county roads
-  County line
-  City limits

Figure 20-8  
Average Daily Traffic 1998

**Future Traffic Volumes**

The model allocated future trips based on forecasted development to the existing plus committed roadway network. In some cases, the travel demand model did not anticipate changes in traffic patterns since it was run in 1997. Additional studies have been completed on Glenstone Avenue between Battlefield Road and James River Freeway and on Chestnut Expressway between Kansas Expressway and Glenstone Avenue to determine future traffic and need for improvements. The following list shows the increase in traffic that is forecast to occur between the years 1990 and 2020 on selected roadway segments in the Springfield-Greene County urban area.

**Table 20-4: Forecast Traffic Volume by Roadway**

US 65 between Evans and James River Freeway	75,250	207%
I-44 east of US 65	70,550	186%
James River Fwy. at Campbell	56,300	Not built in 1990
<b>Expressways:</b>		
Campbell at James River Road	56,900	130%
Glenstone south of Primrose *	45,000	265%
Kansas Expressway north of Sunshine	47,700	47%
Kansas Expressway north of I-44	44,100	100%
West By-Pass south of Chestnut	38,200	101%
Chestnut west of US 65	43,400	76%
Chestnut west of National *	37,000	21%
US 160 in Willard	27,500	342%
<b>Primary Arterials:</b>		
Glenstone north of Kearney	51,700	53%
Battlefield east of National	40,000	11%
Glenstone north of Sunshine	48,000	8%
National north of Grand	33,400	8%
MO H at I-44	16,000	70%
Republic east of Scenic	16,800	2%
<b>Secondary Arterials/Collectors:</b>		
MO M west of MO ZZ	10,000	20%
Plainview west of Campbell	17,000	240%

\* Traffic Volumes developed from additional study.

## Future Capacity Deficiencies

Traffic volume forecasts and roadway capacities provide information used to determine future roadway deficiencies. The relationship of volume to capacity is referred to as the Volume to Capacity ratio (V/C). The V/C translates into six roadway graded levels of service (LOS), ranging from A to F, with F being the worst. In many of the nation's urban areas, roadways are designed to meet design standards for functional classification and accept LOS D operation during the peak hour. The following statements from the Highway Capacity Manual, 1994 Edition may be made regarding the graded levels of service.

**LOS A** describes primarily free-flow operations at average travel speeds, usually about 90 percent of the free-flow speed for the arterial classification. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.

**LOS B** represents reasonably unimpeded operations at average travel speeds, usually about 70 percent of the free-flow speed for the arterial classification. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.

**LOS C** represents stable operations; however, ability to maneuver and change lanes in midblock locations may be more restricted than at LOS B, and longer queues, adverse signal coordination, or both may contribute to lower average travel speeds of about 50 percent of the average free-flow speed for the arterial classification. Motorists will experience appreciable tension while driving.

**LOS D** borders on a range in which small increases in flow may cause substantial increases in delay and hence decreases in arterial speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these factors. Average travel speeds are about 40 percent of free-flow speed.

**LOS E** is characterized by significant delays and average travel speeds of one-third the free-flow speed or less. Such operations are caused by some combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

**LOS F** characterizes arterial flow at extremely low speeds below one-third to one-fourth of the free-flow speed. Intersection congestion is likely at critical signalized locations, with high delays and extensive queuing. Adverse progression is frequently a contributor to this condition.

The forecasted traffic volume capacity deficiencies on Springfield-Greene County urban area highways in 2020 are displayed in **Figure 20-6**. Note that volumes on Interstate/Freeway routes are shown directionally. The capacities for each roadway classification and each type of roadway used in determining the deficiencies are listed in **Table 20-5**. The deficiencies shown are based on daily volumes and capacities. They assume no additional road improvements other than the committed improvements in the Springfield-Greene County area to the year 2001. The forecasted identified deficiencies reflect a significant overall increase in traffic with a relatively minor increase in capacity

from committed highway improvement projects. The capacity of many arterial roadways in the year 2020 system are inadequate to effectively meet the demand of traffic projected for that year.

Typically, as congestion on any given roadway approaches design capacity (deficiency above 1.00 volume to capacity ratio), traffic will begin to search for time saving alternative routes.

### **Severe Problem Areas**

The most severe congestion is projected for the north-south streets. Glenstone Avenue, US 65, Kansas Expressway and National all have level of service F congestion through the urban area. Campbell is at level of service F south of Grand to the south county line. Of the east-west streets, Sunshine Street shows the most congestion with several segments at level of service F. Republic also shows significant areas of congestion at level of service F, while Battlefield and Division show fewer occurrences.

### **Assessment of Solutions**

Transportation recommendations considered for the Major Thoroughfare Plan are based on the results of the Travel Demand Model traffic volume forecasts and the following considerations:

- Transportation Goals and Objectives;
- Growth Management and Land Use Plan goals and objectives;
- Roadway spacing;
- Roadway continuity and connectivity deficiencies;
- Roadway bicycle suitability deficiencies;
- Existing roadway capacity deficiencies; and,
- Other considerations as they relate to the overall transportation system.

The improvement plan uses the following criteria:

- *Transportation Service Requirements:* Traffic volumes, roadway capacity, roadway continuity, linkages to the regional roadway system and distance between the roadways.
- *Physical constraints:* Land use and environmental features, land use access.
- *Financial constraints:* Improvements are designed to be reasonable in cost.

**Table 20-5: Road Capacity/Level of Service (LOS) Springfield Regional Travel Demand Model in Vehicles per Day**

Classification	Type	Urban			Suburban			Rural		
		LOS C	LOS D	LOS E	LOS C	LOS D	LOS E	LOS C	LOS D	LOS E
Freeway	6-lane	64.000		110.000	64.000	99.000	110.000	64.000		110.000
	4-lane	43.000		75.000	43.000	67.500	75.000	43.000		75.000
Expressway	6-lane	48.000	45.200	63.000	48.000	56.500	63.000		40.700	
	4-lane	32.000	30.200	42.000	32.000	37.800	42.000	24.000	27.200	30.000
Divided Arterial	6-lane	42.000	39.000	54.000	42.000	48.800	54.000		35.100	
	4-lane	28.000	26.000	36.000	28.000	32.500	36.000	17.300	23.400	21.500
Undivided Arterial	5-lane	26.000	24.600	34.000	26.000	30.800	34.000		22.100	
	4-lane	20.000	17.600	26.000	20.000	22.000	26.000	12.600	15.800	17.400
	3-lane	12.000	12.800	16.000	12.000	16.000	16.000		11.500	
	2-lane	9.000	9.000	13.000	9.000	11.300	13.000	6.300	81.000	8.700
	one-way	12.000	28.200	16.000	12.000	35.300	16.000		25.400	
Secondary Arterial	5-lane	26.000	22.600	34.000	26.000	28.300	34.000		20.300	
	4-lane	20.000	15.400	26.000	20.000	19.300	26.000		13.900	
	3-lane	12.000	11.200	16.000	12.000	14.000	16.000		10.100	
	2-lane	9.000	7.800	13.000	9.000	9.800	13.000	6.300	7.000	8.700
	one-way	12.000	24.600	16.000	12.000	30.800	16.000		22.100	
Collector	5-lane	26.000	19.600	34.000	26.000	24.500	34.000		17.600	
	4-lane	20.000	14.400	26.000	20.000	18.000	26.000		13.000	
	3-lane	12.000	9.400	16.000	12.000	11.800	16.000		8.500	
	2-lane	9.000	6.600	13.000	9.000	8.300	13.000	6.300	5.900	8.700
	one-way	12.000	22.800	16.000	12.000	28.500	16.000		20.500	

SOURCE: Springfield/Greene County Calibration and Application Report (March 1997) and technical not

## Projects for Consideration

The following is a listing of some of the key transportation improvements that are recommended for the Springfield-Greene County area. These improvements are based on the assessment of solutions.

- **US 65** from I-44 to south Greene County line - expand to six-lane freeway.
- **James River Freeway** from Glenstone Avenue to U.S. 65 – expand to six-lane freeway.
- **Kansas Expressway** from I-44 to James River Freeway - expand to six lanes.
- **Glenstone Avenue** from James River Freeway to Battlefield Road – expand to six lanes.
- **Kansas Expressway** from James River Freeway to River Bluff Arterial - construct new four lane expressway.
- **National** from Walnut to Battlefield Road - Expand to four travel lanes continuous arterial.
- **Chestnut Expressway** from College Road to Glenstone Ave. – expand to six lanes.
- **National** from Plainview Road to proposed New Southern East-West Arterial - expand to five lane arterial.
- **Lone Pine, Oak Grove, Cedarbrook, Packer** from Republic to Kearney - expand to three lane secondary arterial.
- **Campbell** between Sunshine and Grand - construct connector five-lane facility to connect Campbell at Sunshine with Grant at Grand.
- **Campbell** from Battlefield Road to Grand - expand to continuous five lanes.
- **Campbell** from James River Freeway to Battlefield Road - expand to six-lane arterial.
- **Campbell** from south study area boundary to James River Freeway - expand to six-lane expressway.
- **Grant** from Grand to Norton Road - expand to continuous five lanes.
- **Grand** from MO MM to Kansas Expressway and from National to Glenstone - expand to four-lane arterial with median.
- **Grand** from West Bypass to Kansas Expressway - expand to four lane divided arterial.

- **New Airport Access Roadway** - build new four lane arterial to connect I-44 to new airport terminal.
- **Haseltine** from Grand to Division - move west and build new four-lane arterial.
- **Haseltine** from Sunshine to Grand - expand to four-lane arterial.
- **Battlefield/Smith (FR 160, 164)** from US 65 to New Pierson Creek Arterial - expand to four lane arterial (in phases).
- **New Southern East-West Arterial** south of Steinert Road and Evans Road from MO FF to US 65.
- **New Eastern North-South Arterial** two to three miles east of US 65 from US 60 to I-44.
- **New Northern East-West Arterial** approximately 1½ to 2½ miles north of I-44 from MO 13 to US 65 with connecting segment to I-44.
- **US 60/US 65 Interchange** - construct higher capacity interchange.
- **I-44/US 65 Interchange** - construct higher capacity interchange.
- **Chestnut Expressway** upgrade to a four-lane expressway design.

The Implementation of these expansions and improvements will go far in meeting the future roadway traffic needs to the year 2020.

## Proposed Major Thoroughfare Plan

### Process for the Update of the Major Thoroughfare Plan

Members of the Metropolitan Planning Organization and staff worked together to develop an updated version of the Major Thoroughfare Plan Map for the Transportation Plan. The Major Thoroughfare Plan Map (**Figure 20-9**) shows the functional classification needed for roadways to accommodate future development in the community and addresses the need for any new roadways. Proper classification of a roadway is essential to ensure the preservation of the appropriate amount of right-of-way needed for future improvements. The Major Thoroughfare Plan Map addresses the community's roadway needs for the next 20 to 40 years. The Major Thoroughfare Plan should be reviewed at least every five years and classification needs updated, if appropriate.

Various data sources were reviewed to assist in developing the recommendations for the future roadway network for the Springfield metropolitan area. The following sections review both the process that was followed and the data sources analyzed to develop the Major Thoroughfare Plan Map.

## Major Thoroughfare Plan Map

The Major Thoroughfare Plan is intended to provide an overall framework for making decisions on thoroughfare improvements and extensions. The plan identifies the general locations of future major transportation corridors and should serve as a general guide for securing street rights-of-way and for determining appropriate zoning intensities. The Major Thoroughfare Plan Map (**Figure 20-9**) outlines both the general location and classification needs of future roadway facilities. Precise locations of future facilities will be determined prior to right-of-way acquisition and may vary from the exact location shown on the plan.

## Roadway Jurisdiction

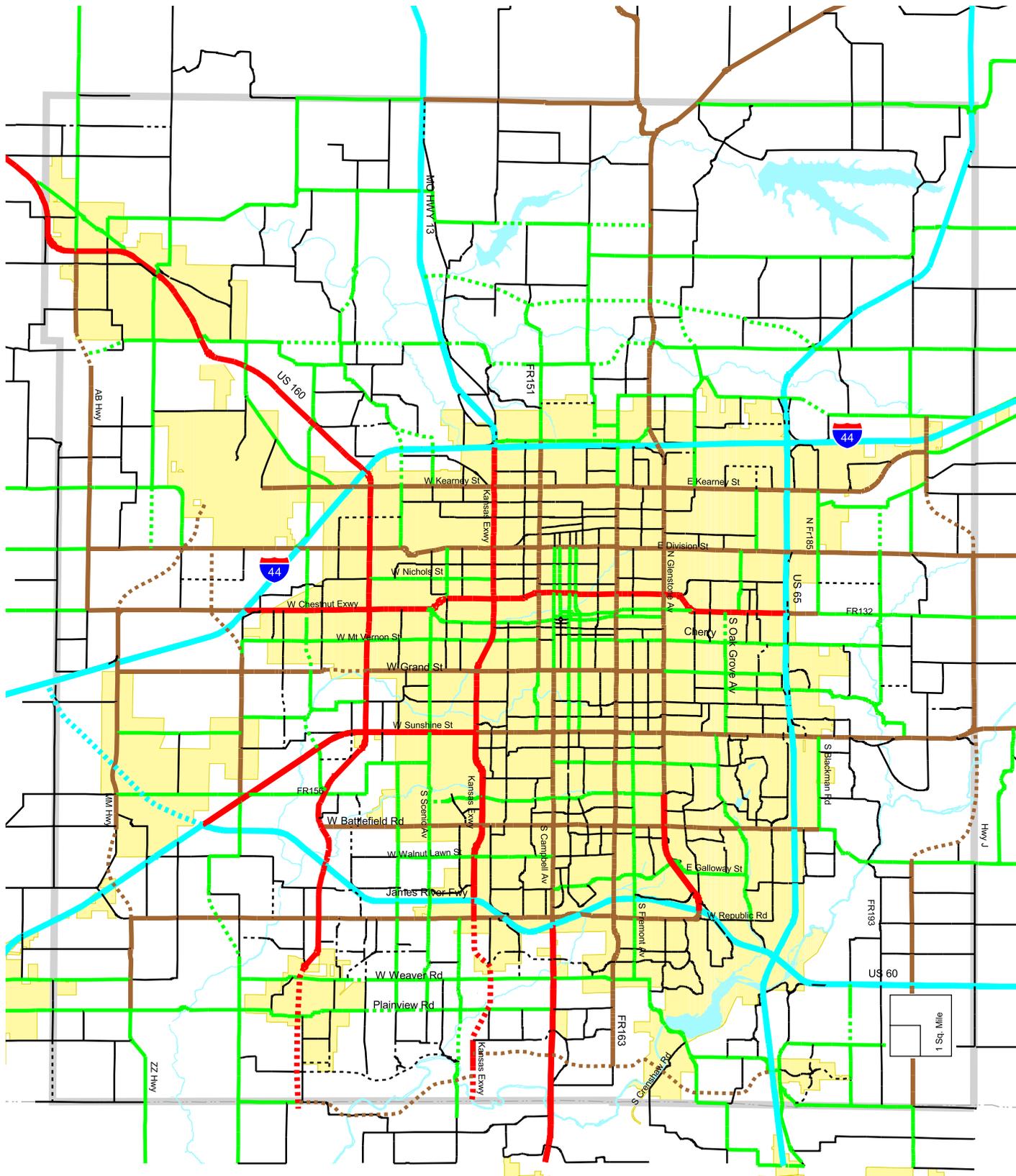
Jurisdiction assignment of roadways is based on several factors including:

- Length of road
- Length of trips served
- Connections to roads of similar jurisdiction
- Average daily traffic
- Functional classification
- Special facilities served

In general, roadways that solely serve local transportation needs are owned and maintained by the local government. Roadways that serve regional, inter-county or statewide transportation needs are owned and maintained by the state. Therefore, it is in the City's and County's interests to own and maintain the streets and roads that provide access to land uses, and facilitate development. Likewise, it is in the State's interest to own and maintain streets and roads that facilitate inter-city and inter-county mobility.

Operational jurisdictional coordination includes consistency in geometric design and pavement at points where there is a change in jurisdiction. It is the responsibility of the various jurisdictions to provide the driver with a seamless driving experience when passing from jurisdiction to jurisdiction.

The jurisdictional system, with the recommended changes in the urban area, is shown in **Figure 20-10**. In general, the system is continuous and corresponds well with street classifications. The single most significant incongruity is the segment of Sunshine Street between Kansas Expressway and Glenstone Avenue. This segment was transferred to City jurisdiction in 1993 in a trade with the State in which the State assumed jurisdiction of south Kansas Expressway. The trade was clearly in the City's and State's interest. However, Sunshine Street remains as a gap in the State system. Sunshine has subsequently been placed on the National Highway System (NHS), which makes it eligible for NHS funds. It is one of the few NHS streets in the nation that is not a state highway, and consideration should be given to establishing control of the facility by one jurisdiction or consider aligning classifications.



- |  |                    |  |                   |
|--|--------------------|--|-------------------|
|  | COLLECTOR          |  | EXPRESSWAY        |
|  | FUTURE COLLECTOR   |  | FUTURE EXPRESSWAY |
|  | SECONDARY ARTERIAL |  | FREEWAY           |
|  | FUTURE SECONDARY   |  | FUTURE FREEWAY    |
|  | PRIMARY ARTERIAL   |  | MPO Boundary      |
|  | FUTURE ARTERIAL    |  |                   |

Figure 20-9  
Major Thoroughfare Plan

Recommended 6-lane facilities:  
 \* Campbell from JRF to Christian County line  
 \* US 65 from I-44 to Christian County line  
 \* Kansas Expressway connection from I-44 to Christian County line

## Key Concepts or Projects

**Parkways:** Parkways are intended to be heavily landscaped linear parks that include roadways with bicycle and pedestrian facilities to meet the community's need for efficient circulation, recreation, and beauty. Parkways serve multiple purposes, including utilitarian and recreational auto, bike and pedestrian travel, neighborhood development and neighborhood revitalization. The number of through-traffic lanes on roadways can vary from segment to segment. Parkway roads can also be designed and classified as collectors or arterials. Changes in travel demand may warrant adjusting lane configurations.

A Parkway treatment could be added to the new Southern east-west Arterial, new Pierson Creek Arterial, new Blue Grass Road Arterial, or any other roadway deemed appropriate. The parkways concept is not limited to new roads. Existing streets, regardless of classification, could be retrofitted to accommodate the parkway concept. The Metropolitan Planning Organization recommended that a parkway concept, as outlined in *The River Bluff Parkway Concept Study* be considered for the Southern east-west Arterial in south Greene County.

The parkways, together with the planned greenways, have tremendous potential to have a positive effect on the image of Springfield and Greene County. They would provide major green corridors across the area, link neighborhoods and parks, provide gateways to community districts, guide residential development, raise and sustain property values, and shape residents' mental maps of their community. Because of this potential, Springfield and Greene County should work proactively and with commitment on these investments, which will require several decades to accomplish.

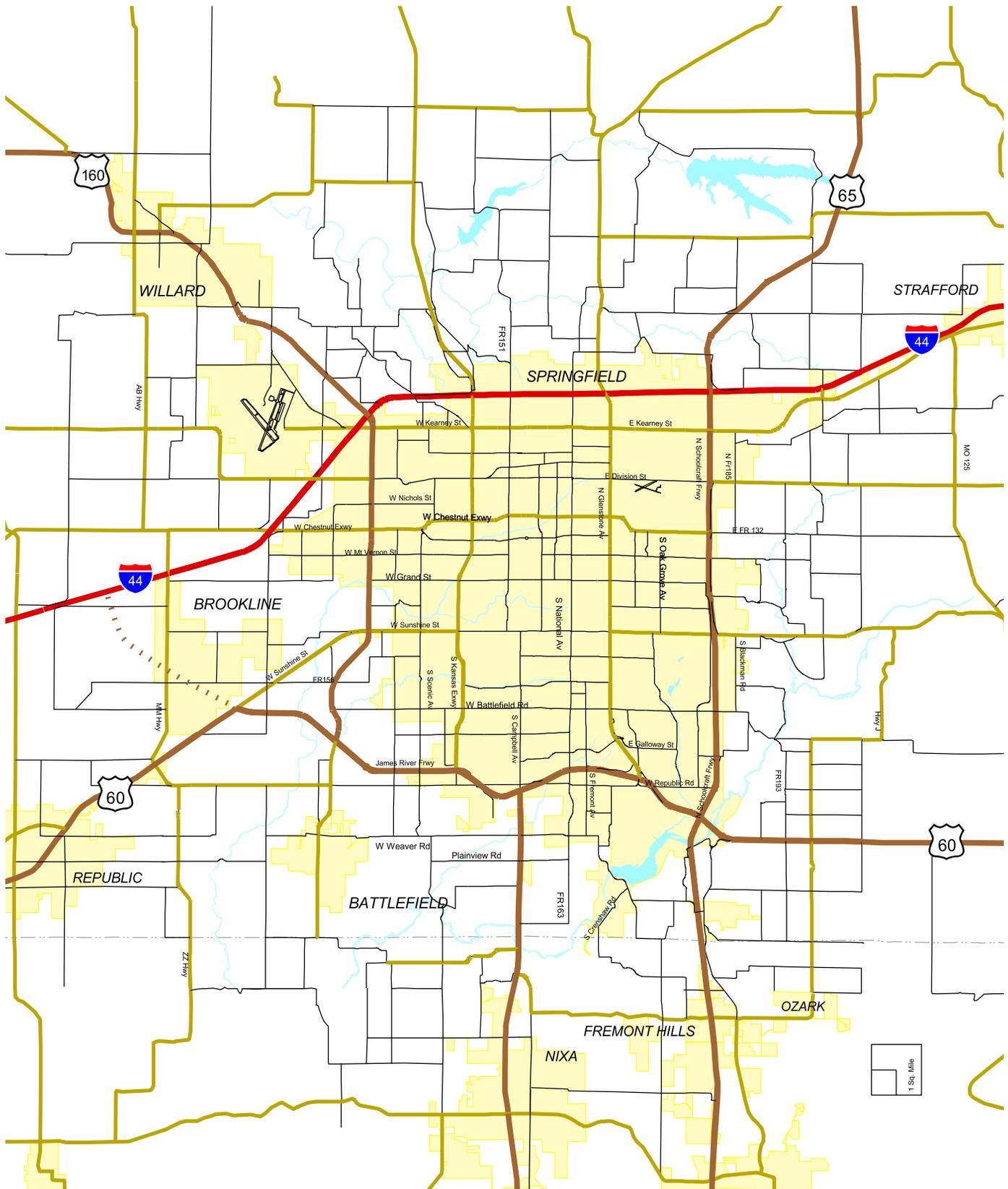
## Center City

Springfield's Center City has excellent access from other parts of the community through connections provided by Chestnut and Kansas Expressways, National, Campbell and Grant Avenues, and Grand and Division Streets. Boonville-South and Benton-Kimbrough Avenues are collector streets that link the Greater Downtown, Government Plaza, and Commercial Street Districts, and provide internal connectors within Center City. Each has certain advantages and disadvantages in terms of circulation and image. Boonville Avenue has non-residential land uses from Commercial Street to Park Central Square, with non-residential land uses continuing along South Avenue to Elm Street. These features give the street the feel of a main arterial, even though its route through Park Central Square interferes with the ability to move traffic through Center City. Benton-Kimbrough on the other hand, is continuous across Center City but directly serves residential neighborhoods near its north and south ends. These two roadways should be considered for improved landscaping and lighting to help define and accentuate their role in connecting and integrating Center City.

Auto circulation within Center City is somewhat hampered by the fact that several streets are discontinuous. Barriers are posed by the railroad yard north of Commercial Street, the railroad tracks in the Jordan Creek Valley, and north of Park Central Square. The Boonville-South Avenue corridor also terminates on the north end of Center City at Commercial Street and on the south at Grand Street. Water Street, East Trafficway, and Olive Street do not combine to form a smooth and unified east-west route.

**Recommendations:**

- The City of Springfield and the Missouri Department of Transportation (MoDOT) should consider alternative scenarios for including the entire length of Sunshine Street under one jurisdiction's control.
- Springfield and Greene County should cooperate on the design and alignment of roadway facilities that incorporate the parkway concept.
- Springfield metropolitan area jurisdictions should consider designing new and existing roadway facilities with amenities included in the parkway concept.
- Designers of future local and collector streets intersecting the parkways should be encouraged to extend the parkway treatments into and across adjacent neighborhoods in order to extend its positive impression.
- On the streets connecting Commercial Street, Government Plaza, and the Downtown District, consider changing traffic operation patterns and improving landscaping and lighting to help define and accentuate their role in connecting and integrating Center City.



-  State Highway
-  US Highway (State)
-  US Highway Under Construction (State)
-  Interstate Highway (State)
-  Local (City and County) Streets and Roads

Figure 20-10  
Existing Jurisdictional System

# Transit and Paratransit

## Introduction

The Transit Chapter of the Transportation Plan includes information from the MPO's current Transportation Plan, City Utilities' 1995 Transit Plan, and Southwest Missouri State University's (SMSU) Master Plan. Critical planning features of all these plans have been combined into the Transit Chapter.

The Paratransit Section of the Transportation Plan updates information from the late 1980's and provides some background on the recent paratransit coordination effort that the MPO facilitated in 1997. The previous Transportation Plan referred to transportation services for the handicapped. This draft refers to these services as "paratransit" and also refers to the Americans with Disabilities Act (ADA) changes that affect transportation.

## Transit

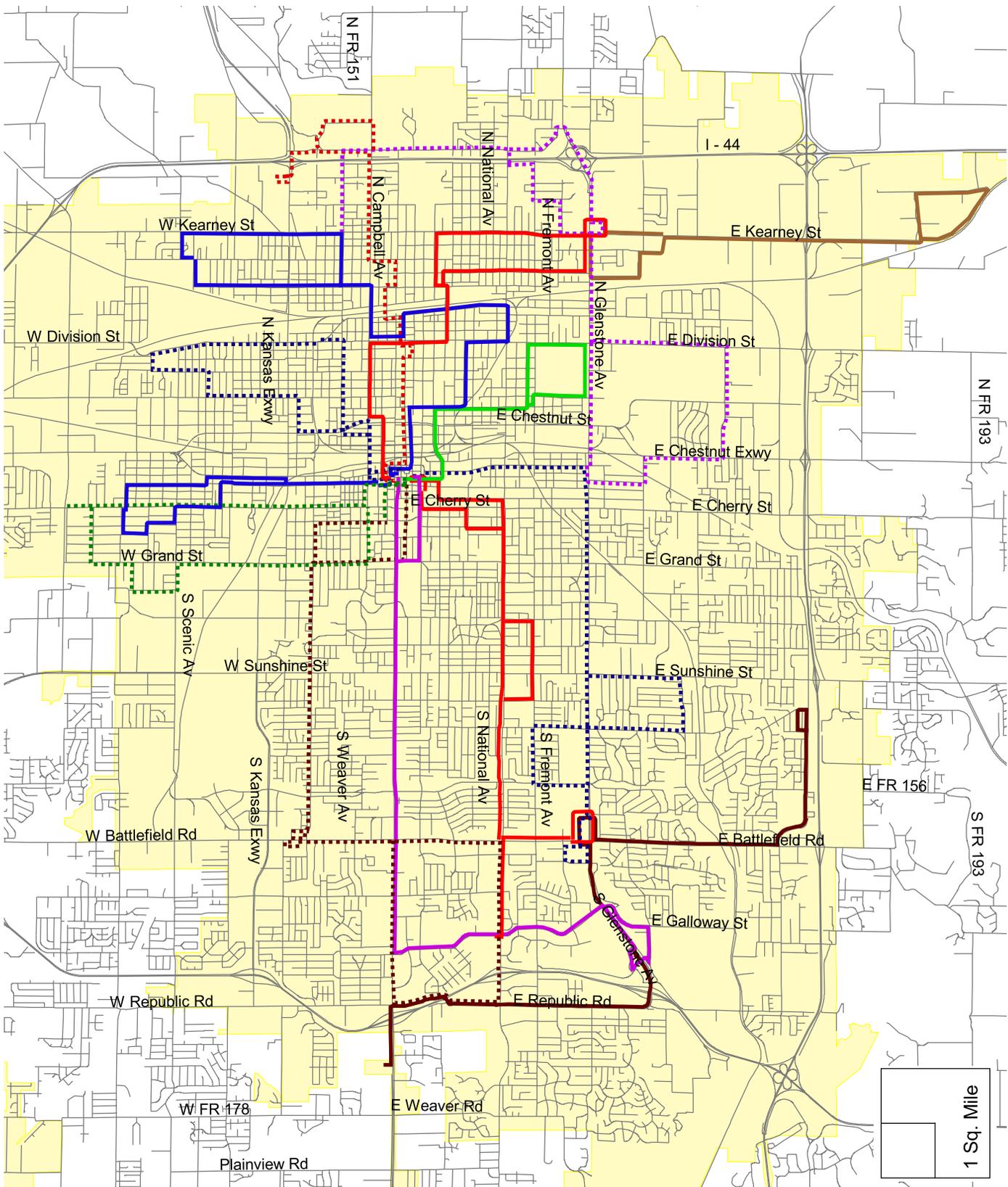
According to the City of Springfield Charter, City Utilities is responsible for providing fixed route and paratransit public transit service to the City of Springfield. Fixed route transit service is an integral mode of transportation for certain citizens in the Springfield area. Public transit serves as an alternative for persons with access to other transportation modes. It also meets the needs of persons unable to utilize, own, or operate an automobile. This includes low-income individuals, the elderly, disabled persons, students, and other under-served populations. The fixed route service impacts the City of Springfield's transportation system by providing trips that would otherwise require an automobile (see **Figure 20-11**).

In addition, Southwest Missouri State University (SMSU) provides a campus shuttle service from their Park and Ride Intermodal Facility on Elm Street. The SMSU service connects buildings throughout the campus, and at various locations in Springfield's Center City. The plans for the Phase II Intermodal Facility at SMSU incorporate the shuttle system into the new facility, which is subject to available financing. This service is designed principally for university students, faculty, and employees. However, the shuttle service is available to the community free of charge when traveling between SMSU sites for community events occurring in SMSU facilities. The success of the SMSU shuttle service is evident in its ridership growth, which increased from 373,629 rides in 1995 to 671,257 rides in 1997. **Figure 20-12**, shows the SMSU shuttle system routes and how these routes connect various facilities.

The future of the SMSU campus shuttle system and its integrated intermodal facilities is outlined in *The SMSU Transportation Study – Where We Are; Where We Are Going*. The Springfield Area Transportation Study Organization supports the SMSU long-range planning efforts as described in the above document, the SMSU Master Plan. However, the MPO must prioritize between individual projects from SMSU and City Utilities as part of the annual Transportation Improvement Program process. Support of the City Utilities and SMSU planning efforts does not indicate pre-approval of a project by the MPO. The Transportation Plan's Fiscal Plan Chapter addresses the MPO's project priorities for the next 20 years.

Both SMSU and City Utilities operate accessible transit vehicles, as prescribed under the Americans with Disabilities Act (ADA). City Utilities and SMSU transit operations have overlapping routes enabling the community to access one transit service from the other, through a simple transfer.

Land use density impacts the effectiveness of fixed route public transit. The denser the land use, the higher the probability for success of the service. City Utilities service to the Center City and the SMSU campus shuttle system are well suited for public transit because they access a higher residential and employment density than suburban areas. Significantly less dense land uses pose probable financial losses to the transit operator. Thus, activity centers should be planned at appropriate densities in areas that are serviced by transit routes.



Bus Routes



- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6



- Route 7
- Route 8
- Route 9
- Route 10
- Route 11

Figure 20-11  
CU Fixed Route Bus System



Springfield-Greene County  
Comprehensive Plan

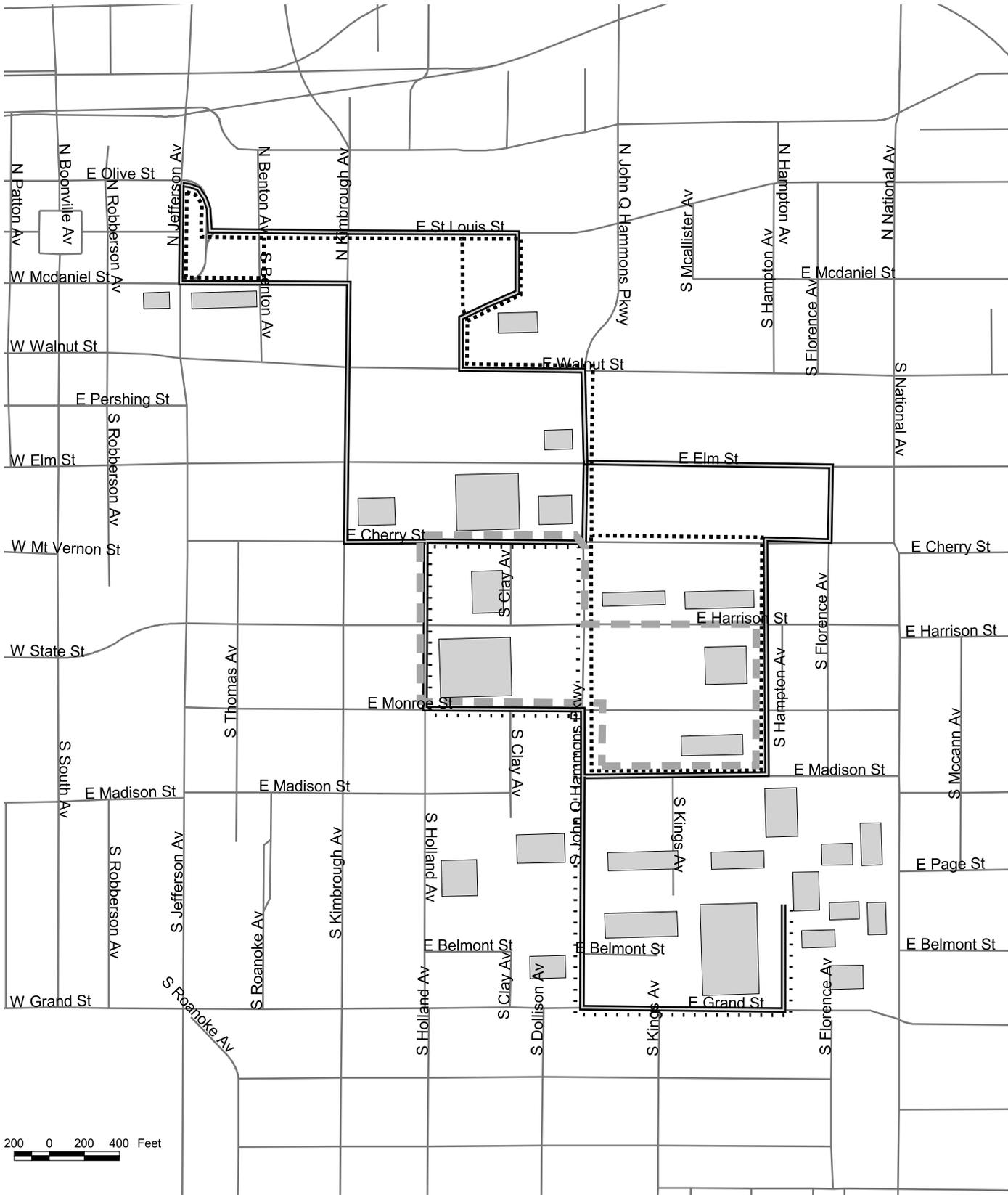


Figure 20-12  
SMSU Shuttle Bus Route System  
(1997 - 1998)

-  Alumni Center/Student Union
-  Carrington/Park&Ride
-  Evening Route
-  Student Union/Park&Ride



The current City Utilities fixed route system consists of 14 fixed bus routes operating weekdays, with limited weekend, holiday, and night service. Passengers have the opportunity to transfer from one route to another at the Park Central Transfer Facility. The system operates on a “pulse” basis with most buses arriving and departing the Transfer Facility at the same time. City Utilities also operates “Access Express”, a complementary paratransit service.

The overall City Utilities fixed-route bus fleet consists of 23 buses with capacities ranging from 28 to 33 riders. The demand responsive paratransit fleet or “access express” consists of an additional five buses. The paratransit vehicles have a ten-passenger capacity, with the flexibility of becoming 18-passenger vehicles, if needed on the fixed route system. City Utilities’ fixed route public transit ridership has been on the increase in recent years. This is in concert with trends in public transit ridership in most urban areas throughout the United States. In 1999 total ridership was 1,366,387 compared to 1,052,353 in 1997, a 30 percent increase in two years. In 1999 farebox revenue covered 10 percent of system costs and advertising contributed 1.1 percent of those costs.

The City Utilities transit system operates at a loss. The average loss per year from 1997-2000 was \$3 million dollars (after deducting all grants and revenues). The City Utilities gas and electric utility ratepayers currently cover this loss. The Springfield area is fortunate to have the utility system cover the transit system deficit. Many other cities of similar size are not able to support a significant transit system because there is no method to cover the deficit. However, potential changes to the gas and electric utility through deregulation could jeopardize future financial support of the transit system.

In anticipation of deregulation, the City Utilities Board has been cautious to expand the transit system. However, the City Utilities transit system is still a critical component of the Springfield-Greene County transportation system. Efforts should be made to financially support the transit system, support grants for the transit system that will decrease their annual deficit, and consideration should be given to expand the transit system service area throughout the urbanized area.

The SMSU shuttle system consists of 16 shuttle buses with capacities ranging from 17 to 30 riders. The shuttle system operates weekdays with limited night service, no holiday service, and no service on weekends. The shuttle buses run approximately every five minutes on the four weekday-routes. The night route serves all areas of the campus and various locations in Center City after 6:00 p.m. The shuttle buses operate approximately every 12 minutes on the night route. In 1999, ridership was up to approximately 663,000 annual trips, compared to 221,000 annual trips in 1988 when it was initiated.

City Utilities undertook a comprehensive study of its transit operations in 1995 and has implemented many of the study’s recommendations. They have established both a fixed route and paratransit advisory committee with memberships including bus passengers, office staff, and bus operators. These committee members have been very helpful with recommendations to improve the system. These steps represent meaningful action on the part of City Utilities to improve its management of the system; transit use continues to rise each month. The challenge is to effectively encourage more automobile drivers to use transit as a viable transportation alternative. This will require attitude changes within the community and a stronger commitment to transit service.

## **Transit Goal and Objectives**

### **Goal:**

Provide a level of transit service to the community that meets the basic travel needs of persons without other means of transportation and serves as an alternative to the private automobile.

### **Objectives:**

- Review, adopt, and modify as necessary a formal set of public transportation performance measures to guide transit planning, operations, and policies.
- Within the limits of financial capabilities, provide transit service to all parts of the community that can generate acceptable levels of ridership.
- Operate the transit system as a customer-oriented service, which is responsive to the needs and desires of the public.
- Review the transit fare structure periodically and develop fare levels, which recover a reasonable portion of operating costs without imposing an undue burden on the passengers.
- Continue to upgrade the transit fleet and maintenance facilities to achieve and maintain a modern, efficient transit operation.
- Evaluate the transit system on a regular basis according to specific criteria in order to determine the need for service improvements, curtailments, reroutings, route extensions, fare revisions, and other policy changes.

## **Transit Plan**

### **Level of Transit Service**

The City Utilities fixed route transit system in Springfield serves a dual function: to transport persons who lack their own means of transportation and to provide an alternative for persons who have automobiles but choose not to use them. At present, two-thirds of all transit passengers have no other transportation available; about one-third ride by choice. The primary goal of the transit system should be to provide reliable transportation at a fair and reasonable price for the community to access jobs, medical services, and other basic activities. Efforts should also be made to attract more passengers who ride by choice, in order to improve the system's productivity, promote energy conservation and decrease auto trips.

Both City Utilities' 1995 Transit Plan and the City Utilities 1980 Short-Range Transit Plan contain a series of standards designed to measure the performance of the transit system, identify its strengths and weaknesses, and indicate where remedial efforts should be directed to improve transit service. Some of the performance measures apply to the system as a whole; while others apply to individual routes. The system-wide

performance measures and the route performance indicators presently used are listed below. These measures should be reviewed annually by the provider and modified as needed to reflect community needs.

### **System-Wide Transit Performance Measures<sup>1</sup>**

1. At least 30 percent of operating costs should be recovered from farebox revenues.
2. The net deficit per revenue passenger should increase no more than 10 percent per year.
3. Patronage should average at least 1.25 revenue passengers (or 1.6 total passengers) per vehicle-mile of service.
4. Patronage (total passengers and revenue passengers) should increase by at least 5 percent per year.
5. Routes which have a high percentage of elderly riders (over 30 percent) should not be curtailed unless their productivity is otherwise very low.
6. Bus speed should average at least 60 percent of auto speed.
7. Average bus age should not exceed nine years.
8. The maximum passenger load on any bus should not exceed 125 percent of the seating capacity.
9. At least 90 percent of all bus trips should be less than five minutes late.
10. The operating expense per vehicle-mile should not increase faster than the general rate of inflation.
11. The system expense per vehicle-mile should not increase per bus operator.
12. The system should average at least 5,000 annual vehicle miles between road calls or breakdowns.

### **Route Performance Profile Indicators<sup>2</sup>**

For the Route Performance Profile, each route is assigned a rank based on its performance relative to the other routes on the following indicators:

1. Operating Ratio: this measure is the ratio of operation revenues (i.e., farebox receipts) to operating expenses.
2. Rate of Ridership: This measure is the ratio of total passengers to total bus miles.

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<sup>1</sup> Source: Short-range Transit Plan, p. 3.12 – 3.13, 3.17 – 3.19

<sup>2</sup> Source: Short-range Transit Plan, p. 3.16.

3. **Transportation Disadvantaged Ridership:** For the purpose of this evaluation, this measure is the percentage of riders 65 years of age or older.

A Route Performance Profile ranking should be prepared annually and used as a basis for further analysis of service changes. The lowest one-third ranked routes should be carefully monitored and subject to increased promotion and minor service adjustments to help their ranking.

**Recommendations:**

- The 1980 Short-Range Transit Plan, adopted by City Council and the Board of Public Utilities, included the aforementioned performance measures and route performance profile indicators. The City Utilities staff, with the assistance of MPO staff should review these measures periodically to determine whether any modifications should be made.

**Service Improvements**

Ideally, the fixed route transit system should attempt to operate a bus within a quarter-mile of every resident of Springfield. Realistically, however, this goal is not achievable under present conditions, based on Springfield's low-density residential development pattern. Expansion of transit service to the entire community would require a larger bus fleet, more bus drivers, and a significant increase in the operating budget. Many areas of the city are sparsely populated and cannot support even minimal transit service. Other areas are characterized by high levels of automobile ownership and will not likely have levels of transit usage comparable to more dense parts of the city. Public policy and economic feasibility should therefore determine the level and extent of transit service, which is provided to the community based upon a vision of its role in maintaining the area's quality of life.

In order to provide guidance for policy-makers in making decisions on transit service changes, a series of criteria were developed in City Utilities' 1995 Transit Plan. These criteria address three basic types of service changes: improvements to existing services; curtailment of existing services; and initiation of new services.

Improvements to existing services may involve factors such as more direct service, faster travel speeds, more frequent service, expanded hours of operation, and revision of schedules to facilitate transfers. Guidelines for these types of improvements, which are intended primarily to increase convenience to existing passengers, are listed in **Table 20-6**.

Any new routes should be undertaken selectively after careful planning when there is reason to believe that an acceptable level of ridership will result. During 1997-2000 City Utilities transit has initiated:

- Two new fixed route services;
- Increased service frequency on an existing fixed route from hourly to half-hourly;
- Extended an existing fixed route to a major shopping center;
- Extended two of the night, Sunday, and holiday fixed-routes to include frequently requested shopping centers;

- Re-routed an existing fixed route to better serve the SMSU campus; and,
- Extended a fixed-route to include additional employment destinations.

**Table 20-6: Guidelines for Route Design, Frequency, and Scheduling<sup>3</sup>**

1. Routes should provide for direct service between areas of high ridership potential and major trip attractions.
2. One or more routes should serve most major generators such as hospitals, shopping centers, and educational facilities.
3. Routes should be linear in alignment to minimize travel time; unnecessary detours and turns should be avoided.
4. Routes should be free of duplication, except where they converge.
5. Parallel routes should normally be spaced one-half mile apart in order to draw upon a service area of one-quarter mile to either side of the route.
6. Basic service should be operated from 6:00 a.m. to 7:00 p.m., Monday through Saturday. Limited service may be provided on certain routes at night and on Sundays and holidays in response to particular needs.
7. Buses on a given route should operate no more than 60 minutes apart, with 30 minutes being the preferred frequency.
8. Whenever possible, headways between buses should be based on even divisions of an hour (e.g., 15, 20, or 30 minutes), and major time checkpoints should be served at easily remembered times (e.g., 30 minutes past the hour).
9. Scheduled arrival and departure times for routes having common end points should be coordinated to the maximum extent practicable in order to facilitate transfers.
10. No more than 30 percent of the total system passengers should have to transfer to complete their trip.
11. When 20 percent or more of the total daily passengers transfer between two separate routes having a common end point, the two routes should be considered for linking into one through route.

The City Utilities transit system is also available on an as-needed basis to assist with community needs and events. Guidelines for development of new fixed route services are listed in **Table 20-7**.

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<sup>3</sup> Sources: 1980 Short-range Transit Plan, p. 4.9-4.10, 4.12, 4.32, 4.72. Route and Schedule Study, p. 37-46.)

**Table 20-7: Guidelines for New Service<sup>4</sup>**

1.	New service should generate levels of patronage and revenues per mile, which are comparable to the system average. This concept implies that new services should not significantly add to the system's deficit per passenger.
2.	A detailed planning feasibility study should precede the implementation of any proposed new services to determine whether the services have the potential for achieving a revenue/cost ratio equivalent to the system average. This study should include estimates of ridership, revenues, expenses, and deficit per passenger.
3.	In general, new services should be considered primarily for implementation in areas characterized by relatively lower-income households, higher residential density, and higher percentage of elderly population, since these areas tend to generate the highest ridership per mile of service.
4.	A trial period of at least 18 months should be allowed for a new route to develop. During this time route performance should be monitored carefully against these standards: <ul style="list-style-type: none"> <li>• After 6 months, the new service must achieve 40 percent of the system average passengers per mile, and ridership should be increasing at this time.</li> <li>• After 12 months, the new service should achieve 60 percent of the system average passengers per mile.</li> <li>• After 18 months, the new service should be evaluated according to the same criteria as the rest of the system. At that point, if the new route falls at the bottom 1/3 of all routes, detailed monitoring and marketing analysis should be performed. If no improvement is noticed in performance, the service should be considered for elimination.</li> </ul>
5.	New service at night, on weekends, and on holidays should be established only in response to a special need as identified through marketing research.

Any service improvements or service expansion considerations for the Southwest Missouri State University shuttle system should comply with the SMSU Master Plan. All services should be monitored annually to determine whether they are meeting a specific need. In the interest of resource efficiency, unproductive services should be curtailed so that the available transportation resources may be more effectively utilized. Criteria for determining when fixed route service reductions are warranted are listed in **Table 20-8**.

**Table 20-8: Guidelines for Service Reduction<sup>5</sup>**

1.	New services should never be terminated before the end of 12 months of operation. If ridership is not increasing after 6 months, remedial actions should be taken, such as increased promotion or minor service modification. If trends do not improve after 12 months, realignment of service within the same basic structure should be considered. At the end of the 18-month trial period, all options should have been exhausted and service should be eliminated if trends persist.
2.	For established services (over 18 months old), a Route Performance Profile ranking should be prepared annually based on the indicators in Table 20-6. The lowest one-third ranked routes should be carefully monitored and subject to increased promotion and minor adjustment to help their ranking. If a route is ranked last in two consecutive evaluation periods and has been subjected to attempts to improve productivity, then that route should be abandoned.
3.	Portions of a route whose daily-boarding passengers per mile of route is less than 30 percent of the total route average should be considered for curtailment. Ridership patterns should be monitored to determine whether such segments should be dropped entirely or operated only during peak hours.
4.	Routes operating at night, on weekends, or on holidays should have productivity in passengers per mile of at least 50 percent of the system-wide average. Routes operating below this level should be considered for modification or deletion.
5.	Service modifications or elimination's should be made gradually and only after attempts at improvement are made. Services falling below the guidelines should be subjected to increased promotion, rerouting, rescheduling, or other improvements for at least 6 months before planning for curtailment is initiated.

<sup>4</sup> Source: 1980 Short-range Transit Plan, p. 4.3-4.4., 4.10-4.11.

<sup>5</sup> Source: 1980 Short-range Transit Plan, p. 4.13-4.15.

### **Battlefield Mall Shuttle Service**

Significant route changes were made to the fixed route system in 1996, following the recommendations made by the 1995 City Utilities Transit Plan. City Utilities revised the route (line 2-S. National) serving the SMSU campus, in order to provide a direct service from the campus to Battlefield Mall. This route has 30-minute service Monday through Friday and hourly service on Saturday, Sunday, and at night.

### **Center City Service**

All of the City Utilities fixed-route buses (with the exception of three) enter and exit the center city area on their routes. City Utilities' transfer facility is located on McDaniel Street at Patton. This transfer facility provides covered waiting areas (inside and out) for passengers, as well as restrooms, a pay phone, and a water fountain. The facility is open from 5:30 a.m. until midnight, seven days a week.

Southwest Missouri State University (SMSU) may explore expansion of their night and weekend shuttle system routes to the Center City. There is a significant portion of the student population that frequents establishments in the Center City during evenings and weekends.

### **Recommendations:**

- To help protect student safety and to provide the student populations with the best level of service possible, SMSU should investigate the need for providing shuttle services to Center City attractions for students during nights and weekends – whether they provide the service or they decide to contract-out the service. This expansion would be subject to available financing and it should comply with SMSU's Master Plan. Note, the City Utilities fixed route transit system does provide service between Center City and SMSU seven (7) days a week. The potential SMSU weekend shuttle service to Center City would need to be more convenient than the existing City Utilities service.
- City Council and the Board of Public Utilities adopted the guidelines in Tables 20-6, 20-7 and 20-8 as part of City Utilities' 1995 Transit Plan, previously included in the 1980 Short-Range Transit Plan. All proposals for service improvements or reductions should be evaluated in relation to those guidelines before any official action is taken.
- The MPO should support the area-wide transit system by supporting grants for their projects during the Transportation Improvement Program (TIP) process. Consideration should be given to projects that will help decrease their annual deficit and efforts to expand the transit system service area throughout the urbanized area.

### **Table 20-9: Guidelines for Passenger Amenities and Customer Relations<sup>6</sup>**

1. An active marketing program should be pursued on a continuing basis to ensure that the transit service provided will be effectively used. This program should include research to identify consumer attitudes; design and delivery of service that meets identified needs; and effective promotion of available services.

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<sup>6</sup> Source: Short-range Transit Plan, p. 4.22-4.41, 7.30-7.32

2. Bus stops should be established that are convenient for passengers, minimize traffic congestion, and promote increased bus speeds. In residential areas, there should generally be four to eight stops per mile. In commercial and industrial areas, stops should be conveniently located with respect to major businesses. Signs should mark all stops. At major stops the signs should identify route numbers and time of buses passing the stop. In general, stops at the far side of the intersection are preferable, and recessed bus turnouts should be considered where high passenger and traffic volumes exist and space is available (such as major shopping centers).
3. Bus shelters should be provided at bus stops where more than 25 passengers board and/or transfer during the course of a typical weekday. Benches should be provided at stops where 12 or more passengers board, especially where a substantial percentage of boarding passengers are elderly or disabled.
4. Bus interiors should be adequately lighted, heated and air-conditioned when appropriate. Buses should be cleaned both internally and externally at least once every two days.
5. Passenger complaints should be promptly addressed and acknowledged by either a letter or telephone response. Any route receiving frequent complaints about on-time performance, overcrowding, malfunctioning equipment, or similar operational problems should receive remedial analysis or personnel consultation. Any personnel-related complaints, such as discourteous actions by drivers, should be just cause for consultation with the appropriate employee.
6. Adequate and up-to-date information on routes and schedules should be provided to the public. A telephone information service should be maintained during normal working hours. Maps and schedules for all routes should be prepared and disseminated. Frequent use should be made of radio, television, and other media to publicize existing services and service changes. Each bus should have its route number and name clearly designated.
7. Passenger safety from accidents and security from crimes should be a major concern. An active course of safety training should be pursued, including sensitivity training for dealing with wheelchair-bound and other disabled passengers. In addition, all accidents should be analyzed to determine possible remedial actions, and any location with more than three transit vehicle accidents per year should receive corrective action with the assistance of the City Traffic Engineer. All buses should be equipped with two-way radios for emergency communication with law enforcement agencies, and any crimes against passengers should be analyzed in order to formulate additional security standards.

### **Marketing and Customer Service**

If transit is to continue its function as an element of the urban transportation system, it must serve a definite need and provide a pleasant experience for the passenger. Like all services for which a fee is charged, transit service should cater to its customers. Market research should be undertaken on a continuing basis to identify customer needs and desires, and the results should be used in designing new services and facilities. The passenger's need for comfort, convenience, and security should be given high priority,

and public information on available services should be prepared and disseminated. Guidelines for passenger amenities and customer relations are listed below.

### **Community Awareness**

As changes are made to the transit system, both City Utilities transit and the SMSU shuttle system must let the public know that quality service is being provided. The message that transit offers quality service on which a number of citizens are absolutely dependent should be delivered at community events, public meetings, on talk shows, and at every other opportunity. Both SMSU and CU should use their customer billings to generate awareness of the system. Public service events, similar to the City Utilities Customer Service Appreciation Day, should be held to benefit transit. City Utilities should also consider approaching the business community for financial support of community-wide special programs that are important to them. In short, both City Utilities and Southwest Missouri State University need to promote the transportation system to the community and help build an awareness of the services they provide in the community. It is important to communicate this message to the public, encourage them to ride transit, and to garner their support for future programs.

### **Advertising**

Using transit as an advertising mechanism is one way for transit systems to generate revenue. City Utilities transit system has recently implemented new advertising methods such as exterior advertising on the panels of buses and “theme bus” advertising where the entire vehicle is painted or wrapped with a commercial message. City Utilities has recently purchased and installed 56 bus shelters throughout the city. These shelters have an advertising panel that allows advertisers to display an ad that would be visible on the end panel of the shelter. City Utilities is also selling advertising space on the printed bus maps, which are updated twice annually. City Utilities recently purchased bus benches and is selling ad space on those as well. City Utilities should continue generating revenue through these various methods and should also consider any additional advertising opportunities.

SMSU should also consider advertising for their shuttle system in the future to help offset student operating subsidies or fund system expansions.

### **Actions:**

- City Utilities transit should maintain a strong marketing program. Both City Utilities and Southwest Missouri State University should conduct periodic surveys of both transit riders and non-riders to identify attitudes toward the bus system and opportunities for customer-oriented improvements. City Utilities and SMSU should design services that meet identified needs, and both agencies should implement and promote such services. City Utilities and SMSU should also maintain and publicize their customer information services and should conduct frequent safety sensitivity training sessions for bus operators.
- Both City Utilities and Southwest Missouri State University should continue to improve their customer service outreach and investigate methods for advertising their transit operations through innovative methods such as bus wraps.

- City Utilities should consider a new marketing position to supervise, coordinate, and expand the actions called for in the Transportation Plan.

### **Promotions**

City Utilities (CU) celebrates a week of national recognition called “Try Transit Week” in which passengers are honored with small gifts, employees are honored, and promotion of the system is emphasized. City Utilities has focused this week on a “Stuff-A-Bus” competition, where a bus is filled with non-perishable food items that are donated to a local food pantry, Ozarks Food Harvest. CU also sponsors a booth at the Ozark Empire Fair, where they promote the system by giving out transit information, talking to fairgoers about the transit system, and displaying a “wrapped” bus. CU is active in the registration process at SMSU each year. This event (SOAR) allows CU and other businesses in the Springfield area to display information at a table in the Student Union Building and introduce incoming students with their services.

### **Recommendation:**

- City Utilities should continue to promote its transit services through various promotional opportunities in the community. SMSU should explore new methods to promote the campus shuttle system for the entire community, by joining with the promotions conducted by City Utilities Transit.

### **Fare Structure**

When the City Utilities fixed-route transit service was operated as a private enterprise, fares were set at levels sufficient to recover all costs and generate a reasonable profit. Transit operations in Springfield have not been a profit-making venture for many years; the system was taken over by the city in 1945, long before most other transit systems in the country became publicly owned. Since transit service is now provided as a benefit to the community, similar to police and fire protection, public policy must determine how much of the cost of the operation should be borne by the community at large and how much by the riders of the transit system. On one hand, the price charged for a bus ride should cover a reasonable portion of the actual cost of providing the service so that the deficit borne by the public is not excessive. On the other hand, if fares are too high, ridership losses will occur and revenues will decrease.

Fares were increased in January 1997, the first fare increase since 1983. Multi-ride passes and discount fares have been introduced and are widely used. The system has not, however, been able to recover 30 percent of its operating costs from farebox receipts and is unlikely to do so without significant cuts in service or sizable fare increases. A goal of 30 percent farebox recovery is probably not a reasonable goal for this transit system, given Springfield’s low-density development pattern and the availability of free parking throughout the community.

Guidelines for City Utilities’ fare structure development as recommended in the 1995 Transit Plan may be found in **Table 20-10**.

When the Southwest Missouri State University shuttle system was established in 1988, it was decided that fares would not be charged for riders of the service. Rather, the

system’s expenses were met through Federal Transit Administration financing and student fees. The SMSU parking facility and shuttle system provides a benefit to the Springfield-Greene County area by providing parking capacity for events at Juanita K. Hammons Hall, John Q. Hammons Sports Complex, and other community events held in the vicinity.

An alternative to help cover operational costs of the intermodal parking facility would be a surcharge for area community events included in overall ticket prices. This might be a better method of sharing the cost in an equitable manner to all users of the intermodal facility, without having to develop fares. Also, this financing mechanism would raise fees from those who park in the intermodal facility and walk to their event, never using the shuttle system. Other options would be to investigate a direct user fee for parking in the intermodal facility or a fare collection method for non-student riders of the shuttle system. These funding methods would help offset operational costs for both intermodal facilities and would reduce the costs that student fees would need to cover.

**Recommendations:**

- Southwest Missouri University officials should examine alternatives to help cover operational costs for the intermodal parking facility and shuttle system.
- City Utilities and City Council should review the fare structure annually and adjust, if needed.

**Table 20-10: Guidelines for Fare Structure Development<sup>7</sup>**

1.	The fare structure should be reviewed yearly to determine whether any adjustments are needed to offset the effects of inflation on transit operating costs.
2.	In order to minimize ridership losses when fare increases are enacted, modest fare increases should be made every one to three years, rather than adopting a more substantial increase on an infrequent basis.
3.	The transit system should encourage the use of multi-ride weekly and monthly passes which offer a small discount to frequent transit users and improve the convenience and flexibility of transit.
4.	To the extent feasible, discount fares should be offered to elderly, disabled, youth, and other groups with special needs.
5.	The system should strive to recover 30 percent of its operating costs from farebox receipts

**Capital Upgrades**

City Utilities and Southwest Missouri State University (SMSU) should develop capital schedules to provide for the replacement of obsolete buses, equipment, and facilities according to a prescribed schedule, which adheres to Federal Transit Administration (FTA) standards. These capital improvements should include the upgrading of bus maintenance facilities, equipment upgrades, and improvements to servicing methods in order to increase efficiency.

City Utilities’ 1995 Transit Plan and the 1980 Short-Range Transit Plan recommended that the transit system maintain a sufficient number of buses to operate all peak hour services and to provide a 20 to 25 percent ratio of spare vehicles. It was also recommended that the average age of the bus fleet should be no more than 9 years and the age of the oldest vehicles should be no more than 12 years.

<sup>7</sup> Source: City Utilities’ 1995 Transit Plan, p.x, p. 3.12, p.4.56-4.57

Although the existing maintenance facilities date from the streetcar era, they have been modernized on several occasions and are generally adequate to meet the present need. However, periodic upgrading of the shop facilities should be continued in order to increase labor efficiency, replace obsolete equipment, and encourage energy conservation.

There is a proposal to move the City Utilities transfer facility from its current Center City location to the proposed Jordan Valley Park intermodal parking facility. This was recommended in a study conducted by the City of Springfield, City Utilities, and OATS, Inc. City Utilities is also considering the possibility of re-locating its bus maintenance and office facility from Boonville Avenue to a Center City location. Both of these projects are strongly encouraged in *Vision 20/20*, which stresses a centrally-focused community.

In addition, the City of Springfield, City Utilities, SMSU, and area not-for-profit transportation providers should work together and coordinate all transit services serving the Jordan Valley Park. This includes a future shuttle that could serve all park amenities and provide connections to adjacent activity centers such as the SMSU campus. A coordinated shuttle service between SMSU and the Jordan Valley Park would encourage a pedestrian “auto-free” environment throughout the development.

**Recommendations:**

- The City of Springfield with City Utilities should consider re-locating their transfer facility to the Jordan Valley Park intermodal parking facility. They should also study the possibility of re-locating their bus maintenance facility and offices to a Center City location, within proximity to the transfer facility.
- City Utilities should continue to perform periodic upgrades of their shop facilities.
- The City of Springfield, City Utilities, SMSU, and area not-for-profit transportation providers should coordinate future shuttle service possibilities in the Jordan Valley Park, thus encouraging a pedestrian “auto-free” environment.
- SMSU and the City Utilities should review their capital and support needs annually through the budgeting process. The needs must be included in the Springfield Area Transportation Study Organization’s Transportation Improvement Program and in the Transportation Plan.

**Data Analysis and Information Resources**

Comprehensive information resources and data analyses are essential to an efficient transit system. To provide a solid information base for making transit policy decisions, both City Utilities and Southwest Missouri State University should maintain comprehensive demand records to facilitate system forecasts. Currently both providers participate in a continuing program of data collection and analysis under the Federal Transit Administration’s National Transit Database (old Section 15) program. Information provided through this program should be enhanced, improved, and made easily accessible to the public. These information systems will allow the entities to document changes in transit system performance, target improvements, and plan strategies to address identified problems.

As the Springfield area continues to grow and change, individual travel habits also change. The transit system must be prepared to respond to these changes if it is to continue serving its function. Ridership on the system must be constantly monitored to identify shifts in the travel desires and behavior of transit patrons and of the non-riding public that comprise potential transit customers.

**Recommendations:**<sup>8</sup>

- All transit planning activities to be undertaken on behalf of City Utilities and SMSU must be included in the Springfield Area Transportation Study Organization's annual Unified Planning Work Program.
- City Utilities and Southwest Missouri State University, in cooperation with the Springfield Area Transportation Study Organization, should engage in joint data collections to achieve improvements to the FTA National Transit Database program of data collection and analysis in order to furnish information to the policy-makers on which transit decisions can be based. An annual report should be prepared documenting the status of the transit system and identifying opportunities for improvements.

**Recommendations:**

To keep transit use at its current increasing level will require a proactive program. The following actions, in additions to those mentioned earlier in the chapter, are proposed:

- Metropolitan area jurisdictions and transportation providers should facilitate the use of transit and shuttle services as attractive alternatives to the automobile through the following planning activities:
  - Effective land use planning, street network planning, and site design;
  - Increasing density at activity centers served by fixed route public transit;
  - Siting buildings to aid transit riders in addition to accommodating driving and parking;
  - Providing pedestrian amenities such as sidewalks and shelters in all major developments near transit and shuttle lines;
  - Pursuing transit and shuttle route restructuring in response to future demands, including innovative service programs;
  - Coordinating public transit with the implementation of Travel Demand Management techniques; and,
  - Monitoring the community for future transit opportunities.

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<sup>8</sup> **Sources:**

- City Council and the Board of Public Utilities, Short-Range Transit Plan, 1980.
- City Utilities of Springfield, Springfield, Missouri Transit Service Study, July 1995.
- Southwest Missouri State University, Master Plan.
- Springfield Area Transportation Study Organization, Transportation Plan, May 1987.

- City Utilities transit and the SMSU shuttle system should:
  - Investigate the feasibility of additional transit operational improvements such as the use of intermodal parking facilities and intelligent transportation system techniques, such as traffic signal timing to accommodate bus movements; and,
  - Continuing to coordinate improvements at the interface between the City Utilities fixed route transit system and the SMSU shuttle system.

## Paratransit

Paratransit service is provided to ensure that all citizens have access to basic mobility needs. The passage of the Americans with Disabilities Act (ADA) in 1990 recognized the rights of persons with regards to services and facilities that are available to the general public. According to the Federal Transit Administration (FTA), around 70 percent of adults with disabilities are unemployed and receive public assistance. Recent welfare to work initiatives have highlighted the need to better address the mobility issues of persons with disabilities. Much of the emphasis to date has been on reducing physical barriers to transit use. City Utilities fixed-route bus system is fully accessible with low-floor buses providing front-door ramps for passengers in wheelchairs, and efforts have been made to improve accessibility by providing improved sidewalk connections to fixed-route bus stops. However, there is still a significant percentage of the Springfield area disabled population that is not able to access the fixed-route transit system, so they are provided accessibility opportunities with the curb-to-curb paratransit service operated by City Utilities transit.

There are over 20 organizations in the Springfield area that provide not-for-profit van and bus transportation services to the community. Many of these organizations serve special populations or provide unique community services such as therapy trips for the chronically mentally ill, foster grandparent transportation services, or medical transportation services for clients with special needs. A number of these transportation providers serve clients that are not disabled but are in need of special transportation services (e.g., Foster Grandparent Services).

The paratransit recommendations in this chapter address not only the paratransit transportation needs throughout the community but also incorporate coordination efforts among the area's not-for-profit special transportation providers.

## Definitions

**Americans with Disabilities Act (ADA):** Passed by the Congress in 1990, this act mandates equal opportunities for persons with disabilities in the areas of employment, transportation, communications and public accommodations. Under the ADA, most transportation providers are obliged to purchase lift-equipped vehicles for their fixed-route services, and must ensure system-wide accessibility of their demand-responsive services to persons with disabilities. Public transit providers also must supplement their fixed-route services with complimentary paratransit services for those persons unable to use fixed-route service because of their disability. *National Transit Resource Center Glossary*

**Complementary Paratransit:** Paratransit service that is required as a part of the ADA which complements, or is in addition to, already available fixed-route transit service. Complementary paratransit services must meet a series of criteria designed to ensure they are indeed complementary. The City Utilities Access Express service in Springfield is an example of complementary paratransit. *National Transit Resource Center Glossary*

**Curb-to-Curb Service:** A common designation for paratransit services. The transit vehicle picks up and discharges passengers at the curb or driveway in front of their home or destination. In curb-to-curb service the driver does not assist the passenger along walks or steps to the door of the home or other destination. *National Transit Resource Center Glossary*

**Demand-Responsive Service:** The type of transit service where individual passengers can request transportation from a specific location to another specific location at a certain time. Transit vehicles providing demand-response service do not follow a fixed route, but travel throughout the community transporting passengers according to their specific requests. Can also be called “dial-a-ride.” These services usually, but not always, require advance reservations. *National Transit Resource Center Glossary*

**Designated Public Transportation:** Transportation provided by a public entity (other than public school transportation) by bus, rail, or other conveyance (other than by aircraft, inter-city, or commuter rail transportation) that provides the general public with general or special service, including charter service, on a regular and continuing basis. *49 CFR Subtitle A, Office of the Secretary of Transportation*

**Deviated Fixed Route:** This type of transit is a hybrid of fixed-route and demand-response services. While a bus or van passes along fixed route stops and keeps to a timetable, the bus or van can deviate from its course between two stops to get to a specific location on demand. *National Transit Resource Center Glossary*

**Disabled:** Any person who by reason of illness, injury, age, congenital malfunction or other permanent or temporary incapacity or disability is unable, without special facilities, to use local transit facilities and services as effectively as persons who are not so affected. *National Transit Resource Center Glossary*

**Door-to-Door Service:** A form of paratransit service, which includes passenger assistance between the vehicle and the door of his or her home or other destination. A higher level of service than curb-to-curb, yet not as specialized as “door-through-door” service (where the driver actually provides assistance within the origin or destination). *National Transit Resource Center Glossary*

**Fixed Route System:** Transit services where vehicles run on regular, pre-designated, pre-scheduled routes, with no deviation. Typically, printed schedules or timetables, designated bus stops where passengers board and alight and the use of larger transit vehicles, characterize fixed-route service. *National Transit Resource Center Glossary*

**Not-for-profit Transportation Provider:** Refers to a non-profit private transportation entity that provides service to a community via bus, van, etc. to the general public, with general or special service (including charter service) on a regular and continuing basis. *49 CFR Subtitle A, Office of the Secretary of Transportation*

**Paratransit:** Type of passenger transportation that is more flexible than conventional fixed-route transit but more structured than the use of private automobiles. Paratransit includes demand-response transportation services, subscription bus services, shared-ride taxis, carpooling and vanpooling, jitney services, and so on. Most often refers to wheelchair-accessible, demand-responsive van service. *National Transit Resource Center Glossary*

## Paratransit Background

### City Utilities Transit

Although the older areas of Springfield are well served by the transit system, expansion of conventional bus service into low-density suburban areas is often not feasible because of high operating costs and low-ridership. As a result, many Springfield residents do not have transit service available at their origin, their destination, or both. In addition, many persons are unable to use conventional transit service because of a permanent or temporary physical disability. Those Springfield area residents that are able to meet the Americans with Disabilities Act (ADA) paratransit eligibility standards may request trips from the City Utilities Access Express system. The City Utilities Access Express service provides a means of transportation to those riders who are unable to use the regular fixed-route transit service. The OATS paratransit system provides service to metropolitan area residents that live outside the City Utilities Access Express service area. The paratransit service clearly fills a special need by allowing greater independence for the wheelchair-bound, elderly, and other disabled persons.

The Access Express system provides curb-to-curb demand response van service that is tailored to specific travel needs. The Access Express system had five buses and service approximately 1,700 trips-per-month during the summer of 1996. A resident's eligibility to use the system is based on their inability to use the regular fixed-route bus system. All riders are required to complete an application for certification for paratransit eligibility, unless they are visitors to Springfield. The Access Express program utilizes scheduling software that requires that reservations for transportation be made at least 24 hours ahead of the scheduled trip. Same day appointments are made on a space-available basis. The system's current service area includes all areas served by the City Utilities' fixed-route bus system, including a  $\frac{3}{4}$  mile area beyond those current boundaries, all within the City of Springfield boundaries. The program maintains the same hours as the regular fixed-route system and is in full-compliance with the requirements of the Americans with Disabilities Act (ADA).

### Other Not-For-Profit Van, Shuttle, or Alternative Transportation Services

Examples of other not-for-profit van, shuttle, or alternative transportation services in the community include:

**Carpooling:** An organized effort to increase the occupancy of private automobiles by encouraging persons with similar origins and destinations to share rides. Carpooling is applicable to a number of trip purposes and schedules. Some assistance may be provided by the city or another third party to match riders and drivers.

The Springfield MPO currently maintains a Rideshare Hotline and has an established program to match riders with drivers who may be traveling to destinations in close proximity, at the same time. Some residents of the community may make these type of arrangements on their own with friends or co-workers. Employers can also facilitate the process by offering incentives to workers who carpool. Regardless of the method employed to establish carpool groups, the effect is to help reduce the number of vehicles on the roadway system, thus adding capacity to the existing roadway system.

**Vanpooling:** Similar to carpooling but involving the use of vans instead of automobiles. Vanpooling is most commonly sponsored by employers for work trips only. The employer normally purchases the vehicle and charges the riders a fee, which covers all capital and operating expenses. In most cases no public funds are involved. Vanpooling is most appropriate for trips over 10 miles in length, which begin or end at major employment centers.

**Taxicabs:** Normally operated by the private sector and hired by an individual for door-to-door transportation. Taxis may also provide shared-ride service, carrying several passengers at reduced rates from different origins or to different destinations. When such shared-ride service is provided along a fixed-route it is known as a limousine or jitney service.

**Social Service Transportation:** Normally provided by a public or private not-for-profit agency to meet the particular needs of its clients. The service is usually operated by vans or similar vehicles and may operate either on a regular schedule or on a demand-responsive basis.

## Paratransit Goal and Objectives

**Goal:** Encourage the provision of paratransit and not-for-profit transportation services in the metropolitan area, particularly to the populations not served by the transit system.

### Objectives:

Maintain the capability to provide a carpool/rideshare matching service to the general public.

- Encourage better coordination of existing not-for-profit transportation services in the Springfield area.
- Continue to provide special transportation services to the disabled population while exploring methods of making the service more cost-effective.
- Encourage the private sector to provide van, shuttle, or alternative transportation services, where appropriate.

### Rideshare

A rideshare-matching program helps to reduce traffic congestion and conserve energy by promoting greater use of carpooling, vanpooling, and other forms of shared vehicular trips.

The City of Springfield currently has a rideshare-matching program, run by the Springfield Area Transportation Study Organization (MPO). Rideshare provides travelers with an easy method of locating people interested in carpooling. A special telephone number (831-RIDE) has been set up to take requests from the general public for rideshare matching. There are official highway signs that advertise the program and the contact information. These signs are located on the major freeways near the City limits of Springfield. MPO staff assistance has been provided to match all inquiries and to assist any employers who may wish to sponsor their own carpool programs.

As funding levels for future roadway improvements in the MPO area remain tight, there will be opportunities to coordinate with major traffic generating employers on alternative transportation programs such as carpooling. All participants in the MPO should continue efforts to encourage ridesharing in their communities in order to conserve energy, assist people in need of transportation, and better use the existing highway infrastructure.

**Recommendation:**

- Continue to support and enhance the existing rideshare-matching program. The program is presently located in the Planning Division but could easily be transferred to another department, to City Utilities, or even to a private not-for-profit agency. The minimal level of activity should include continuation of the telephone line and the ability to provide match-lists to the public. Whenever sharp rises in fuel costs occur efforts to contact major employers would be initiated. A more concerted effort should be made to continue and enhance the duties of the rideshare position, and to promote ridesharing and vanpooling through assistance to major employers.

**Not-for-Profit Transportation Providers**

There is a need for the establishment of a program that promotes the efficient utilization and coordination of the Springfield area's not-for-profit transportation providers. Better coordination would allow for not-for-profit and other social service agencies to transport more passengers for the same cost. Currently over 20 different not-for-profit transportation providers offer a variety of transportation services in the Springfield area. Most of these services are restricted to the clientele of each agency, with little coordination among the groups. Although the City of Springfield and Greene County are not directly involved in funding or operating these services, they can nonetheless assist the various agencies in improving the efficiency of their operations.

In 1996-1997, the MPO staff attempted a coordination process among not-for-profit transportation providers in the Springfield-Greene County area. All of the discussions and data from the not-for-profit transportation coordination effort were compiled into a *Paratransit Coordination Report*, published June 16, 1997, that could be used in later efforts to revive the coordination effort. All the parties that participated on the not-for-profit provider coordination committee strongly supported the need to provide a coordinated system in the Springfield area. The members were supportive of the concept but the administrative issues proved unfeasible during 1997, when the implementation of the concept was scheduled to take place. However, the members of the pilot study indicated that they foresaw an opportunity to re-investigate the coordination effort in the future.

### **Recommendation:**

- The MPO could provide technical assistance to not-for-profit transportation providers in the annual Unified Planning Work Program (UPWP). Such assistance shall be subject to funding availability, unless internal expertise is available.

### **Improvements to Existing Service**

The City Utilities Access Express service provides a means of transportation to those riders who are unable to use the regular fixed-route transit service. The paratransit service clearly fills a special need by allowing greater independence for the wheelchair-bound, elderly, and other disabled persons. Because of the high cost of the Access Express service, it is responsible for a disproportionate share of the transit operating deficit. Its high operating costs inhibit expansion of both the fixed-route transit service and the paratransit service. All reasonable efforts should be made to continue to improve fixed-route transit. The inaccessibility of some of these stops prevents some passengers from having the option of using the fixed-route system for their transportation needs. Sidewalk improvements and better pathways to and from adjacent activity centers would increase the number of paratransit riders to use the less costly fixed-route service.

The Springfield Area Transportation Study Organization should continue to support the area's not-for-profit transportation providers that provide needed lift-equipped transportation services or other special transportation services in the community to those who are unable to use regular transit routes. The City Utilities Access Express Service is the MPO area's official ADA paratransit transportation provider. The MPO should continue to support future funding needs of this service to ensure that the area has sufficient paratransit transportation capacity.

Other providers in the area also fill some of this need, such as the transportation services provided by OATS, Inc. OATS, Inc. is a not-for-profit transportation provider that serves a number of surrounding counties, in addition to serving the Springfield area served by the City Utilities' Access Express service. OATS, Inc. provides both specialized paratransit services and van transportation services for the general public. However, the OATS service does not provide the extensive hours of service that City Utilities provides. This service does, however, serve as an alternative means of transportation when the Access Express Service cannot fulfill a trip request. OATS is also the only public transportation provider for many of the outlying communities.

Other types of providers that fulfill a need are area private ambulance type services such as Medi-Transit. Medi-Transit's service is more expensive but does serve as an alternative paratransit service and provides transportation for medical patients that need both medical and wheelchair-lift support. There are also a host of transportation service options in the community for the ambulatory clients such as taxis, limousine service, and other specialized transportation providers.

Most of the not-for-profit transportation services, except the public City Utilities Access Express service, are privately owned and operated. The MPO should work with these providers to explore alternative means of reducing costs and upgrading their services.

**Actions:**

- Area not-for-profit transportation providers should continue to investigate opportunities for coordination of shuttle, van, and special needs transportation services. The MPO can assist providers with information on the area's transportation needs and facilitate public/private agency discussions.
- Improve MPO review procedures for the Federal Transit Administration (FTA) Section 5310 program that generally provides funding for one to two vans, requiring a 20 percent local match. There are always more needs in the community than there is funding. It is often difficult to gauge the relative benefit of each individual program to the community needs. Therefore, future funding decisions should continue to stress the importance of sharing transportation resources between agencies and investigate the possibility of shared fleets.
- The MPO should continue to research transportation options that might include contracting paratransit transportation, shuttles, or other special transportation needs in the community. Such a contract could be with an individual company or a not-for-profit transportation provider, which could operate some or all of the service.
- The City of Springfield should develop an implementation plan for sidewalk and ramp improvements to help improve the accessibility to and from the City Utilities fixed-route transit bus stops, providing connections to major destinations along these routes.

**Private Sector Involvement**

The use of regular fixed-route transit service may not be feasible because of a person's inability to access the service or because the service is not provided in the geographical area. Capitalizing on transportation coordination efforts with existing private transportation providers economizes public spending by encouraging privately operated transportation services, where appropriate.

Some forms of transportation, such as taxi service, can be most effectively provided by the private sector as a profit-making enterprise. In certain situations, shared-ride taxi service and limousine operations might be more cost-effective than extending transit service into low-density areas. The MPO should encourage the private sector to experiment with such services where they would not compete with the City Utilities transit system, or in areas where transit service would be poorly used.

**Actions:**

- The MPO should work with Springfield metropolitan area jurisdictions to identify any legal barriers, which may prevent private transportation operators from providing paratransit and special needs transportation services in the area.
- Public transportation agencies in the Springfield metropolitan area should consider the use of subsidized taxi scripts, monthly bus passes based on income levels, and other equity programs for individuals when they do not have an alternative means of transportation.

- The MPO should investigate the feasibility of establishing an organization such as a transportation authority to possibly plan, build, and/or operate in the Springfield metropolitan area. This type of agency could be part of a freestanding MPO or operate as a separate entity. The significant number of legal and practical barriers inherent in this proposal would need to be considered in studying this proposal.



# Bicycle System

## Introduction

Over the past several years, more people have recognized bicycling as an alternate mode of transportation. Bicycling has the capacity to play an increased role in making the transportation system more economical, energy efficient, and environmentally and aesthetically attractive. Especially important are bicycle linkages and transit opportunities between residential areas, employment destinations and education centers. Bicycle facility improvements, coordinated with land use, can encourage bicycling as an alternative to driving.

Bicyclists value many of the same travel features as motor vehicle drivers, such as accessibility and directness, yet they also value other characteristics such as designated bicycle facilities, lower traffic volumes and speeds, and an attractive and comfortable environment.

A potential federal funding source for bikeway and greenway development is the Surface Transportation Program Enhancement Funding Program.

## Background

In the late 1970s, the City of Springfield adopted a bikeway plan that recommended a network of routes in Springfield. Subsequently, 20-miles of bicycle routes were signed or striped, mostly on major streets. Routes included high volume arterial streets with narrow outside lanes. When four-lane streets were restriped as five-lane streets, the bike routes were removed. It was determined that:

1. Many of the Bikeway Plan's designated routes had conditions that were unattractive to bicyclists;
2. Most bicyclists preferred to use less heavily traveled streets than the routes that were marked;
3. Personal safety on the streets was an issue, especially at signalized intersections; and,
4. Bicycling was a significant mode of transportation only in the vicinity of the Southwest Missouri State University campus.

Therefore, the more expensive recommendations, such as ramps from sidewalks to streets at major intersections were not implemented. The 1981 update to the Transportation Plan recommended that the City not make any major investments in bikeway facilities, and in fact recommended removal of signed routes.

Part of the *Vision 20/20* process included a detailed bicycle route suitability analysis that targeted the roadway facilities that were most suited for bicycle commuter traffic. Some routes that were both suitable and continuous were signed as bike routes in the late 1990s. Many of these routes are roadways with low traffic volumes and few impediments; and

they provide the connections needed between residential areas and major community attractions. In addition, there are several greenway projects that are in various stages of implementation. These projects are further outlined in the Parks, Open Space and Greenways Element of the Springfield-Greene County Comprehensive Plan. The greenway system provides a recreational multi-use trail system that complements commuter bicycle routes.

The following significant greenway improvements are underway.

- **South Creek / Wilson's Creek Greenway:** A new multi-use trail that accommodates bicycles is under construction in the south and southwest parts of the city and the county. The South Creek / Wilson's Creek Greenway, a project spearheaded by the citizens' group, Springfield-Greene County Park Board, and Ozark Greenways, will eventually be a twelve mile trail from McDaniel Park along South Creek and Wilson's Creek to Wilson's Creek National Battlefield Park.
- **Frisco Highline Trail:** Ozark Greenways is also leading the development of the Frisco Highline Trail, a rails-to-trails project located on an abandoned railroad bed which extends 30.4 miles from Springfield/Willard to Bolivar, Missouri. The trail will be multi-use and will accommodate bicycles. Along the trail corridor, which crosses the Little Sac River near Stockton Lake, are agricultural lands, a youth camp, land owned by the Missouri Department of Conservation, a high school and the Southwest Baptist University in Bolivar. Future plans for the trail include a connection to the City of Springfield near the Springfield/Branson Regional Airport.
- **Galloway Creek Greenway:** Three miles of trail have been constructed from Sequiota Park south to the Springfield Nature Center. This section of greenway was developed in eighteen months, funded by Ozark Greenway member donations and a National Recreation Trails Fund grant. An area quarry provided the rock for the trail surface. This is the most heavily used greenway trail in the Springfield-Greene County area to date. Plans include extending this greenway two miles north to Pershing School on Seminole.

In support of the *Vision 20/20* effort, the Metropolitan Planning Organization (MPO) established a Bicycle Subcommittee in February 1997, which began the process of developing a region-wide commuter bicycling map and a long-range bicycle implementation plan. The subcommittee membership included multi-jurisdictional planning and public works representatives, bicycle advocates, and Ozark Greenways staff. The focus of this group was to develop a plan of the area's suitable and safe routes, focusing on routes that lead to major employers.

**Figure 20-13** shows the suitability route map. Those routes that provide continuous East-West or North-South connections, that currently have good suitability, will be the first commuter routes targeted for signing and improvements.

## Goal and Objectives

**Goal:** Improve the safety, comfort and popularity of bicycling in Springfield and Greene County.

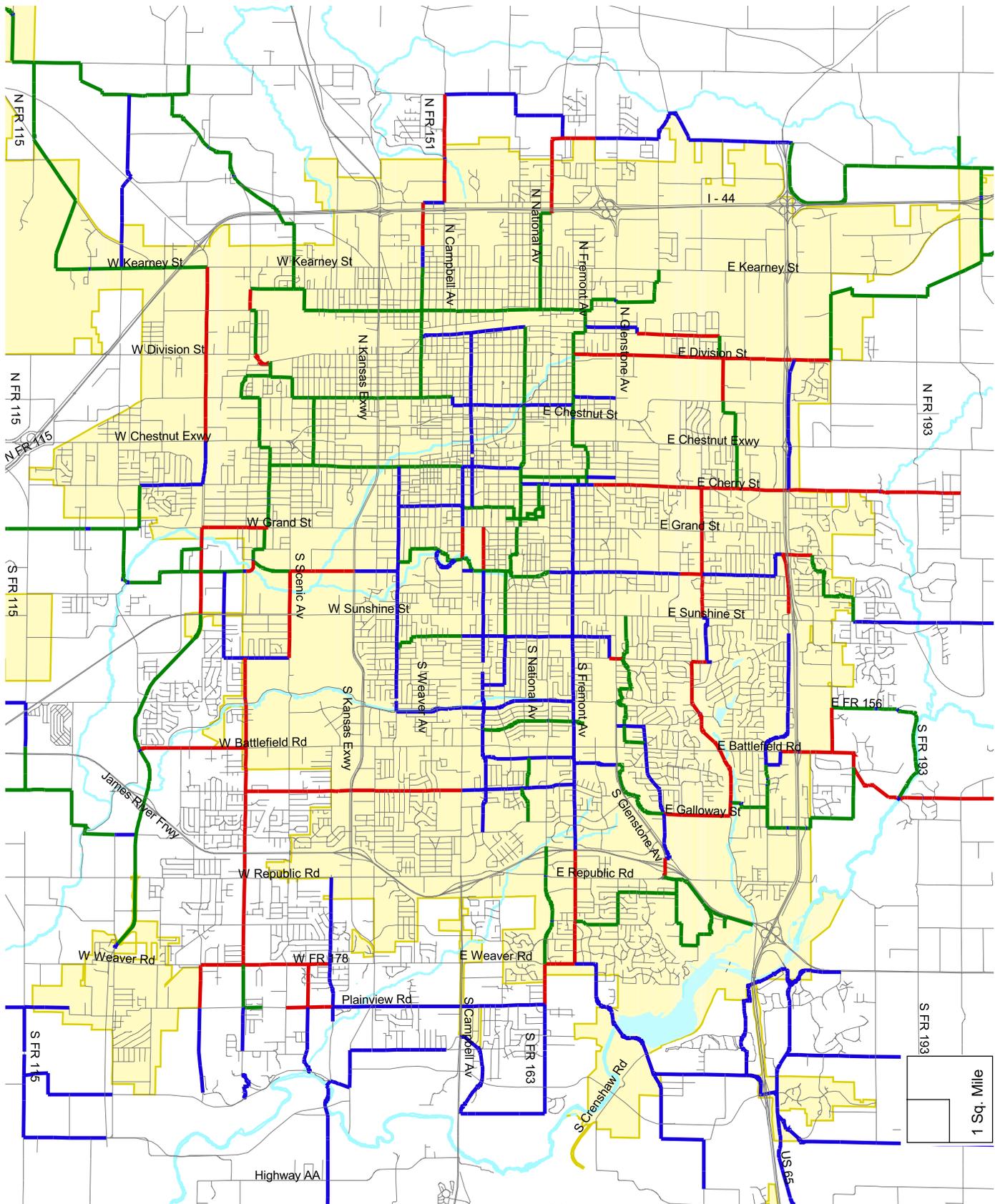
**Objectives:**

- Create a bicycling system that capitalizes on the roadway network and include a series of trail linkages.
- Create a system of bicycle routes that are direct, convenient, safe, and easy to use; that minimize potential conflicts with pedestrians and motor vehicles; and that can be maintained so they do not present hazards to safe bicycling.
- Link business centers and neighborhoods with bicycling facilities.
- Ensure that all bicycle facilities are consistent with the bicycling system plan.
- Consider bicycles in the timing of traffic signal cycles and in the selection of a traffic detection systems.
- Create a safe, smooth riding surface for bicyclists that is free of obstructions.
- Develop bridge crossings or other structures as needed to provide for safe, continuous bicycle travel across barriers.
- Provide for convenient bicycle parking at destinations.

## Bicycle Route Suitability Assessment

**Figure 20-13** is a graphical representation of the bicycle roadway suitability assessment. The procedures and methodology of the suitability assessment are set forth in the Appendix. The map is an indication of the suitability of the roads, based on their conditions as assessed in the summer 1997. The yellow color indicates that the road has a low risk for a typical bicycle commuter. The green color indicates a slight risk and the blue color indicates a moderate risk. The areas that present a high risk and should be avoided by bicycle traffic are in red. The *Vision 20/20* Bicycle Subcommittee recommended that a policy be developed where any roadway that is signed as a bicycle route should be brought up to the lowest feasible risk standard along the extent of the marked route.

The Appendix at the back of the Bicycle Chapter outlines the parameters measured to determine the bicycle use suitability of each roadway in the Springfield-Greene County area. The objective criteria ranked roadway characteristics based on traffic speed, curb lane width, traffic volume, perception of safety, affects of major intersections, the roadway crossing width, and the crossing traffic volume. The measurements of all of these criteria were combined to determine the level of bicycle rider that would feel comfortable on a roadway facility. The criteria also provided data on roadways that are not safe for bicycle commuter travel and should strongly discourage bicycle travel.



- Slight Risk
- Moderate Risk
- High Risk
- City limits

Figure 20-13  
Bicycle Route Suitability



## Major Attractions and Destinations

The *Vision 20/20* Bicycle Subcommittee began their review of community bicycle needs by identifying the major attractions and destinations for bicyclists. The Springfield-Greene County area has a number of large employers and community facilities that are primary attractions in the community. The facilities deemed most important by the subcommittee include: the Battlefield Mall, St. John's Hospital, Cox Hospital, the Government Plaza Area, Center City, Southwest Missouri State University, Drury University, Ozarks Technical College, Evangel University, community and neighborhood shopping centers, parks, connections to the greenway system, and School system facilities.

The *Vision 20/20* Bicycle Subcommittee recommended that the implementation of the bicycle route system first focus on the largest employers and that the routes connect those areas with neighborhoods to the north, south, east, and west. **Figure 20-14** shows the bicycle route system that has been implemented. The phases implemented so far focus on providing facilities on streets with slight or low risk for bicyclists. In some cases, short segments with moderate risk are included to provide connections. These segments successfully link Springfield neighborhoods on all sides of the community. They also provide connections to the two major community hospitals, major universities, and a number of schools, parks, and recreational facilities.

## Elements of the Bicycle Route System

The Springfield and Green County bicycle system will consist of a combination of these three types of routes:

- **Off-Street Bicycle Paths (Class I):** Paths made of asphalt or other materials on exclusive rights-of-way with minimal cross flow by motor vehicles. In Springfield, these are usually the Greenway paths.
- **On-Street Bicycle Lanes (Class II):** Striped lanes on a road.
- **On-Street Signed Routes (Class III):** Streets shared with motor vehicles and designated by signs.

The off-street paths of the Greenway system will primarily provide recreational riding although they will also be suitable for utilitarian trips. The on-street system, consisting of striped lanes and signed-only routes, will be primarily oriented to utilitarian trips. Connections will be provided between the Greenway paths and the on-street system.

Whenever space allows, striped lanes will be used instead of merely erecting signs. Striped lanes do a better job of alerting motorists of the possible presence of bicyclists, of providing a safe riding environment, of promoting the route to bicyclists and of providing some traffic calming effect. However, there is often inadequate space in existing streets to stripe a bicycle lane. It is also essential to keep the edge of the road well swept and maintained for either bicycle lanes or signed routes.

Sidewalks are not appropriate for bicycling except by very young children and are, thus, not part of this system.

### **Actions:**

- Coordinate the needs for bicycle transportation and bicycle recreation in the Springfield-Greene County area. The Greenway system should include separate paths for bicyclists and pedestrians except where volumes warrant.
- Provide seamless connection between exclusive bicycle paths, multi-use paths and streets designated as bicycle routes.
- The metropolitan area jurisdictions should implement a bicycle plan that addresses how a bicyclist can safely cross freeways, railroads, major drainage corridors, and other barriers. When additional streets are required to address connectivity, make appropriate changes on the Major Thoroughfare Plan. When connectivity is best provided by pedestrian and bicycle facilities, determine for the bikeways plan the location and type of crossing to be provided.
- Establish and implement a maintenance plan for bicycle routes. This plan should schedule routes for continuous maintenance including sweeping, marking and pavement maintenance.

### **Off-Street Paths**

Bicycle paths are most often provided as recreational paths. Where usage is low to moderate, bicycles are permitted on paths that also permit different uses such as walking, running, and roller-blading. Where usage is high, a separate path is needed for commuter bicyclists who often travel at speeds three to six times that of other users. In corridors serving a high volume of bicyclists, bicycle paths are the preferred type of bikeway when land is available for their development.

*Vision 20/20* calls for a system of greenways, parkways and bicycle routes across and around Springfield. Both of those elements would consist of linear public open space with paths for bicycling and sometimes walking. The greenways are usually along creeks and parkways and generally on the perimeter of the community. The on-street bike route system provides connections between the off-street system and trailheads to residential areas and other destinations.

Bicycle paths are normally two-way facilities or a pair of one-way paths. Bicycle paths provide the best mobility where the path is between two major generators or between a major generator and a service area for that generator. They function best when isolated from motor vehicles, such as along floodways, abandoned rail lines or in parks, campuses, or other vehicle-free areas. Intersecting roadways and driveways create hazards and delays on bicycle paths and should be minimized. Bicycle paths parallel to major surface streets should be avoided because of the complicated operations created by the bicycle path crossing each street and driveway near its intersection with the major street.

**Table 20-11: Guidelines for Bikeway Location and Design**

<b>Class I Bikeways (Bike Paths)</b>	
<b>Location Criteria:</b>	<ol style="list-style-type: none"> <li>1. Bikeways should serve destinations attractive to cyclists.</li> <li>2. A significant volume of bicycles should be anticipated.</li> <li>3. A separate right-of-way should be available or easily acquired (e.g. abandoned railroad line, utility easement, streambed, public park).</li> </ol>
<b>Design Criteria:</b>	<ol style="list-style-type: none"> <li>1. Minimum width should be 8 feet.</li> <li>2. Surface should be smooth and preferable paved.</li> <li>3. Maximum grade should be 5 percent.</li> <li>4. Bikeways should be designated by "Bike Route" signs.</li> <li>5. Animals and motor vehicles (including mopeds) should be prohibited, except for service vehicles.</li> </ol>
<b>Class II Bikeways (Bike Lanes)</b>	
<b>Location Criteria:</b>	<ol style="list-style-type: none"> <li>1. Bikeways should serve destinations attractive to cyclists.</li> <li>2. A significant volume of bicycles should be anticipated.</li> <li>3. Bike lanes should normally be along heavily traveled streets where there is a need to provide a separate lane for bicycles because no suitable parallel streets are available.</li> <li>4. The roadway should have an adequate pavement width through all intersections to accommodate traffic lanes and bike lanes.</li> </ol>
<b>Design Criteria:</b>	<ol style="list-style-type: none"> <li>1. Minimum width should be 4 feet with shoulder and 3 feet from gutter or 5 feet from face of curb for curb and gutter streets.</li> <li>2. Bike lanes should be a smooth paved surface, free of bumps and dips.</li> <li>3. A solid white line should delineate Lanes, changing to a broken line approaching intersections where bike lanes is shared with right-turning motorists.</li> <li>4. Lanes should be one-way facilities carrying traffic in the same direction as motor traffic.</li> <li>5. Drainage grates should be flush with the surface and of a design which will not allow bicycle tires to drop into the grate.</li> <li>6. Lanes should be marked by standard "Bike Route" signs mounted on posts.</li> <li>7. Bicycles should be considered in the timing of traffic signal cycles and in the placement of stop signs.</li> </ol>
<b>Class III Bikeways (Bike Routes)</b>	
<b>Location Criteria:</b>	<ol style="list-style-type: none"> <li>1. Bikeways should serve destinations attractive to cyclists.</li> <li>2. A significant volume of bicycles should be anticipated.</li> <li>3. Bike routes should normally be along secondary streets, which provide an alternative to parallel streets.</li> <li>4. Bike routes may also be designated to provide continuity to other bicycle facilities or to direct cyclists around safety hazards.</li> <li>5. Bike routes should be reasonable direct in comparison with parallel arterial streets.</li> <li>6. Sidewalks should not normally be designated as bikeways except on long and narrow bridges and other instances where sidewalks have the same characteristics as one-way bicycle paths.</li> </ol>
<b>Design Criteria:</b>	<ol style="list-style-type: none"> <li>1. On streets with moderate traffic volumes, a curb lane 14 feet wide can accommodate both bicycles and motor vehicles.</li> <li>2. On streets with low traffic volumes, a standard 12-foot curb lane is adequate for designation as a bike route.</li> <li>3. Streets designated as bike routes should have a smooth paved surface, free of bumps and dips.</li> <li>4. Drainage grates should be flush with the surface and of a design that will not allow bicycle tires to drop into the grate.</li> <li>5. Bike routes should be designated by standard "Bike Route" signs mounted on posts.</li> <li>6. Bicycles should be considered in the timing of traffic signal cycles and in the placement of stop signs.</li> </ol>
<b>Class IV Bikeways ("Suggested" Routes)</b>	
<b>Location Criteria:</b>	<ol style="list-style-type: none"> <li>1. "Suggested" routes should be identified where low to moderate volumes of bicycle traffic are anticipated.</li> <li>2. "Suggested" routes should normally be along secondary streets, which provide an alternative to parallel arterial streets.</li> <li>3. "Suggested" routes may also be identified to provide continuity to other bicycle facilities or to direct cyclists around safety hazards.</li> <li>4. "Suggested" routes should be reasonably direct in comparison with parallel arterial streets.</li> </ol>
<b>Design Criteria:</b>	<ol style="list-style-type: none"> <li>1. Streets identified as suggested routes should normally have standard 12-foot traffic lanes with curbs and gutters. Narrower widths may be suitable on streets with low traffic volumes.</li> <li>2. Streets identified as suggested routes should have a smooth paved surface, free of bumps and dips.</li> <li>3. Drainage grates should be flush with the surface of a design that will not allow bicycle tires to drop into the grate.</li> <li>4. The locations of traffic signals and stop signs should be considered in the identification of suggested routes.</li> <li>5. Suggested routes require no formal designation by signs or markings; they should simply be identified on maps distributed for public information.</li> </ol>

Preservation of city and county land, before it develops, is necessary to create a future system of parks, open space, and greenways. Utilizing existing public land and redevelopment of the center city in order to assemble land for open space is also necessary for the vision to be realized. The over-arching concept of identifying and acquiring land for public open space provides a framework for the vision of future parks, open space and greenways.

According to AASHTO bicycle guidelines, under most conditions, the recommended all-paved width for a two-directional bicycle path is ten-feet. Whenever possible, 12-foot paths will be built for comfort and safety. Eight-feet is considered the minimum width but should only be used when there is low bicycle use, little expected pedestrian use, and no anticipated maintenance vehicle loading conditions causing damage to the pavement edges.

The minimum width of a one-directional bicycle path is five-feet. A minimum of a two-foot “shy” distance or clear zone should be maintained adjacent to both sides of a bicycle path. The recommended width of two-way bike path structures (overpasses, underpasses, long bridges) is 12-feet (eight-foot minimum width and two-foot shy distances on each side).

### **On-Street Striped Lanes**

There are three types of on-street striped bicycle lanes:

- Next to the curb
- Next to parked cars
- Paved shoulders

Bicycle lanes should always be one-way facilities and carry traffic in the same direction as motor vehicle traffic. Two-way bicycle lanes on one side of the roadway are not acceptable because they promote riding against the flow of motor vehicle traffic. When parking is permitted on streets with bicycle lanes, bicycle lanes should always be placed between the parking lane and the motor vehicle lanes.

Bicycle lanes should be a five-foot wide (the gutter pan plus three-feet). If the bicycle lane is located next to the parking lane, it should also be five-foot wide.

If the bicycle lane is a combined bicycle / parking lane, it should be a minimum of 12 feet wide.

Paved, striped shoulders should not exceed eight-feet because they tend to look like auto driving lanes and may inadvertently be used as such.

### **Actions:**

- Stripe bicycle lanes on designated bicycle routes whenever space allows and volume warrants.

## **On-Street Signed Routes**

There are two types of on-street signed bicycle routes:

- Wide curb lanes
- Signed-only routes

### **Wide Curb Lanes**

On arterials and collector streets with higher motor vehicle volumes, truck traffic and/or bus traffic, the outside travel lane should be at least 14-feet wide so it can accommodate bicyclists. The four generally accepted advantages of having a wider outside travel lane are:

- To accommodate shared bicycles without reducing the roadway capacity for motor vehicle traffic;
- To reduce both the real and perceived operating conflicts between bicyclists and motor vehicles;
- To increase the roadway capacity by at least the number of bicyclists and motor vehicles; and
- To assist turning vehicles entering the roadway without encroaching into another lane and better accommodating buses and other wide vehicles.

The City of Springfield and Greene County do not generally stripe a wide curb lane as a “bicycle route” unless the roadway is designated as part of the regional bicycle route system (**Figure 20-14**). However, a wider outside travel lane is often all that is needed to adapt a roadway for bicycle travel. Where a wider travel lane is needed on a roadway, in order to bring it up to a suitable bicycle route designation, 14-feet of roadway and two-feet of gutter is recommended.

The fact that all Farm Roads in Greene County are paved is excellent for bicyclists. However, most do not have paved shoulders, which greatly diminishes their riding safety. Bicycling would be greatly enhanced if shoulders were added even if they were as little as three-feet wide.

### **Signed-Only Routes**

Bicyclists can be safely accommodated on many streets in combination with auto traffic if conditions are appropriate. That is, the volume and speed of motorized traffic must be reasonably low and the intersections widely spaced. Local and collector residential streets often fit these criteria.

This plan has designated numerous such streets as Bicycle Routes. Along those streets, signs will be erected to indicate to bicyclists that this is a street suitable for bicycling and to alert motorists to the possible presence of bicyclists.

The early 2000 system of signed on-street routes consisted of six east-west corridors and three north-south corridors. Many roadways in Springfield-Greene County are not suitable for bicycling at this time. In some instances, there are less direct parallel local streets that can be designated as bike routes until the desirable roadways can be improved

to provide a suitable route. The bicycle function should be included on roadway improvement projects that are developed on the designated bike routes.

**Recommendations:**

- The City of Springfield and Greene County should consider modifying their roadway marking standards to provide additional width on the outside travel lanes on roadways that are included on the Springfield-Greene County Bikeway Map.
- The City, the County, and the Missouri Department of Transportation should consider providing additional width on the outside travel lanes for bicycles when designated bikeways are reconstructed. If this is not feasible, address how a reasonable alternative can be provided.
- Greene County should begin a long-term process of adding paved shoulders to those Farm Roads on bicycle routes.
- Signs should continue to be used to designate bicycle routes in the Springfield-Greene County area. City, county and state traffic departments should adopt signage consistent with the Manual on Uniform Traffic Control Devices (MUTCD) and work together on creating continuous routes throughout the area based on this plan.
- The City of Springfield, Greene County, and the State should consider modifying their roadway design standards to accommodate the following bicycle friendly practices that can be employed in the construction of a wide outside travel lane:
  1. Retrofit existing storm water inlet drains to models that are “bicycle safe.”
  2. The gutter also serves as a buffer to keep pedals from hitting the curb. Use a design for new inlets that has the drop in the curb and no grate in the street.

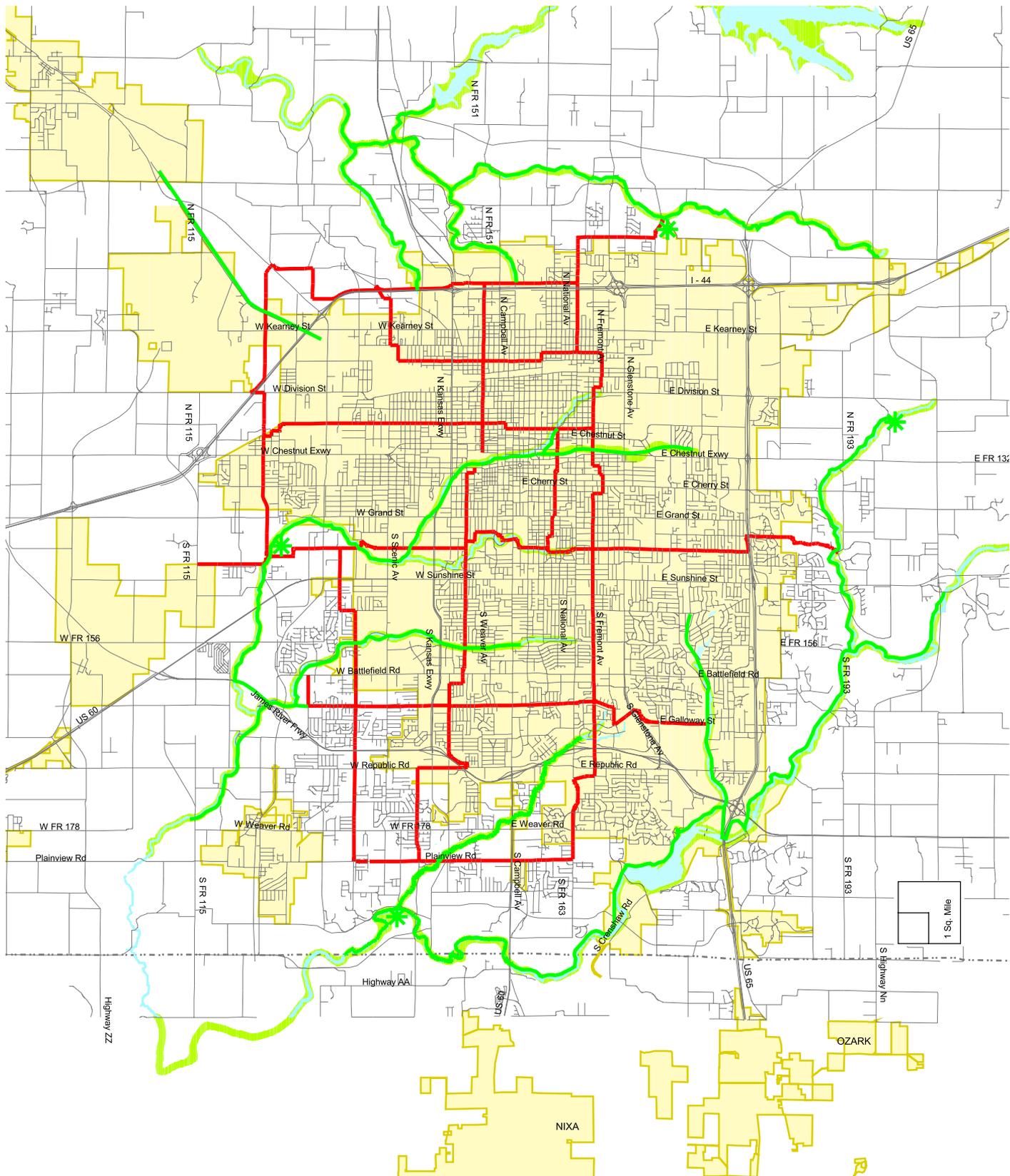
**Other Local and Collector Streets**

Most bicycle travel in the United States now occurs on streets and highways without bikeway designations. Low volume local and collector streets with suitable lane width and no bikeway designation serve as the basic bicycle system. Therefore, it is important that all local residential streets be interconnected. Narrow local streets promote traffic calming and, thus, tend to be safer and more comfortable for bicyclists than wide streets. The standards being applied currently in Springfield are appropriate for this purpose.

On a shared roadway, bicyclists and motorists are accommodated in the same travel lane. Because of narrow widths or parked vehicles, motorists may find it necessary to overtake bicyclists by switching into the oncoming travel lane. Bicyclists share the roadways with motorists in Springfield-Greene County. However, the outside lane width of many major streets and roads is not sufficient for safe bicycle travel.

**Recommendation:**

- Coordinate the implementation of the bicycle plan among the Springfield and Greene County Planning Departments, the Springfield Public Works Department, the Greene County Highway Department, the Springfield-Greene County Parks and Recreation Department, Ozark Greenways and other MPO jurisdictions to ensure that the portions of the bicycle system being developed by each organization are done so in concert.



-  Primary Bike Routes
-  Multi Purpose Trails
-  Regional Parks
-  Greenways

Figure 20-14  
Bicycle Plan

## Sidewalks

Sidewalks are designed for pedestrian speeds. Consequently, bicycles on sidewalks can present dangerous conflicts with pedestrians and should not be allowed except for small children. In addition, bicyclists on sidewalks are often not seen by motorists at intersections, especially when the bicyclist is riding in the opposite direction as the autos. Bicyclists can more safely interact with turning vehicles from a traffic lane than from outside the street possibly travelling a different direction than motor vehicles.

### Actions:

- The city should maintain its current policy of prohibiting riding bicycles on sidewalks in business districts and providing for bicycle travel on the streets (except for children).
- Metropolitan area jurisdictions should implement a systematic program for the bicycle route system, providing continuous connections to the major employers and attractions from all neighborhoods.
- The metropolitan area jurisdictions should develop a bicycle network as set forth in **Figure 20-14** that accommodates commuting.
- Metropolitan area jurisdictions should modify their zoning ordinance to include provisions for storage and security of bicycles associated with building development in the same manner that parking provisions are now included.

## Bicycle Route System

The following is a general description of the recommended primary bicycle routes:

**Jordan Valley Park and Vicinity:** There are currently several major generators in the vicinity of Jordan Valley Park and more are planned. There is a need to provide bicycle facilities for transportation in the area in addition to recreational and multi-use paths. It is likely that use along Jordan Creek from Smith Park to the proposed park near the intersection of Wilson's Creek and Farm Road 146 (Bennett Street) will be sufficient to warrant a separate bicycle path. A path in that corridor will provide service to Southwest Missouri State University, Ozarks Technical College, the government complex, downtown Springfield, and major entertainment venues. Southwest Missouri State University has included in their master plan a Class I bikeway along the Holland Street corridor from Grand Street to Jordan Valley Park.

**Norton Street and Valley Water Mill Road from Westgate Avenue to Valley Water Mill Park:** Each of the streets are classified as collector or secondary arterial streets. With the improvements currently underway on Norton Street, that roadway will be suitable from Kansas Expressway to Glenstone Avenue in another three to four years. Norton Street provides direct connection to the zoo, fairgrounds, and Payne Stewart Golf Course, and connections to the Sac River Greenway via the Spring Creek Greenway, the Pea Ridge Creek Greenway, and Valley Water Mill Park.

**Atlantic Street from Norton Street to Fremont Avenue corridor:** A system of collector streets provides access to residential areas, employers and services north of the BNSF railroad.

**Nichols Street and Central Street from Westgate Avenue to Fremont Avenue:** These collector streets provide access to the government complex and three colleges and universities as well as residential areas.

**Bennett Street from Westgate Avenue to Pierson Creek Arterial:** This collector street spans central Springfield from east to west with connections to the greenway system at each end and both residential areas and connections to major attractions throughout the route.

**Walnut Lawn Street, Primrose Street and Galloway Street from South Creek Greenway to Galloway Greenway:** This set of secondary arterial streets and collector streets spans Springfield from west to east one-half to three-quarters of a mile south of Battlefield Road. The route bisects the major commercial area of the city. While parts of this route have moderate to heavy traffic volumes, the recently constructed roadways are of adequate width for shared outside lanes. Reconstruction of parts of Walnut Lawn Street is expected in the next few years. The Inman Road and Galloway Street portions of the corridor are narrow farm roads which would also need to be reconstructed before all of this corridor is suitable for bicycle route designation.

**Plainview Road from National Avenue to Golden Avenue:** This west to east corridor provides the southern west to east connection across the urban area. Plainview Road, which is maintained by Greene County, has recently been widened to three lanes, which improves its suitability for bicycle route designation.

**Westgate Avenue from Farm Road 106 to Farm Road 146 (Bennett Street):** This proposed secondary arterial roadway in some locations is a farm road and in other locations does not exist. As the street is designed and built to secondary arterial street standards, the recommended designation as a bicycle route should be incorporated into the design.

**Golden Avenue and Moore Avenue from Bennett Street to Plainview Road:** This secondary arterial roadway is in Springfield and Greene County. Most of the road now is a narrow farm road design. Much of the road is programmed for reconstruction for a three-lane curb and gutter street. As the street improvements are designed and constructed, the recommended designation as a bicycle route should be incorporated into the design.

**Broadway Avenue, Fort Avenue, and Kansas Avenue from Norton Street to Plainview Road:** Broadway Avenue and Fort Avenue north of Grand Street are currently suitable and designated as bicycle routes. Cox Avenue south of Republic Street also has a low risk for bicycle use. The remaining streets in this corridor are predominately of narrow farm road construction. As plans are developed to upgrade these roadways, the recommended designation as a bicycle route should be incorporated into the roadway design.

**Fremont Avenue (and other streets) from Dale Street to Plainview Road:**

Weller Avenue, Fremont Avenue, and other streets north of Cherokee Street are suitable for designation for bicycle routes and are proposed for that designation this year. South of Cherokee Street, portions of Fremont Avenue are still of the farm road construction and portions that have been rebuilt have narrow outside lanes with high traffic volumes. However, the corridor provides the only non-interchange north-south crossing of James River Freeway within two miles and is more suitable than parallel major arterial streets. Public Works and planning staff need to continue to evaluate the best way to provide an acceptable bicycle route in this corridor.

**Street Deficiencies:** In the area bounded by Glenstone Avenue, Sunshine Street, Kansas Expressway and Kearney Street there are many secondary arterial and collector streets that are suitable for bicycle travel. Many of those have been designated as bicycle routes. Outside of that area, many of the through streets are the original farm roads that existed prior to urbanization. It is difficult to find suitable roadways for continuous bicycle routes with low risk suitability. Further, the freeway system forms a barrier for providing continuity between urbanized areas on each side of it. As future roadway improvement programs are developed, continuity of safe bicycle travel should be one of the considerations in development of priorities and in project design.

**Greenway Linkages:** The City and County should create linkages to the Greenway paths from the on-street routes and also provide routes that run parallel to or supplement the Greenway system. Parallel or supplementary routes may often be needed because riders on utilitarian trips often travel faster than appropriate on recreational trails, those cyclists usually prefer use roads and they often have destinations not easily accessible from the Greenway paths. The Greenways Plan should be referenced as bicycle routes are added to ensure that connections are provided

## Design Considerations

### Layout and Spacing for Bikeways

Bikeways should serve two purposes for the non-recreational user – to serve as major routes across the city and area and to provide access to services. The bikeways then function much like the arterial, collector, and local classifications of the Major Thoroughfare Plan.

The major routes for moving across the area, or arterial bikeways, can be off-street paths, on-street lanes or on-street signed routes, depending on volume and available facilities. The arterial bikeways should be straight and continuous, designed for speeds of 15 mph or greater, and easy to follow. Where off-street paths are not feasible, lanes or routes should be created on minor arterial and/or collector streets.

The arterial bikeways should be supported by collector bikeways, which provide access to major destinations. The collector bikeways should run parallel to major arterial streets with commercial services and provide access via the rear of those commercial services. There should be at least one, and sometimes two collector bikeways between each set of major arterial streets. On-street signed routes will normally provide the collector

function, but paths and lanes can be used where there is a high volume of bicycle use and suitable facilities are available. The spacing for bikeways serving the collector function should be ¼ to one mile apart.

Local streets provide connection to the designated bikeway system and provide the local bikeway network. Local streets should be designed with the expectation that use will be shared among motorists and bicyclists.

### **Recommendations:**

- Update major street design standards and subdivision requirements to accommodate the bicycle definitions, classes, design and location guidelines listed above.
- The Bicycle Plan should be reviewed periodically and updated as necessary.
- Metropolitan area jurisdictions should consider redesigning roadways to accommodate bicyclists.

### **Barriers**

A number of barriers to a continuous bicycle system are encountered in the urban environment. For bicycling to become a mode of transportation considered safe and acceptable by a large number of people, safe direct routes must be provided between residential areas and destinations such as employment locations, commercial services, and recreational facilities. The barriers in our environment such as freeways and expressways, railroads, and major drainage corridors must be overcome.

**Freeways/Expressways:** The congestion and number of turning movements creates an environment in which most bicyclists are not comfortable. The speed and traffic volume on the roadways where interchanges are present is not suitable for bicycle traffic. Therefore, crossings need to be provided between each interchange to provide adequate access across freeways/expressways. Local and collector street crossings are desirable for movement of neighborhood traffic. Where street crossings are not available, crossings for pedestrians and bicycles should be provided.

**Railroads:** Railroads also create substantial barriers across the community. Normally, there are street crossings of the railroads at intervals of not more than one per two miles. Each railroad crossing, whether grade-separated or at-grade, should be designed to accommodate bicycles, or an adequate parallel crossing provided.

**Rivers and Major Drainage Corridors:** Drainage corridors also interrupt the continuity of travel corridors. Bicycle crossings can usually be provided most effectively on street bridges than on separate structures. Whenever a bridge is constructed or modified, bicycle needs should be included as a part of the design.

## Regulatory and Warning Signs

Along the bikeway, regulatory and informational signs are required for safety and convenience. These signs may display destinations, distances, cross streets, and hazards. Sign and pavement marking design must be consistent with the Manual on Uniform Traffic Control Devices (MUTCD). Because some bike lane marking materials tend to be slippery, especially when wet, carefully selecting marking materials is important.

### Recommendation:

- Bicycles should be considered in the selection and condition of traffic control devices. Although most traffic control devices apply equally to motorists and to bicyclists, bicyclists have distinctive needs in two initial areas:
  1. Signal timing and detection; and
  2. Bicycle-related signing and marking.

## Traffic Signal Timing

Under the same signal phasing arrangement, both a motorist and an average bicyclist should be able to cross an intersection. Moreover, on multi-lane streets, setting of clearance intervals should consider time required for bicyclists to cross. As necessary, an all red clearance interval may be used.

### Recommendation:

- Traffic signal timing and detection needs to allow for bicycles to safely cross intersections with the flow of traffic.

## Signal Actuation

The preferred options for bicycle loop detectors at traffic signals are as follows:

**Video Detection:** The newest detection technology which involves video cameras that view each approaching roadway permits detection of any movement on the street. The detection cameras can be programmed to detect bicycles in the same manner as motor vehicles. However, the video detection frequently costs more than other methods. It should be considered as one of the alternatives at each intersection, especially where bicyclists are given a high priority.

**Diagonal Quadrupole Loop:** In shared roadway situations, where the exact location of the bicycle cannot be easily predicted, the diagonal quadrupole loop may be considered, since it is bicycle sensitive over its entire width while being relatively immune to false calls caused by motor vehicles in adjacent lanes.

**Quadrupole Loop:** In the bicycle path or bicycle lane situations, where the location of the bicycle can easily be predicted, a quadrupole detector works well. The quadrupole loop is highly sensitive over the center wires, less sensitive over the outer wires and relatively insensitive to motor vehicles in adjacent lanes.

**Standard Loop:** Standard loops are the least desirable for sensing bicycles. These loops are square or rectangular in shape and are most sensitive over the wires that form the outer boundary of the loop. While some are sensitive enough to detect bicycles directly over the wires, the bicyclist must know just where to stop and why it is important to stop there. For this reason, standard loops are the least desirable and should not be used in new or permanent installations.

In special cases, pedestrian activated buttons may be mounted near the curb for bicycle use. For example, this approach may be useful where a bicycle path crosses a highway. However, in most roadway situations, the need for bicyclists to position themselves at intersections according to their destinations (e.g., in left-turn lanes or to the left- or a right-turn only lane) makes such push buttons the least desirable option.

### **Recommendations:**

- Metropolitan area jurisdictions should have detectors for traffic-actuated signals that are sensitive to bicycles and the detectors should be located in the bicyclist's expected path, including left turn lanes.
- Where programmed visibility signal heads (traffic lights) are used, they should be checked to ensure that they are visible to bicyclists who may be positioned near the right edge of the roadway.

### **Signing and Marking**

Installing pavement markings encourages the use of bicycle facilities. Pavement markings facilitate the flow of traffic and indicate the use of bicycles. Simultaneously, it legitimizes the presence of bicycles in the view of potential bicyclists and motorists. The *Vision 20/20* Bicycle Committee supported designating entire roadways as bicycle routes rather than frequent use of marked bicycle commuter travel lanes. The committee did support general pavement markings that alert motorists of the possibility of bicyclists.

Although it is not discussed specifically in the Manual on Uniform Traffic Control Devices (MUTCD), the use of "bike route" signs in conjunction with destination information or a map can contribute to the development of a network of designated bicycle routes for basic bicyclists and children. The *Vision 20/20* Bicycle Committee supported signage for bicycle routes and strongly recommended that a route sign be developed that is unique to the Springfield-Greene County community. This has been done for the City of Springfield.

### **Recommendation:**

- Metropolitan area jurisdictions should implement bicycle traffic control devices that adhere to five basic requirements, in order for them to perform their intended function. They must:
  1. Fulfill a need;
  2. Command attention;
  3. Convey a clear, simple meaning;
  4. Command respect of road users; and
  5. Give adequate time for proper response.

## Route Designation

Bicyclists are encouraged to use different routing than the vast majority of motorists. Directional signing should be utilized to verify to bicyclists that the special routing leads to their destination. Bike route signs, bike path signs and bike lane signs are all discussed in detail in the MUTCD or the Traffic Control Devices Handbook.

When designing a bike route, the MUTCD recommends the location and spacing of signs. For bike route signs to be useful, supplemental signs may be placed beneath them when situated along routes leading to high demand destinations (e.g., "To Downtown").

Bicycle route continuity is critical. Therefore, directional changes should be signed with proper arrow subplaques. In addition, signing should not end at a dead end or barrier. Information steering the bicyclist around the barrier should be provided. An appropriate number of route markers and directional signs should be installed to inform the bicyclist of his location and course without the clutter and loss of effectiveness resulting from excessive signing.

### Recommendation:

- Metropolitan area bicyclists should be provided with maps that outline the bicycle route system. The bicyclists should be encouraged to select marked or unmarked routes that incorporate suitable routes, as indicated on the Bicycle Suitability Map (**Figure 20-13**).

## Pavement Surface Characteristics and Hazards

With their narrow frame, high-pressure tires, and lack of suspension-bicycles demand a smooth riding surface. Pavement surface irregularities can do more than cause an unpleasant ride - they have the potential to cause accidents. Drop-offs at overlays parallel to the direction of travel or holes between pavement slabs can lead to loss of control. Depressions and bumps can induce bicyclists to swerve into the course of motor vehicle traffic. Whenever possible, pavement surfaces should be level and the edge of the pavement should be consistent in width. It may be imperative to fill joints, adjust utility covers or, in severe circumstances, overlay the pavement to make it suitable for bicycling.

In restrictive urban conditions, wide curb lanes and bicycle lanes are typically favored. The widened shoulder will be more desirable in rural circumstances. Smooth paved shoulder surfaces ought to be rendered and sustained where it is expected that bicyclists ride on shoulders. In defining the shoulder from the motor vehicle lanes, pavement edge lines augment surface texture. Rumble strips can be a drawback to bicycling on shoulders. Their advantages should be weighed against the possibility that bicyclists will travel in the motor vehicle lanes to avoid rumble strips.

Shoulder width should be a minimum of four feet when proposed to accommodate bicycle travel. Bikeways should not be assigned where roads with shoulders less than four feet wide. Extra width is desirable where motor vehicle speeds exceed 35 mph, the percentage of trucks, buses, and recreational vehicles is high, or stationary obstructions remain at the right side.

The superior way to accommodate bicyclists in rural areas is adding or enhancing shoulders. This can also benefit motor vehicle traffic. If funding is limited, then adding or improving shoulders on uphill segments first will grant slow moving bicyclists needed steering space and reduce conflicts with faster moving motor vehicle traffic.

Motorists will not likely need to change lanes to pass a bicyclist where a wide outside lane is present. Wide outside lanes can also provide more steering room when drivers are exiting from driveways or in areas with restricted sight distance. In most circumstances, a 14-foot usable width is suggested. Usable width is considered from the edge line to a lane stripe or from inside edge of gutter to a lane stripe. However, alterations need to be formulated for parking, drainage grates, and longitudinal ridges between pavement and gutter sections. In urban areas, widths greater than 14-feet may stimulate the unsuitable operation of two motor vehicles in one lane. Therefore, some consideration should be given to striping as a bicycle lane when outside lane width greater than 14-feet are available.

### **Recommendations:**

- **Shoulders on Bicycle Routes:** Implement regulations that protect the outside travel lane where bicycle traffic normally operates. The lane should be completed free of longitudinal seams, bumps, holes, joints or drop-offs. These areas should be kept clean of debris as well. Examples of protective measures include rumble strips.
- **Wide Curb Lanes for Bicycle Routes:** Provide wide curb lanes of 14-feet or more for commuter bicycle travel in Springfield-Greene County, especially along those facilities that are designated as part of the bicycle route system.

### **Railroad Crossings**

Railroad-highway grade crossings should be perpendicular to the rails. It is also important that the roadway approach be at the same elevation as the rails. Consideration must be given to the materials of the crossing surface and to the flangeway (space between the running rail and a guard rail which provides clearance for the passage of wheel flanges) depth and width. Concrete, rubber matting or compressible crossing pads are the preferred types of surface materials. If the crossing angle is less than 45 degrees, an additional paved shoulder of adequate width to permit the bicyclist to cross the track at a safer angle, preferably perpendicular, should be provided.

### **Recommendation:**

- Metropolitan area jurisdictions should apply proper design and safety standards whenever a bicycle path or bicycle route must cross railroad lines.

### **Drainage Grates and Gutter Devices**

Drainage grates with bars running parallel to the direction of travel can result in bicycle tires falling between the bars and throwing the bicyclist. Because of the serious consequences for bicyclists, these grates should be replaced as soon as reasonably possible. These grates should be replaced with bicycle safe and hydraulically efficient ones. Additional hazards include curb ramps, utility poles, raised pavement markers, manhole covers and curb drop-offs.

If a potentially dangerous grate exists that cannot be immediately replaced, the MUTCD suggests warning stripes around the grate.

**Recommendations:**

- Only bicycle compatible drainage grates should be used along a bicycle path or bicycle route. If existing grates along these routes are incompatible, provisions should be made to make the grates safe until such time as they can be replaced.
- Develop a standard for inlets in which inlets are recessed in the curb and surface design for curbs and adjacent driving surface provides safe travel for bicyclists.

**Manhole Covers**

Manhole covers should be level with the pavement.

**Recommendation:**

- Manhole covers along bicycle facilities should be installed at the surface level. Any manhole covers along bicycle facilities that have a raised surface should be corrected or the bicyclist should be provided with warning information prior to the impediment.

**Pavement Patching**

Level pavement should be maintained on the roadway surface for the safety of motorists and bicyclists.

**Recommendation:**

- Roadway pavement patching projects along bicycle facilities should be smoothed to the surface level to avoid unsafe conditions.

**Bridges and Other Structures**

Bridges, overpasses, and culverts on streets and highways frequently serve as critical connections for bicycle paths, routes, or lanes. Access by emergency, patrol, and maintenance vehicles should be considered in establishing the design clearances of structures on bike lanes, routes, and paths. Vertical clearance may be dictated by occasional motor vehicles using the bicycle facility. Widening bridges for accommodation of bicyclists and pedestrians are expensive and normally not undertaken except as major roadway construction projects. It is important that policy and design standards be adopted that require all new bridges, bridge replacements and major bridge improvements make provisions for non-motorized travel.

For any new structures, the minimum clear width must be the same as the approach paved bicycle path or route. The agreeable clear width ought to be the minimum two-foot wide clear areas. Sustaining the clear areas across the structures has two benefits. First, it supplies a minimum horizontal reserved distance from the railing or barrier. Second, it supplies required maneuvering space to avert confrontations with pedestrians and other bicyclists who are stopped on the bridge. Entry by emergency, patrol and maintenance

vehicles should be contemplated in initiating the design clearances of structures on bicycle paths. A vertical clearance of ten-feet is desirable for sufficient vertical “shy” distance when feasible.

Barriers, fences, and railings on both sides of a bicycle path structure must be a minimum of 4.5-feet high. It is suggested that smooth rub rails be joined to barriers at handlebar height of 3.5-feet.

### **Recommendations:**

- Bridges can be designed for both bicycle traffic and pedestrian traffic. Exceptional attention must be taken to ensure bicycle safe expansion joints are utilized. In some cases, it might be necessary to retrofit a bicycle path onto an existing highway bridge. There are currently several alternatives worth serious consideration in contention of what the geometric of the bridge will yield, such as:
  1. Extend the bicycle path across the bridge on one side.
  2. Provide either bicycle lanes or wide curb lanes over the bridge.
  3. Use existing sidewalks as one-way or two-way facilities.
- If a bridge is on a route determined to be essential for bicycle and pedestrian transportation and cannot be improved to a reasonable standard, convenient alternative access should be provided, such as:
  1. Routing bicyclists and/or pedestrians to an alternative, accessible and direct route;
  2. Developing a second, bicycle/ pedestrian bridge; or
  3. Using an existing route as an alternative or developing a short-cut transportation route such as a bicycle/pedestrian underpass.

### **Parking**

An integral component in an overall attempt to encourage bicycling is providing bicycle parking facilities. A common reason why people do not bicycle is the lack of adequate bicycle parking facilities.

Bicyclists can benefit significantly from expanded and improved bicycle parking. In many communities, secure bicycle parking is recognized as one of the first and most important facility improvements necessary to enhance the viability of bicycle transportation. The implementation of bicycle parking improvements is the responsibility of not only government, but business, schools, and commercial establishments. Local governments can adopt regulations for the provision of bicycle parking, just as requirements for motor vehicle parking are adopted. Bicycle parking facilities should be considered at trip destinations and should offer protection from theft and damage. Secure parking is especially critical for commuters leaving their bicycles for long periods of time.

Many of the bicycle parking devices fall into two classifications of user needs: long-term or commuter parking, and short-term or convenience parking. The minimal needs for each differ in their protection and placement. Commuter parking should be required at locations such as transit or subway stations, employment centers, and multi-family

dwellings. Facilities should be provided which allow both wheels, the frame, and accessories to be fastened. The facility should also provide protection from the weather. Examples of protected commuter parking facilities are attended storage areas or bicycle lockers. Libraries, shopping centers, recreation areas, and post offices are locations where convenient parking should be required. Facilities can be self-policing if they are accessible, near building entrances and in highly visible areas. The design of the facility should consider possible damage to the bicycles (bent rims are common with racks that only brace one wheel). Bicyclists will use railings, trees, and other fixtures if an improper bicycle parking design and location exist. This activity can produce an impediment for pedestrians and harm the structure.

Before planning and providing bicycle parking facilities, a number of factors ought to be given proper consideration. To ensure that bicycles will not be ruined, care must be taken in choosing bicycle parking locations. However, parking facilities must not disrupt pedestrian flow. Facilities also should be devised so that other parked bicycles will not be bothered by persons parking their bicycles. For each area, the measure of security required to prevent theft needs to be surveyed.

**Recommendation:**

- Develop and implement bicycle parking standards by inserting standards into the land development code, for major employers, major attractions, commercial operations, and public facilities that include:
  1. Good support of the bicycle.
  2. Capacity to lock bicycle frame and both wheels.
  3. Ease of use.
  4. Durability.
  5. Visibility.
  6. Convenience to destination
  7. Compatibility to site conditions.

**Lighting**

Along paths and at intersections, fixed-source lighting lessens conflicts. Also, lighting permits the bicyclist to view the bicycle path direction, obstacles, and surface conditions. For bicycle paths serving commuters or college students, and at highway intersections, lighting for bicycle paths is crucial and must be contemplated where riding at night is anticipated. Through underpasses or tunnels, and when nighttime security could be a dilemma, lighting should also be contemplated. Heightened illumination levels might be considered where unusual security problems remain. Light standards (poles) must meet the suggested horizontal and vertical clearances.

**Recommendation:**

- Provide for lighting requirements along bicycle facilities with standards and luminaries at a scale for bicyclists and pedestrians.

## **Multi-Use**

Multi-use paths are inappropriate for high traffic volumes. Bicycles and pedestrians do not blend properly. When possible, separate pedestrian and bicycle paths should be provided. If not, additional width, striping and signing should be utilized to reduce conflicts.

In residential areas, young bicyclists riding on sidewalks can be anticipated. Possible conflicts are slightly lessened, but exist, with reduced bicycle speeds and reduced motor vehicle speeds. This example of sidewalk bicycle use is often allowed.

It is inappropriate to combine bicycles and mopeds on the same facility. The AASHTO multi-use path guidelines would be insufficient for moped use. Moreover, mopeds reduce the quiet, relaxing experience most bicyclists desire on bicycle paths.

Another unsuitable and potentially dangerous mix is using a path for bicycles and horses. If horses perceive bicyclists as a danger, they may startle easily and may kick out suddenly. Also, surface requirements for a bicycle path and a bridle path are irreconcilable. Bicycles perform best on hard surfaces while horses perform best on soft surfaces. A compromise to indulge both would result in a less than sufficient surface for both.

### **Recommendation:**

- Permit use of paths developed in the Springfield-Greene County area by each kind of user that can operate safely together with respect to traffic volume and path design.

## **Liability**

Proper maintenance of surfaces, signage, and striping, along with regular removal of debris and obstructions would keep liability issues to a minimum. The design phase should also address liability concerns.

Signage and pavement marking are usually insufficient. Warnings can be posted if repairs cannot be made immediately. Alerting bicyclists and pedestrians to potential risk is a major element of a risk reduction program. A program of signage and pavement marking can reduce the risk. An agency's potential loss is minimized when signs and markings are provided and maintained.

### **Recommendation:**

- Provide safeguards for the Springfield-Greene County bicycle paths, routes, and lanes that minimize liability through warnings, procedures for calling-in hazards, and having a quick-response maintenance system.

## Maintenance and Risk Management

The Springfield-Greene County bicycle route system should be well maintained, provide warnings of upcoming hazards, and provide timely response to citizens reporting repair needs. Metropolitan area jurisdictions should provide ordinary care on the route system in their maintenance plans. The bicycle route system is a part of the right-of-way. The jurisdictions must follow a maintenance and risk management program.

This program should be based on the following general principles:

1. Establish an effective team that designs, constructs, maintains, and operates facilities in a safe and prudent manner;
2. Create an effective planning and early warning system so that the jurisdiction can detect potential risks;
3. Provide an immediate response to the risks identified – signing and warning for those conditions you cannot immediately change, and funding for spot improvements for those that you can change; and
4. Listen to the public.

### Recommendation:

- Metropolitan area jurisdictions should develop a risk management procedure for the area-wide bicycle system as part of a comprehensive effort to ensure that the bicycle route system is both accessible and safe to use.

## Transportation System Management

The Springfield-Greene County bicycle route system is a significant piece of the area's transportation system. The use of bicycles, along with increased transit ridership, and a more efficient roadway system are key considerations in transportation system management. In fact, City Utilities transit has helped enhance the Springfield- Greene County multi-modal transportation system by adding bicycle racks to the entire fixed-route fleet.

A continued community-wide focus on energy conservation and air quality necessitate that alternatives to continuously adding to roadway capacity be explored. Therefore, potential expansion of the bicycle route system should be considered when any new roadway project is planned in Springfield-Greene County.

### Recommendation:

- Metropolitan area jurisdictions should coordinate transportation system management policies that can add both efficiency and capacity to the area's future transportation system.

## Public Education and Implementation

The metropolitan area needs to plan for the physical improvements necessary to facilitate a safe and friendly bicycle community. Public programs and policies on the proper use of these facilities is important to effectively implement the recommendations in the Bicycle Plan. The metropolitan area jurisdictions should continue to consider support bicycle and pedestrian issues through staff support. This staff support should ensure the accommodation of bicycles as part of the community's transportation infrastructure.

A dedicated staff position would provide the review capability needed to ensure that new developments are bicycle and pedestrian friendly. This position would also function as a public resource and outreach contact for schools and the general public, improving education and public awareness of the issues.

Possible responsibilities of this position might include:

- Development of a bicycle education program in local schools and universities;
- Coordination with area colleges to encourage bicycle use, safety programs, and bicycle support facilities;
- Develop printed materials concerning bicycle facilities and resources;
- Develop and maintain updated metropolitan area standards for bicycle transportation;
- Review development plans to ensure bicycle compatibility;
- Work with employers to implement bicycle commuter programs;
- Review plans for new and upgraded streets to ensure bicycling needs are properly considered;
- Pursue internal and external funding opportunities to carry-out the Bicycle Plan and the Pedestrian Plan; and,
- Instruct and promote "effective cycling" within the community.

### Recommendation:

- Metropolitan area jurisdictions should explore the feasibility of supporting a Bicycle/Pedestrian Coordinator function that needs to be incorporated into the entire transportation planning process.

## Funding Sources

### Funding Sources Currently Used for Bicycle Facilities in Springfield-Greene County

- City of Springfield General Fund
- Greene County Highway Department Funds
- Surface Transportation Program Enhancement Funds (i.e. greenways only to date)
- Land and Water – Department of Natural Resources

### **Funding Sources Available to Springfield-Greene County but Not Currently Used for Bicycle Facilities**

- Surface Transportation Program Funds (STP)
- Surface Transportation Program Safety Set-Aside
- Federal Highway Administration TEA-21 Enhancement Funds (i.e. used on greenways but not for bicycle routes, to date)
- Transportation Development District
- Transportation Sales Tax
- Capital Improvement Sales Tax
- Impact Fees
- Developer's Agreements
- Bicycle Registration Fee/License
- County Road/Bridge Tax

### **Recommendation:**

- Investigate all existing and innovative financing techniques available to aid in the implementation of the bicycle route plan and its coordination with the Springfield-Greene County greenway system.

### **References:**

American Association of State Highway and Transportation Officials. *Guide for Development of New Bicycle Facilities*, 1981.

California Department of Transportation. *Planning and Design Criteria for Bikeways in California*, 1978.



# Pedestrian System

## Introduction

One of the goals established through the *Vision 20/20* comprehensive planning process is to develop an on- and off-street, safe, high-quality, continuous, barrier-free pedestrian system that functions as an integral part of metropolitan area transportation system. Communities throughout the country are developing methods of improving pedestrian access and movement. Some possible approaches to improving the pedestrian system in the Springfield metropolitan area are illustrated in the Appendix to this plan.

The on-street pedestrian system usually consists of sidewalks or multi-modal paths adjacent to the motorized vehicle street system. The off-street pedestrian system is usually a series of paths that accommodate both pedestrians and bicyclists. The various recommendations and locations for the greenway system are included in the Parks, Open Space and Greenway Element of the Springfield-Greene County Comprehensive Plan. The focus of the pedestrian system within the Transportation Element will be on sidewalks. Every effort should be made, however, to integrate both the greenways system and the sidewalk system in the Springfield metropolitan area.

## Definitions

*Pedestrian Facilities* – Walkways, sidewalks, paths, shoulders, traffic signals, crosswalks, and other amenities such as illumination and benches.

*Sidewalks* – Pedestrian facilities located along roadways, separated by a curb and/or planting strip, with a hard, smooth surface.

*Paths* – Pedestrian facilities that are used by walkers, cyclists, skaters, and joggers (multi-use paths). Paths may be unpaved, constructed with packed gravel, asphalt grindings, etc. if they are smooth enough to meet the Americans with Disabilities Act (ADA) requirements.

*Shoulders* – Area on a roadway from the travel lane to the curb that may, in certain rural areas, serve as a pedestrian facility if the right-of-way is sufficient to provide for safe travel.

## Goal and Objectives

**Goal:** Provide for the movement of pedestrians through the construction of walkways from residential areas to activity areas such as schools, employment centers, shopping facilities, and other area attractions.

### Objectives:

- Provide Sidewalks along all newly developed arterial, collectors, and local streets in areas with population densities that are conducive to pedestrian travel.

- Develop state and local programs to construct sidewalks where they have not already been provided.
- Provide sidewalks along state highways in urbanized areas.
- Establish priority areas for construction of curb depressions, sidewalk improvements to substandard segments, and pedestrian ramps to promote ease of movement by the disabled protected under the Americans with Disabilities Act (ADA).
- Encourage the development of land-use patterns that accommodate pedestrian travel.
- Provide for safe pedestrian accessibility between neighborhoods and activity areas.
- Provide enhancements in retail areas for better pedestrian connections between establishments, thereby minimizing vehicular trips.
- Provide safe pedestrian accessibility to all public facilities.
- Encourage new business proprietors to provide pedestrian connections from the front door through the parking areas, also providing connections to adjacent activity areas.
- The City of Springfield and the Missouri Department of Transportation (MODOT) should work with City Utilities Transit to provide pedestrian and ADA (Americans with Disabilities Act) improvements to transit stops throughout the service area.
- The Missouri Department of Transportation should look at the feasibility of using their retained federal enhancement funding to facilitate pedestrian improvements throughout the Springfield metropolitan area.

## **Current Policies and Conditions**

### **City and County Subdivision Requirements**

Since 1978, the subdivision ordinance of the City of Springfield has required that sidewalks be constructed on both sides of most arterial, collector, and local streets. Within the City limits residential developers do not need to provide sidewalks if the development is less than three units to the acre. Between three and five units per acre a developer only needs to provide a sidewalk on one side of the road. A residential development needs to have more than five units an acre before it is required to provide sidewalks on both sides of its streets. Other sidewalk requirements are driven by the classification of the roadway.

Greene County's subdivision ordinance requires sidewalks on one side of an arterial, collector, or major land access streets in residential areas, but not on minor land access streets. Sidewalks may be required in other cases to facilitate travel to a school or a school bus pick-up point.

The *Community Physical Image and Character Element*, which was adopted by the Springfield City Council in 1998, contains an action which calls for "sidewalks with a minimum width of 5 feet along both sides of residential streets". The AASHTO

(American Association of State Highway and Transportation Officials) policy on geometric design of highways and streets recommends that sidewalks in residential areas vary from 4 to 8 feet. It goes on to state that where sidewalks are placed adjacent to the curb, the widths should be approximately 2 feet wider than those widths used when a planted strip separates the walk and curb. However, it is recommended that a planting strip be placed between the curb and the sidewalk.

**Recommendations:**

- Consider amending the City of Springfield’s subdivision ordinance to require five-foot sidewalks on both sides of all streets except in residential areas: (a) where the design density is less than three dwelling units per acre, or (b) on cul-de-sacs serving six dwelling units or less.
- The County should consider amending its subdivision ordinance to require five-foot sidewalks on both sides of all streets in residential developments in the Urban Service Area except: (a) where the design density is less than three units per acre, or (b) on cul-de-sacs serving six dwelling units or less. Within the Urban Service Area (the portion of the county expected to be urbanized in the future), sidewalk requirements should be the same as for the city.

**State Highways**

The *Vision 20/20* Transportation Focus Group stressed the importance of sidewalks along the entire street network, whether the sidewalks are city, county, or state-maintained. In 1987 the Missouri Department of Transportation had only five miles of sidewalks on portions of Kearney Street, Sunshine Street and Glenstone Avenue in Springfield. Most of the other state-maintained roads such as Campbell Avenue and Kansas Expressway had few, if any sidewalks.

State highways are often equipped with drainage ditches instead of curbs and gutters. In these circumstances, adjacent jurisdictions often do not require sidewalks when abutting properties are subdivided. But, in some cases there is adequate right-of-way available to accommodate sidewalks in open-ditch sections as well as in curb and gutter sections. In such cases, developers of abutting properties should be required to construct sidewalks during the platting process. Sidewalks may be located within the highway right-of-way, with the installation and maintenance responsibilities to be worked out on a case-by-case basis.

**Recommendations:**

- The City of Springfield and Greene County’s subdivision regulations should be amended so that sidewalks are required along open-ditch sections where adequate right-of-way is available.
- MoDOT’s design policies should be revised to reflect the need to accommodate pedestrians along parts of its system, especially in urban areas.

## Sidewalk and Pedestrian Plan

### Existing Sidewalk Map

A map of the existing sidewalks in the MPO planning area for collector level roadways and higher, is shown in **Figure 20-15**. This map was developed from site surveys conducted by MPO staff in 1997. Aerial photos and field surveys were used to develop this inventory.

**Figure 20-15** also shows the existing and planned greenway system for Springfield-Greene County. The greenway facilities provide off-system pedestrian pathways from neighborhoods to attractions. The greenways provide a system of safe pedestrian pathways that provide connections to the sidewalk system.

### Americans with Disabilities Act (ADA) Issues

The *Vision 20/20* Transportation Focus Group stressed the importance of providing continuous sidewalks throughout the community. Although state law now requires that curb depressions be installed in all new sidewalks and at intersections undergoing reconstruction, many of the sidewalks in the central area of Springfield are old, dilapidated, and are not equipped with curb depressions. It would be desirable to have a systematic method of correcting the situation.

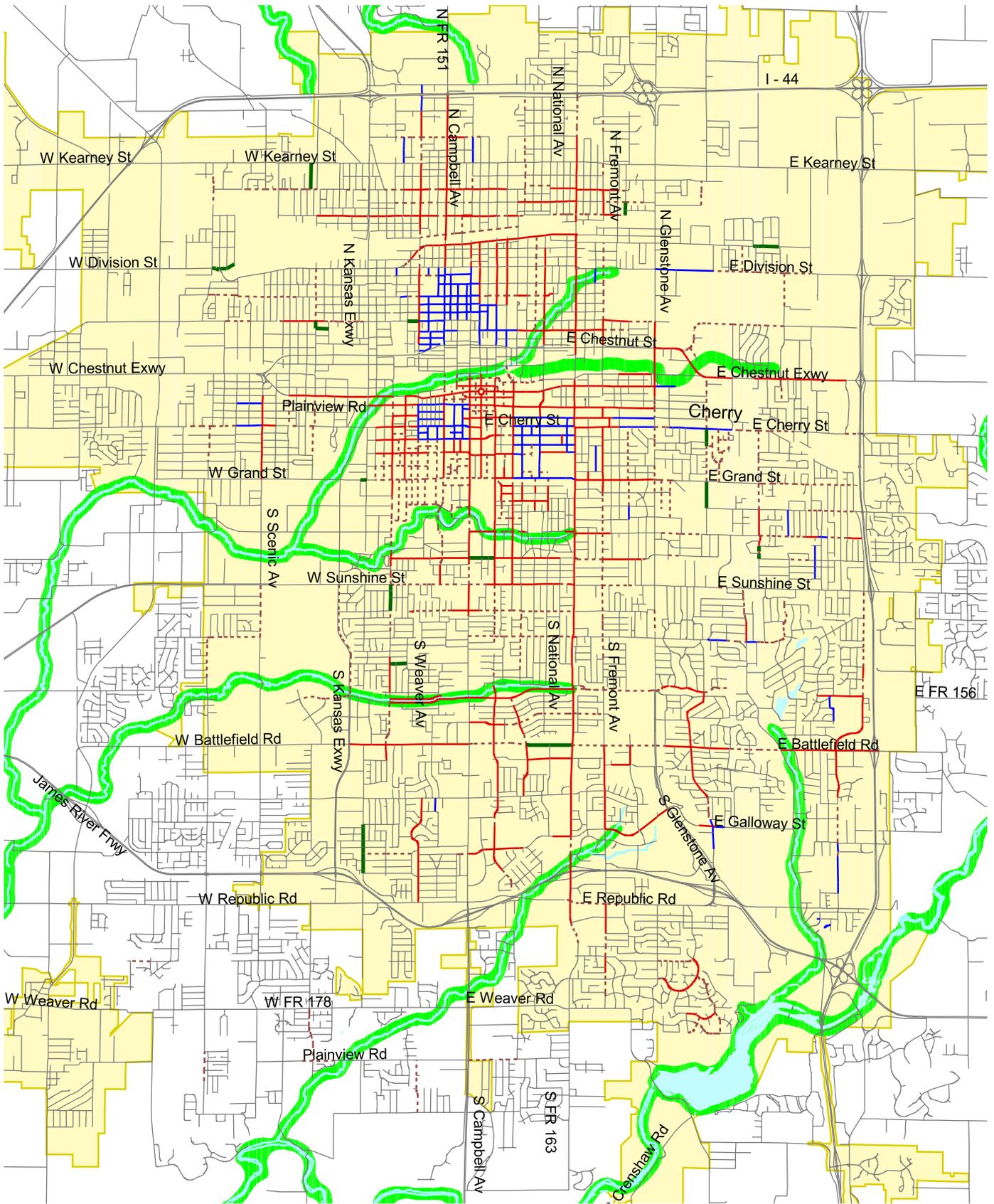
When installing new curb depressions, there should be a method of insuring that matching provisions are made on the other side of the roadway and through intermediate islands. In addition, curb depressions should be constructed to safely direct pedestrians through intersections, as outlined in the ADA standards. The surface finish of a curb ramp should differ from that of the roadway or crosswalk so that visually impaired people can detect the difference. This tactile warning texture should be slip resistant and extend the full width and depth of the curb depressions, including any flares.

Several criteria should be used in establishing priorities for installing curb depression areas:

- Commercial activity within the area,
- Density of pedestrian activity, and
- Concentration of elderly and handicapped residents.

### Recommendations:

- Using the above criteria, staff from the City of Springfield, Greene County, MoDot, and other area jurisdictions in cooperation with representatives of the effected neighborhoods, should identify areas that lack continuity of accessibility. Those involved should also develop a plan that establishes priorities for construction of curb depressions. Recommendations should be part of an ADA Improvement Plan that outlines sidewalk continuity improvements.
- Each jurisdiction should have a program for assessing the need for and condition of sidewalks on routes within their jurisdiction and maintaining those sidewalks in a safe and functional condition.



-  No sidewalks
-  Elementary School Route
-  Sidewalk Program from Capital Improvement Program (1990-1999)
-  Sidewalks on one side - 1997
-  Sidewalk on two side - 1997
-  Greenways

Figure 20-15  
Sidewalk Survey and Greenways

## Sidewalk Connections

### Sidewalk Continuity

Many of the existing sidewalks in the Springfield-Greene County area are substandard, discontinuous and are not ADA accessible. Sidewalk improvements that have been made in the Springfield metropolitan area have primarily been around Springfield R-12 elementary schools that have been given a high priority by parent teacher associations. There have also been a number of sidewalk improvements made in the Community Development Block Grant eligible areas.

In the north and the central portions of the city, many of the neighborhoods have a sidewalk on at least one side of the roadway. However, underground roots and time have left many of these sidewalk segments in poor condition. Sidewalk segments are intermittent in unincorporated Greene County and many that do exist are not ADA accessible.

A primary recommendation from the *Vision 20/20* process is to ensure continuity in the existing sidewalk system. Prior to 1978, Springfield's subdivision ordinance contained no provisions for sidewalks, and as a result large portions of the city developed without any sidewalks. Again, where land adjoining an existing street has not already been subdivided, sidewalks should normally be required in the platting process. However, if no subdivision takes place or if a tract is already developed without sidewalks, pedestrian facilities will usually have to be provided at public expense.

In developing a local program to install sidewalks, priority should be given to construction of segments needed to achieve continuity on the sidewalk system or to provide additional safe school routes. Such segments have been and should continue to be identified through a systematic analysis of the sidewalk system with the assistance of the Parent-Teacher Associations of each school. Since difficulty in crossing major streets tends to discourage walking and because solutions are often expensive, the program should also address the need for additional pedestrian underpasses, overpasses, or signalized crosswalks.

As plans for freeways, principal arterial highways, railroad relocations, and other barriers to local travel in the Springfield metropolitan area are developed, consideration should be given to pedestrian connections between neighborhoods and major generators. In the central part of the city, safe pedestrian facilities should be provided across barriers at approximate intervals of one-half mile. In areas with suburban density, the spacing for pedestrian facilities should be approximately at one-mile intervals. A safe pedestrian crossing would include collector street crossings, multi-purpose path crossings, or pedestrian crossings, either as a grade separation or at a simple at-grade intersection. Mixing pedestrian traffic in freeway interchange intersections should be prohibited.

### Recommendations:

- MPO staff should work with area jurisdictions to identify sidewalk segments and other pedestrian facilities that need to be constructed in order to ensure network continuity.

- MPO staff should work with area jurisdictions to explore various funding sources in order to finance the construction of these sidewalk segments.

### **Critical Sidewalk Improvements**

Major activity areas, as identified by *Vision 2020*, should provide pedestrian connections to adjacent neighborhoods that are within walking distance. Existing sidewalk connections should be upgraded in areas where they are substandard.

Some of the high-priority sidewalk connection improvements are:

- Sidewalk connections along streets serving bus stops within 3/8 mile of bus stops;
- Pedestrian enhancements in the Primrose/Glenstone area to provide better walking connections between retail establishments, thereby minimizing vehicular trips;
- Pedestrian and sidewalk connections between the Jordan Valley Park, Southwest Missouri State University, Ozark Technical College, Government Plaza, and Drury College;
- Sidewalks near Springfield R-12 elementary schools, which do not currently have sidewalk connections to adjacent neighborhoods; and
- Sidewalk connections to City-County parks and the greenway system from adjacent neighborhoods.

The recommended pedestrian improvements that are the highest priority are shown on **Figure 20-16**. These are priority improvements that should be considered during the City and County subdivision approval process or capital improvements programming. The connections are safety issues in areas that are currently hazardous to pedestrians or provide critical pedestrian connections. Other generalized pedestrian improvement guidelines are included in the last section of this chapter, Funding Considerations and Recommendations. Guidelines and implementation strategies are listed in that section.

### **School Sidewalk Priorities**

Sidewalk connections between elementary schools and adjacent neighborhoods are and should continue to be a high priority. The Springfield R-12 Parent-Teacher Associations should continue to provide recommendations to the City, County, and MoDot for sidewalk improvements. Sidewalks around middle and high schools should also be improved but have a lower priority than sidewalks around elementary schools. Other school districts should also consider sidewalk connections between schools and adjacent neighborhoods, with emphasis on connections to the elementary schools.

Middle and high schools need to have appropriate sidewalks. Many middle school and high school students walk to school, often crossing busy arterial roadways. Proper continuous and safe pedestrian facilities should be provided to these schools. Pedestrian connections to adjacent attractions need to be accessible and safe.

### **Recommendations:**

- Local jurisdictions should work with school districts to help develop a sidewalk accessibility and priority plan for elementary, middle, and high schools.
- Parent-Teacher Associations should continue to work with area jurisdictions on sidewalk improvement recommendations for area elementary schools.

### **Land Use Compatibility**

The *Vision 20/20* goal for the Springfield-Greene County area is to have an efficient and safe pedestrian system that allows people to walk rather than drive. This extensive pedestrian system would include sidewalk continuity between major developments and connections with surrounding neighborhoods. A large number of automobile trips in the urban area are less than a mile in length - a distance that could easily be covered on foot in many situations improving energy conservation and reducing traffic.

Allowing mixed land uses (residential, commercial, office, etc) can encourage pedestrian travel on the same site or in proximity to one another. Mixed-use developments must be carefully designed to allow complimentary uses that enhance the community. In reviewing such proposals, consideration should be given to the adequacy of internal pedestrian facilities connecting the various uses.

Many major shopping centers have poor pedestrian access to adjoining residential areas. Often the commercial facilities are isolated from neighboring areas by large parking lots, which make no provision for pedestrians. Where commercial areas are situated near residential districts that could generate significant pedestrian activity, sidewalk connections should be encouraged during the platting process, not only along public streets but also along internal private streets where appropriate.

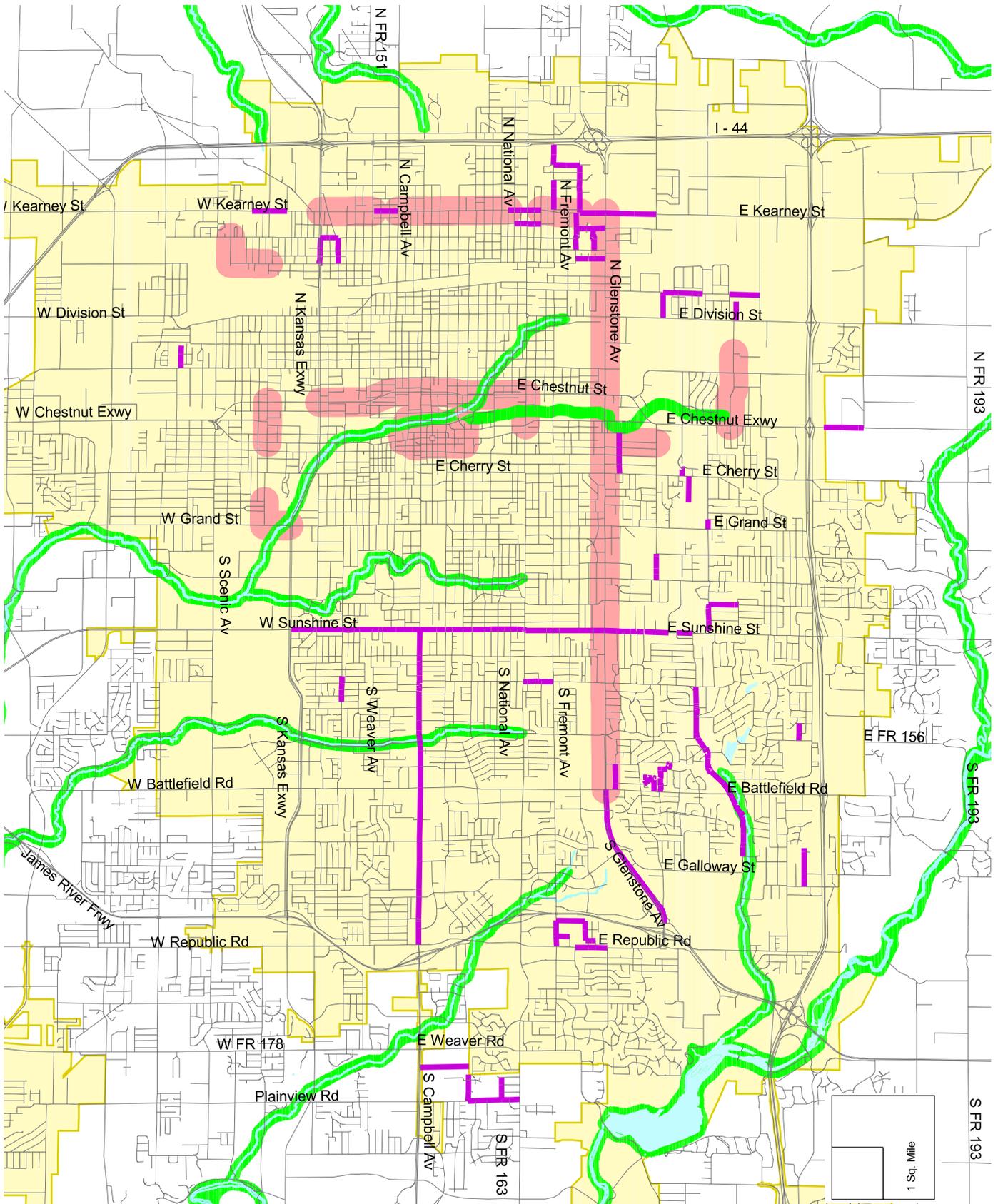


Figure 20-16  
Recommended Sidewalk Improvements

-  High Priority Pedestrian Connectors
-  Pedestrian Improvement Consideration Areas
-  No Recommendations
-  Greenways

### **Recommendation:**

- Most of the mechanisms to implement this objective are already in place. The Planned Development and the Plot Assignment District encourage mixed land uses and allow for flexibility in designing internal pedestrian systems. However the City and County subdivision regulations should be revised to:
  - Require sidewalks, not only along arterial and collector streets, but also along local roadways;
  - Require sidewalks along all streets in commercial and industrial areas;
  - Require sidewalks along internal private streets where appropriate; and,
  - Amend regulations to provide incentives for pedestrian friendly site plans

### **Activity Center Pedestrian Considerations**

A primary recommendation of the *Vision 20/20* process included targeting several locations in the metro area for activity centers. Both zoning and subdivision regulations would be established to guide development in these areas as mixed-use opportunities for employment, business, residences, or any combination thereof. The mixed-use design would need to highlight pedestrian orientation, attractive public space, high-quality site planning and architecture, and convenient transit service. These developments would use modern urban design principles to epitomize many of the desirable design principles of a town or city but accomplish them on a smaller scale.

### **Recommendations:**

- Metropolitan jurisdictions should consider specific guidelines for pedestrian amenities, as part of a Planned Development District, a Plot Assignment District, activity center, or an equivalent zoning classification.

### **Funding Considerations**

Various sources of funding could be used to finance sidewalk improvements in the Springfield metropolitan area. Both Community Development Block Grants (CDBG) and ¼ cent sales tax funds have been utilized within the City of Springfield, particularly in conjunction with other road improvements or in redevelopment areas. Special assessments or tax-billings can be used when the property owners petition for sidewalks; however, the City may also use this procedure to finance improvements that a developer is unwilling and cannot be legally required to make. Another possible source of financing sidewalks is through the creation of a benefit district, where property owners agree to tax themselves to construct and maintain public improvements. There are also improvement district options, such as the Community Improvement District (CID); particularly where there are active community organizations to facilitate the programs.

### **Recommendations:**

- The City of Springfield, Greene County, and the Missouri Department of Transportation should work together to investigate funding mechanisms to implement a sidewalk priority plan.

- The City of Springfield should set a high funding priority for improving sidewalk connections where possible in community development block grant (CDBG) eligible areas.
- The City of Springfield and the Missouri Department of Transportation should coordinate with City Utilities to provide pedestrian and transit stop improvements throughout the service area.
- The City, County, and State should coordinate their efforts, where possible, to provide pedestrian ramps and sidewalk improvements to substandard segments, particularly targeting areas around elder care facilities, hospitals, etc. where the need for ADA accessibility is substantial.
- Work with existing businesses to address the importance of providing pedestrian connections through their parking areas and to adjacent attractions.
- MPO member jurisdiction should work with MoDot to find funds for pedestrian safety improvements.
- Jurisdictions should encourage proprietors of new major businesses to provide pedestrian connections from the front door, through the parking areas, to connect to adjacent activity areas.
- All MPO jurisdictions should ensure that pedestrian connections are provided to all public facilities, from their designated parking areas.

# Transportation System and Demand Management

## Introduction

In the past, building new and bigger roads was often seen as the solution to increased roadway congestion. New roads encouraged more development along these corridors, which in turn led to increased traffic and congestion. Although road improvements are still the most important strategy for providing mobility in a metropolitan area, the community does not have unlimited funds to build new roads or add lanes on existing roads. Transportation System Management (TSM) and Transportation Demand Management (TDM) offer additional strategies to maximize the efficiency of the existing system.

Transportation System Management (TSM) and Transportation Demand Management (TDM) practices include strategies to improve the operation of the transportation system. While the terms sound familiar, they are really two different approaches for dealing with improving the efficiency and effectiveness of the transportation system. TSM looks at more cost effective ways of maximizing capacity of the existing system. These strategies may include strategically placed turning lanes, signal coordination programs, eliminating left turns, or minimizing roadway access points. TSM focuses on the supply side of the transportation system.

In contrast, Transportation Demand Management (TDM), as the name describes, addresses the demand side of transportation. TDM strategies focus on way of minimizing the number of vehicular trips on the roadway network. These strategies may include, incentives for using transit or carpooling, encouraging flexible work time to decrease peak hour travel, or promoting mixed land uses that allow people to live within walking distance of work and other activities.

There are a number of inexpensive management tools that have been developed through the Federal Highway Administration's Applied Research and Technology Program, including improved materials and procedures, more cost-effective designs, better system management and analysis tools, and innovative financing mechanisms.

## Definitions

**Transportation System Management (TSM)** is an approach to improving the existing transportation system by seeking solutions to immediate transportation problems that better manage transportation and treat all modes of surface transportation as a coordinated urban transportation system. (Source: *Transportation System Management Report*)

**Travel Demand Management (TDM)** approach to congestion mitigation focuses on user demand and behavior modification strategies to reduce drive-alone and peak-period travel.

**Operating Costs for Traffic Monitoring, Management, and Control** includes labor costs, administrative costs, costs of utilities and rent, and other costs associated with the continuous operation of traffic control, such as integrated traffic control systems, incident management programs, and traffic control centers. (Source: *Federal Highway Administration*)

**Operational Improvements** mean a capital improvement for installation of traffic surveillance and control equipment, computerized signal systems, motorist information systems, integrated traffic control systems, incident management programs, and transportation demand management facilities, strategies, and programs, and such other capital improvements to public roads. By definition, this does not include resurfacing, restoring, or rehabilitating improvements, construction of additional lanes, interchanges, and grade separations, and construction of a new facility on a new location. (Source: *Federal Highway Administration*)

## Goal and Objectives

**Goal:** To encourage and promote the safe and efficient management and operation of an integrated, intermodal surface transportation system to provide for the mobility and accessibility needs of people and freight.

### Objectives:

- Consider various Transportation System Management and Transportation Demand Management techniques for the Springfield metropolitan area to help maximize efficiency and reduce traffic demand on the transportation system.
- Maintain and improve the quality of transportation services on the existing system.
- Minimize the cost of improving the quality of service on, and the efficiency of, the existing transportation system.

## Recommended Plan

### Major Employers

In 1999, the City of Springfield had 169,900 persons in the civilian labor force. This represents a 22 percent increase over a five-year period. The largest employment sector was the service industry (49 percent), followed by the retail sector (33 percent). The *Vision 20/20* planning process estimated that job availability in the current MPO Transportation Planning Area will increase 66 percent by the year 2020. These forecasts estimate that 25 percent of the 2020 jobs would be in the retail industry. Retail jobs are estimated for the MPO area to help anticipate demand on the transportation system. Trip generation at a retail establishment is significantly greater than for other land uses. The MPO travel demand model forecasted 2020 traffic volumes based on the 2020 employment estimates. The largest employers in the Springfield metropolitan area are listed in **Table 20-12**.

Large employers in the community add significantly to the peak hour transportation demand on the roadway system. One Transportation Demand Management (TDM)

technique is to encourage work hour rescheduling (flextime) for some of the largest employers in the region. This technique decreases peak hour demand by spreading out commute trips.

**Work Hour Rescheduling:** Work hour rescheduling attempts to reduce peak period congestion by distributing travel demand over a longer period of time to allow for more efficient use of both roadway and transit facilities. The strategy includes staggered work hours, shortened workweeks, and flextime hours.

**Staggered Hours:** Staggered hours are an arrangement where subgroups of a work force operate on fixed schedules, but starting times of the groups are staggered to relieve congestion. This method is generally applicable to large organizations with major subgroups that are somewhat independent due to the nature of their work. An organization may also stagger its hours relative to other nearby employers to relieve congestion in the area.

**Shortened workweek:** The shortened work week concept is based on rescheduling the normal work week for increased hours per day but fewer days per week, such as four ten-hour days. The strategy provides an additional leisure day and reduces energy consumption for cooling and heating (when all employees work the same days). Reduced traffic congestion is also a benefit because employee work trips fall before the morning peak and after the evening peak. Also, the total number of work trips made is reduced.

**Flextime:** Flextime-hours allow individual employees to set their own arrival and departure times within prescribed limits. Employees are usually required to be present during “core” working hours (such as 9:30 to 11:30 a.m. and 1:30 to 3:30 p.m.). A flextime program may require daily adherence to a chosen schedule or the program may permit variation as long as a specified number of hours are worked daily or weekly. This strategy is applicable where workers are less dependent upon others for the accomplishment of work tasks. Flextime is usually implemented as an employee benefit, but it has been effective in some communities by reducing local congestion by spreading arrivals and departures over a greater time period.

**Table 20-12 Springfield-Greene County Employment Largest Employers in the Area, By Sector and in Rank Order**

Type of Employer	Rank	Name of Company	Local Full-Time Employees
<b>Institutional</b>	1	Springfield Public School System R-12	3,054
	2	Southwest Missouri State University	1,886
	3	State of Missouri	1,709
	4	City of Springfield	1,407
	5	City Utilities of Springfield	956
<b>Manufacturing</b>	1	Aaron's Automotive Products	1,450
	2	Willow Brook Foods, Inc.	1,300
	3	Kraft USA	1,250
	4	General Electric Co.	1,000
	5	Springfield Remanufacturing Co.	850
<b>Commercial-Service</b>	1	Bass Pro Shops	3,693
	2	Associated Wholesale Grocers	1,030
	3	O'Reilly Auto Parts	921
	4	First Card Services, Inc., a Bank One Co.	750
	5	MCI Worldcom	723

\*\*\* From: *The Springfield Business Journal, 1999 Book of Lists, Volume XIX, No. 37, March 23, 1999, p.32-36.*

**Shared Trips**

**Ridesharing:** Ridesharing generally refers to carpooling, and represents a valuable alternative for reducing traffic. It is especially useful in reducing commuter traffic, benefiting both the commuter and the community. Commuter benefits include better personal health through the creation of a less stressful commuting environment and monetary savings in maintenance, gasoline, and parking costs. Benefits to the community include less congestion and air pollution.

The City of Springfield, on behalf of the Metropolitan Planning Organization, operates a rideshare program for the metropolitan area. Carpool rides are matched for interested parties who may commute to locations as remote as Branson, Missouri. Currently the program receives inquiries from 20 interested parties per year, with approximately 25 percent of those being matched. There is a potential for expansion of this TDM program. There are opportunities to increase community awareness of the program through additional advertising and there is the possibility of adding a park and ride lot along U.S. 65, which could further facilitate carpooling between Springfield and Branson.

**Vanpooling:** Large businesses in many communities have implemented ridesharing programs for their employees. Many of these companies have sponsored a vanpool, either purchasing or leasing the van(s), where the employees are responsible for

coordinating pickup and driving responsibilities. Employers often offer employees incentive, such as preferred parking, to promote the vanpool.

### **Transit Service Improvements**

Transit service improvement is an important Transportation System Management strategy. In the Springfield area, a number of improvements to the transit system were recommended in City Utilities 1995 Transit Service Study. City Utilities Transit has implemented a number of the plan's recommendations and continues to update these recommendations.

City Utilities has also explored transit system expansions in areas where there appears to be appropriate demand. Additional funding sources to support the expanded services were utilized, including Jobs Access grant provided by the Federal Transit Administration.

The Southwest Missouri State University (SMSU) shuttle system serves the campus community and is a complement to the City Utilities fixed route system. Additional coordination of the two systems should be explored to maximize transit system efficiency. Both systems should continue to explore transit system efficiencies, system expansion possibilities where the demand warrants, and re-allocation of resources on routes that do not have minimal levels of demand.

### **Advanced Transportation Management Systems**

Roadway system delays are the result of inadequate facility capacity, significant conflicts from access points, accidents, stalled vehicles, roadway debris, and other things that can slow traffic. Advanced Transportation Management strategies can significantly reduce delay.

Some of the types of Advanced Transportation Management strategies that might be implemented include:

- An Advanced Traveler Information System (ATIS) that provides real-time information to system operators, emergency response personnel, and commuters regarding traffic conditions in order to facilitate less congested travel.
- An Advanced Traffic Management System (ATMS) to rely on new and evolving technologies to detect incidents and expedite emergency response. Included in this system are the Mobility Assistance Patrols to assist motorists with incidents and accidents. Transportation Management Centers, including transit, will be integrated into the ATIS. The Transportation Management Centers will support traffic management and major incident response and clearance.
- An Advanced Public Transportation System (APTS) includes Transit Management Centers, which will serve as communication hubs. These systems are integrated with state and local government centers, providing better region-wide service and increased user safety.

- Three additional systems that are often implemented include: an Advanced Rural Transportation System, a Commercial Vehicle Operations System, and an Advanced Vehicle Safety System. As the technologies for these systems develop, in both the public and private sectors, they can be integrated into a region's overall Advanced Transportation Management System.

As previously mentioned in the Streets and Highways section, the City of Springfield and the Missouri Department of Transportation are currently developing an Intelligent Transportation System (ITS) Deployment Plan. This study will provide information on the current Transportation Management Center, operated by the City and the State in the Discovery Center, and recommend possible improvements to this system. All of the Advanced Transportation Management Systems listed above will be analyzed in the ITS Deployment Plan. Some of these systems have been partially implemented but will need refinement in the future. Other strategies could be implemented to improve the overall efficiency of the system. The completed ITS Deployment Plan is expected by the end of 2000 and will recommend appropriate systems for the Springfield metropolitan area. These Advanced Transportation Management Systems will be crucial to the future roadway system because these strategies are more financially feasible than building additional roadway.

New technologies are enabling the transportation sector to increase efficiency and productivity. Transportation agencies are getting the job done quicker, better, and more economically. This is possible because of improved materials and procedures, more cost-effective designs, and better system management and analysis tools, many of which have been developed through the Federal Highway Administration's Applied Research and Technology Program.

### **New Technologies**

**New technologies applied to bridges:** New technologies are being developed that improve or prolong the life of system bridges such as: bonded overlays, curved-steel bridge components and innovative bridge designs using enhanced-performance steels. The Springfield metropolitan area should consider taking advantage of these technologies where appropriate.

**Improved marking:** Several of the safety-related projects that are being conducted under the Applied Research and Technology Program are related to the development of minimum retroreflectivity standards for traffic signs and markings. The Federal Highway Administration has developed mobile pavement marking retroreflectometers that take the measurements at highway speeds without disrupting the flow of traffic. These devices provide both increased productivity and safety. Jurisdictions within the metropolitan area should review the current minimum retroreflectivity standards for traffic signs and markings. Jurisdictions should also investigate the applicability of new minimum standards and capitalize on new technologies, as applicable.

**Cost Effective Designs:** The Federal Highway Administration (FHWA) is researching the use of deep foundations which provide considerable cost savings and can be implemented through the revision of overly conservative and expensive bridge design methods. FHWA has assembled a large, research-quality database of load test results from field demonstrations and other uses of rational foundation design coupled with modern construction monitoring techniques. The data will help verify the performance of

foundations built using the more cost-effective rational design methods. The FHWA will make this database available on diskette or via modem. Jurisdictions within the metropolitan area should investigate the use of deep foundations if the technology proves safe and is sanctioned by the FHWA.

**Improved Bridge Condition Data:** Effective bridge management systems combine management, engineering, and economic input to make decisions about when, where, and how to spend money and how to ensure bridge safety and durability. Accurate data about the condition of bridges is essential to any bridge management system. Better data will yield better engineering and financial management decisions. Most bridge condition data are based on visual inspections, which are subjective, difficult to quantify, and often fail to detect hidden deterioration that may affect structural reliability. The FHWA is investigating methods to improve bridge condition data. This may include ways to improve the interpretation and value of the basic data collected, advancement of new methods of data collection, or enhancing the way data is used. The jurisdictions within the MPO should investigate any advances in bridge management systems and should implement the FHWA recommendations that are applicable to the area.

**Eliminating Freight Bottlenecks:** MPO jurisdictions should improve freight movements and economic competitiveness by identifying and removing bottlenecks to effective intermodal transportation. Both the Federal Highway Administration (FHWA) and the Office of the Secretary of Transportation are currently supporting cooperative research projects, which hope to improve intermodal connections. MPO jurisdictions should investigate any intermodal transportation improvements that are recommended by the FHWA, the Office of the Secretary of Transportation, or any other applicable study findings. Any advancement in intermodal technologies that are recommended should be investigated and implementation should be considered if the technology benefits the metropolitan area and if funding can be obtained.

**Improved Congestion Management and Traffic Data Collection Tools:** With existing highway systems strained to capacity, congestion management is an important concern in metropolitan areas. The FHWA is developing a series of tools that transportation agencies can use to plan and operate more efficient highway systems. These tools include: integrating traffic data collection with traffic operations, developing nonintrusive technology for monitoring urban vehicle operations, developing more effective Congestion Management Systems (CMS's), improving vehicle occupancy data collection procedures, providing technical support for Geographic Information Systems, including Spatial Data Base Design, and developing automated roadside inspection technologies using under-vehicle scanning. Area jurisdictions should use the above information, when applicable, to help plan for the community's future transportation system needs.

**Better Transportation Planning Forecasting Models:** Transportation planning models are generally developed and used by states and Metropolitan Planning Organizations for estimating the system's future traffic demand. Many of these transportation planning models were developed many years ago and have not been thoroughly reviewed since they were developed. The Los Alamos National Laboratory is developing a new generation of transportation analysis models using simulation and other advanced computer technologies. The new models will enable transportation planners and policy analysts to evaluate a broader range of options and to account for the many factors that affect the operation of transportation systems. This multiyear research effort is being sponsored jointly by the Department of Transportation and the Environmental Protection

Agency. The MPO and MoDot should review the recommendations from the national transportation planning model review study and make any needed improvements to the area's current transportation planning model, if appropriate.

### **Alternative Transportation System Management Strategies**

Alternative Transportation System Management strategies can be useful in achieving TSM objectives. However, communities may not implement the more advanced TSM strategies until significant capacity deficiencies occur and roads become severely congested. More advanced TSM strategies include: commercial vehicle regulation, parking management, paratransit coordination, implementation of parking fees, improvements in pedestrian and bicycle facilities, high occupancy vehicles (HOV) treatments, and work hour rescheduling). At that point, drivers are more likely to change their transportation behavior and to consider alternative transportation. The metropolitan area has abundant free parking availability and relatively few roadway system delays. This level of service is partly explains the low percentage (about one percent) of transit usage in the community.

Jurisdictions within the MPO area should continue to investigate all TSM opportunities and implement them when feasible. Many of the TSM alternatives are more cost effective than building new roadway capacity and could be an effective transportation solution for the community.

### **Access Controls**

A successful access management program will help minimize potential traffic conflicts and enhance roadway capacity by controlling the frequency and location of driveway accesses to all street classifications. Controlling the frequency and manner of access helps to avoid disruptions in traffic flow. Attempts should be made to consolidate existing accesses into shared driveways when feasible.

Each type of street is intended to perform a different function, and access should be regulated accordingly. Local streets are intended primarily to provide access to abutting property and should do so with minimal restrictions. Arterials are intended primarily to move traffic and cannot do so efficiently if there are too many access points, which disrupt through traffic. Collector streets serve a dual function of access and traffic movement and should have moderate restrictions on access.

The proper design, location, and spacing of access points depend on the type, volume and speed of existing and anticipated traffic. Adequate sight-distance and travel-lanes are of particular concern for all access points. The Springfield Urban Area Traffic Flow Management Plan, as approved by the MPO in November 1996, identifies recommended guidelines for access to major streets.

**Spacing of Interchanges and Intersections:** Spacing of points of friction or stopping has more impact on the volume of traffic that can be moved safely on any highway or street, than any other design consideration. Freeway interchanges must be designed so that traffic from ramp intersections with surface streets does not back up on the freeway. Interchanges should be spaced to allow enough distance for weaving maneuvers to occur between interchanges without significantly slowing through-traffic.

Signalized intersections should be spaced to allow the largest practical proportion of traffic on the street to pass through the intersection without stopping. This can be accomplished only through uniform spacing at a distance that allows platoons from both directions travelling at a uniform speed to pass through each signalized intersection at the same time. Random spacing of traffic signals reduces the usable time at intersections to as little as 15 percent and results in frequent stops for one direction or both directions. In addition, there must be sufficient distance between intersections so that traffic does not back up from one intersection into another. Spacing policies will be different with each roadway classification.

Unsignalized intersections and driveways should be spaced and designed to minimize the potential conflicts for the driver in the through-lane. Driveways should be designed to facilitate rapid movement of turning vehicles from the roadway so that the decrease in speed required of the following vehicle is minimized. Driveways should be spaced at a distance such that the driver has to monitor vehicles entering or exiting only one driveway at a time within the distance required to react and brake for a potential danger. Driveways near signalized intersections should be spaced beyond that area that vehicles are normally stopping, stored, or starting because of the traffic signal. When driveways are permitted in the functional area of the intersection, movements should be limited to permit only those that are safe, such as right turn in and right turn out.

The City of Springfield’s current driveway ordinance addresses the number of driveways permitted and the minimum spacing between driveways. The ordinance does not address any difference in operation of driveways on different street classifications with regard to design or spacing. The Missouri Department of Transportation (MoDOT) acquires full or limited access control based on roadway classification as part of right-of-way acquisition. Access control is further managed by using minimum entrance stopping sight distance as set forth in AASHTO’s A Policy on Geometric Design of Highways and Streets (1994 edition) and the MoDOT Metric Design Manual. The Greene County subdivision regulations permit staff to limit access from collectors and arterials.

**Access Criteria for Major Streets:**

- *All Streets:* All existing tracts of record are guaranteed at least one driveway to a public street.
- *Collector Streets:* Direct access is not permitted to residential lots accommodating less than 5 dwelling units.
- *Secondary Arterial Streets:* One driveway is allowed for each 200 feet of frontage.
- *Primary Arterial Streets:* One driveway is allowed for each 250 feet of frontage.
- *Expressways:* No direct access is allowed from any property unless it provides the expressway provides the only access available.

**Driveway Spacing:** The recommended spacing from center to center of a driveway is:

**Spacing from Center to Center of a Driveway**

	Collector	Secondary Arterial	Primary Arterial
Street Speed (mph)	30	35	40
Spacing Distance (feet)	160	210	270

Driveway spacing should not be greater than the typical frontage of a lot. Issues that should be considered to address difficult vehicle movements include: the use of joint driveways, the use of cross access easements, and the degree of access permitted by law to each property.

**Site Access Policy:** Springfield's current driveway ordinance addresses the number of driveways permitted on a site. The ordinances and policies of each jurisdiction should be reviewed with respect to the recommended spacing criteria.

Spacing between driveways for effective traffic flow is an issue on development sites as well as on streets. It is important that any intersection of driveways internal to a development site be far enough back from the public street that traffic backed up from the internal driveway intersection will not affect the operation of the driveway and public street intersection. There are currently no ordinances that address management of access to driveways internal to development sites. The distance from the street right-of-way to the nearest internal driveway intersection needs to be addressed by an ordinance provision related to site plan requirements.

The City of Springfield's current zoning ordinance requires a traffic impact study for some submittals. The Traffic Management Plan should address the thresholds for when a traffic impact study should be required for a City of Springfield or Greene County development, and the requirements for the required traffic impact study. The traffic impact study requirements need to be included in appropriate ordinances, policies, design standards, or any other appropriate guidelines of each jurisdiction reviewing the impact of land development on streets and highways.

**Traffic Flow Management Corridor Plans:** The most effective way to manage access on a major street is to define the access parameters for the street early in the development of the corridor. Traffic Flow Management Corridor Plans should be prepared for each major street in the study area, beginning with expressways and working to collector level streets.

**Parking:** Normally not permitted on new major streets. On major streets where parking is permitted, an On-Street Parking Management Plan shall be prepared that addresses a balanced vehicular flow, an efficient pedestrian flow, and parking needs.

### **Traffic Calming**

The problem of excessive volume and speed of motor vehicle traffic is one of the biggest negative factors affecting the quality of life in the Springfield-Greene County community, particularly in the older and more densely developed parts of the community. One method of dealing with excessive speed and volume on roadways is traffic calming. There are a number of different traffic calming techniques that have proved beneficial in other communities. Examples are found in the plan's Appendix.

Traffic calming is the redesign and reconstruction of roadways to encourage "calmer" (i.e., slower) traffic speeds. It is a relatively new approach in the United States but is becoming an increasingly popular approach to solving these problems. It is effective, relatively inexpensive and generally popular with neighborhood residents. Devices employed in traffic calming include sidewalk extensions, pedestrian islands, raised crosswalks, speed humps, traffic circles, and other physical and visual modifications.

The City of Springfield, Greene County, and MoDOT recognize the importance of creating a safe pedestrian environment near schools. For that reason, planning and engineering officials should work with the Springfield R-12 school system and other neighboring school systems to ensure that safe driving speeds are encouraged, pedestrian safety mechanisms are implemented where favorable, and traffic calming solutions are considered to address safety problems.

### **Intelligent Transportation Systems**

In an effort to alleviate traffic problems and to create a transportation system that keeps pace with traffic growth in the Springfield-Greene County area, the City and the State have designed and implemented several components of an Intelligent Transportation System (ITS) created specifically to compliment the area's unique inter-jurisdictional roadway and signal system. The inter-jurisdictional system includes over 240 traffic signals and more than 25 closed-circuit television traffic monitoring cameras maintained by the City of Springfield and the Missouri Department of Transportation.

In 1989, the City of Springfield and the Missouri Department of Transportation entered into a contract to implement a multi-user, multi-jurisdictional centralized closed loop signal system. This cooperative agreement allowed each agency to implement mutual signal coordination at locations where jurisdictions overlap. Traffic signal timing plans are developed and implemented at the Transportation Management Center by the City of Springfield and MoDOT signal system coordinators. Because signals maintained by each agency are inter-connected through the central computer, City and State system coordinators are able to coordinate signal timing between all signals, as appropriate.

The existing ITS includes four categories, which have been ongoing since 1989: City and State traffic signal system, transportation management center, traffic video monitoring, and traffic information network. All of these programs should continue and the programs should be enhanced, whenever feasible in accordance with the recommendations of the ITS Study for the Springfield region - Final Concept Plan developed by the City of Springfield and MoDOT in July 2000.

The City and MoDOT worked together with regional stakeholders as a part of the 2000 ITS Study to develop a vision and goals for ITS in the region. The resulting vision for ITS in the Springfield region is:

**“Using Intelligent Transportation Systems (ITS) with other available technologies and engineering advancements, the City of Springfield, MoDOT, and other partners will strive to plan, implement and operate the safest, most efficient and most effective multi-user, multi-modal transportation system possible.”**

In support of achieving the vision, the Steering Committee and other stakeholders agreed to the following goals for ITS in the region. These goals are divided into a series of categories:

**Transportation Management:**

- Deploy traffic management systems which:
  - improve congestion management;
  - improve traffic movement and enhance the movement of people and goods;
  - incorporate multiple transportation modes;
  - improve traffic signal control; and
  - develop a freeway management system.
  
- Deploy incident management systems which:
  - improve safety;
  - reduce incident response time; and
  - reduce delays during incidents.
- Deploy emergency vehicle management systems which:
  - reduce incident response time.
- Deploy road and weather information systems which:
  - improve knowledge of weather-related road conditions
  - reduce incidents;
  - increase public awareness of weather-related road conditions; and
  - maximize snow removal efficiency.

**Information Management:**

- Create seamless solutions;
- Create easy access to information on transportation conditions; and
- Educate the public.

**Institutional Cohesiveness:**

- Encourage improved partnerships among state government, local governments, the public and private sectors;
- Create interdependent relationships; and
- Encourage enhanced cooperation.

**Life-Cycling Funding:**

- Minimize operational and maintenance costs;
- Consider cooperative funding;
- Consider joint use of facilities; and
- Identify revenue opportunities.

**Regional Impacts:**

- Increase safety;
- Minimize environmental impacts; and
- Streamline communications.

**Recommendations:**

- Increase community awareness of the rideshare program through additional advertising, promotion, and other means.
- Identifying appropriate locations for park and ride facilities along U.S. 65, which could further facilitate carpooling between Springfield and Branson.
- Work with large area employers to look at various programs for implementing Transportation Demand Management (TDM) mechanisms, especially in areas where the transportation system meets or exceeds its capacity.
- Encourage coordination between the City Utilities fixed-route transit system and the Southwest Missouri State University shuttle system to maximize transit system efficiency in the metropolitan area.
- Explore Advanced Transportation Management Systems options in the metropolitan area and investigate potential funding sources to implement these strategies.
- Jurisdictions should utilize driveway ordinances in order to control access to major streets.
- Subdivision ordinances should incorporate access standards for major streets, in order to control access to future streets.
- Jurisdictions should work together to draft and implement an area-wide Traffic Flow Management Plan. Policies in this document should ensure that access points are adequate in number and designed to prevent both on-site and off-site traffic congestion.
- Jurisdictions should work together to develop Traffic Flow Management Corridor Plans for major streets in the MPO Transportation Planning Area.
- Continue to modernize existing signal systems.
- Expand the regional Intelligent Transportation System in accordance with recommendations of the Springfield Region ITS Concept Plan.
- Consider using traffic calming methods in appropriate locations. Developers should be encouraged to implement traffic calming methods, where appropriate.
- The City of Springfield and Greene County should work together to develop an official policy for gated communities.

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# Airports

## Introduction

The Springfield-Branson Regional Airport is the main air facility in Southwest Missouri and is an important link to future national and international markets. It is located in the northwest portion of the City of Springfield, in the central part of Greene County. The Springfield-Branson Regional Airport is owned by the City of Springfield and operated by an administrative board of the City, the Springfield Regional Airport Board. The Airport Board has the power and duty to operate the airport and related facilities including the day-to-day care, supervision and custody of airport activities and properties. In carrying out these duties, the Airport Board is empowered to: acquire property and materials; adopt (subject to approval by the City Council) bylaws, rules and regulations for the control and management of airport facilities; and hire employees as necessary to oversee and operate airport facilities.

Springfield/Greene County also has a private aircraft airport, the Downtown Airport, which is located off East Division Street. This facility, along with the general aviation facility at the Springfield-Branson Regional Airport, serves the charter and private aircraft needs for the community.

An increasing aviation era, driven by new technologies and characterized by “just in time sourcing”, suggests that the airport will have an increased role in the regional and national movement of goods. As airport overcrowding and congestion increases at many of the country’s major airports, opportunities for economic development at sites such as the Regional Airport should increase.

The Springfield-Branson Regional Airport currently provides important passenger service to the area. In 1999, commercial passenger usage increased one percent from 1998, for a total of 705,882 enplanements and deplanements. Airport officials project a three percent increase in enplanements and deplanements in 2000. Airfreight increased at a much greater rate (66 percent) over the same three-year period. The regional airport was recognized as a major community asset by *Vision 20/20*. The airport should be supported, enhanced and protected from incompatible future development.

## Goal and Objectives

**Goal:** Provide airport facilities to meet the needs of air carriers, general aviation, and air freight in a safe and adequate manner.

**Objectives:**

- Enhance the Springfield-Branson Regional Airport, its commercial and general aviation interests, and its regional aviation industries; and provide for appropriate aviation development while minimizing any negative impact on adjacent land uses.

- Continue the phased implementation of the master plan for the Springfield-Branson Regional Airport, ensuring that improvements are timed to be in place when warranted by air traffic.
- Coordinate airport development with land use patterns to ensure that environmental conflicts are minimized.
- Update the airport plan as needed to ensure the continued validity of the forecasts and recommendations of the plan.

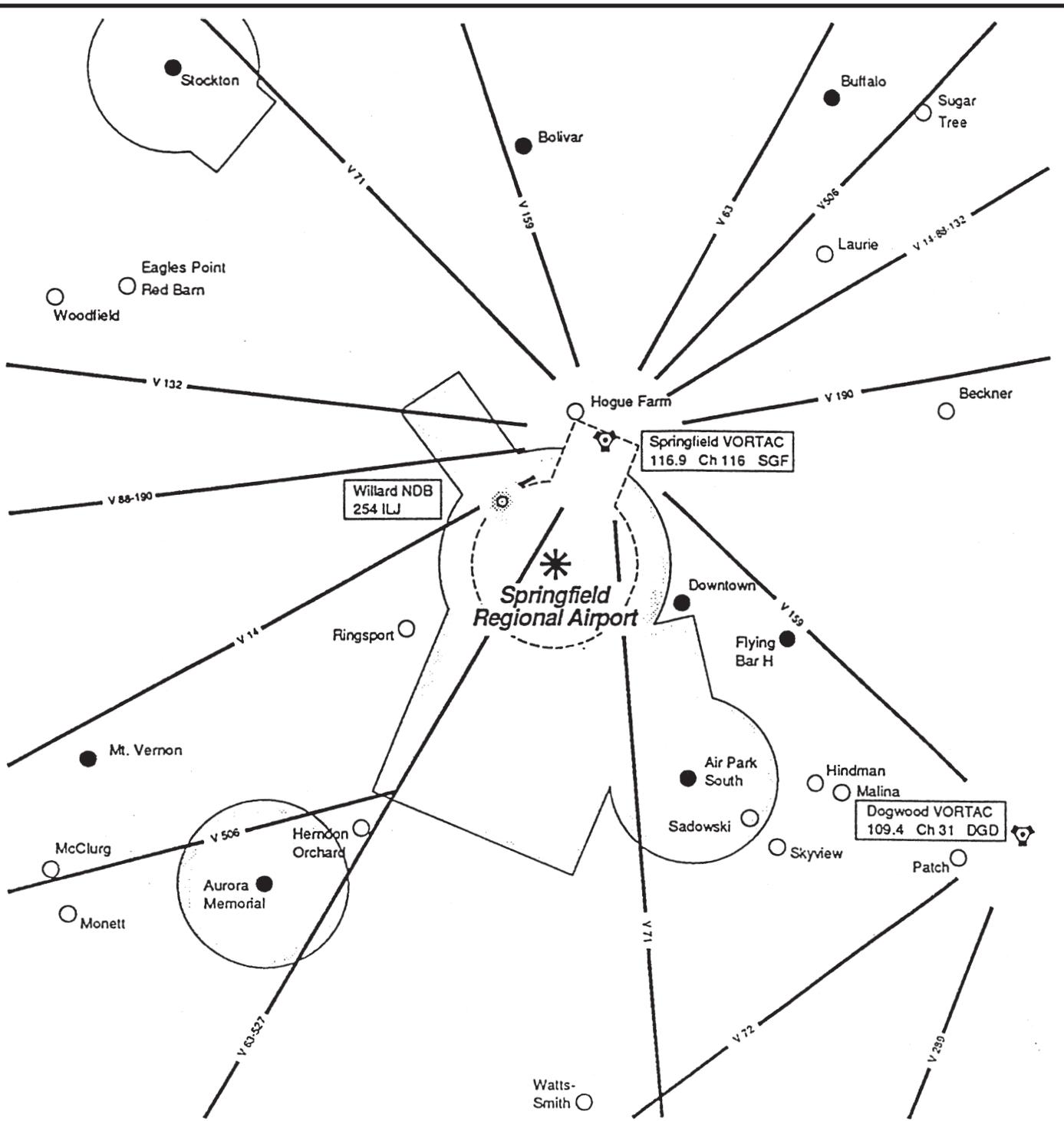
## Community Airports Inventory

In addition to the two Springfield-Greene County airports mentioned in the introduction, there are several existing public and private airports located in the general vicinity of Springfield-Branson Regional Airport. According to the U.S. Department of Commerce Kansas City Sectional Aeronautical Chart, there are two public airports, three privately owned and publicly used airports, and nine privately owned private-use airports in the area. The public airports include Aurora Memorial Municipal Airport and Bolivar Memorial Airport. The private with public use airports are Air Park South, Downtown Airport, and Flying Bar H Ranch. The privately owned and privately used airports within the environs of the Springfield-Branson Regional Airport include Beckner, Herndon Orchard, Hindman, Hogue Farm, Laurie, Malina, Ringsport, Sadowski, and Skyview. **Figure 20-17** shows all of the facilities in the Springfield-Greene County area. The following is **Table 20-13**, Airports Inventory Summary:

**Table 20-13: Airports Inventory Summary**

Airport	Owner/Use	Direction & Distance from Springfield-Branson Regional Airport	Runway Length(s) (feet)
Aurora Memorial	Public/Public	22 NM Southwest	3,000
Bolivar Memorial	Public/Public	22 NM North	2,565 & 2,480
Air Park South	Private/Public	13 NM Southeast	2,535
Downtown	Private/Public	7 NM Southeast	3,845
Flying Bar H Ranch	Private/Public	13 NM East	2,640
Beckner	Private/Private	22 NM Northeast	2,600
Herndon Orchard	Private/Private	17 NM Southwest	2,200
Hindman	Private/Private	17 NM Southeast	2,300
Hogue Farm	Private/Private	8 NM North	1,300
Laurie	Private/Private	21 NM Northeast	1,800
Malina	Private/Private	19 NM Southeast	1,800
Ringsport	Private/Private	10 NM Southwest	2,000
Sadowski	Private/Private	16 NM Southeast	2,700
Skyview	Private/Private	19 NM Southeast	2,100

Source: *Springfield Regional Airport Master Plan*, 12/90  
 NM = Nautical Miles



**LEGEND**

- Public Use Airport
- Private Use Airport
- ⬮ VORTAC
- ⊙ NDB
- Low Altitude Federal Airways
- Floor of Controlled Airspace 700' AGL
- - - Control Zone

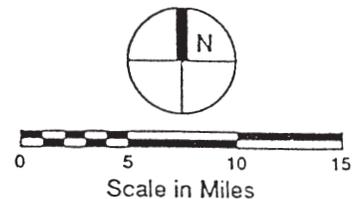


Figure 20-17

**Recommendation:**

- The city should examine zoning patterns for vacant land around Downtown Airport (the primary private/public Springfield community airport) and should encourage only compatible uses within the approach paths of the runways.

## **Springfield-Branson Regional Airport Plan**

### **Master Plan**

The Master Plan for the Springfield-Branson Regional Airport was last updated December 1990. The plan addresses the planned growth of airport facilities to meet future demand for “on-airport” facilities and facilities related to the surrounding land uses and the community as a whole.

### **Commercial Airlines**

Seven scheduled commercial airlines operate at Springfield-Branson Regional Airport. Non-stop commercial air service is provided to the following hub cities: St. Louis, Missouri; Kansas City, Missouri; Denver, Colorado; Dallas, Texas; Chicago, Illinois; and Memphis, Tennessee. Private aircraft storage is available at the airport, as are facilities for aircraft maintenance, repair, and fuel.

### **Existing Land Use and Zoning**

Existing land use within the vicinity of the Springfield-Branson Regional Airport is mostly rural in nature, with a few dense residential subdivisions west and east of the airport. Directly east of the airport along Kearney Street are scattered commercial and industrial uses, with a few residential uses close to Interstate-44. To the southeast of the airport property are scattered residential units, along with a cemetery. Southeast of Interstate-44 is an elementary school and a residential subdivision. Directly south of the airport is a cemetery and scattered residential units. Farther to the south are commercial and industrial uses along the interstate highway.

To the southwest are mostly agricultural uses and scattered residential uses. The area to the west includes scattered residential and agricultural uses, with a few residential subdivisions. To the north and northwest are scattered residential and agricultural uses, with the same type of uses to the northeast. The developed area of the City of Springfield is to the southeast of the airport, with the Center City being at a distance of approximately five miles. There are no rest homes, hospitals, or other noise sensitive uses in the airport environs.

The generalized existing zoning within the vicinity of the Springfield-Branson Regional Airport includes a significant amount of agricultural use to the north, northwest, and northeast of the airport, outside the city limits. The area to the west of the airport, also outside the city limits, is zoned for residential and agricultural uses, with agricultural zoning to the southwest of the airport, beyond the city limits. There is one small area of Greene County residential zoning to the southwest. The area to the south and southeast of the airport, beyond the city limits, is zoned for agricultural and manufacturing uses.

The area beyond the city limits beyond the city limits to the east and northeast of the airport is zoned for manufacturing, agricultural, and residential uses.

The area within the city limits, surrounding the airport on all sides except for the northwest, is zoned for manufacturing uses. The small area to the northwest within the city limits is zoned for agricultural uses. To the east of the airport, the City of Springfield zoning is composed of manufacturing and residential uses, with some commercial uses to the southeast.

### **Airport Zone**

In addition to traditional land use zoning, Greene County has also adopted an Airport Zone pursuant to state statute which *mandates* that the County shall adopt such regulations (House Bill No. 957, First Regular Session, 1979, of the General Assembly of the State of Missouri, Vernon's Annotated Missouri Statutes, Section 305.400 et seq.). This statute, unique to Greene County, prohibits the development of residential structures, hospitals, health institutions, clinics, sanitariums, nursing homes, convalescent homes, institutional homes, schools, libraries, sports arenas, daycare centers, churches, auditoriums, theatres or other similar facilities within the Airport Zones. In addition, no structure may exceed 50-feet in height within the same zone or more than 100-feet in height within any area located outside of an airport zone but located otherwise within an area 2,000-feet parallel to and on each side of the centerline of the runway extended 10,000-feet from the end of the runway. This includes both the existing runway and a proposed runway to the west.

The Airport Zone is (4,000-feet) in width, which extends for a distance of 10,000-feet off the end of each runway. These zones are illustrated in **Figure 20-18**, Airport Zoning Boundary.

Identification of the current and future development issues, which may impact the future use of a public facility, is an important step in any planning process. This is particularly true of an airport where the infrastructure investment is great and where the issues are complex. Airport facilities and its environs must be planned to function in unison so as to not build constraints in one area that will significantly limit the capacity of the entire facility.

### **Passenger Terminal**

The issues facing passenger terminal development at Springfield-Branson Regional Airport are possibly the most complex of any single use area on the airport grounds. The issues involve the ability to use the terminal efficiently as the point on the airport grounds where passengers purchase tickets, check baggage, and board commercial aircraft. This is the point where the landside and the airside must interface, where efficient access for both aircraft and ground vehicles is essential.

There are a number of passenger facilities that need improvements to facilitate the ease of access between passengers and aircraft. The following systems and their related facilities are targeted for future improvements to help facilitate efficiencies:

- Ground vehicle access;
- Automobile parking;

- Rental car facilities;
- Aircraft access; and,
- Public transportation access.

### **Air Cargo**

Because of local and national growth in the air cargo industry, there needs to be the identification and development of an expansion area for the air cargo function at Springfield-Branson Regional Airport. The air cargo area at the airport presently contains a multi-tenant office/air cargo building, United Parcel Service facilities, and an air cargo apron that can simultaneously accommodate as many as five large aircraft (B727-200) and (B757) along with several smaller aircraft. An additional expansion area is available in the immediate vicinity of the existing cargo area to accommodate the expected future growth in air freight facilities. However, extraordinary growth associated with a large freight complex (e.g., a sorting plant) would require a more spacious site than is available near the existing cargo area.

### **Industrial Facilities**

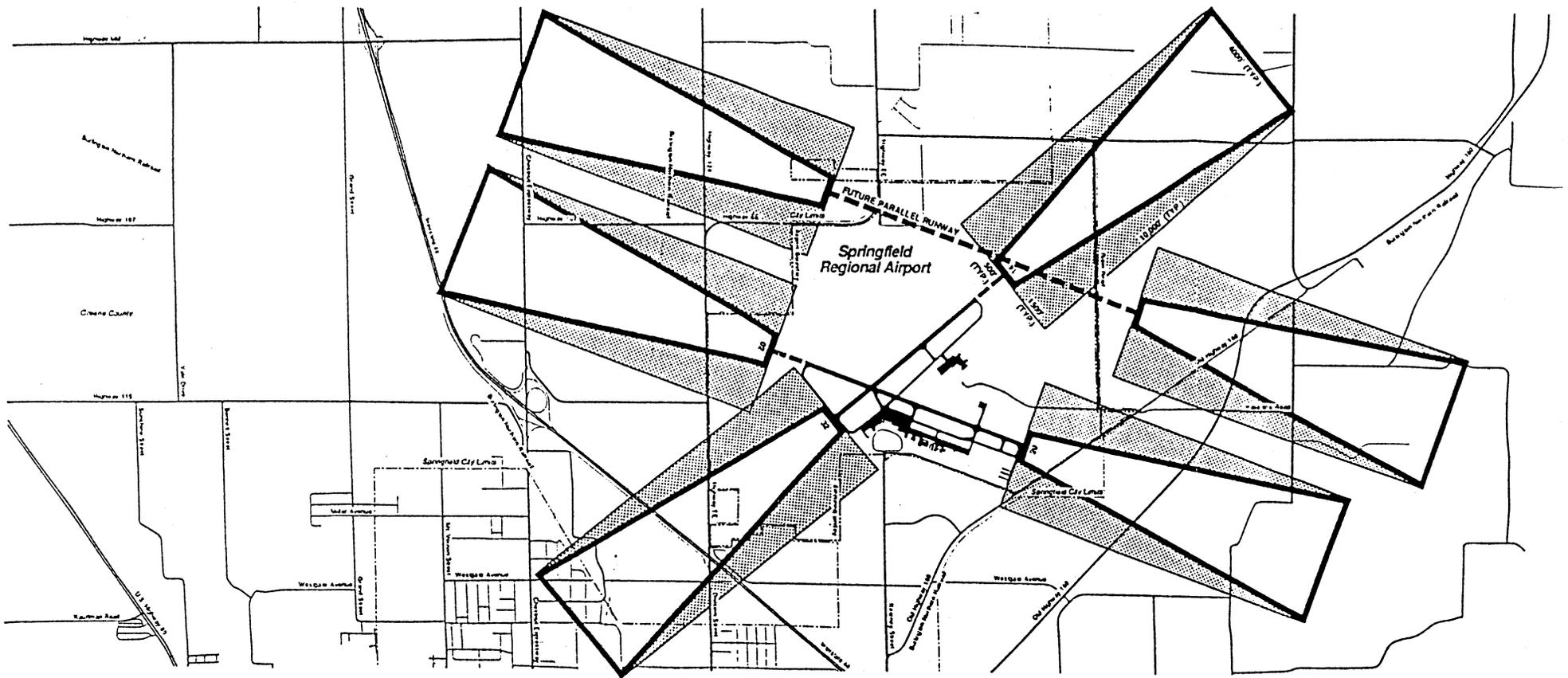
The opportunities provided by aviation and non-aviation related industrial development on airport property are great. Land has been allocated and supporting infrastructure provided in the northern portion of the airport property for the Air Centre Industrial Park. The Air Centre Industrial Park can accommodate both aviation and non-aviation industrial facilities. As industrial site development demand exceeds the airport area's supply, other sites in the Springfield-Branson Regional Airport environs or within Springfield-Greene County proper should be able to accommodate future industrial park demand and the potential for growth in projected industrial park demand.

### **Airport Ground Access**

In addition to the air carrier terminal, convenient ground access is vital to all commercial and employment areas located on airport property. At the same time, airside security with restricted access to the actual airfield is vital at the airport. Springfield-Branson Regional Airport will need to continue to address this landside access as the airport grows to meet future demand.

### **General Aviation**

The Springfield-Branson Regional Airport is not only a facility, which accommodates air carrier traffic, it also functions as a major general aviation facility. This combination of uses at the airport creates opportunities, conflicts, and questions that pertain to the future use of the facility. There is a separate general aviation terminal that accommodates the general aviation passengers and aircraft. Future airport planning should continue to minimize any conflicts between the general aviation facility and the air carrier traffic.



Scale in Feet  
1" = 3000'

Airport Zoning Boundary

- Airport Zones  
50' Height Maximum and  
Land Use Restrictions
- Transitional Zones  
100' Height Maximum

Springfield Regional Airport  
Master Plan Update

BARNARD DUNKELBERG & COMPANY  
ISBILL ASSOCIATES, INC./MESTRE GREVE ASSOCIATES  
HOWARD MOORE GROUP/URBAN ENVIRONMENT ASSOCIATES

Figure 20-18

SOURCE: AERIAL PHOTOGRAPHY, USGS MAPS AND CITY OF SPRINGFIELD BASE MAPS

### **New Parallel Runway**

The existing Airport Master Plan calls for the expansion of airside development at Springfield-Branson Regional Airport, with the construction of a new parallel runway. The construction of this runway will impact the function of other areas of the airport, including the air carrier terminal, ground vehicle access, area available for commercial and industrial development, etc. In addition, aircraft traffic mix and allocations will be affected as well by noise abatement requirements and opportunities.

### **Taxiway Development**

Along with the future development of runway improvements and landside improvements at Springfield-Branson Regional Airport, the existing taxiway system will need to be modified/expanded to properly serve airport facilities.

### **Air Traffic Control Tower**

The Air Traffic Control Tower (ATCT) at Springfield-Branson Regional Airport is located on the western portion of the airport property, northwest of Runway 02/20 and southwest of Runway 14/32. This location appears to work well with both the existing airport layout and the future airport layout, including the new parallel runway. Future runway extensions, new runway development, and new structures should be sited to avoid the creation of ATCT line-of-sight problems.

### **Office Building/Hotel Sites**

Presently, there is no hotel or office development on Springfield-Branson Regional Airport property. In 1999 a new hotel and restaurant development was constructed at the Interstate-44 and West Bypass interchange. This development is constructed on private property near the airport.

Many airports around the country not only lease land for hotels but also for office/commercial structures which do not directly relate to airport functions but benefit from a location adjacent to the airport. As the airport expands the demand for these types of facilities is likely to increase.

### **Land Acquisition**

As future development concerns are identified and future development areas are located on the site of Springfield-Branson Regional Airport, recommendations will be made on the need for additional land acquisition along with the best use of the existing airport land. These recommendations will include land acquisition for not only facility expansion but also noise abatement and land use compatibility purposes. To enable the development of future airport facilities and to help ensure land use compatibility, the Springfield Airport Board and staff have aggressively pursued land acquisition in the past. This past activity, along with current land acquisition projects, provides the airport with relatively few land use compatibility problems and the majority of the land necessary to develop future airport facilities.

## Phased Airport Improvements

A goal of *Vision 20/20* is to continue to upgrade the Springfield-Branson Regional Airport facilities in accordance with the Airport Master Plan. This goal includes the need to review the implementation schedule annually, based on airport activity and financing availability.

The Airport Master Plan adopted in December 1990, set forth recommendations for development of the airport facilities for the subsequent 20 years. The Airport Board has followed the framework of this plan in making major improvements. Both the programmed and planned ground transportation improvements to the year 2020 are included in the Fiscal Plan of the Transportation Plan.

Passenger activity at the airport has grown more dramatically than anticipated, but implementation of the Airport Master Plan has not kept pace or proceeded as rapidly as originally proposed. As recommended in the plan, improvements should be made not according to a predetermined schedule, but when warranted by aircraft and passenger activity levels.

The Airport Master plan recommended eventual relocation of the airport terminal complex to a point west of the existing north-south runway, with highway access off West Division Street. The new terminal relocation is anticipated within the next 15 years, depending on enplanement and deplanement figures. There is also a corridor study being conducted to determine the most appropriate land access to the new terminal facility.

The Airport Board has also decided to make improvements to the existing terminal to the maximum allowed by the physical site constraints. These improvements will help alleviate facility problems where they are currently deficient, until such time as increased capacity for all facilities is added with the new terminal facility. For this reason the Kearney Street entrance to the airport should be maintained and improved until such time as a relocated terminal becomes necessary to accommodate airport operations.

## Forecast Updates

It is critical that the findings and recommendations of the Airport Master Plan be current and accurate. Since the Master Plan serves as a guide for the implementation of airport improvements, it is important that it be kept up-to-date to reflect changes in patterns of airport usage and other conditions in the community. The plan should be reviewed annually to verify its assumptions and forecasts. If any major changes occur in the aviation industry or in Springfield which were not anticipated when the plan was originally developed, an updated plan should be prepared.

## Recommendations:

- Implementation of the Airport Master plan is the responsibility of the Airport Board and the Springfield-Branson Regional Airport staff. A schedule of proposed capital improvements is prepared annually, based on identified needs and funding availability, and is incorporated into the MPO Transportation Improvement Program. Planned future capital improvements are included in the Fiscal Plan. The

Transportation Plan should be amended to include future airport projects that are not included in the Fiscal Plan.

- The Springfield Airport Board and the Springfield-Branson Regional Airport staff are responsible for assuring that the Master Plan is current. In the event that a major update of the plan is needed, the Airport Board should appropriate funds and retain a consultant or hire additional staff to conduct the study.

### **Land Use Considerations and Day-Night Sound Levels (Ldn)**

The *Vision 20/20* process stressed the importance of assuring the citizens of Springfield-Greene County that only compatible land uses surround airport development now and in the future.

A major environmental conflict, which could result from future development adjacent to the Springfield-Branson Regional Airport, is noise. However, with careful control over development in the area, adverse noise impacts on the area can be minimized.

Noise has been defined as unwanted sound and it is known to have several adverse effects on people. Because of the effects of noise, criteria have been established by the Federal Aviation Administration (FAA) to help protect the public health and safety, thus preventing disruption of certain human activities. The FAA methodology includes Day-Night Sound Level (Ldn) contours as a guide to identify areas susceptible to noise from aircraft operations. The Ldn is a 24-hour, time-weighted annual average noise level. “Time-weighted” refers to the fact that noise that occurs during certain sensitive time periods (i.e., after 10 p.m.) is penalized for being more obtrusive.

This methodology takes into account not only absolute noise levels but also factors such as noise duration, number of aircraft operations, flight paths, and time of day. This criteria is based on known effects of noise on people such as hearing loss, communication interference, sleep interference, physiological responses, and annoyance.

According to the FAR Part 150 Land Use Compatibility Matrix, residential land use is deemed acceptable for noise exposures up to 65 Ldn. Certain sensitive land uses such as hospitals, nursing homes, churches, auditoriums, and concert halls must have structures that are compatible to noise level readings of 25-35 decibels. **Table 20-14** indicates land uses, which are compatible with various levels of noise exposure.

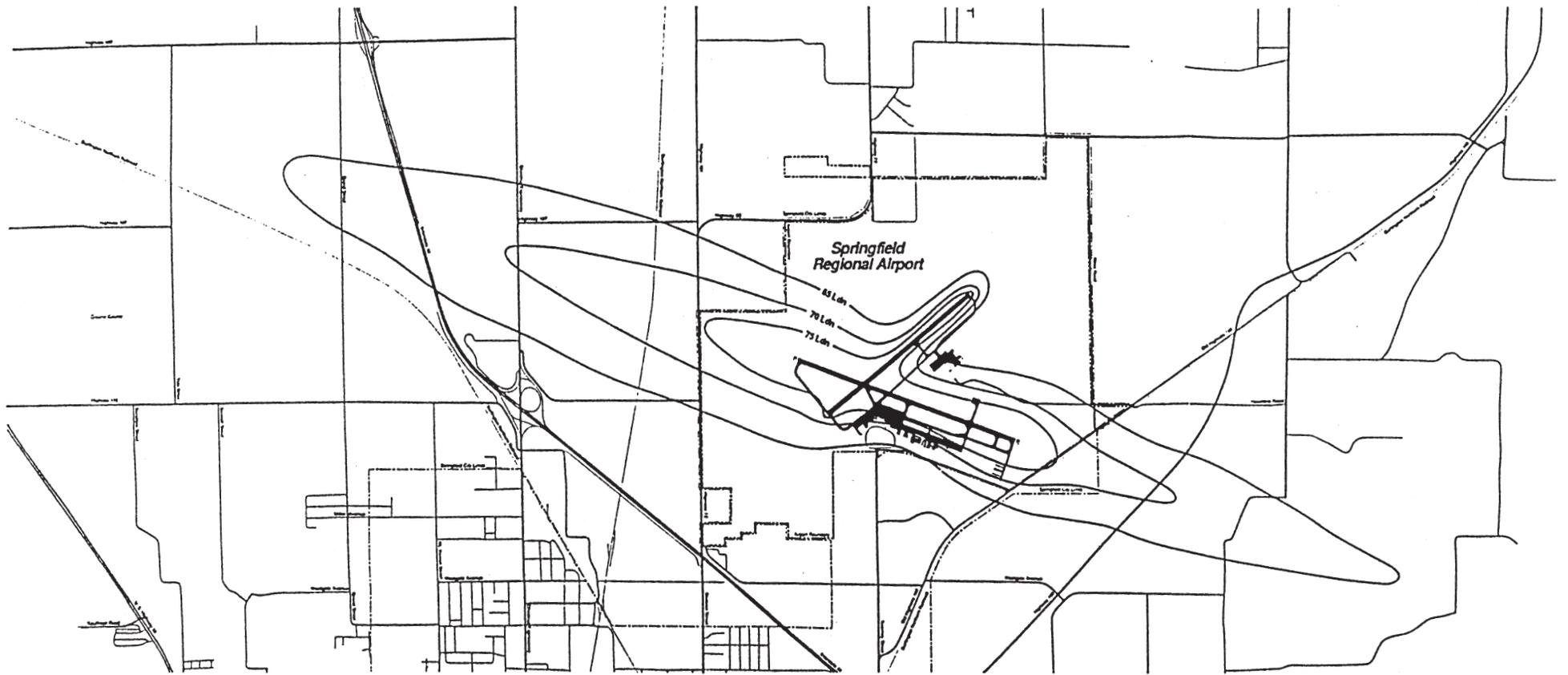
The 1990 Airport Master Plan identified Ldn contours for the year 1988, as indicated in **Figure 20-19**. **Table 20-14** indicates recommended noise level guidelines for determining acceptability and permissibility of land uses. The guidelines specify a maximum amount of noise exposure (Ldn) that will be considered acceptable or compatible with people in living and working areas. These noise levels are derived from case histories involving aircraft noise problems at civilian and military airports and the resultant community response.

The FAA notes that the responsibility for determining the acceptability and permissible land uses remains with the local authorities. It is important that Greene County continue the existing zoning policy as authorized by RSMO 305.400 et.seq in order to ensure noise compatibility of uses. As a general rule, land within any of the defined noise contours (65-75 Ldn) should not be zoned to allow construction of residences, hospitals, theaters,

outdoor amphitheaters, or other noise-sensitive uses. In certain cases, however, such uses may be permitted if a detailed noise analysis is made and noise control features are included in the building design (as specified in **Table 20-14**).

**Recommendation:**

- It is critical that the City of Springfield and Greene County follow existing practices for protecting noise levels, the environmental quality, and the land use compatibility of the Springfield-Branson Regional Airport area. The city and the county should continue the existing zoning patterns in effect around Springfield Regional Airport. No rezoning of agricultural land to noise-sensitive uses should be allowed within the noise contours (65-75 Ldn) unless a detailed noise analysis is made and noise control features are included in the building design.



1000 0 1000 2000 3000

Scale in Feet  
1" = 3000'

Existing Noise Contours, 1988

Figure 20-19

Springfield Regional Airport  
FAR Part 150 Noise Exposure and  
Land Use Compatibility Study

BARNARD DUNKELBERG & COMPANY  
ISBELL ASSOCIATES, INC. AND STEPHEN GAGNE ASSOCIATES  
HOWARD MOORE GROUP/URBAN ENVIRONMENT ASSOCIATES

**Table 20-14: Suggested Land Use Compatibility for Airport Development**

LAND USE	Yearly Day-Night Sound Level (Ldn) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
<b>Residential</b>						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodgings	Y	N(1)	N(1)	N(1)	N	N
<b>Public Use</b>						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums and concert halls	Y	25	30	N	N	N
Government Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
<b>Commercial Use</b>						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade-general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communications	Y	Y	25	30	N	N
<b>Manufacturing and production</b>						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
<b>Recreational</b>						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature Exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in Parentheses refer to notes

\* The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State or Local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

**Key to Table 1**

SLUCM	Standard Land Use Coding Manual.
Y (Yes)	Land uses and related structures are compatible without restrictions.
N (No)	Land uses and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor or indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25,30, or 35	Land Use and related structures generally compatible; measures to achieve NLR of 25,30, or 30 dB must be incorporated into design and construction of structure.

**Notes:**

- (1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) or at least 25 dB to 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 2, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use NLR criteria will not eliminated outdoor noise problems.
- (2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
- (3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
- (4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
- (5) Land uses compatible provided that special sound reinforcement systems are installed.
- (6) Residential buildings require an NLR of 25.
- (7) Residential buildings require an NLR of 30.
- (8) Residential buildings not permitted.

# Trucking

## Introduction

The trucking industry has a strong presence in Springfield and Greene County. Trucking companies are divided into truckload carriers and less-than-truckload carriers. According to a 1999 survey, there are 18 truckload carriers doing business in the Springfield area, 14 are headquartered in the area. These 18 companies carry a variety of commodities and have a total of 2,731 employees. In 1999, there were 5,648 tractors and 7,406 trailers used locally. Thirteen companies disclosed ICC revenues (1998) which totaled \$688.8 million in local revenues. The four companies with headquarters outside the Springfield area either failed to report revenues or reported only local revenues. Sixteen companies serve all 48 states in the continental U.S. and two serve regional markets. In addition, seven go to Canada and four to Mexico.

There were ten less-than-truckload carriers doing business in the area in 1999, one of which has its headquarters here. The ten less-than-truckload carriers employ 799 people and utilize 307 tractors and 863 trailers locally (**Figure 20-20**).

## Goal and Objectives

**Goal:** Provide for the safe, efficient movement of trucks through and within Springfield and Greene County.

### Objective 1

Locate truck-generating facilities along major streets, or on collector streets connecting directly to major streets, in order to encourage trucks to confine their travel to arterials and expressways.

**Intent:** To avoid traffic congestion and safety hazards resulting from truck travel on streets unsuited for such usage.

Facilities that generate movements of heavy trucks are generally permitted in certain commercial, manufacturing, or industrial zoning districts. Within the City of Springfield these would include CS (Commercial Service), RI (Restricted Industrial), LI (Light Industrial), GM (General Manufacturing), and HM (Heavy Manufacturing) zoning districts, along with certain uses in the LB (Limited Business), GR (General Retail), HC (Highway Commercial), and CC (Center City) districts. The Greene County zoning districts likely to have movements of heavy trucks are C1 (Neighborhood Commercial), C2 (General Commercial), M1 (light Manufacturing or Industrial), and M2 (General Manufacturing or Industrial). Control of truck movements can be exercised largely through zoning and subdivision regulations. Given proper land use and subdivision design, most trucks will tend to use the major arterial system without being required to do so. However, a tract of land may be zoned for an intense use but be surrounded by a residential area. In such a situation, if there is no direct access to a major street, truck traffic will intrude on the residential streets.

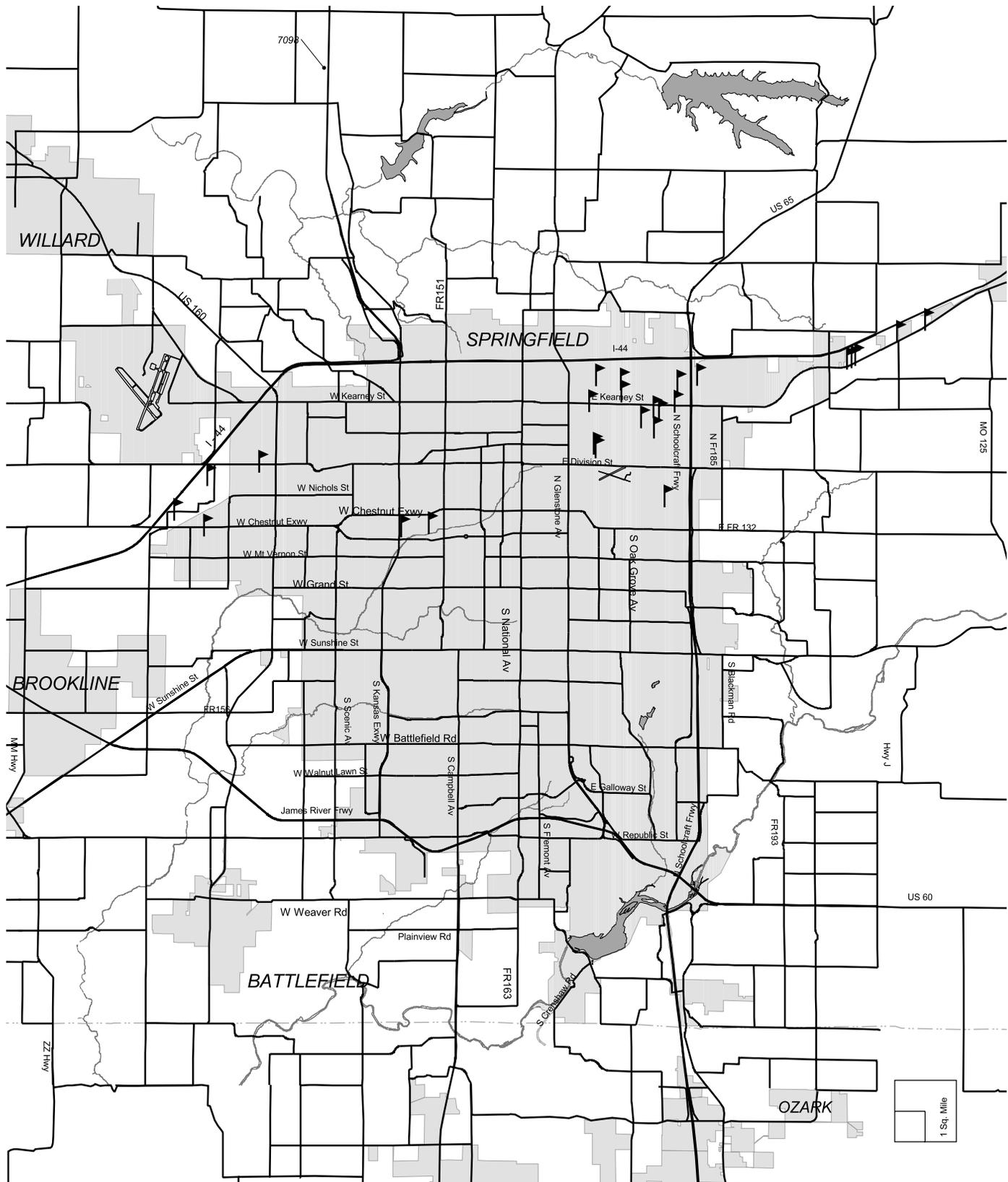


Figure 20-20  
Truckload and Less-Than Truckload Carriers

-  Major Streets and Roads
-  Truckload Carriers



When land, either platted or unplatted, is not already zoned for intense uses and a rezoning is requested which would allow truck-generating facilities, the ability to handle truck traffic should be considered in evaluating the request. Approval for the rezoning should be granted on the basis of:

- Directness of access to a major street;
- Proximity of facility to a residential area;
- Adequacy of surrounding street system for truck traffic;
- Impact on adjoining land uses of possible noise and air pollution; and
- Developer's willingness to make any needed improvements within a specified period of time.

### **Recommendations:**

- As a general rule, deny a rezoning request if the proposed use would result in truck travel through a residential area.
- Design subdivisions to provide for streets that channel truck traffic to the arterial system without passing through residential areas.
- Design transportation facilities to discourage truck movement through residential neighborhoods.

### **Objective 2**

Protect residential neighborhoods from the intrusion of truck travel.

**Intent:** To eliminate noise and air pollution from trucks traveling through a residential neighborhood. To reduce residential street maintenance costs to repair damage resulting from truck travel. To decrease the safety hazards on residential streets by discouraging through trips by trucks.

Zoning and subdivision regulations can be an effective control over new developments, which generate truck traffic. However, such regulations are less effective in dealing with existing situations. Where land is already subdivided and zoned for commercial or industrial uses a building permit can be obtained for new construction with minimal review by the City or County. Consequently, there is little control over access, and it is possible for a truck-generating facility to locate near residential areas and take access from residential streets.

The City of Springfield has enacted an ordinance to limit the use of certain streets to passenger cars only. The Traffic Advisory Board studied the problem of truck traffic in residential areas and recommended that truck prohibitions be used selectively to address specific problems. It was also recommended that Springfield use the following policy to guide the City Traffic Engineer in placement of Truck Prohibitions.

Truck prohibitions should be placed on all local and collector streets with residential zoning when the following conditions are met:

### **Volume of Truck Traffic**

- Total daily traffic volume is less than 3,500 vehicles per day; and
- Total number of trucks two-axle dual rear wheels, three-axle and greater exceed 25 in any consecutive four-hour time period; and
- Percentage of trucks exceeds five percent of the total traffic volume in the same four-hour time period; and
- An acceptable alternative route for the trucks exists.

Truck prohibitions would continue to permit delivery and service vehicles, including Public Works and City Utilities trucks, trash trucks, CU buses and school buses, and recreational vehicles.

### **Inadequate Street Design**

- When the alignment of a street is not adequate to accommodate all trucks as evidenced by accidents or leaving the roadway: or
- When the permitting of truck traffic would aggravate existing street maintenance problems.

Truck prohibitions placed due to inadequate street design may be eliminated when the street design and maintenance conditions are eliminated.

### **Recommendations:**

- Identify streets with potential or existing truck traffic problems. Then, using the criteria discussed above, determine whether or not truck traffic should be limited or prohibited on those streets.
- Develop measures (e.g., noise walls, berms, increased setbacks, etc.) to mitigate adverse noise impacts of major transportation facilities on adjacent less intense land uses.
- Locate major activity centers requiring extensive goods and service movements near major highway interchanges and along major arterial streets, so that truck traffic will not impact residential neighborhoods.
- Use traffic-calming devices and other means available to deal with problems in existing neighborhoods.

### **Objective 3**

Provide adequate off-street loading spaces for businesses, which receive or distribute goods by truck.

**Intent:** To avoid traffic congestion resulting from commercial vehicles using a roadway for loading or unloading.

**Recommendation:**

- Determine if there is a need for additional requirements for provision of off-street loading spaces in Greene County and the City of Springfield.

**Objective 4**

Maintain mobility on downtown streets while accommodating on-street loading of delivery vehicles.

**Intent:** To prevent delivery trucks from blocking the flow of vehicular traffic. This objective may be achieved through such means as:

- Provision of adequate number of loading zones at block ends.
- Stricter enforcement of No-Parking Zones (ticketing or towing of illegally-parked vehicles may be an effective means of reducing congestion if the city's policy is well understood and the supply of loading zones is adequate).
- Limit hours and areas of delivery. Springfield already imposes some restrictions on hours and areas of loading in the Park Central area, and similar limitations could be imposed upon other parts of downtown. In order to be effective, such restrictions would have to be strictly enforced.

**Recommendation:**

- Determine those areas where traffic congestion occurs due to truck deliveries and, working with neighborhood and merchant groups, determine the most effective method of dealing with the problem. The traffic engineer has the authority to implement effective parking control measures.

**Objective 5**

Continue to plan for response and mitigation for hazardous material spills and manage hazardous material transportation within sensitive areas along highways and railroads. Improve the regulation of shipments of explosives and other hazardous materials through the Springfield urban area.

**Intent:** To reduce the safety hazards involved in the transport of hazardous materials.

The shipment of truckloads of hazardous materials – explosives, flammable liquids, and toxic chemicals – has become increasingly common. A number of accidents involving such shipments have occurred in the Springfield area, and although none have been serious, the potential for loss of life and property is ever-present. Springfield has enacted an ordinance setting stringent restrictions on shipments of explosives within the city limits. The city has also established gasoline transport routes which restrict gasoline trucks to major streets while allowing them to make deliveries to retail service stations; however, the routes have not been kept up to date as new service stations have opened. Moreover, there are not existing city regulations for all hazardous materials transported within the city limits. The Springfield Fire Department, which is responsible for drafting such regulations, is in the process of revising the city's Fire Prevention Code to address these and other problems.

**Recommendations:**

- Ensure that stringent provisions concerning the transport of hazardous materials are included in local regulations for the City of Springfield, Greene County, and the other incorporated cities within Greene County.
- Provide annual code review and updates to ensure that provisions remain current.
- Work with Emergency Management, MoDot, and others in the community to plan and carry out responses to Hazardous Materials incidents.

**Objective 6**

Encourage the development of intermodal or multi-modal facilities, accommodating rail and trucking needs, in the Springfield area.

**Intent:** Today a significant percentage of freight in the U.S. is moved through a combination of rail and truck transport services. Full service multimodal freight service will become the norm and must be accommodated in the Springfield metro area.

**Recommendations:**

- Encourage development of a multimodal or inter-modal ground transport park that accommodates the movement of freight by rail and by truck.
- Work with railroads for development of a new intermodal rail facility that is easily accessible by interstate trucking.
- Provide more efficient freight transfer points.
- Provide a multimodal or inter-modal terminal at the airport and coordinate development of land and transportation facilities in the vicinity of the airport.

**Objective 7**

Improve communications with representatives of the trucking industry in Springfield and Greene County.

**Intent:** Although trucking companies are a private industry, they have a significant impact on transportation facilities and traffic flow in the metro area. It is in the best interest of the community and the industry to cooperate whenever possible. Cooperation is dependent on good communication.

**Recommendation:**

- Include a representative of the trucking industry on the Metropolitan Planning Organization (MPO) Technical Committee.

# Intercity Buses

## Introduction

Three inter-city passenger bus companies, Greyhound, Jefferson Lines, and Show Me Coaches, provide regular connecting service to cities throughout the country. The bus facility is currently served by the City Utilities Line 10 bus, which runs limited service in the mornings and afternoons.

The Springfield area also has a number of charter bus companies and companies offering bus tours to popular tourist areas in the region.

## Goal and Objectives

**Goal:** Facilitate the movement of intercity buses into, out of, and within the urbanized area.

### Objective 1

Encourage consolidation of all intercity bus transportation into a single, modern, conveniently located terminal.

**Intent:** To economize the provision of bus terminal facilities and to facilitate connections between various bus services. In addition to a terminal building, a bus facility should include: short-term and long-term parking, adequate loading and unloading spaces, and turn-around spaces large enough to accommodate a large bus. The location for a terminal should minimize traffic impacts on surrounding streets and should offer convenient access to overnight lodging and eating accommodations.

### Recommendations:

- Work with intercity bus companies to find locations for terminals that facilitate connections with other transportation providers.
- Consider a satellite intercity bus terminal in the proposed Jordan Valley Park Intermodal Parking Structure.

### Objective 2

Discourage the use of residential streets by intercity buses.

**Intent:** To protect the residential character of neighborhoods by discouraging intercity bus traffic on residential streets.

Intercity buses can have much the same effect as heavy trucks on residential neighborhoods. Bus traffic can be regulated much the same as truck traffic, through the location of terminals and, if necessary, by limiting certain streets to passenger vehicles only. Since there are a limited number of bus companies, and buses as a rule follow

defined routes into and out of the city, any major problems with buses using residential streets could usually be resolved through discussions with the companies.

**Recommendation:**

- City and County departments and agencies should monitor potential and existing problems with use of local streets by intercity buses. If a problem is identified, representatives from the City or County should discuss the issue with the appropriate company.

**Objective 3**

Provide convenient connections to local public transportation for persons using intercity buses.

**Intent:** To facilitate usage of intercity buses by residents in the Springfield area.

**Recommendation:**

- City Utilities should continue current service to the location of the new inter-city bus terminal and should investigate increased service to that location.

**Objective 4**

Encourage expanded intercity bus service.

**Intent:** To have additional intercity buss service available to people living in or traveling to this area.

**Recommendations:**

- Follow up on the Springfield/Branson Corridor Study proposal for an interregional and express bus service to meet the travel needs the corridor.
- Encourage intercity bus companies to provide service to at the Springfield/Branson Regional Airport.

# Railroads

## Introduction

In the last 20 years, the importance of the railroad industry in Springfield and Greene County has lessened. However, since their merger, the Burlington Northern and Santa Fe Railway Company has experienced an increase in train traffic through Springfield. Although the company recently closed its Diesel Shops in Springfield, approximately 850 jobs remain in the area. Rail lines, including many in the Partnership Industrial Center serve a variety of industries throughout the area. Over the last decade, some abandoned railroad land has been used for trails in the area through participation in rails to trails programs. Railroads within the metropolitan area are shown in **Figure 20-21**.

## Goal and Objectives

**Goal:** Railroad facilities should be compatible with other transportation modes and adjoining land uses in a way, which encourages desirable development patterns, promotes safe and efficient movement of people and goods, and facilitates rail operations.

### Objective 1

Provide an appropriate degree of safety between railroad traffic and motor vehicle traffic.

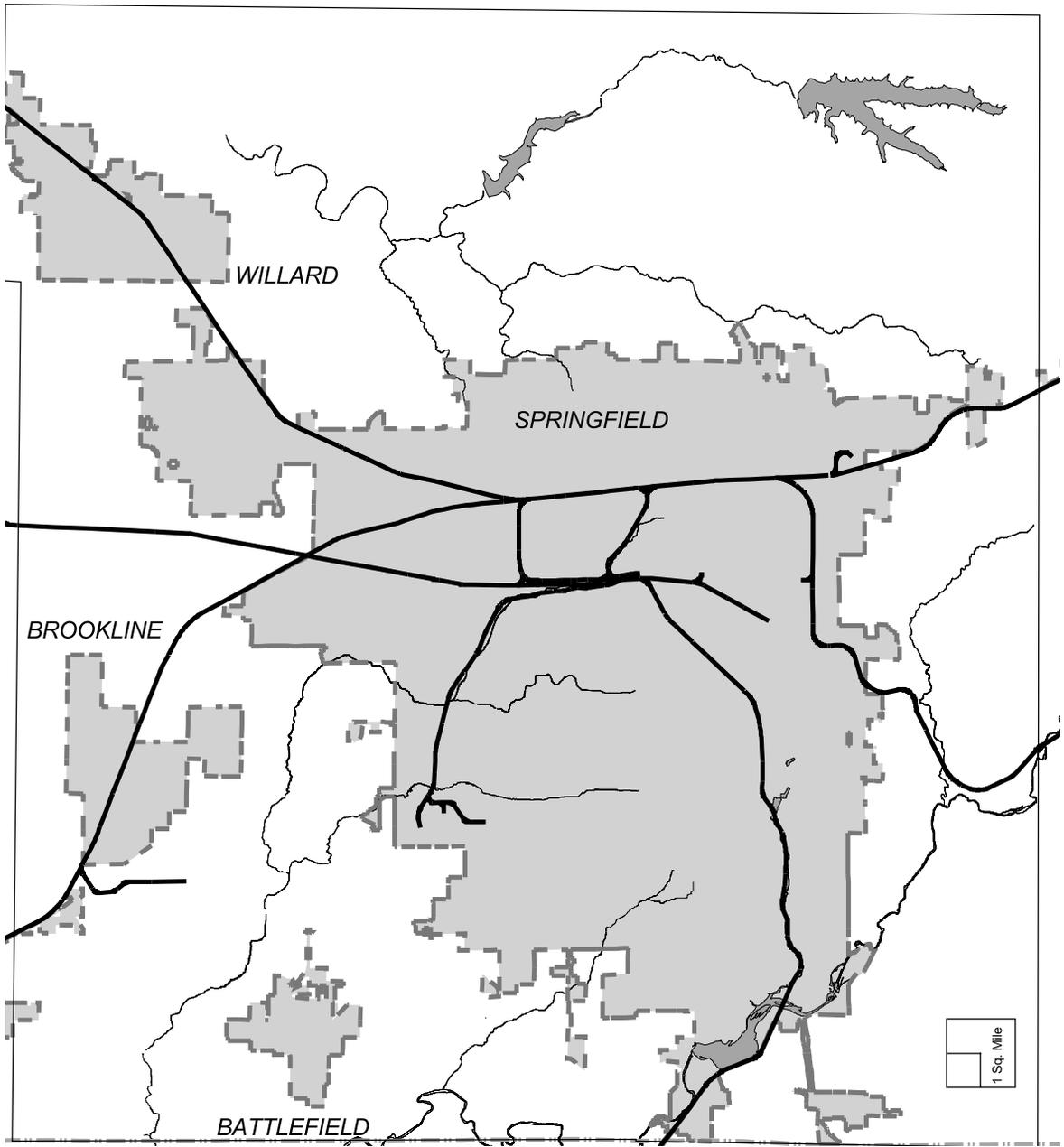
**Intent:** To provide maximum safety for both modes of travel and adequate access with respect to time and distance to all properties within the vicinity of railroads.

An adequate number of grade-separated crossings of frequently used railroads should be provided to ensure timely access to all properties in event of an emergency. Generally, a grade-separated crossing should be provided across main line tracks with frequent usage at intervals of two miles or less. If a train blocks an at-grade crossing, there should be an alternate way to cross the track with a travel time increase of not more than five minutes. For local tracks where trains may be stopped for extended periods of time, grade separated crossing should also be provided at reasonable intervals.

As plans are developed for new thoroughfares, the degree of protection should be included in project development. At-grade crossings of main line tracks should be avoided to provide for maximum safety and minimal disruption for interstate railroad movement. Appropriate levels of protection for thoroughfares of different classifications are identified in **Table 20-15**.

### Recommendations:

- Identify street crossings of railroad lines and recommend maintaining safety and accessibility train and motor traffic increase.
- Through subdivision review, ensure that all new developments have adequate access to the major thoroughfare system without crossing railroad tracks.



 Railroads

Figure 20-21  
 Railroad lines within the MPO Boundary (1997)

**Table 20-15: Level of Protection between Motor Vehicle Thoroughfares and Railroads**

Thoroughfare Classification	Main Line Railroad Track	Local Railroad Track
Freeway	Grade separation required	Grade separation encouraged; Gates, signals and extensive warning devices required
Expressway	Grade separation strongly encouraged; gates and signals required	Gates and signals required
Principal Arterial	Grade separation encouraged; gates and signals required	Gates and signals required
Secondary Arterial	Avoid crossing if alternative is available; gates and signals required	Gates and signals required
Collector	Avoid crossing; gates and signals required	Gates and signals required
Local	Avoid crossing; gates and signals required	Gates and signals required

**Objective 2**

Provide grade-separated crossings with adequate horizontal and vertical clearances between rail lines and high-volume streets.

**Intent:** To avoid interference between rail activity and the flow of vehicular traffic and to ensure the adequacy of clearances for vehicles at grade-separated crossings.

Several existing grade separations between railroads and area roadways contain inadequate clearances or insufficient roadway widths that should eventually be modified or replaced. The railroads are responsible for maintaining overpasses above streets and highways. However, since improvements to these crossings would probably be of greater benefit to motor vehicles than to rail activity, local governments usually share in the cost of improvements.

The minimal vertical clearance for any vehicular overhead structure should be 14-feet with 16-feet preferred. The minimum horizontal clearance should be at least 1.5-feet greater than the motor vehicle roadway width on either side, or five-feet on either side for pedestrian travel.

**Recommendation:**

- The appropriate local government would negotiate with the railroads concerning the location and funding of future grade-separated crossings.

**Objective 3**

Provide adequate warning devices at railroad crossings where grade separation is not feasible.

**Intent:** To minimize traffic accidents at railroad grade crossings through proper warning devices.

Where grade separation of railroad crossings is not practical (due to expense, terrain, or low volumes of rail or vehicular traffic), special effort should be made to alert motorists of approaching trains through appropriate crossing protection. The State of Missouri determines the types of warning devices used at highway/railroad at-grade crossings. Each at grade crossing is evaluated by a Diagnostic Review Team comprised of representatives from MoDot, the Missouri Division of Motor Carrier and Railroad Safety, the respective railroad public works engineer, and the local road authority. Each crossing is evaluated on identical factors and each crossing is ranked and then prioritized by the state for warning device upgrades. The type of warning device may also be determined. Funding is provided from federal funds and local matching funds.

**Recommendation:**

- Hazardous rail crossings should continue to be identified through the existing process with the appropriate state agencies.
- This objective should be implemented through negotiation between the Missouri Department of Transportation, railroads, local municipalities, and Greene County.

**Objective 4**

Encourage the development of compatible land uses in areas adjoining rail lines.

**Intent:** To encourage compatible land uses along major rail lines in order to take advantage of rail access. To provide a visual and noise buffer between rail traffic and incompatible land uses.

Industrial and heavy commercial activities are generally more compatible with major railroad facilities because such uses often require rail access. In addition, intense uses can provide a buffer from the noise and visual intrusion which railroad operations tend to create.

Railroad compatible land uses are not always practical, particularly along lightly traveled rail lines, in areas with unsuitable topographic features, or in areas containing existing development. Therefore, it would be appropriate to require plantings, fences, walls, or earth berms for any new development to provide a buffer against intrusion by rail operations. However, care should be taken that such bufferyards do not obstruct visibility at railroad crossings.

Much of the land along rail lines in Springfield is already developed or zoned for industrial uses. The main exception is in the southeast portion of the city, where a secondary rail line bisects several residential neighborhoods. Although much of the adjoining land is already developed, there are a number of vacant parcels zoned for residential use. Innovative site design incorporating bufferyards should be encouraged on these parcels.

**Recommendation:**

- When evaluating rezoning requests near a rail line, consider the suitability of the proposed use. If manufacturing or industrial uses are not feasible and the site characteristics permit, encourage use of the Planned Development District to provide bufferyards along rail lines. The city and county should also consider amending their zoning ordinances to include requirements for bufferyards between rail facilities and less-intense land uses, even when Planned Development District provisions are not used.

**Objective 5**

Encourage the reduction or elimination of lightly used trackage, which creates conflicts with vehicular traffic movement.

**Intent:** To reduce the hazards involved in the presence of railroad tracks within street rights-of-way where feasible.

The central area of Springfield contains a network of railroad tracks within the rights-of-way of several parallel streets (including Water, Phelps, and Mill Streets) which were originally intended to serve warehouses and industries located in the area. If current trends continue, many of these industries are likely to relocate to other parts of the community as the need arises for more modern facilities. Consequently, many of the tracks in the central area are likely to fall into disuse. When tracks are no longer needed they may be abandoned and the land used for other purposes, such as trails. Attention should be given to removal of unneeded tracks in conjunction with redevelopment projects in the Center City.

**Recommendation:**

- The tools needed to implement this objective are already in place. Removal of obsolete facilities can be achieved through negotiation between the city and the railroads, as has occurred in the past. In some cases, federal funds are available to assist with the removal and repair of at-grade crossings.

**Objective 6**

Encourage development of rail passenger service and expansion of rail freight service.

**Intent:** Passenger rail service has not been available to residents of the Springfield area since 1970. If passenger rail service could be made available, it would benefit the community by reducing automobile trips, traffic congestion, and air pollution. Expansion of rail freight service would benefit the economic interests on the community.

**Recommendation:**

- Work with representatives of state and national government to explore the possibility of Amtrak service (rail or connecting bus service) to the Springfield area.

**Objective 7**

To the extent feasible, encourage development of multimodal ground transport (accommodating rail and truck freight) in Springfield and Greene County.

**Intent:** Freight is often moved through a combination of rail and truck transport services. Full service multimodal freight service has become the norm and should be accommodated in the Springfield metro area.

Multimodal transport refers to the door-to-door movement of goods under the responsibility of a single transport operator.

**Recommendations:**

- Encourage multimodal freight handling in the Springfield metro area by facilitating efficient freight transfer.
- Identify appropriate locations and obtain funding for multimodal freight facilities at the airport.

**Objective 8**

Provide for industrial land uses in proximity to rail service where appropriate.

**Intent:** Efficient access should be a determining factor in the location of industrial uses. Industrial land uses can place heavy demands on transportation facilities rail, as well as trucking.

**Recommendation:**

- Provide for industrial areas that are accessible to one or more of the following regional transportation facilities: airports, railroads, and the arterial roads or the interstate highway system.

**Objective 9**

Improve communication with representatives of the railroad industry in Springfield and Greene County.

**Intent:** Although railroad companies are private corporations, they have a significant impact on public transportation facilities and traffic movement in the metro area. It is in the best interest of the community and the industry to cooperate wherever possible. Cooperation is dependent on good communications.

**Recommendation:**

- Provide representation on the Metropolitan Planning Organization (MPO) Technical Committee for a representative of the railroad industry.

**Objective 10**

Through Intelligent Transportation System (ITS) packages, provide communication among railroad dispatchers, emergency service providers, and motor traffic operations systems regarding location of trains and status of at-grade crossings.

**Intent:** An architecture has been provided in which multiple agencies using the transportation system can share data. A high priority should be given to using that system to provide location of trains and status of at-grade crossing warning equipment to applicable users such as emergency vehicle dispatch, motor traffic operations systems, and train dispatchers.

**Recommendation:**

- Include in the ITS Implementation Plan a priority for providing location of trains and status of at-grade crossing warning equipment to applicable users such as emergency vehicle dispatch, traffic operations systems, and train dispatchers throughout Springfield and Greene County.



# Fiscal Plan

## Introduction

The Fiscal Plan addresses the existing and potential financial resources currently available and projected to be available for implementation of the Transportation Plan. Financing techniques and available funding resources are described and discussed. Projected funding available for implementing the transportation Plan is critical for creating a fiscally constrained project list. The Fiscal Plan is necessary to ensure that the plan can realistically be implemented over the next 20 years.

## Financing Techniques

### Development Participation

A primary *Vision 20/20* transportation objective is to ensure that major thoroughfare improvements are implemented in a timely manner and that the costs of these improvements are shared equitably between the public and the private sectors.

The following is a listing of the City of Springfield's current policies on financing street improvements, per street classification. The prioritization criterion focuses on the type of street and whether it is a new or existing facility.

**Local and collector streets:** For new streets, the proposed development is responsible for all costs. For improvements to existing streets, the City ordinarily pays all costs unless a development on the abutting property is solely responsible for creating the need for the improvement. In the latter case, the developer is required to make the needed improvements.

**Primary and secondary arterials:** For new streets, the developer of the abutting land is required to pay for the cost of a street to collector street standards, and the City finances the additional pavement needed for an arterial street. For existing streets, the City ordinarily pays for the improvements unless a development on the abutting property is primarily responsible for creating the need for the improvement. In this case the developer is required to pay for upgrading the street to collector standards and the City finances the additional pavement needed for an arterial street.

**Expressways:** The City normally bears the cost of constructing and upgrading expressways. A developer does not participate in the financing of expressways because the city ordinarily acquires the access right to abutting properties when it acquires the right-of-way.

Greene County and the Missouri Department of Transportation have policies similar to the City's policies mentioned above. Many new roadway improvements in the area are financed through shared expenditures from the private sector and from public means. The City of Springfield, Greene County, and the Missouri Department of Transportation should continue to work together on inter-governmental methods of financing transportation improvements and continue to work with the private sector to ensure that the costs of new roadway improvements are equitably shared between all benefiting parties.

## Available Financing Tools

**Federal and State Financing Resources:** The planning area of the Metropolitan Planning Organization (MPO) is projected to have \$811,700,000 from Federal and State sources available for roadway expenditures between 2000 and 2025. This includes \$6.76 million for planning. The forecasts were conducted by the Missouri Department of Transportation in 2000.

The MPO, as a singular organization, plans, programs and authorizes improvement, expansion or maintenance revenues, and receives an annual suballocation of Surface Transportation Program (STP) funds for capital planning, or engineering improvements. The jurisdictions within the MPO area that receive state revenues for roadway improvements are the cities of Springfield, Battlefield, Brookline, and Willard and Greene County as of 2000. The revenues forecasted for the MPO area from the various federal and state programs are shown on **Table 20-16**. This is followed by **Table 20-17** which shows the short term projected revenues from Motor Fuel Taxes, Motor Vehicle Sales and Use Taxes, and Vehicle Fees for Greene County, Springfield, Battlefield, Brookline and Willard. In addition to the jurisdictions listed on **Table 20-17**, The City of Republic, which is partially included within the MPO boundaries, also receives approximately \$35,000 in Surface Transportation Program funds per annum from MoDOT.

**City and County Financial Tools:** The City of Springfield and Greene County have a variety of revenue sources available to fund street, highway and bridge improvements. These sources were identified in the *Springfield-Greene County Available Financing Tools* and are summarized in the following section. Since transportation needs to 2020 are projected to exceed available financial resources, the City and County will need to use all the financial tools available to them.

**Table 20-16: Springfield MPO Long Range Plan Resource Projections (Millions of Dollars)**

Column	A	B	C	D	E	F	G	H	I	J	K	L	M
	(B+H)	(C+D+E+F+G)						(I+J+K+L+M)					
			80% MoDOT Program (1)	STP	Off-System Bridge Cities	Off-System Bridge Counties	Metro Planning	Total Missouri	20% MoDOT Program (1)	State System Maintenance	Motor Fuel	Sales and Use Tax	License and Fees
Year	Total Resources	Total Federal	80% MoDOT Program (1)	STP	Off-System Bridge Cities	Off-System Bridge Counties	Metro Planning	Total Missouri	20% MoDOT Program (1)	State System Maintenance	Motor Fuel	Sales and Use Tax	License and Fees
2000	\$26.81	\$13.42	\$12.32	\$0.64	\$0.00	\$0.20	\$0.26	\$13.39	\$3.08	\$1.50	\$6.17	\$1.57	\$1.07
2001	\$26.45	\$13.18	\$12.08	\$0.64	\$0.00	\$0.20	\$0.26	\$13.27	\$2.72	\$1.56	\$6.26	\$1.65	\$1.08
2002	\$28.31	\$15.58	\$14.48	\$0.64	\$0.00	\$0.20	\$0.26	\$12.73	\$1.92	\$1.62	\$6.36	\$1.73	\$1.10
2003	\$27.34	\$13.10	\$12.00	\$0.64	\$0.00	\$0.20	\$0.26	\$14.24	\$3.17	\$1.68	\$6.45	\$1.82	\$1.12
2004	\$22.99	\$8.47	\$7.36	\$0.65	\$0.00	\$0.20	\$0.26	\$14.52	\$3.17	\$1.75	\$6.55	\$1.91	\$1.14
2005	\$28.60	\$13.79	\$12.67	\$0.66	\$0.00	\$0.20	\$0.26	\$14.81	\$3.17	\$1.82	\$6.65	\$2.01	\$1.16
2006	\$28.90	\$13.80	\$12.67	\$0.67	\$0.00	\$0.20	\$0.26	\$15.10	\$3.17	\$1.89	\$6.75	\$2.11	\$1.18
2007	\$29.22	\$13.81	\$12.67	\$0.68	\$0.00	\$0.20	\$0.26	\$15.41	\$3.17	\$1.97	\$6.85	\$2.22	\$1.20
2008	\$29.54	\$13.82	\$12.67	\$0.69	\$0.00	\$0.20	\$0.26	\$15.72	\$3.17	\$2.05	\$6.95	\$2.33	\$1.22
2009	\$29.87	\$13.83	\$12.67	\$0.70	\$0.00	\$0.20	\$0.26	\$16.04	\$3.17	\$2.13	\$7.05	\$2.45	\$1.24
2010	\$30.22	\$13.84	\$12.67	\$0.71	\$0.00	\$0.20	\$0.26	\$16.38	\$3.17	\$2.22	\$7.16	\$2.57	\$1.26
2011	\$30.58	\$13.85	\$12.67	\$0.72	\$0.00	\$0.20	\$0.26	\$16.73	\$3.17	\$2.31	\$7.27	\$2.70	\$1.28
2012	\$30.95	\$13.86	\$12.67	\$0.73	\$0.00	\$0.20	\$0.26	\$17.09	\$3.17	\$2.40	\$7.38	\$2.84	\$1.30
2013	\$31.33	\$13.87	\$12.67	\$0.74	\$0.00	\$0.20	\$0.26	\$17.46	\$3.17	\$2.50	\$7.49	\$2.98	\$1.32
2014	\$31.72	\$13.88	\$12.67	\$0.75	\$0.00	\$0.20	\$0.26	\$17.84	\$3.17	\$2.60	\$7.60	\$3.13	\$1.34
2015	\$32.12	\$13.89	\$12.67	\$0.76	\$0.00	\$0.20	\$0.26	\$18.23	\$3.17	\$2.70	\$7.71	\$3.29	\$1.36
2016	\$32.54	\$13.90	\$12.67	\$0.77	\$0.00	\$0.20	\$0.26	\$18.64	\$3.17	\$2.81	\$7.83	\$3.45	\$1.38
2017	\$32.97	\$13.91	\$12.67	\$0.78	\$0.00	\$0.20	\$0.26	\$19.06	\$3.17	\$2.92	\$7.95	\$3.62	\$1.40
2018	\$33.42	\$13.92	\$12.67	\$0.79	\$0.00	\$0.20	\$0.26	\$19.50	\$3.17	\$3.04	\$8.07	\$3.80	\$1.42
2019	\$33.88	\$13.93	\$12.67	\$0.80	\$0.00	\$0.20	\$0.26	\$19.95	\$3.17	\$3.16	\$8.19	\$3.99	\$1.44
2020	\$34.36	\$13.94	\$12.67	\$0.81	\$0.00	\$0.20	\$0.26	\$20.42	\$3.17	\$3.29	\$8.31	\$4.19	\$1.46
2021	\$34.85	\$13.95	\$12.67	\$0.82	\$0.00	\$0.20	\$0.26	\$20.90	\$3.17	\$3.42	\$8.43	\$4.40	\$1.48
2022	\$35.37	\$13.96	\$12.67	\$0.83	\$0.00	\$0.20	\$0.26	\$21.41	\$3.17	\$3.56	\$8.56	\$4.62	\$1.50
2023	\$35.90	\$13.97	\$12.67	\$0.84	\$0.00	\$0.20	\$0.26	\$21.93	\$3.17	\$3.70	\$8.69	\$4.85	\$1.52
2024	\$36.45	\$13.98	\$12.67	\$0.85	\$0.00	\$0.20	\$0.26	\$22.47	\$3.17	\$3.85	\$8.82	\$5.09	\$1.54
2025	\$37.01	\$13.99	\$12.67	\$0.86	\$0.00	\$0.20	\$0.26	\$23.02	\$3.17	\$4.00	\$8.95	\$5.34	\$1.56
<b>TOTAL</b>	<b>\$811.70</b>	<b>\$355.44</b>	<b>\$324.31</b>	<b>\$19.17</b>	<b>\$0.00</b>	<b>\$5.20</b>	<b>\$6.76</b>	<b>\$456.26</b>	<b>\$80.63</b>	<b>\$66.45</b>	<b>\$194.45</b>	<b>\$80.66</b>	<b>\$34.07</b>

(1) Annual average beyond 1999 based on the total of MPO projects contained in the MoDOT's ROW and construction program. Includes 18% for engineering and contingencies.

**Table 20-17: Short-Term Revenue Projections for MPO Area Governments  
(Millions of Dollars)**

<b><u>Projected Fiscal Year 1998</u></b>			
<b>Entity</b>	<b>Motor Fuel</b>	<b>Sales and Use Tax</b>	<b>Vehicle Fees</b>
Battlefield	\$ 0.043	\$ 0.009	\$ 0.007
Brookline	0.008	0.002	0.001
Springfield	3.908	0.882	0.680
Willard	0.061	0.014	0.010
Greene County	1.979	0.389	0.284
<b>Total</b>	<b>\$ 5.999</b>	<b>\$ 1.296</b>	<b>\$ 0.982</b>

<b><u>Projected Fiscal Year 1999</u></b>			
<b>Entity</b>	<b>Motor Fuel</b>	<b>Sales and Use Tax</b>	<b>Vehicle Fees</b>
Battlefield	\$ 0.044	\$ 0.009	\$ 0.007
Brookline	0.008	0.002	0.001
Springfield	3.967	0.926	0.690
Willard	0.062	0.015	0.010
Greene County	2.009	0.408	0.288
<b>Total</b>	<b>\$ 6.090</b>	<b>\$ 1.360</b>	<b>\$ 0.996</b>

<b><u>Projected Fiscal Year 2000</u></b>			
<b>Entity</b>	<b>Motor Fuel</b>	<b>Sales and Use Tax</b>	<b>Vehicle Fees</b>
Battlefield	\$ 0.045	\$ 0.009	\$ 0.007
Brookline	0.008	0.002	0.001
Springfield	4.027	0.972	0.700
Willard	0.063	0.016	0.010
Greene County	2.039	0.428	0.292
<b>Total</b>	<b>\$ 6.182</b>	<b>\$ 1.427</b>	<b>\$ 1.010</b>

**City of Springfield Funding Sources:** The City's share of road improvement costs comes from several sources. The major sources presently used are: federal grants; Missouri state road funds from motor fuel taxes, license fees, and sales taxes on motor vehicles. In the past, general obligation bonds approved by the voters have been used to fund specific projects (such as East Chestnut Expressway). The general obligation bonds were retired through an increase of property taxes. The City's use of the quarter-cent and one-eighth cent sales taxes ended their reliance on general obligation bonds for funding transportation projects.

All of these sources, however, have limitations and may not generate the revenues needed to finance needed improvements. The City does have the ability to finance street construction through the tax-billing procedure, in which the cost of the improvement is assessed against the owners of abutting properties. This process is used primarily when property owners petition for improvements, or when the City undertakes an improvement on the behalf of a development. Tax-billing has not been used since 1974, and has never been used for major thoroughfares because a contractor undertaking a tax-billed project does not receive a lump-sum payment but rather is paid off over a period of years as the tax receipts come in. Many contractors cannot afford to carry such costs for several years and consequently will not bid on such projects. However, there are benefit district programs such as the Neighborhood Improvement District and the Community Improvement District (CID) that will allow for periodic payments to be made by those who will benefit from the transportation improvements. The public entity implements the improvements on behalf of the benefactors.

It would be possible to make more extensive use of the tax-billing procedures through benefit districts such as the CID, if the jurisdiction initially funded the project. Another source of funding could be the establishment of a road fund, derived from general obligation bonds, which could be used to cover the construction costs and be repaid through tax-billing. A similar arrangement is already in use in Springfield for the construction of sanitary sewer lines.

Other sources of possible transportation improvement funding sources for the City of Springfield include:

**Capital Improvements Sales Tax:** The City levies a quarter cent sales tax for capital improvements. Every three years this tax must go before the City of Springfield voters for renewal. This tax is characteristically tied to a series of promised capital improvement projects. When a capital improvements sales tax is approved, the voters also approve a list of projects to be funded from the proceeds. The list includes expenditures in excess of \$15,000,000 over a three-year period for street and sidewalk construction. The City of Springfield could levy an additional quarter-cent sales tax, bringing the total up to one-half cent.

**Transportation Development District:** A special district can be created and a levy imposed up to one-half of one percent sales tax for transportation improvements. This district would be a special purpose political subdivision independent of the City. State law considers the existence of City and County transportation and County capital improvements sales taxes in the district and restricts the total sales tax when combined to one-half of one percent. Currently, the maximum that could be levied in

a transportation development district that includes the City of Springfield would be 3/8 percent. Funding sources other than a sales tax that could be implemented within a transportation district include special assessments, property taxes, and toll roads. The district could levy a property tax up to ten cents per \$100 assessed valuation. Voters would have to approve the district, tax, officers, and projects. The City of Springfield could increase funding for a Transportation Development District up to one-half of one percent.

**Transportation Sales Tax:** In November 1996 and again in August 2000, Springfield voters approved a one-eighth of one percent (0.145%) sales tax for transportation purposes. The 1/8 percent sales tax generates approximately \$3,500,000 annually. The City of Springfield could levy up to one-half of one percent sales tax for transportation improvements.

**Stormwater and Public Works:** With voter approval, the City could levy a one-tenth of one percent sales tax for stormwater and public works improvements, other than stadiums or sports facilities. This tax could generate approximately \$2,700,000 annually. Voters turned down a 1/10-cent sales tax for stormwater improvements in February 1994. The City of Springfield could levy up to one-tenth sales tax for public works improvements.

**Community Development Block Grant Funds:** Springfield is an entitlement city in the federal Community Development Block Grant (CDBG) program. The City received \$1,992,340 in CDBG funds in 1996-97. Sixty thousand dollars (\$60,000) was allocated for street corner treatments in the Commercial Street Historic District. The corner treatments include construction of sidewalk curb ramps. Past CDBG street projects have included intersection improvements in low-moderate income neighborhoods. The CDBG funds are allocated annually and the City of Springfield has received some sidewalk construction funding in past years. This funding source is not guaranteed and is therefore not programmed in the Feasible Funding Sources section.

**Special Assessments:** The City of Springfield currently has available a number of ordinances which are not used that allow the City to make special assessments for a wide range of public improvements from sidewalks to street improvements. Many of these assessments are not popular and as a consequence the City has in recent years relegated the use of tax bills to the creation of district and joint district sewers and public health enforcement actions, such as the removal of dangerous buildings, abatement of weeds, and other public nuisances. Use of special assessments seems to be an appropriate way to assess the costs to those who benefit instead of to the general taxpayers. The City of Springfield can develop a special assessment for a transportation project with a City Council action. This potential funding mechanism is not considered under the Feasible Funding Sources section.

**Impact Fees:** Many communities across the United States have enacted impact fees which is a way to measure and charge a particular development for their contribution towards needed transportation improvements. Springfield has made limited use of impact fees. Generally Springfield's Subdivision Ordinance provides for the recovery of costs for most internal public works projects related to a subdivision. However, there are currently no means to recover other community costs such as the need for

additional school capacity, parks, or improvements to streets external to the development. Many communities recover significant sums of money through impact fees. A significant body of law has developed over the imposition of impact fees, since developments may initially have to pay more than their share of the impact. Whether or not a vote is required depends on whether or not the impact fee is considered to be a fee or a tax. The prospect of impact fee usage in the Springfield area is not likely, therefore this funding mechanism is not included under the Feasible Funding Sources section.

**Excise Tax:** Several communities in Missouri have developed an excise tax on new development as a way of recovering community costs for new development. The excise tax seems to be the most feasible way in the Springfield area of recovering development costs. An excise tax is a method of raising revenue by levying a tax on a particular activity. An excise tax can be defined as a tax that is measured by the amount of business done, income received, or by the extent to which a privilege may have been enjoyed or exercised by the taxpayer, irrespective of the nature or value of the taxpayer's assets or investments in business. The excise tax is imposed as a separate surcharge component of the annual business license tax paid each year by building contractors. It is different than a property tax, which is a tax on the assessed value of property.

**Development Agreements:** The City of Springfield may enter into agreements with developers to fund capital improvements with tax revenues generated by the new development. Typically the developer builds the improvement and is reimbursed by utilizing up to 50 percent of the sales tax generated by the business activity. Projects are usually funded up to a set amount plus interest and paid back over three to five years.

The City of Springfield may enter into Development Agreements, but due to the payback nature of the agreements, this funding mechanism simply provides the up-front funding, which will be paid back to the development over time. Therefore, additional funding from Development Agreements is not considered in the Feasible Funding Sources section, at least in terms of potential programming funds.

**Missouri Transportation Finance Corporation:** The Missouri Transportation Finance Corporation (MTFC) is financed by federal highway funds, transit funds, as well as state and local matching funds. The Corporation may loan money to finance projects or provide collateral to gain favorable financing elsewhere. A local corporation is usually established to participate in the funding. The City of Springfield is using this funding mechanism, in conjunction with MoDOT, to accelerate a series of projects in the Springfield area. The 1/8 cents sales tax program is the funding mechanism to pay the debt service on the bonds. The local corporation that was formed is called the Springfield Missouri State Highway Improvement Corporation.

The funds available under the MTFC are available throughout the State of Missouri and are applied for competitively. The funds are paid back to the Corporation following the construction of projects. These funds will roll-over and subsequent projects will not have the federal requirements associated with the project. Currently most of the funds available under the Corporation are programmed for projects.

Based on the competitive nature of securing Corporation funding, this funding mechanism is not included in the Feasible Funding Sources section.

**Neighborhood Improvement District (or Community Improvement Districts):** State law authorizes cities and counties to establish Neighborhood Improvement Districts (NIDs) and Community Improvement Districts (CIDs) for the purpose of improving public infrastructure. Once established, the jurisdiction may issue temporary notes and long-term general obligation (GO) bonds (up to 20 years) to pay for improvements. Bonds are repaid through a special assessment on the properties within the district. A NID and CID require the support of a majority of the property owners within the district and City Council or County Commission approval. The City of Springfield currently has a CID in the Center City.

Funding available under the NID and CID programs requires the support of the property owners to participate in the program. The current City of Springfield CID does not include funding that can be applied to any of the future needs shown in the Fiscal Plan. Since this funding mechanism must be instigated by a group of owners in a district, along with the projects that those funds will support, the Feasible Funding Sources section does not include future funding under this method.

**Tax Increment Financing (TIF):** Tax increment financing is a method for funding public facilities to support private development or redevelopment in targeted areas. TIF uses the projected increases in tax revenues generated by a private investment in a designated redevelopment project area to pay for public capital improvements. Tax revenue streams are redirected for a set period of time to retire debt. For example, the City approved TIF for the Target store in south Springfield. Under the TIF plan, the developer financed and constructed \$500,000 of storm water and traffic improvements and relocated a major utility corridor. The developer will be reimbursed for those costs from 50 percent of the sales tax generated from the store. City Council or County Commission action is required to establish a TIF.

The City of Springfield may enter into TIF agreements, but due to the payback nature of the agreement this funding mechanism simply provides the up-front funding, which will be paid back to the development over time. Therefore, additional funding from Development Agreements is not considered in the Feasible Funding Sources section, at least in terms of potential programming funds.

**Gasoline Taxes:** (This source is also listed under Federal and State Financial Resources.) The City of Springfield has budgeted revenues of \$3,575,000 for 1996-97 from gasoline taxes. These taxes are a transfer from the State of Missouri. Springfield receives a prorata share based on 1990 Census population of the 15 percent of statewide gasoline taxes set aside for Missouri cities. These funds are used for street maintenance. These funds are included in the Feasible Funding Sources section.

**Motor Vehicle and License Fees:** (This source also listed above under Federal and State Financial Resources.) The City receives \$1,515,000 from the State of Missouri's fund. These funds are included in the Feasible Funding Sources section.

**Greene County Road and Bridge Fund:** The City receives \$855,000 from the Greene County Road and Bridge Fund. A state statute requires that a portion of the County's property tax be allocated to municipalities for their roads. A separate agreement between the City of Springfield and Greene County sets the parameters for that allocation. These funds are included in the Feasible Funding Sources section.

**U.S. Department of Transportation:** The MPO receives around \$750,000 in Surface Transportation Program funding per year. Approximately \$70,000 of these funds is allocated, per agreement, to Greene County. These funds are already programmed in **Table 20-16**.

**Charges for Services:** Charges for curb cuts and other transportation related services generate \$400,000. These funds are included in the Feasible Funding Sources section.

**Other Methods:** The City has used lease purchase and other techniques that provide for the creation of an encumbrance against the property at the time the property is bought as a means to purchase property. This method of financing delays the need for financing up front, however, it does not produce any additional funding. Therefore, this funding mechanism is not included under the Feasible Funding Source section.

**Railroad and Public Utility Tax:** Paid by railroads and public utilities, this tax generates \$52,258 for the road and bridge fund.

**Surcharge, Subclass III:** This tax is placed on certain types of commercial properties. Anticipated 1997 revenue is \$355,000 for the road and bridge fund.

**Intergovernmental Transfers:**

- *Gasoline Taxes (CART fund)* (this source also listed in **Table 20-16**) - \$1,730,400.
- *Motor Vehicle Sales Tax* (this source also listed in **Table 20-16**) - \$650,000.
- *Other Government Entities* - \$840,000. This fund includes grants such as that for the Del Prado sanitary sewer and cooperative projects such as the City/County project to improve West Battlefield Road
- *Other Intergovernmental Transfer* - \$84,188. Vehicle operations reimbursement - \$57,828; rabies control reimbursement - \$20,891; miscellaneous - \$5,469.

**Other Revenues:** Anticipated 1997 revenue - \$377,339. Interest earned - \$275,039; right-of-way inspections - \$70,000; miscellaneous - \$31,000.

**Greene County Funding Sources:** Greene County uses property tax and sales tax revenue to fund capital improvements such as street widening improvements. In 1997, \$5,310,000 was budgeted for road improvements and \$2,300,000 was appropriated for bridge construction.

**Sales Tax:** The County levies a one-half of one percent (0.5%) sales tax. Half of the sales tax is dedicated to the road and bridge fund. In 1997, the road and bridge portion was estimated to be \$8,262,688.

**Real Property Tax:** The County levies eight cents per \$100 assessed valuation for the road and bridge fund. Real property tax revenue for the road and bridge fund in 1997 was estimated to be \$1,314,407.

**Personal Property Tax:** The County levies the same personal property taxes for the road and bridge fund (eight cents each) as it does for real property taxes. Personal property tax revenue for the road and bridge fund in 1997 is estimated to be \$331,187.

**Other Methods:** Greene County has available most of the same innovative funding mechanisms available to the City of Springfield. Each of these innovative funding mechanisms is described in detail under the City of Springfield's Available Funding Sources section. The following is a listing of those sources that Greene County also has available to it for potential future funding:

- Transportation Development District
- Capital Improvement Sales Tax
- Storm Water and Public Works Sales Tax
- Benefit Districts (NID, CID, etc.)
- Missouri Transportation Finance Corporation
- Impact Fees
- Tax Increment Financing

The amount of additional funding available for each of the above types of financing, for both the City of Springfield and Greene County, are outlined in the Feasible Funding Sources section. In all likelihood, many of the future transportation improvements will be joint projects with intergovernmental cooperation. As such, many of the funding mechanisms that require a citizen vote may be packaged as some combination of City, County, and State involvement. Therefore, the funding sources available will benefit all citizens of Greene County, regardless of the entity that is legally able to seek them.

**Actions:**

- The City of Springfield should explore the creation of a road fund derived from general obligation bonds to provide the initial costs of street improvement projects, which would be repaid through tax-billing the abutting property owners.
- Jurisdictional policies should be reviewed to consider an option for private development to assist in undertaking a street improvement. If this development also benefits another landowner, the initial project contributor could be partially reimbursed through the tax-billing procedure. The initial contributor would be required to provide the construction costs, but the other affected property owners would be assessed in proportion to their frontage along the street and would repay the initial contributor over a period of 15 or 20 years.
- The City, County, and MoDOT should work together to secure the various innovative funding sources for transportation improvements outlined in this section. Specific projects should be outlined as part of a package that is compiled for each funding source sought. All projects listed for funding through a particular source should be

feasible to complete with the projected revenue stream that the funding source will produce.

- The City of Springfield, Greene County, and the Missouri Department of Transportation should also work with the private sector to ensure that the costs of new roadway improvements are equitably shared between all parties that benefit.
- The City of Springfield and Greene County should participate in efforts to ensure that an appropriate share of state and federal resources for roadways are allocated to the area.

## **Priority Projects**

### **Major Problems to be Addressed**

Following the presentation of the Travel Demand Model output by BRW, Inc., the City, County, and State staff met to discuss the various transportation problems and issues in the area. The following criteria were considered:

- Comprehensive plan relationship
- Mobility issues
- Preservation
- Innovative financing
- Regional perspective
- Growth management
- System connectivity
- Multi-modal focus
- Environmental considerations
- Congestion
- Safety
- Economic development
- Cost considerations

The following is a listing of the problems and issues and the type of projects that could help alleviate the problem. The listed projects are not necessarily programmed or funded, they are simply an example of the types of projects that could be implemented in the area to help address a transportation problem.

### **Alleviate capacity and traffic flow deficiencies for North/South travel between Springfield and Christian County.**

- Widen U.S. 160 to a six-lane expressway.
- Convert U.S. 160 to a freeway operation.
- Build a parallel facility to U.S. 160 (i.e. Kansas Expressway or West Bypass).
- Widen U.S. 65 to six-lanes.
- Widen Plainview Road to four-lanes.
- Build the Southwest east-west arterial.
- Widen National Avenue to four-lanes from Plainview Road south.
- Upgrade Steinert Road to Secondary Arterial standard.

- Upgrade Evans Road to Secondary arterial standard.
- Extend National Avenue from Plainview Road south into Christian County

**Alleviate capacity deficiencies in the National Avenue/Glenstone Avenue corridor from James River Freeway (U.S. 60) to Chestnut Expressway.**

- Improve transit service and access control on National Avenue.
- Add lanes at Grand Street and Bennett Street intersections with National Avenue.
- Improve transit service and access control on Glenstone Avenue.
- Add lanes at all signalized intersections on Glenstone Avenue.
- Add lanes to Cherokee Street and Seminole Street intersections with National Avenue.
- Widen Fremont Avenue to Secondary Arterial standard.
- Widen Fremont Avenue to a four-lane with median.
- Improve transit service on Fremont Avenue.
- Widen National Avenue to six lanes.

**Alleviate capacity and traffic flow deficiencies in the Campbell Avenue/Kansas Expressway corridor from James River Freeway (U.S. 60) to I-44.**

- Widen Kansas Expressway to six lanes.
- Rebuild Sunshine Street/Kansas Expressway intersection.
- Rebuild Chestnut Expressway /Kansas Expressway intersection or build interchange.
- Rebuild Battlefield Street/Kansas Expressway intersection.
- Rebuild Kearney Street/Kansas Expressway intersection.
- Improve transit service and access control on Campbell Avenue.
- Grade separate some roadways, purchase or limit commercial and street access to Kansas Expressway.
- Review alternative road/street construction or extensions to provide access to adjacent properties.

**Alleviate capacity, safety, and traffic flow deficiencies on U.S. 65 from the Christian County line to I-44, including interchanges.**

- Widen U.S. 65 to a six-lane facility and rebuild interchanges.
- Build alternative north-south corridors for local traffic.
- Encourage residential development closer to the work place.

**Improve traffic flow on James River freeway from Glenstone Avenue to U.S. 65.**

- Eliminate at-grade railroad crossing on James River Freeway.
- Get railroad crossing exempted so vehicles do not have to stop.
- Look at alternative ways to deliver coal to the power plant, enabling removal of the railroad crossing.
- Upgrade U.S. 65 and James River Freeway ( U.S. 60) interchange.
- Six-lane James River Freeway from Glenstone Avenue to U.S. 65.

**Alleviate the capacity and safety deficiencies on Battlefield Street from Blackman Road to Kansas Expressway.**

- Improve transit service and access between U.S. 65 and Kansas Expressway.
- Improve intersections along Battlefield Street.
- Upgrade Battlefield Street from U.S. 65 to Blackman Road.

**Alleviate capacity deficiencies, improve traffic flow and safety concerns with the railroad crossing on Chestnut Expressway between East Trafficway and Schoolcraft Freeway (U.S. 65).**

- Upgrade Chestnut Expressway to more closely meet expressway standards.
- Widen Chestnut Expressway to six lanes.
- Grade separate Chestnut Expressway and railroad west of U.S. 65.

**Alleviate capacity and traffic flow deficiencies on Chestnut Expressway between Grant Avenue and National Avenue.**

- Rebuild closer to expressway standards.
- Add additional lanes to Chestnut Expressway and continue to optimize signal timing.
- Grade separate some streets.

**Alleviate the safety and volume issues at I-44 and MO 13 Interchange to destinations north of Springfield.**

- Improve interchange at I-44 and S.R. 13.

**Alleviate capacity deficiencies in the National Avenue/Glenstone Avenue corridor from Chestnut Expressway to I-44.**

- Widen Glenstone Avenue to six lanes with raised median.
- Add turning lanes to all signalized intersections.
- Improve transit service and access control along Glenstone Avenue and National Avenue.

**Alleviate connectivity and capacity deficiencies on east/west streets south of Republic Road from U.S. 65 to MO FF.**

- Upgrade Republic Road to a two-lane with median.
- Upgrade Republic Road to a four-lane with median.
- Build Southern east-west arterial.
- Upgrade Plainview Road to a Secondary Arterial.
- Upgrade Plainview Road to a four-lane roadway.
- Upgrade Steinert Road to Secondary Arterial.
- Upgrade Weaver Avenue to four-lane with median.
- Rebuild interchange or relocate at Weaver Avenue and Route 160.

**Alleviate the capacity and safety deficiencies on U.S. 60 from U.S. 65 to the east study area boundary.**

- Six-lane U.S. 60.
- Improve interchange at U.S. 60 and U.S. 65.
- Reconstruct accesses to freeway requirements.
- Implement East 60 Concept Study recommendations.

**Alleviate the capacity and safety deficiencies on U.S. 60 from the west study area boundary to James River Freeway.**

- Six-lane U.S. 60 West from James River Freeway.
- Provide a parallel facility to U.S. 60 West (two to four lanes).
- Reconstruct accesses to freeway requirements.

**Alleviate the capacity and traffic flow deficiencies on Sunshine Street from Scenic Avenue to the east study area boundary.**

- Four-lane Sunshine from Blackman to east study boundary.
- Consider additional capacity improvements to Sunshine Street.
- Improve transit and access control on Sunshine Street.

**Alleviate capacity deficiencies on the Republic Street corridor from Glenstone Avenue to MO FF.**

- Upgrade Republic Street to a two-lane with median.
- Upgrade Republic Street to a four-lane with median.
- Build River Bluff Parkway.
- Upgrade Plainview Road to a Secondary Arterial.
- Upgrade Plainview Road to a four-lane roadway.

**Alleviate the capacity and safety deficiencies on Division Street from the east study boundary to Glenstone Avenue.**

- Upgrade to a three-lane facility.
- Upgrade to a four-lane facility with median.

**Provide a connection to the proposed location for the new airport terminal building.**

- Build a new roadway facility to access the new terminal building.

**Alleviate capacity deficiencies on I-44 from the east study boundary to MO 13.**

- Upgrade I-44 to a six-lane freeway.
- Improve I-44 interchanges.

**Alleviate continuity deficiencies in the north/south corridor between Glenstone Avenue and U.S. 65 from Battlefield Road to Kearney Street.**

- Six-lane U.S. 65.
- Upgrade Oak Grove Avenue to a Secondary Arterial standard.
- Six-lane Glenstone Avenue.
- Build Lone Pine Avenue to a Secondary Arterial standard.
- Improve transit on Lone Pine Avenue and Glenstone Avenue.
- Manage access on Glenstone Avenue.
- Provide Lone Pine Avenue to Oak Grove Avenue connection.
- Build continuous outer roadways.
- Complete Oak Grove to Chestnut.

**Alleviate the continuity and traffic flow deficiencies for east/west travel in the downtown area.**

- Provide for the connection to Water Street for a continuous roadway.
- Modify the one-way roadway travel throughout the central business district.
- Provide increased street connections in a grid pattern.
- Provide continuity between Cherry Street and Mt. Vernon Street via Elm Street or Harrison Street.

**Alleviate the capacity deficiencies related to the Scenic Avenue/Golden Avenue corridor.**

- Improve Scenic Avenue and Golden Avenue to Secondary Arterial pairs.
- Build one of the above facilities to a Primary Arterial standard.

**Alleviate the capacity and safety deficiencies MO 13 (not including interchanges) from I-44 to destinations north of Springfield.**

- Convert MO 13 north of I-44 to a four-lane freeway.

**Alleviate the continuity and capacity deficiencies for east/west travel between Sunshine Street and Chestnut Expressway from Glenstone Avenue to the east study area boundary.**

- Upgrade Cherry Street to a Secondary Arterial standard.
- Improve access control and transit on Sunshine Street.
- Upgrade Sunshine Street to a six-lane roadway with median.
- Upgrade Bennett Street and Grand Street to Secondary Arterials.

**Alleviate continuity deficiencies for north/south travel east of U.S. 65 from the south study area boundary to I-44.**

- Six-lane U.S. 65.
- Build Pierson Creek Parkway.
- Upgrade Blackman Road to a Secondary Arterial.
- Upgrade FR 197/FR 199 system to Secondary Arterial.

- Upgrade FR 193 to Secondary Arterial.

**Alleviate the continuity deficiencies for east/west travel from I-44 north, between MO 13 to the east study area boundary.**

- Six-lane I-44.
- Build the Bluegrass Parkway.
- Upgrade Valley Water Mill Road to a Secondary Arterial standard.

**Alleviate the capacity and safety deficiencies on MO MM from U.S. 60 to U.S. 160.**

- Upgrade MO MM to a three-lane Primary Arterial.

**Alleviate the capacity and safety deficiencies on U. S. 65 from I-44 to destinations northeast of Springfield.**

- Add lanes and upgrade intersections to interchanges on U.S. 65 north of Valley Water Mill Road for a four-lane freeway.

**Alleviate the capacity and safety deficiencies on U.S. 160 from I-44 to destinations northwest of Springfield.**

- Add lanes on U.S. 160 north of I-44 to a four-lane expressway standard.
- Widen West Bypass as a six-lane expressway.
- Upgrade MM to a Primary Arterial.
- Upgrade FR 115 and/or FR 123 to Primary Arterial standard and provide direct north-south connection across I-44.

**Alleviate the capacity and safety deficiencies MO H from I-44 to destinations north of Springfield.**

- Upgrade MO H to a Primary Arterial.
- Improve transit access.

## Fiscal Plan

### Project Programming Methodology

The Metropolitan Planning Organization's Constrained and Unconstrained project lists are included in **Table 20-20** and **Table 20-21**. The Unconstrained list includes projects that do not have a dedicated funding source for implementation. A number of innovative funding mechanisms are outlined in the Fiscal Plan that could move these potential projects onto the 2000-2020 Constrained Plan. The Fiscal Plan's recommendation section includes a listing of critical unconstrained projects and suggests steps for jurisdictions to find additional funding sources to implement them. Also, many of the projects listed in the Unconstrained Plan may not receive funding until after the 2000-2020 time frame. Therefore, the Transportation Plan's project programming includes all potential projects for the next twenty to thirty years.

The Constrained list includes projects that have an anticipated funding source. Projects in the Short-Range (2003-2010), Medium-Range (2011-2015), and Long-Range (2016-2020) lists should have adequate funding based on the MPO's anticipated funding projections. The anticipated road funding is based on funding projections from the Missouri Department of Transportation, an assumption of the continuation of the City of Springfield's 1/4 cent and 1/8 cent sales tax for the life of the Transportation Plan, and a continuing allocation by Greene County to roadway capacity improvement projects. Projected transit funding was based on current Federal Transit Administration (FTA) current annual allocations.

A number of issues were taken into consideration in choosing the projects to include within the Constrained Plan:

- Traffic volume of existing roadway or the projected traffic relief for new construction projects;
- The project's current Level of Service based on the Travel Model;
- Does the project provide continuity improvements?
- Cost/Benefit Analysis of the project;
- Economic Development impacts of the project;
- Designation of the project on the Major Thoroughfare Plan;
- Does the project further the goals of other *Vision 20/20* Comprehensive Plan Elements?
- Is the project a continuation of a multi-phased project?
- Is the project eligible for the funding sources that the jurisdiction has available? and,
- Are there opportunities for jurisdictions to work together on a high priority project?

Project needs were initially listed on the Unconstrained list and based on the above criteria, the most advantageous projects were moved to the Constrained list. This process was repeated until the amount of projected available funding was exhausted. The funding projections for all 2000-2020 projects are listed on **Table 20-18** and **Table 20-19**.

**Table 20-18: Funding Categories Available for Programming 2000-2025  
(Categories are Specific to Jurisdiction Projects)**

YEAR	Total STP (fed.port)	County's 11.9% *	Total County STP including Match	City's 88.1% *	Total City STP including Match	City's UBF Estimate (federal)	Total City UBF with Match	City's 1/4 cent sales tax revenues (minus parks)	City's 1/8 cent sales tax revenues	MoDOT Program in MPO	MoDOT MPO Program including Match	Off-System Bridge (County)	Off-System Bridge (County) Incl. Match	FTA Section 5307 Federal Funding	FTA Section 5307 Federal Funding Incl. Match	Greene County New Road Construction Budget
2000	\$640,000	\$76,160	\$95,200	\$563,840	\$704,800	\$280,000	\$350,000	\$5,774,000	\$3,825,000	\$12,320,000	\$15,400,000	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2001	\$640,000	\$76,160	\$95,200	\$563,840	\$704,800			\$5,947,220	\$3,939,750	\$12,080,000	\$15,100,000	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2002	\$640,000	\$76,160	\$95,200	\$563,840	\$704,800			\$6,125,637	\$4,057,943	\$14,480,000	\$18,100,000	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2003	\$640,000	\$76,160	\$95,200	\$563,840	\$704,800			\$6,309,406	\$4,179,681	\$12,000,000	\$15,000,000	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2004	\$650,000	\$77,350	\$96,688	\$572,650	\$715,813			\$6,498,688	\$4,305,071	\$7,360,000	\$9,200,000	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2005	\$660,000	\$78,540	\$98,175	\$581,460	\$726,825			\$6,693,649	\$4,434,223	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2006	\$670,000	\$79,730	\$99,663	\$590,270	\$737,838	\$280,000	\$350,000	\$6,894,458	\$4,567,250	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2007	\$680,000	\$80,920	\$101,150	\$599,080	\$748,850			\$7,101,292	\$4,704,268	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2008	\$690,000	\$82,110	\$102,638	\$607,890	\$759,863			\$7,314,330	\$4,845,396	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2009	\$700,000	\$83,300	\$104,125	\$616,700	\$770,875			\$7,533,760	\$4,990,757	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2010	\$710,000	\$84,490	\$105,613	\$625,510	\$781,888			\$7,759,773	\$5,140,480	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2011	\$720,000	\$85,680	\$107,100	\$634,320	\$792,900			\$7,992,566	\$5,294,695	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2012	\$730,000	\$86,870	\$108,588	\$643,130	\$803,913	\$280,000	\$350,000	\$8,232,343	\$5,453,535	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2013	\$740,000	\$88,060	\$110,075	\$651,940	\$814,925			\$8,479,314	\$5,617,141	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2014	\$750,000	\$89,250	\$111,563	\$660,750	\$825,938			\$8,733,693	\$5,785,656	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2015	\$760,000	\$90,440	\$113,050	\$669,560	\$836,950			\$8,995,704	\$5,959,225	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2016	\$770,000	\$91,630	\$114,538	\$678,370	\$847,963			\$9,265,575	\$6,138,002	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2017	\$780,000	\$92,820	\$116,025	\$687,180	\$858,975			\$9,543,542	\$6,322,142	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2018	\$790,000	\$94,010	\$117,513	\$695,990	\$869,988			\$9,829,848	\$6,511,806	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2019	\$800,000	\$95,200	\$119,000	\$704,800	\$881,000			\$10,124,744	\$6,707,161	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2020	\$810,000	\$96,390	\$120,488	\$713,610	\$892,013	\$280,000	\$350,000	\$10,428,486	\$6,908,375	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2021	\$820,000	\$97,580	\$121,975	\$722,420	\$903,025			\$10,741,341	\$7,115,627	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2022	\$830,000	\$98,770	\$123,463	\$731,230	\$914,038			\$11,063,581	\$7,329,096	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2023	\$840,000	\$99,960	\$124,950	\$740,040	\$925,050			\$11,395,489	\$7,548,968	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2024	\$850,000	\$101,150	\$126,438	\$748,850	\$936,063			\$11,737,353	\$7,775,437	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000
2025	\$860,000	\$102,340	\$127,925	\$757,660	\$947,075			\$12,089,474	\$8,008,701	\$12,670,000	\$15,837,500	\$200,000	\$250,000	\$1,500,000	\$1,875,000	\$3,000,000

**UBF** - Becky B indicated that the City generally receives 4 UBF grants over 20yrs. The year 2000 grant was programmed and is actual dollars. The other 3 UBF grants are estimates and are not guaranteed.

**STP** - Estimates Provided by MoDOT

**1/4 cent** - New vote will affect "unprogrammed projects" from 2005-2020. Previous tax year's projects are already programmed. Revenues projected with a 3% conservative annual growth rate per the City Finance Director's estimate. Assumes continuation of tax per voter approval. Amount also reflects a subtraction of 26.5% of the total revenue for parks' projects.

**1/8 cent** - New vote will affect "unprogrammed projects" from 2005-2020. Previous tax year's projects are already programmed. Revenues projected with a 3% conservative annual growth rate per the City Finance Director's estimate.

**Airport** dollars were not estimated since Springfield-Branson Regional Airport submitted a fiscally constrained list of projects except for the mid-field terminal. Their dollar projections are reflected in the project totals of the constrained plan.

**FTA - Section 5307** Funding - Assume a flat conservative annual allocation. The only FTA Section 5307 projects shown in the Constrained Plan are the Planning & Guaranteed Operational Dollars for CU and SMSU. All other project requests will remain in the Unconstrained Plan and are subject to subcommittee annual rankings. **NOTE:** Amounts shown for SMSU Planning may vary as there has not been an agreement established by the MPO as to its annual allocation. This agreement should be set in 2001.

**FTA - Section 5310** Funding - Dollars not shown in chart above. Usually have enough dollars for two vehicles (some years only one). Assume that two MPO area vehicles can be funded per year.

**FTA - Section 5309** Funding - Most all dollars that will be requested of the State are included in the constrained plan if there is a reasonable likelihood for approval. The MPO does not control whether these projects will receive funding. A few large dollar projects are not included in the constrained plan because they are questionable for approval (i.e. the Airport's new terminal building) and should be considered unconstrained.

**FTA - Section 3037** Funding - Jobs Access and Reverse Commute Grant. These projects are subject to annual competitive allocations. However, these projects are included in the plan when they have received prior approvals and are likely to receive subsequent funding.

**FHWA Enhancements** - Only those projects that have been approved are shown in the plan. Future project requests are considered unconstrained until approved by MoDOT.

\* - The County and City's percentage of the **STP** funding allocation will change, these shares will be reviewed annually as part of the funding formula.

**Table 20-19: Total Jurisdictional Funding Available per Jurisdiction and Funding Category for Each of the Programming Periods**

Funding Source (all include match)	Short-Term Projects Total Funds (2003- 2010)	Mid-Term Projects Total Funds (2011- 2015)	Short-Term Projects Total Funds (2016- 2020)
County STP	\$803,250	\$550,375	\$587,563
City STP	\$5,946,750	\$4,074,625	\$4,349,938
City 1/4	\$43,297,262	\$42,433,620	\$49,192,196
City 1/8	\$28,682,374	\$28,110,252	\$32,587,487
County Rd. Const.	\$24,000,000	\$15,000,000	\$15,000,000
MoDOT Program	\$119,225,000	\$79,187,500	\$79,187,500

Short-term funds for 1/4 and 1/8 projects begin in year 2005 since the funds are programmed to yr. 2004.

There were some project assumptions made in developing the Constrained list. The assumptions are included in the footnotes of **Table 20 -18** and include the following comments:

- SMSU planning dollars assumed to be approved at some level per year for FTA Section 5307. ACTUAL amount may be less. CU and SMSU will likely have an agreed to allocation per year. The year 2001 amount shown is guaranteed.
- Funds for all City and County future projects, not currently programmed, shown as local funds. Jurisdictions may determine the projects that will use federal sources. The federal sources were considered in the total dollar amount of programmed projects.
- Some of the projects are phased projects and show up with varying amounts in different years (e.g. Walnut Lawn, Main to Kansas Expressway is programmed multiple years between 2001-2010)
- Projects shown in individual years from 2000 to 2004 are programmed in the MPO's Transportation Improvement Program (TIP) or the City of Springfield's Capital Improvement Program (CIP). Short-range projects overlap for 2003 and 2004 because some jurisdictions only guarantee funding for projects to 2002 and begin their short-term projected lists at 2003.

The listing of projects in the Constrained and Unconstrained Plans are subject to regular review and modification. The project lists provide a framework of transportation needs for the metropolitan area. Innovative funding mechanisms should be sought to fully develop as many of the project needs from both lists, as possible.

Projects approved in the MPO Transportation Improvement Program (TIP) should correspond with the projects in the Constrained list. Occasionally there are projects in

the Unconstrained list that are more appropriate for implementation, based on overall jurisdictional goals. The Unconstrained list is provided in the Transportation Plan to show all transportation needs in the metropolitan area and to provide flexibility to the jurisdictions to solve problems with alternative projects. Transportation Improvement Program projects may include projects from the Unconstrained list if proper justification is provided to the MPO on why a project should be implemented prior to projects already on the Constrained list.

### **Fiscal Plan - Constrained Plan**

**Table 20-20** includes all of the projects included in the constrained plan for the Springfield-Greene County area. All projects included in this table have funding sources identified for their implementation. All 2000-2004 projects for highways, transit, greenways, and airport with identified funding sources are shown.

### **Fiscal Plan - Future Projects**

**Table 20-21** lists all of the anticipated projects included in the unconstrained plan for the Springfield-Greene County area. A few projects included in this table have funding sources identified for their implementation, but these sources are not guaranteed. The unconstrained plan shows all projects anticipated for consideration between 2003-2020 for highways, transit, and the airport.

**Table 20-20: Constrained Plan**

Project Description	Agency	Total (000s)	Federal		Local	
			Source	(000s)	Source	(000s)
<b>2000</b>						
<b>Highways</b>						
Republic Road street widening, add left, free right and dual turn lanes - Kansas Expressway to Scenic	City	2,800	STP	2,240	City	560
Traffic control on Central at Hampton	City	280			City	280
Construct roundabout at Central & Sherman	City	250			City	250
Cherry and Barnes intersection improvements and drainage	City	1,100			City	1,100
Norton Street widening Maranatha to Summit	City	750			City	750
Fremont & Sunset intersection improvements, add right & left turn lanes	City	1,150			City	1,150
Traffic Signal Annual Program 1995-2001, install one new signal annually or replace & maintain signal system	City	200			City	200
School Sidewalk Program 1995-2001, construct new sidewalks near city's schools in compliance with ADA	City	150			City	150
Sidewalk Reconstruction & Curb Ramp Annual Program 1995-2001, replace old sidewalks & curb ramps in compliance with ADA	City	425			City	425
Fremont widening, center turn-lane, curb & sidewalks - Republic to James River	City	775			City	775
Annual Residential Street Upgrade Program	City	225			City	225
Road Concept Design Program	City	75			City	75
Shared Econ. Dev./Transportation Costs	City	450			City	450
Farm Road 182, FR 141 to FR 135 (Cox to Abbey Lane), new street, widening	County	1,500			County	1,500
Farm Road 141, bridge approaches south of FR 182	County	2,000			County	2,000
Farm Road 170/FR125	County	400			County	400
ROW Acquisition/Development Costs	County	750			County	750
Accessibility Improvements-improve curb ramps & sidewalk gaps at various locations	County	50			County	50
<b>TOTAL</b>		<b>13,330</b>		<b>2,240</b>		<b>11,090</b>
<b>Airport</b>						
Intermodal Facility	Airport	9,952	PFC FHWA	4,441 3,527	Airport	1,984
Planning and Design for Midfield Terminal	Airport	8,000	FAA	4,000	Airport Other	400 3,600
Airport Over-Look Park	Airport	70			Airport	70
Security Fencing	Airport	50			Airport	50
Fuel Farm Expansion	Airport	78			Airport	78
Snow Removal Equipment, new snow plows, blowers & spreaders	Airport	1,050			Airport	1,050
<b>TOTAL</b>		<b>19,200</b>		<b>11,968</b>		<b>7,232</b>
<b>Transit</b>						
Maintenance of Existing Operations - Fixed Route	CU	4,174	FTA	1,463	CU	2,711
Maintenance of Existing Operations - Paratransit	CU	565	FTA	185	CU	380
Route Expansion - Line 7, Route Expansion - Line 10	CU	210	FTA	105	CU	105
Purchase & replace two vehicles used by Transit Management	CU	20	FTA	16	CU	4
Replace computerized diagnostic equipment	CU	28	FTA	22	CU	6
Renovation of building north of the Transit Office	CU	425	FTA	340	CU	85
Replace Bus Maintenance pits/lifts in Fleet Management	CU	471	FTA	377	CU	94
1-12 Passenger raised-roof van w/lift, w/wheelchair tie downs	OATS	36	FTA	29	OATS	7
2 Mini-bus w/lift	OATS	96	FTA	77	OATS	19
Intermodal Transfer Facility	SMSU	1,250	FTA	1,000	SMSU	250
2 - Lift Equipped Vans	Not-for-Profit Providers	50	FTA	40	Not-for-Profit Providers	10
<b>TOTAL</b>		<b>7,325</b>		<b>3,653</b>		<b>3,672</b>
<b>Ozark Greenways</b>						
Jordan Creek Greenway, Jordan Valley Park, pedestrian mall	Ozark Greenways	490	FHWA	392	Ozark Greenways	98
<b>TOTAL</b>		<b>490</b>		<b>392</b>		<b>98</b>
<b>TOTAL FOR 2000</b>		<b>40,344</b>		<b>18,252</b>		<b>22,092</b>

Table 20-20: Constrained Plan

Project Description	Agency	Total (000s)	Federal		Local	
			Source	(000s)	Source	(000s)
<b>2001</b>						
<b>Highways</b>						
Route 65 at Route D Interchange Modifications Phase II; bridges and add lanes	MoDOT	12,623	STP	3,379	MoDOT	9,244
Route 160 (West Bypass) Division to Route 44 BL (Chestnut) Replace 1 railroad bridge and remove 1 railroad bridge as first stage of widening to 5 lanes	MoDOT	6,283	STP	3,379	MoDOT	2,904
I-44, w/O Pond Creek to Lawrence Co. line, Resurfacing 2-24' pavements	MoDOT	4,767	NHS	3,814	MoDOT	953
Repayment of Bond Proceeds	MoDOT	5,000	STP	4,000	MoDOT	1,000
I-44 e/o Pond Creek to w/o Route 266, resurfacing 2-24' pavements	MoDOT	3,930	NHS	3,144	MoDOT	786
Fremont Ave & Republic Rd intersection improvements, gutters, lighting, etc.	City	100			City	100
Grant Av, Norton Rd to North City Limits	City	100			City	100
Jefferson Ave and Sunshine Intersection	City	100			City	100
Norton Rd between Summit and National	City	100			City	100
Walnut Lawn - Main to Kansas Expressway	City	500			City	500
FR 119 (Hutchison Rd) extension to the intersection of FR 168	City	75			City	75
School Sidewalk Program 1998-2004 to ADA compliance	City	65			City	65
Sidewalk Reconstruction and Curb Ramp Annual Program 1998-2004	City	300			City	300
Annual Residential Street Upgrade Program	City	200			City	200
Central Street Bridge replacement at Jordan Creek	City	350	UBF	280	City	70
Fremont - Sunset to Seminole, street widening, center turn land, curb & gutter, sidewalks & storm sewers	City	1,500	STP	883	City	617
Road Concept Design Program, develop design plan for major road improvements for new or existing streets	City	75			City	75
Traffic Signal Annual Program 1998-2004, install one new signal annually or replace & maintain signal system	City	135			City	135
Shared Econ. Dev./Transportation Costs	City	450			City	450
ITS Deployment	City/MoDOT	800	FHWA	400	City/MoDOT	400
Glenstone & Chestnut Expwy Intersection Improvement	City/MoDOT	600	STP	240	City/MoDOT	360
Glenstone & Kearney Intersection Improvement	City/MoDOT	400	STP	160	City/MoDOT	240
Glenstone & Meadowmere Intersection Improvement	City/MoDOT	750			City/MoDOT	750
Glenstone and Sunshine Intersection Improvement	City/MoDOT	500	STP	200	City/MoDOT	300
Kansas Expwy & Battlefield Intersection Improvement	City/MoDOT	500	STP	200	City/MoDOT	300
Kansas Expwy & Chestnut Intersection Improvement	City/MoDOT	1,000	STP	400	City/MoDOT	600
Shared Cost/Economic Development/Transportation	City/MoDOT	2,650	STP	760	City/MoDOT	1,890
South Glenstone Corridor Improvements - Primrose and East Republic Road	City/MoDOT	550			City/MoDOT	550
Curb ramps, various locations at intersections to ADA Standards	County	70	STP	56	County	14
FR 102 - Valley Water Mill 900' west of FR 175 street widening and bridge replacement	County	1,465	UBF	350	County	1,115
Republic Road, FR 125 to Hemlock Street widening & safety	County	400			County	400
Kansas Expressway, City Limits to FR 186	County	1,000			County	1,000
Farm Road 141/FR 190, FR 182 to FR 190, realign FR 190 to Rivercut	County	3,500			County	3,500
ROW Acquisition/Development Costs	County	1,000			County	1,000
FR 132 over Pierson Creek. Bridge Replacement	County	675			County	675
<b>TOTAL</b>		<b>52,513</b>		<b>21,645</b>		<b>30,868</b>
<b>Ozark Greenways</b>						
Southcreek - Golden to Republic Road, surface improvements, 2 bridges/1 trailhead	Ozark Greenways	540	FHWA	375	Ozark Greenways	165
Galloway Creek Greenway - Sequoia Park north to Pershing School	Ozark Greenways	728	FHWA	228	Ozark Greenways	500
Highway FF Trailhead, .5 mile trail	Ozark Greenways	59	DNR	19	Ozark Greenways	39
Galloway Greenway surface improvements	Ozark Greenways	37	DNR	19	Ozark Greenways	19
South Creek surface improvements	Ozark Greenways	30	DNR	15	Ozark Greenways	15
South Creek, Phase IV, infill trail (project submitted for funding)	Ozark Greenways	229	FHWA	182	Ozark Greenways	46
Greenway Development, conservation/recreation corridors	Ozark Greenways	50	1/4 cent sales tax		Ozark Greenways	50
Ward Branch Greenway	Ozark Greenways	388	FHWA	311	Ozark Greenways	78

**Table 20-20: Constrained Plan**

Project Description	Agency	Total (000s)	Federal		Local	
			Source	(000s)	Source	(000s)
Chestnut Expwy Greenbelt Beautification	OTC Technical College	356	FHWA	249	OTC Technical College	107
Jordan Creek Pedestrian Way- landscaping & beautification	OTC Technical College	330	FHWA	231	OTC Technical College	99
<b>TOTAL</b>		<b>2,746</b>		<b>1,628</b>		<b>1,118</b>
<b>Airport</b>						
New Runway 14/32 & Taxiway Extension	Airport	15,000	FAA	13,500	Airport	1,500
Security Fencing	Airport	50	FAA	45	Airport	5
Fuel Farm Expansion	Airport	78			Airport	78
Passenger Loading Bridge	Airport	650	PFC	650	Airport	0
Intermodal Ground Transportation & baggage claims facility	Airport	6,700			Airport	6,700
New Ozark Airport	Airport	3,600	Air21	2,880	Airport	720
<b>TOTAL</b>		<b>26,078</b>		<b>17,075</b>		<b>9,003</b>
<b>Transit</b>						
Maintenance of Existing Operations - Regular Fixed Route & Access Express	CU	4,474	FTA	1,202	CU	3,272
Maintenance of Existing Operations - Paratransit	CU	581	FTA	140	CU	441
Route Expansion - Line 7	CU	128	FTA	64	CU	64
Route Expansion - Line 10	CU	88	FTA	44	CU	44
Route Expansion - Line 11	CU	220	FTA	110	CU	110
Bus Turnouts at various locations	CU	50	FTA	40	CU	10
Bus Benches & Bus Shelter Maintenance	CU	10	FTA	8	CU	2
Bus Route Maps & Route Sign	CU	11	FTA	8	CU	2
Farebox Swipe Card Attachment	CU	120	FTA	96	CU	24
Bike Racks for Bus Routes	CU	14	FTA	13	CU	1
1-12 Passenger raised roof van w/lift, w/wheelchair tiedowns	OATS	36	FTA	29	OATS	7
1 Mini-bus w/lift	OATS	48	FTA	38	OATS	10
Purchase 1 Minibus with Lift	City-County Parks Dept.	45	FTA	36	City-County Parks Dept.	9
Holland Street land acquisition to develop transitway adjacent to Intermodal Facility	SMSU	300	FTA	240	SMSU	60
Transit Planning	SMSU	56	FTA	45	SMSU	11
Intermodal Transfer Facility	SMSU	1,447	FTA	1,158	SMSU	289
2 - Lift Equipped Vans	Not-for-Profit Providers	50	FTA	40	Not-for-Profit Providers	10
<b>TOTAL</b>		<b>7,678</b>		<b>3,311</b>		<b>4,367</b>
<b>TOTAL FOR 2001</b>		<b>89,015</b>		<b>43,660</b>		<b>45,356</b>
<b>2002</b>						
<b>Highways</b>						
Repayment of Bond Proceeds	MoDOT	5,000	STP	4,000	MoDOT	1,000
Route 360 (James River Freeway) I-44 to Route 60, new 4-lane freeway	MoDOT	9,212	NHS	7,370	MoDOT	1,842
Route 65 at Route I-44, modify interchange, begin ROW acquisition	MoDOT	6,673	NHS	5,338	MoDOT	1,335
Replace Bridge K-281 east of Route ZZ on Route M	MoDOT	2,368	STP	1,894	MoDOT	474
Replace Bridge M-214 west of Route 13 on Route O	MoDOT	924	STP	1,894	MoDOT	-970
Cherokee Street & Campbell Avenue intersection improvements	City	2,000	STP	1,600	City	400
Fremont Ave and Republic Rd intersection and storm improvements	City	500			City	500
Access Management	City	250			City	250
Center City Parking and Streetscape Enhancement	City	200			City	200
Jefferson Ave and Sunshine Intersection Improvements	City	300			City	300
Grand Between East of Fort to Grant, Street widening, add signals, sidewalks & street lighting	City	1,500			City	1,500
Widen Grant Ave. Norton to North City limits	City	600			City	600
Traffic Signal Annual Program 2001-2004	City	200			City	200
School Sidewalk Program 2001-2004	City	150			City	150
Sidewalk Reconstruction & Curb Ramp Annual Program 2001-2004	City	400			City	400
Walnut Lawn - Main to Kansas Expressway	City	1,000			City	1,000
Norton Road between Summit & National, widen Norton Road to three lanes, stormwater control, sidewalks, street lighting	City	1,000			City	1,000
Annual Residential Street Upgrade Program	City	375			City	375

**Table 20-20: Constrained Plan**

Project Description	Agency	Total		Federal		Local	
		(000s)	Source	(000s)	Source	(000s)	Source
Road Concept Design Program, develop design plan for major road improvements for new or existing streets	City	50				City	50
Shared Econ. Dev./Transportation Costs	City	450				City	450
Widen FR 160 - Battlefield Rd, City limits east to White Oak	County	400				County	400
Widen FR 185 - Blackman Rd, City limits east to FR 187	County	750				County	750
Extend FR 119 (Hutchison Rd) from FR 168 intersection to M Hwy	City/County	1,000				City/County	1,000
Glenstone & Chestnut Expwy Intersection Improvement	City/MoDOT	1,900	STP	760		City/MoDOT	1,140
Glenstone and Division Intersection Improvements	City/MoDOT	400	STP	160		City/MoDOT	240
Glenstone & Kearney Intersection Improvements	City/MoDOT	300	STP	120		City/MoDOT	180
Glenstone & Sunshine Intersection Improvements	City/MoDOT	300	STP	120		City/MoDOT	180
Intelligent Transportation System	City/MoDOT	1,000	FHWA	500		City/MoDOT	500
Kansas Expwy & Battlefield Intersection Improvements	City/MoDOT	1,200	STP	480		City/MoDOT	720
Kansas Expwy & Sunshine Intersection Improvements	City/MoDOT	1,200	STP	480		City/MoDOT	720
Shared Cost/Economic Development/Transportation	City/MoDOT	2,650	STP	760		City/MoDOT	1,890
South Glenstone Corridor Improvements - Primrose and East Republic Rd	City/MoDOT	200				City/MoDOT	200
Kansas Expwy & Kearney Intersection Improvements	City/MoDOT	500	STP	200		City/MoDOT	300
<b>TOTAL</b>		<b>44,952</b>		<b>25,676</b>			<b>19,276</b>
<b>Airport</b>							
Security Fencing	Airport	50				Airport	50
Land Acquisition	Airport	600				Airport	600
Rehabilitate Runway 02/20	Airport	10,000	Air 21	9,000		Airport	1,000
<b>TOTAL</b>		<b>10,650</b>		<b>9,000</b>			<b>1,650</b>
<b>Transit</b>							
Jordan Valley Park Intermodal Parking Structure study - planning & design of possible relocation of transit facility	City	50	FTA	40		City	10
2 -12 passenger raised roof vans w/lifts and tie-downs	OATS	72	FTA	58		OATS	14
6 - 2 Way Radios w/antennas \$1200	OATS	7	FTA	6		OATS	1
Maintenance of Existing Operations - Regular Fixed Routes	CU	561	FTA	561		CU	0
Route Expansion - Line 10	CU	90	FTA	45		CU	45
Route Expansion -Line 11	CU	225	FTA	113		CU	113
Bus Security Cameras & Equipment	CU	175	FTA	140		CU	35
* - Transit Planning	SMSU	63	FTA	50		SMSU	13
Bus Replacement (5 w/lifts)	SMSU	500	FTA	400		SMSU	100
2 - Lift Equipped Vans	Not-for-Profit Providers	50	FTA	40		Not-for-Profit Providers	10
<b>TOTAL</b>		<b>1,793</b>		<b>1,452</b>			<b>341</b>
<b>TOTAL FOR 2002</b>		<b>57,395</b>		<b>36,128</b>			<b>21,267</b>
<b>2003</b>							
<b>Highways</b>							
Access Management	City	250				City	250
Center City Parking & Streetscape Enhancement	City	200				City	200
Fremont Ave and Republic Rd Intersection Improvement	City	2,000				City	2,000
Widen Grant Av, Norton Rd to North city limits	City	600				City	600
Widen Norton Rd between Summit and National	City	2,200				City	2,200
Construct Walnut Lawn - Main to Kansas Expwy	City	1,000				City	1,000
Traffic Signal Annual Program 2001-2004	City	200				City	200
School Sidewalk Program 2001-2004	City	150				City	150
Sidewalk Reconstruction & Curb Ramp Annual Program 2001-2004	City	400				City	400
Annual Residential Street Upgrade Program	City	375				City	375
Road Concept Design Program, develop design plan for major road improvements for new or existing streets	City	50				City	50
Shared Econ. Dev./Transportation Costs	City	450				City	450
Repayment of Bonds	MoDOT	5,000	STP	4,000		MoDOT	1,000
Route 65 at Route I-44 Interchange Modifications	MoDOT	6,674	NHS	5,339		MoDOT	1,335
Route 160 (West Bypass), To 744 (Kearney) to Route 44 BL (Chestnut) R/W	MoDOT	965	FHWA	772		MoDOT	193
FR 178 - Weaver Road, Campbell to Cox, street widening	County	2,700	FHWA	329		County	2,371
Glenstone and Division Intersection Improvements	City/MoDOT	300	STP	120		City/MoDOT	180
Glenstone and Kearney Intersection Improvements	City/MoDOT	1,800	STP	720		City/MoDOT	1,080
Glenstone and Sunshine Intersection Improvements	City/MoDOT	2,800	STP	1,120		City/MoDOT	1,680
Intelligent Transportation System	City/MoDOT	1,000	FHWA	500		City/MoDOT	500
Shared Cost/Economic Development/Transportation	City/MoDOT	2,650	STP	760		City/MoDOT	1,890

**Table 20-20: Constrained Plan**

Project Description	Agency	Total (000s)	Federal		Local	
			Source	(000s)	Source	(000s)
<b>Kansas Expressway &amp; Kearney Intersection Improvements</b>						
	City/MoDOT	300	STP	120	City/MoDOT	180
<b>TOTAL</b>		<b>32,064</b>		<b>13,780</b>		<b>18,284</b>
<b>Airport</b>						
Infrastructure for new Ozark Airport	Airport	2,400	Air 21	1,920	Airport	480
<b>TOTAL</b>		<b>2,400</b>		<b>1,920</b>		<b>480</b>
<b>Transit</b>						
Maintenance of Existing Operations - Fixed & Paratransit	CU	561	FTA	561	CU	0
Route Expansion - Line 10	CU	92	FTA	46	CU	46
Route Expansion - Line 11	CU	230	FTA	115	CU	115
1 - 12 Passenger raised roof van w/lift and tie-downs	OATS	36	FTA	29	OATS	7
Office building/wash facility	OATS	250	FTA	160	OATS	90
* - Transit Planning	SMSU	66	FTA	53	SMSU	13
	Not-for-Profit				Not-for-Profit	
2 - Lift Equipped Vans	Providers	50	FTA	40	Providers	10
<b>TOTAL</b>		<b>1,235</b>		<b>964</b>		<b>271</b>
<b>TOTAL FOR 2003</b>		<b>3,635</b>		<b>2,884</b>		<b>751</b>
<b>2004</b>						
<b>Highways</b>						
Route 160 from Kearney to Chestnut, Upgrade to Expressway	MoDOT	5,207			MoDOT	7,700
Route 160, grading, paving, bridge & signals from Route 123 to north of I-44, add lanes - dual existing left turn lanes	MoDOT	11,267			MoDOT	11,267
Center City Parking & Streetscape Enhancement	City	200			City	200
Norton Road Widening between Summit and National	City	50			City	50
Annual Residential Street Upgrade Program	City	375			City	375
Road Concept Design Program, develop design plan for major road improvements for new or existing streets	City	50			City	50
Walnut Lawn Right-of-Way Acq. & Const. Main to K. Expressway	City	1,000			City	1,000
<b>TOTAL</b>		<b>18,149</b>		<b>0</b>		<b>20,642</b>
<b>Transit</b>						
Maintenance of Existing Operations - Fixed & Paratransit	CU	561	FTA	561	CU	0
* - Transit Planning	SMSU	66	FTA	53	SMSU	13
	Not-for-Profit				Not-for-Profit	
2 - Lift Equipped Vans	Providers	50	FTA	40	Providers	10
<b>TOTAL</b>		<b>677</b>		<b>654</b>		<b>23</b>
<b>Airport</b>						
General Aviation Development	Airport	1,077			Airport	1,077
<b>TOTAL</b>		<b>1,077</b>		<b>0</b>		<b>1,077</b>
<b>TOTAL FOR 2004</b>		<b>19,903</b>		<b>654</b>		<b>21,742</b>
<b>TOTAL FOR 2000-2004 Constrained Plan</b>		<b>210,293</b>		<b>101,578</b>		<b>111,208</b>
<b>Short Range Future Project Needs (2003-2010)</b>						
<b>Highways</b>						
City UBF Project	City	350	FHWA	280	City	70
Improve intersection at Sunshine & Jefferson	City	1,000			City	1,000
Widen Grand between Fort & Grant	City	2,800			City	2,800
Widen Norton Road between Summit & National	City	3,200			City	3,200
Widen Grant Avenue between Norton & North City Limits	City	1,200			City	1,200
Widen Fremont Avenue from North of Republic Road to Lark	City	2,500			City	2,500
Improve intersection of Primrose & National	City	2,000			City	2,000
Improve intersection including dual left turn lanes at Republic & Campbell	City	2,600			City	2,600
Widen Campbell & add dual left turn lanes at Primrose	City	2,400			City	2,400
Widen Walnut Lawn between Main & Kansas Expressway	City	5,200			City	5,200
Construct left turn lanes on Fort Avenue at Sunshine	City	1,500			City	1,500
Construct Oak Grove Avenue between Cherry and Walnut	City	500			City	500
Construct left turn lanes on National & Walnut	City	100			City	100
Widen left turn lane on Grand Street between Holland & Kings for Median & left turns	City	1,500			City	1,500

**Table 20-20: Constrained Plan**

Project Description	Agency	Total (000s)	Federal		Local	
			Source	(000s)	Source	(000s)
Extend Sunset to Scenic	City	850			City	850
Weller Avenue railroad crossing approach improvement	City	35			City	35
Widen Blackman Road between Sunshine & the south city limits	City	2,275			City	2,275
Widen Battlefield Road from U.S. Highway 65 to East city limits	City	800			City	800
Widen Luster Avenue between Primrose & Glenstone	City	900			City	900
Railroad crossing improvement - Bennett at Enterprise	City	150			City	150
Relocate Cherokee & Campbell intersection	City	2,000			City	2,000
Add left & right turn lanes to National & Grand	City	2,000			City	2,000
Add left turn lanes to St. Louis & National	City	200			City	200
Change Campbell & Jefferson to 2-way north of Chestnut	City	500			City	500
Widen Republic from Hillcrest to Scenic	City	2,700			City	2,700
Improve intersection at Glenstone & Meadowmere	City	350			City	350
Widen & improve Battlefield from City Limits to Blackman	City	2,700			City	2,700
Construct bridge on Lakewood St. at Ward Branch	City	500			City	500
Farm Road 135, SCL to James River Freeway	County	1,700			County	1,700
Farm Road 164, Fr 135 to FR 141	County	2,000			County	2,000
South East-West Arterial - Kansas to Campbell, new road construction	City/County	6,200			City/County	6,200
Off-System Bridge Project(s) - 2 Per Year	County	8,000	FHWA	3,200	County	4,800
Farm Road 84, Fr 197 to FR 205, construct gap	County	1,000			County	1,000
FR 137, Republic Road to FR 182	County	3,000			County	3,000
Lakewood Street Bridge over Ward Branch	County	1,000			County	1,000
Farm Road 135, FR 170 to FR 182	County	1,700			County	1,700
Farm Road 146, Fr 115 to West Bypass	County	3,000			County	3,000
Farm Road 151, Intersection FR 151/FR 84	County	1,000			County	1,000
Farm Road 152, West Bypass to SCL	County	1,000			County	1,000
FR 151 over Pea Ridge Creek Bridge Replacement.	County	275			County	275
FR 144 over a branch of Jones Branch Bridge Replacement	County	350			County	350
Farm Road 178, FR 131 to U.S. 160	County/City/ MoDOT	6,000			County/City/ MoDOT	6,000
<b>TOTAL</b>		<b>79,035</b>		<b>3,480</b>		<b>75,555</b>
<b>Transit</b>						
Maintenance of Existing Operations - Fixed & Paratransit (annual)	CU	4,488	FTA	4,488	CU	0
* - Transit Planning	SMSU	529	FTA	423	SMSU	106
	Not-for-Profit				Not-for-Profit	
2 - Lift Equipped Vans (annual)	Providers	400	FTA	320	Providers	80
<b>TOTAL</b>		<b>5,417</b>		<b>5,231</b>		<b>186</b>
<b>Airport</b>						
Land Acquisition - Expansion & Land Use Compatibility (820 acres)	Airport	2,050	FAA	1,845	Airport	205
Construct New Fuel Facilities	Airport	1,647			Airport	1,647
Construct Snow Equipment Building	Airport	1,100	FAA	190	Airport	910
Extend and Renovate Runway 14/32 Along With Parallel and Connecting Taxiway System With Lights and PAPI	Airport	5,960	FAA	5,364	Airport	596
Install Runway 14 CAT I Approach	Airport	Unknown	FAA	Unknown	Airport	Unknown
Purchase 3 ARFF Vehicles	Airport	725			Airport	725
Remove Large Hangars North of Terminal and Expand Apron	Airport	303	FAA	273	Airport	30
Construct G.A. Apron and Taxiways	Airport	872	FAA	785	Airport	87
Improve/Expand Terminal Access Roadway System	Airport	43			Airport	43
Expand Passenger Terminal Auto Parking	Airport	130			Airport	130
Expand Air Cargo Apron	Airport	163	FAA	147	Airport	16
Expand Fuel Storage Facilities	Airport	120			Airport	120
Expand Airline Maintenance Facility Apron	Airport	363	FAA	327	Airport	36
Expand Passenger Terminal	Airport	1,600			Airport	1,600
<b>TOTAL</b>		<b>15,076</b>		<b>8,930</b>		<b>6,146</b>
<b>TOTAL FOR SHORT-RANGE</b>		<b>99,528</b>		<b>17,641</b>		<b>81,887</b>
<b>Mid-Range Future Project Needs (2011 – 2015)</b>						
<b>Highways</b>						
City UBF Project	City	350	FHWA	280	City	70
Add left & right turn lanes to National & Republic	City	2,100			City	2,100
Widen Republic Road between Charleston & Glenstone	City	3,100			City	3,100
Widen Grand Street between Glenstone & Wildan	City	3,500			City	3,500

**Table 20-20: Constrained Plan**

Project Description	Agency	Total (000s)	Federal		Local	
			Source	(000s)	Source	(000s)
Widen Republic Road between Kansas Avenue & Campbell	City	8,700			City	8,700
Widen Primrose Street between the Ronald McDonald House & Campbell	City	2,200			City	2,200
Widen Jefferson Avenue between Sunshine & Seminole	City	1,800			City	1,800
Construct left turn lanes on Grand Street & Fremont Avenue	City	1,000			City	1,000
Reconstruct Scenic Avenue at Railroad overpass	City	1,350			City	1,350
Widen Scenic Avenue between Battlefield & City limits	City	575			City	575
Widen National Avenue between Kearney & the north city limits	City	2,600			City	2,600
Widen Neergard Road between Kearney & I-44	City	1,900			City	1,900
Reconstruct left turn lane at Sunset & National	City	110			City	110
Widen Galloway Road between Luster & Lone Pine	City	1,900			City	1,900
Widen Division Street between Glenstone and U.S. 65	City	5,600			City	5,600
Widen Luster Avenue between Battlefield & Primrose	City	2,200			City	2,200
Extend Kansas Expressway from Republic Road to the south city limits	City	1,000			City	1,000
Add left right lane to Fremont & Sunshine	City	500			City	500
Change Campbell & Jefferson to 2-way south of Chestnut	City	1,000			City	1,000
Widen Republic from National to Fremont	City	1,100			City	1,100
Widen Republic from Fremont to Charleston	City	2,300			City	2,300
Widen Scenic from Nathanael Greene Park to Battlefield	City	2,000			City	2,000
Widen Campbell from Walnut Lawn to south city limits	City	6,800			City	6,800
Traffic calming on Commercial from Lyon to Washington	City	500			City	500
Widen & improve Weaver from National to Cox	City	6,300			City	6,300
Widen & improve Blackman from city limits to Battlefield	City	4,600			City	4,600
Construct Westgate from Chestnut to 160	City	6,750			City	6,750
Improve intersection of Campbell & Weaver	City	2,000			City	2,000
Construct bridge on Bennett Street at Wilson's Creek	City	800			City	800
Farm Road 102, FR 171 to U.S. 65	County	3,000			County	3,000
FR 156, BCL to FR 131	County	3,000			County	3,000
Farm Road 137, extend to FR 190	County	500			County	500
Farm Road 164, FR 129 to FR 135	County	1,000			County	1,000
Farm Road 170, FR 135 to HWY FF, 5 lanes	County	4,000			County	4,000
Farm Road 182, FR 131 to FR 135	County	1,000			County	1,000
Farm Road 186, U.S. 160 to FR 141	County	3,000			County	3,000
Off-System Bridge Project(s) - 2 Per Year	County	5,000	FHWA	2,000	County	3,000
Off-System Bridge Project(s) - 2 Per Year	County	5,000	FHWA	2,000	County	3,000
<b>TOTAL</b>		<b>100,135</b>		<b>4,280</b>		<b>95,855</b>
<b>Transit</b>						
Maintenance of Existing Operations - Fixed & Paratransit (annual)	CU	2,805	FTA	2,805	CU	0
* -Transit Planning (annual)	SMSU	331	FTA	265	SMSU	66
	Not-for-Profit				Not-for-Profit	
2 - Lift Equipped Vans (annual)	Providers	250	FTA	200	Providers	50
<b>TOTAL</b>		<b>3,386</b>		<b>3,270</b>		<b>116</b>
<b>Airport</b>						
Rehabilitate Runway 02/20 Including Parallel and Connecting Taxiway System	Airport	1,434	FAA	1,291	Airport	143
Construct General Aviation Apron and Taxiways	Airport	396	FAA	356	Airport	40
Add Connecting Taxiway East Side of Runway 02/20	Airport	260	FAA	234	Airport	26
Construct Security Fencing	Airport	211	FAA	190	Airport	21
Construct Perimeter Road	Airport	323	FAA	291	Airport	32
Relocate ARFF Facility	Airport	400	FAA	360	Airport	40
Expand Air Cargo Apron	Airport	126	FAA	113	Airport	13
Construct General Aviation Apron and Taxiways	Airport	780	FAA	702	Airport	78
<b>TOTAL</b>		<b>3,930</b>		<b>3,537</b>		<b>393</b>
<b>TOTAL FOR MID-RANGE</b>		<b>107,451</b>		<b>11,087</b>		<b>96,364</b>
<b>Long Range Future Project Needs (2016-2020)</b>						
<b>Highways</b>						
Off-System Bridge Project(s) - 2 Per Year	County	5,000	FHWA	2,000	County	3,000
City UBF Project	City	350	FHWA	280	City	70
Off-System Bridge Project(s) - 2 Per Year	County	5,000	FHWA	2,000	County	3,000
Widen & construct Summit from I-44 to Camorene	City	850			City	850
Construct Camorene from Summit to Grant	City	900			City	900
Construct left turn lanes on Summit Avenue at Kearney	City	750			City	750
Widen Oak Grove Avenue between Sunshine & Cherry	City	3,200			City	3,200

**Table 20-20: Constrained Plan**

Project Description	Agency	Total		Local		
		(000s)	Source	(000s)	Source	(000s)
Widen Cherry Street between Glenstone & U.S. 65	City	5,000			City	5,000
Widen LeCompte Road between Kearney & to South of I-44	City	2,400			City	2,400
Widen Republic Road between Campbell and National	City	7,900			City	7,900
Widen Barnes Avenue between Walnut & Chestnut Expressway	City	800			City	800
Widen Grand between Kansas Expressway & West Bypass	City	4,800			City	4,800
Widen Bennett Street between Enterprise & Oak Grove	City	900			City	900
Widen Partnership Boulevard	City	1,100			City	1,100
Improve Mustard Way from Kearney to Partnership Boulevard	City	1,100			City	1,100
Widen Briar Street between McCann & Arlington	City	1,500			City	1,500
Widen Campbell Avenue between Stanford & Grand	City	3,900			City	3,900
Widen Catalpa Street between Barnes & east city limits	City	5,700			City	5,700
Widen Cedarbrook Avenue between Pythian & Division	City	700			City	700
Widen Cherokee Street between South and Glenstone	City	4,400			City	4,400
Widen Cherry between National & Glenstone	City	2,500			City	2,500
Widen Pythian Street between Cedarbrook & U.S. 65	City	1,400			City	1,400
Widen Fort Avenue between Sunshine & Broadmoor	City	1,900			City	1,900
Widen Park Avenue between Kearney & Melville Road	City	950			City	950
Construct Grand from West Bypass to west city limits	City	1,200			City	1,200
Widen Bennett Street between Kings & Campbell	City	2,000			City	2,000
Widen Bennett Street between Oak Grove & Plaza	City	770			City	770
Widen Grand Street between Barnes & Oak Grove	City	1,000			City	1,000
Construct Holland Avenue extension over South Creek	City	550			City	550
Widen Valley Water Mill from Barnes to U.S. 65	City	6,000			City	6,000
Widen Walnut Lawn from Kansas Expressway to Cox	City	750			City	750
Widen Golden Avenue between Kearney & Division	City	2,500			City	2,500
Widen Grand Street between Wildan and Barnes	City	1,000			City	1,000
Extend Kansas Expressway from city limits to Christian County	City/County	11,000			City/County	11,000
Widen Valley Water Mill from Glenstone to National and National from Valley Water Mill to north city limits	City	3,000			City	3,000
Farm Road 94, Highway H to U.S. 65	County	4,000			County	4,000
Farm Road 115, Fr 146 to Chestnut Expressway	County	5,000			County	5,000
Farm Road 129 (Ext), FR 60 to FR 68, construct gap	County	1,000			County	1,000
Farm Road 151, intersection FR 151/FR96	County	250			County	250
Farm Road 188, FR 169 to Southwoods	County	3,000			County	3,000
Farm Road 189, FR 144 to FR 136	County	1,000			County	1,000
Farm Road 205, FR 84 to Highway C, construct gap	County	1,000			County	1,000
<b>TOTAL</b>		<b>108,020</b>		<b>4,280</b>		<b>103,740</b>
<b>Transit</b>						
Maintenance of Existing Operations - Fixed & Paratransit (annual)	CU	2,805	FTA	2,805	CU	0
* - Transit Planning (annual)	SMSU	331	FTA	265	SMSU	66
	Not-for-Profit				Not-for-Profit	
2 - Lift Equipped Vans (annual)	Providers	250	FTA	200	Providers	50
<b>TOTAL</b>		<b>3,386</b>		<b>3,270</b>		<b>116</b>
<b>Aviation</b>						
Construct Runway 02L/20R 4,100'x75' with MIRL, PAPI and REIL	Airport	1,434	FAA	1,291	Airport	143
Extend Runway 02/20 and Parallel Taxiway with Lights and PAPI	Airport	1,781	FAA	1,603	Airport	178
Install Runway 02 CAT II Approach	Airport	Unknown	FAA		Airport	Unknown
Expand Fuel Storage Facilities	Airport	120			Airport	120
Construct Security Fencing	Airport	526	FAA	473	Airport	53
Construct Perimeter Road	Airport	724	FAA	652	Airport	72
Construct Runway 02L/20R 10,000'x150' with Parallel Taxiway, Lights and PAPI	Airport	16,955	FAA	15,260	Airport	1,696
Install CATI Approach Runways 02L and 20R	Airport	Unknown	FAA		Airport	Unknown
<b>TOTAL</b>		<b>21,540</b>		<b>19,278</b>		<b>2,262</b>
<b>TOTAL FOR LONG-RANGE</b>		<b>132,946</b>		<b>26,828</b>		<b>106,118</b>
<b>TOTAL FOR ENTIRE LONG-RANGE CONSTRAINED PLAN 2000-2020</b>						
		<b>545,011</b>		<b>157,133</b>		<b>387,878</b>

**Table 20-21: Unconstrained Plan**

Project Description	Agency	Total (000s)	Federal		Local	
			Source	(000s)	Source	(000s)
<b>2002</b>						
<b>Transit</b>						
Maintenance of Existing Operations - Regular Fixed Routes	CU	3,417	FTA	504	CU	2,913
Maintenance of Existing Operations - Paratransit	CU	637	FTA	163	CU	474
Route Expansion - Line 7	CU	132	FTA	66	CU	66
Route Expansion - Line 12	CU	372	FTA	186	CU	186
Replace Transit Management Vehicle	CU	25	FTA	20	CU	5
Bus Turnouts	CU	50	FTA	40	CU	10
Bus Bench & Bus Shelter Maintenance	CU	10	FTA	8	CU	2
Bus Sign Purchase & Route Maps	CU	11	FTA	8	CU	2
Transitway connection from Hammons Pkwy to Intermodal Facility	SMSU	250	FTA	200	SMSU	50
Hammons Transitway from Briggs to Monroe	SMSU	1,200	FTA	960	SMSU	240
Intermodal Transfer Facility	SMSU	16,715	FTA	13,372	SMSU	3,343
<b>TOTAL FOR 2002</b>		<b>22,819</b>		<b>15,527</b>		<b>7,292</b>
<b>Short Range Future Project Needs (2003-2010)</b>						
<b>Highways</b>						
Roadway improvements for Jordan Valley Park	City		To be deter - mined		City	To be deter - mined
Route 160 (West Bypass), To 744 (Kearney) to Route 44 BL (Chestnut) Construction	MoDOT	5,768	FHWA	4614		
Route 65 and I-44 interchange improvements – right-of-way	MoDOT	6				
<b>TOTAL</b>		<b>5,774</b>		<b>4614</b>		<b>0</b>
<b>Transit</b>						
Maintenance of Existing Operations - Fixed & Paratransit - (Annually)	CU	27,336	FTA	5,536	CU	21,800
Route Expansion - Line 7 (annual)	CU	1,018	FTA	540	CU	478
Route Expansion - Line 12 (annual)	CU	3,040	FTA	1,520	CU	1,520
Bus Turnouts (annual)	CU	400	FTA	40	CU	360
Bus Bench and Bus Shelter Maintenance (annual)	CU	80	FTA	64	CU	16
Bus Route Maps and Route Signs (annual)	CU	84	FTA	67	CU	17
Transit Equipment for Intermodal Facility	SMSU	500	FTA	400	SMSU	100
Purchase 3 trolley-style buses	CU	900	FTA	720	CU	180
Replace Access Expresses buses	CU	750	FTA	600	CU	150
Replace Transit Management vehicles	CU	60	FTA	48	CU	12
Intelligent Fare Technology	CU	750	FTA	600	CU	150
Upgrade software system	CU	150	FTA	120	CU	30
Replace shop floor in Fleet Management area	CU	500	FTA	400	CU	100
Conduct Transit Operations Planning	SMSU	185	FTA	148	SMSU	37
Construct Transit Way Connection	SMSU	250	FTA	200	SMSU	50
Construct Hammons Transit Way	SMSU	1,200	FTA	960	SMSU	240
Widen Holland St. adjacent to Intermodal Facility	SMSU	300	FTA	240	SMSU	60
Construct Facilities for Pedestrians, Bicycles, Parking, Landscaping, Passenger Amenities	SMSU	1,600	FHWA	1,440	SMSU	160
Purchase and replace five buses w/lifts	SMSU	1,150	FTA	920	SMSU	230
Purchase Transit Equipment, Passenger Amenities, Refurbish Facilities	SMSU	1,000	FTA	800	SMSU	200
Construct Holland Avenue Transit Way	SMSU	600	FTA	480	SMSU	120
Construct Transit Maintenance Center	SMSU	1,296	FTA	1,037	SMSU	259
<b>Total</b>		<b>43,149</b>		<b>16,880</b>		<b>26,269</b>
<b>Aviation</b>						
Upgrade Security Access Control System	Airport	300	FAA	240	Airport	60
Acquire Avigation Easement	Airport	500	FAA	400	Airport	100
<b>Total</b>		<b>800</b>		<b>640</b>		<b>160</b>
<b>TOTAL FOR SHORT-RANGE</b>		<b>49,724</b>		<b>17,520</b>		<b>26,429</b>
<b>Mid-Range Future Project Needs (2011 – 2015)</b>						
<b>Highways</b>						
Farm Road 94, FR 125 to MO 13	County	2,000			County	2,000
Farm Road 94, FR 79 to FR 87	County	1,200			County	1,200
FR131 between FR 152 to FR 156	County	1,200			County	1,200
Farm Road 136, SCL to Greene County bridge	County	1,000			County	1,000
Farm Road 151, SCL to Beverly Hills Drive	County	500			County	500

**Table 20-21: Unconstrained Plan**

Project Description	Agency	Total (000s)	Federal		Local	
			Source	(000s)	Source	(000s)
Farm Road 178, FR 141 to FR 131 (500 ft. west)	County	3,500			County	3,500
Kansas Expressway extension, Republic Road to FR 182	County/City	12,000			County/City	12,000
FR 175 over Farmers Branch Bridge Replacement	County	375			County	375
FR 169 over Farmers Branch Bridge Replacement	County	300			County	300
FR 167 over Farmers Branch Bridge Replacement	County	300			County	300
East-West Arterial, Phase II, Campbell to National, new road construction	City/County	8,500			City/County	8,500
<b>TOTAL</b>		<b>30,875</b>		<b>0</b>		<b>30,875</b>
<b>Transit</b>						
Bus Turnouts (annual)	CU	250	FTA	200	CU	50
Bus Shelter Maintenance (annual)	CU	25	FTA	20	CU	5
Bus Bench Maintenance (annual)	CU	25	FTA	20	CU	5
Bus Stop Signs (annual)	CU	10	FTA	8	CU	2
Bus Maps (annual)	CU	35	FTA	28	CU	7
Replace Access Expresses buses	CU	750	FTA	600	CU	150
Replace Fixed Route buses	CU	6,900	FTA	5,520	CU	1,380
Replace Transit Management vehicles	CU	40	FTA	32	CU	8
Study Phase - second bus terminal	CU	50	FTA	40	CU	10
Design Phase - second bus terminal	CU	150	FTA	120	CU	30
Construct second bus terminal	CU	2,000	FTA	1,600	CU	400
<b>TOTAL</b>		<b>10,235</b>		<b>8,188</b>		<b>2,047</b>
<b>TOTAL FOR MID-RANGE PROJECTS</b>		<b>41,110</b>		<b>8,188</b>		<b>32,922</b>
<b>Long Range Future Project Needs (2016-2020)</b>						
<b>Highways</b>						
Six-lane Route 65 from Kearney to Christian Co. line (r/w, const., interchange modifications)	MoDOT	339				
Route 65 and I-44 interchange improvements – right-of-way and construction	MoDOT	61				
Route 160 from I-44 to Willard. Upgrade to expressway	MoDOT	10,530				
Widen Lone Pine between Seminole & Sunshine	City	1,300			City	1,300
Widen Nichols Street between Fulbright & Eldon	City	3,000			City	3,000
Widen Summit Avenue from I-44 to Kearney	City	950			City	950
Widen Mt. Vernon Street between South and West Bypass	City	10,100			City	10,100
Widen McClernon between Glenstone & Stewart	City	450			City	450
Widen Scenic Avenue between Sunshine & Nathanael Greene Park	City	1,500			City	1,500
Widen Seminole Street between Lone Pine & Fort	City	6,400			City	6,400
Widen Grand Street between National and Glenstone	City	2,700			City	2,700
Widen Blaine Street between Glenstone & Packer	City	4,200			City	4,200
Widen Barnes Avenue between Dale and Kearney	City	360			City	360
Widen Fremont Avenue between Lark & Briar	City	2,200			City	2,200
Construct/Widen Golden Avenue between Sunshine & Battlefield Road	City	5,100			City	5,100
Widen Barnes Avenue between Cherry & Bennett	City	2,900			City	2,900
Widen Packer Road between Kearney & Division	City	2,200			City	2,200
Reconstruct Kings Avenue between Catalpa & Bennett	City	850			City	850
Widen Kimbrough Avenue between Grand & Walnut	City	6,100			City	6,100
Widen Kansas Avenue between Walnut Lawn & Republic	City	2,700			City	2,700
Widen Barnes Avenue between Sharon to South of I-44	City	960			City	960
Widen Turner Street between Glenstone & Barnes	City	900			City	900
Widen Grand Street between Oak Grove & Belcrest	City	1,300			City	1,300
Widen Broadmoor Street between Campbell & Fort	City	1,900			City	1,900
Widen Cherry Street between Kimbrough and National	City	2,000			City	2,000
Widen Eldon Avenue between Nichols & Collings	City	1,500			City	1,500
Widen Seminole Street between Scenic & the west city limits	City	1,100			City	1,100
Widen Bennett Street between Hillcrest & Kansas Expressway	City	1,100			City	1,100
Widen Lone Pine Avenue between Republic & Seminole	City	8,500			City	8,500
Widen Fulbright Avenue between Kearney & north city limits	City	650			City	650
Widen Bennett Street between National & Fremont	City	700			City	700
Reconstruct Lyon Avenue at the railroad overpass	City	1,400			City	1,400
Widen & improve Republic from Golden to FF	City	4,200			City	4,200
Widen Inman from Golden to Cox	City	2,600			City	2,600
Widen National/James River Road from Plainview to	City	5,300			City	5,300

**Table 20-21: Unconstrained Plan**

Project Description	Agency	Total (000s)	Federal		Local	
			Source	(000s)	Source	(000s)
<b>Campbell</b>						
Six-lane Kansas Expressway from I-44 to JRF	City/MoDOT	88,000			City/MoDOT	88,000
Six-lane Kansas Expressway from JRF to Christian County Line	City/MoDOT	Unknown			City/MoDOT	Unknown
Six-lane Campbell from JRF to Christian County Line	City/MoDOT	Unknown			City/MoDOT	Unknown
Farm Road 115, BCL to MO 13	County	2,500			County	2,500
Farm Road 140, Highway MM to SCL	County	4,000			County	4,000
Farm Road 193, MO YY to FR 144	County	4,000			County	4,000
FR 146 over Wilson's Creek Bridge Replacement	County	400			County	400
FR 164 over the James River Bridge Replacement	County	500			County	500
East-West Arterial, Phase III, National to 65	City/County	19,150			City/County	19,150
<b>TOTAL</b>		<b>216,599</b>		<b>0</b>		<b>205,670</b>
<b>Aviation</b>						
Midfield Terminal Environmental Assessment	Airport	150	FAA	120	Airport	30
Midfield Terminal Land Acquisition	Airport	80	FAA	64	Airport	16
Midfield Terminal Site Work	Airport	11,029	FAA	8,823	Airport	2,206
Midfield Terminal Roads	Airport	7,347	FAA	5,877	Airport	1,469
Midfield Terminal Terminal Building	Airport	49,307	FAA	39,445	Airport	9,861
Midfield Terminal Apron/Connecting Taxiways	Airport	11,198	FAA	8,958	Airport	2,240
Midfield Terminal Parking Lots	Airport	4,857	FAA	3,886		
<b>TOTAL</b>		<b>83,967</b>		<b>67,174</b>		<b>15,822</b>
<b>Transit</b>						
Bus Turnouts (annual)	CU	250	FTA	200	CU	50
Bus Shelter Maintenance (annual)	CU	25	FTA	20	CU	5
Bus Bench Maintenance (annual)	CU	25	FTA	20	CU	5
Bus Stop Signs (annual)	CU	10	FTA	8	CU	2
Bus Maps (annual)	CU	35	FTA	28	CU	7
Replace 3 trolley-style buses	CU	900	FTA	720	CU	180
Replace Transit Management vehicles	CU	40	FTA	32	CU	8
<b>TOTAL</b>		<b>1,285</b>		<b>1,028</b>		<b>257</b>
<b>TOTAL FOR LONG-RANGE PROJECTS</b>		<b>301,852</b>		<b>68,202</b>		<b>221,749</b>
<b>Other Projects to Consider for 2000 - 2020</b>						
Route H, widening to provide left turn lanes and resurface from 1.5 miles north of I-44 to north of I-44	MoDOT	1,369			MoDOT	1,369
Route 13, grading, paving, & bridge from Polk County to Spring Creek Road	MoDOT	30,777			MoDOT	30,777
Route 44, grading & paving from Greene/Lawrence County line to Greene/Webster county line, add lines	MoDOT	68,678			MoDOT	68,678
Route 60, grading, paving & bridges for 4 lane relocation from west of Billings to east of Republic. Purchase right of way for interchange	MoDOT	60,994			MoDOT	60,994
Route 60, grading, paving, interchange & outer roadway for 4 lane relocation (freeway) from Republic to James River Freeway	MoDOT	56,635			MoDOT	56,635
Route 65, grading, paving, bridges & outer roadway from 1.0 mile south of Route 125 to Valley Water Mill Road	MoDOT	23,016			MoDOT	23,016
Route MM, grading, paving and railroad bridge for new 4 land highway from James River Freeway to Route 60	MoDOT	4,691			MoDOT	4,691
US 65 from north of Valley Water Mill Road to the Greene County Line. Expand to six lane freeway and upgrade interchanges and relocate outer roads	MoDOT	292,000			MoDOT	292,000
US 160 and MO 13 from south study area boundary to the James River Fwy (Route 60). Expand or construct new facilities to address congestion to south of Nixa.	MoDOT	50,000			MoDOT	50,000
Route H from I-44 to the north urban boundary. Upgrade to five lanes.	MoDOT	1,200			MoDOT	1,200
Bus. 65 (South Glenstone) from Battlefield Road to Route 60. Upgrade to six lanes and revise interchange at Route 60.	MoDOT	5,900			MoDOT	5,900
Route 266 from I-44 to new Airport Access Road (const. Only)	MoDOT	3,300			MoDOT	3,300
Route M and MM from I-44 to Route ZZ. New and upgrade existing to expressway with revised interchange at I-44 and new interchange at Route 60.	MoDOT	14,700			MoDOT	14,700
Route 744 from I-44 to Route 65. Upgrade to five lanes (const. Only).	MoDOT	3,900			MoDOT	3,900

**Table 20-21: Unconstrained Plan**

Project Description	Agency	Total (000s)	Federal		Local	
			Source	(000s)	Source	(000s)
New East-West Arterial, south of Steinert Road and Evans Road from MO F to US 65. Only as part of solution for South Campbell.	MoDOT	58,000			MoDOT	58,000
MO 13 from I-44 to existing MO 13. New four lane freeway north of Springfield.	MoDOT	No. est.			MoDOT	No. est.
Route M from Route ZZ to Route 160. Upgrade to five lanes (const only).	MoDOT	3,900			MoDOT	3,900
Chestnut Expressway west of Route 65. Railroad grade separation.	MoDOT	No. est.			MoDOT	No. est.
Route 60 from Route 65 to east urban boundary. Upgrade to freeway including new interchange at Route 65.	MoDOT	230,000			MoDOT	230,000
Route 60 from Route 360 to City of Republic. New relocation or upgrade to freeway.	MoDOT	54,000			MoDOT	54,000
Route 60 (James River Freeway) from Route 160 to Route 65. Add lanes for six lane facility.	MoDOT	19,800			MoDOT	19,800
I-44 from the Webster County line to the Lawrence County line. Add lanes for six lane facility.	MoDOT	64,545			MoDOT	64,545
Route H at I-44. Replace bridges and modify interchange.	MoDOT	No. est.			MoDOT	No. est.
<b>TOTAL FOR OTHER PROJECTS</b>		<b>1,047,405</b>				<b>1,047,405</b>
<b>TOTAL FOR UNCONSTRAINED LONG-RANGE PLAN 2000-2020</b>		<b>1,463,357</b>	<b>105,551</b>			<b>1,335,797</b>

## Feasible Funding Sources

To be included in the Springfield-Greene County Long Range Transportation Plan (LRTP), a project must have an identified source of funds that may be reasonably expected during the timeframe of planned project implementation. Thus, another purpose for this Plan is to identify funding sources believed to be reasonably available to fund the implementation of the Transportation Planning Area's (TPAs) needed transportation improvements identified in the 2020 plan horizon. However, many details will need to be resolved in further studies for specific projects.

Currently, major transportation funding sources include federal monies (Interstate Maintenance funds and National Highway System funds, regional or statewide Surface Transportation Program funds, and various types of grant funds) and state monies (Highway Maintenance & Operating Fund, Transportation Trust Fund, and General Fund).

Additionally, the City of Springfield and the Missouri Department of Transportation (MoDOT) have worked together to capitalize on the federal government's establishment of state infrastructure banks. The two entities entered into an interlocal agreement in April 1997, providing a re-payment schedule for MoDOT to pay back project funds. Essentially, this innovative funding mechanism was backed by a 1/8 cent transportation sales tax within the City of Springfield to back Transportation Revenue Bonds. The program is being administered by the Springfield Missouri State Highway Improvement Corporation.

Examples of innovative funding methods include a mechanism employed by various counties in Northern Virginia that issued public bonds to raise transportation revenues. A two percent motor fuels tax on gasoline sold in Northern Virginia localities is returned by the Commonwealth to the Northern Virginia Transportation Commission (NVTC) and the Potomac & Rappahannock Transportation Commission (PRTC) to support subregional transportation programs. These types of programs could also be considered as future innovative transportation funding mechanisms for the Springfield-Greene County area.

In addition to these traditional funding sources, the Northern Virginia region has been very adept at crafting and using creative and non-traditional revenue sources. Examples include the Route 28 Tax District, established by commercial landowners adjacent to Route 28 near Dulles Airport, in which commercial properties pay an annual tax that has been used to widen Route 28 and improve access to their properties. "The Dulles Greenway", an extension of the Dulles Toll Road from the vicinity of Route 28 westward to the Town of Leesburg that opened in 1995, was privately constructed under enabling legislation passed in 1988. This legislation provided a foundation for the Public Private Transportation Act of 1995 that encourages such public-private partnering.

The Northern Virginia members of the General Assembly have been highly successful in obtaining General Assembly authorization for the Commonwealth to sell a series of public bonds valued at over \$370 million funded by the taxes received from the recordation of real property sales in Northern Virginia. These bonds have greatly helped expedite completion of high priority subregional projects such as the Fairfax County Parkway, Route 234 Bypass around Manassas, the Franconia – Springfield Metrorail station, and the widening of Route 7 east of Leesburg. A newly established source of

funds is the "right-of-way use fee" which the Commonwealth charges for telecommunications towers erected within highway rights-of-way.

Local jurisdictions, such as Prince William County, have passed local road bonds to design and construct facilities. The Prince William Parkway, completed in the mid-1990s, used in part the over \$180 million in road bonds passed in Prince William County.

The following is a list of potential local revenue sources currently not used that could be accessed in the Springfield-Greene County area:

<u>Funding Source</u>	<u>Maximum Levy</u>	<u>Estimated Annual Revenue</u>
Transportation Sales Tax (City)	3/8 cent	\$10,237,500
Transportation Development District	3/8 cent	City - \$10,237,500 County - \$12,000,000
Transportation Development District	10 cents/\$100 assessed valuation	City - \$1,480,000 County - \$2,100,000
Capital Improvements Sales Tax	City - 1/4 cent County - 1/2 cent	\$6,825,000 \$16,000,000
Storm Water and Public Works Sales Tax	1/10 cent County - \$3,200,000	City - \$2,730,000
Property Tax for General Municipal Purposes (City)	\$1/\$100 assessed valuation	\$14,800,000

Local jurisdictions in Missouri (e.g. – Lee’s Summit, Liberty, and Raymore) have enacted excise taxes to recover some of the cost of new development. Missouri statutes are in place for a development related excise tax. The local jurisdictions enacting an excise tax would need to develop a cost for improvements related to new development, establish a tax proposal that would finance those costs, and have a referendum on that tax proposal. The potential revenue to be raised by this innovative financing mechanism is under study.

**Recommendations:**

The Metropolitan Planning Organization, as recognized by the federal government, has an important role to play, along with the Missouri Department of Transportation, in making transportation decisions for the area. MoDOT is responsible under the federal transportation act to select projects on the National Highway System, interstate maintenance and bridges, in cooperation with the MPO. The MPO, in consultation with MoDOT, is responsible for selecting other transportation projects in the area. The MPO's project ranking process is intended to provide a method by which the MPO's perspective is articulated and made available to MoDOT. Prior to being approved for funding by the MPO, each of the recommended capital projects included in this plan will be reviewed to ensure that they continue to meet the *Vision 20/20* transportation objectives.

**Actions:**

- Through the Metropolitan Planning Organization (MPO), the City of Springfield and Greene County, and other jurisdictions should work together with MoDOT to implement the needed road system improvements. These improvements address major transportation needs in the Springfield-Greene County urban area. They do not, however, mitigate all deficiencies. Hence, alternative transportation improvements shall also be explored as part of the transportation roadway system improvement program.
  
- The MPO will work with local jurisdictions to identify funding sources for the highest-priority transportation projects, such as:
  - Six-lane Campbell south of James River Freeway
  - Six-lane Kansas Expressway from I-44 to James River Freeway
  - Six-lane US 65
  - New north-south arterial east of US 65
  - James River Freeway/Glenstone Interchange
  - East-west arterial in southern Greene County between US 65 and Kansas Expressway extension



## Implementation Program

This section describes the major actions involved in implementing the Transportation Plan. The actions are prioritized relative to each other for each major transportation section. The agency responsible for implementation is identified and those agencies required for coordination efforts are listed.

### Priority      Action

- 1. Plan Adoption:** Springfield and Greene County should formally adopt the Vision 20/20 Transportation Plan as their guiding document for transportation improvements.

Responsible Agency:      Springfield and Greene County  
Coordination:              MPO area jurisdictions and Missouri Department of Transportation

- 1. Plan Implementation:** Develop a strategic plan for implementing the Springfield-Greene County Transportation Plan.

Responsible Agency:      MPO

## Streets and Highways

1. Regularly update Street Classifications for the Major Thoroughfare Plan.

Responsible Agency:      Springfield MPO  
Coordination:              Springfield City Council, Missouri Department of Transportation, and Greene County Commission

1. Regularly update the Functional Classification Map to align with the recommendations in the Major Thoroughfare Plan within the confines of the federal requirements.

Responsible Agency:      Springfield MPO  
Coordination:              Federal Highway Administration and the Missouri Department of Transportation

1. Ensure that the classifications of street types contained in metropolitan area zoning ordinances, subdivision regulations, and design standards agree with those discussed in the Street and Highway section.

Responsible Agencies:      City of Springfield, Greene County, MoDOT, other metropolitan area jurisdictions  
Coordination:              Springfield MPO

1. Adopt the Design Standards for Streets and Highways (**Table 20-2**) and the Generalized Characteristics of Streets by Classification (**Table 20-3**) as part of policies concerning the design standards of all major streets (e.g., zoning ordinances and subdivision regulations).

Responsible Agencies: City of Springfield, Greene County, the Missouri Department of Transportation, and other jurisdictions in the planning area

Coordination: Springfield MPO

1. Regularly update their adopted Major Thoroughfare Plan, subdivision ordinance, zoning controls, and criteria for the installation of traffic controls. All of these tools should be used to ensure land use compatibility and the preservation of the neighborhood unit.

Responsible Agencies: Metropolitan Area Jurisdictions

Coordination: Springfield MPO

1. Utilize the identified guidelines for off-site and on-site improvements related to development proposals.

Responsible Agencies: Metropolitan Area Jurisdictions

Coordination: Springfield MPO

1. Establish provisions for secondary circulation systems in subdivision and zoning ordinances. The application of these provisions should be done on a case-by-case basis, where it applies to the need to improve an existing secondary circulation system or provide a new connection into an existing secondary circulation system.

Responsible Agency: Metropolitan Area Jurisdictions

Coordination: Springfield MPO

2. Adopt a Major Thoroughfare Plan and cooperate together to preserve corridors. Future corridors should be established and adhered to, although some flexibility to determine precise alignments is possible during platting and right-of-way acquisition. All right-of-way preservation techniques should be explored in the effort to preserve street corridors as shown on the Major Thoroughfare Plan.

Responsible Agency: Metropolitan Area Jurisdictions

Coordination: Springfield MPO

2. Consider alternative scenarios for including the entire length of Sunshine Street under one jurisdiction control.

Responsible Agencies: City of Springfield and the Missouri Department of Transportation

Coordination: Springfield MPO

2. Cooperate on the design and alignment of roadway facilities that incorporate the parkway concept.

Responsible Agencies: City of Springfield, Greene County, and MoDOT  
Coordination: Springfield MPO

2. Consider designing new and upgrading existing roadway facilities with amenities included in the parkway concept. These facilities would include the highest quality in engineering, landscaping, signage, lighting, linear public open space and pedestrian-bicyclist accommodation.

Responsible Agencies: Metropolitan Area Jurisdictions and MoDOT  
Coordination: Springfield MPO

2. Improve traffic linkages between the three Center City districts.

Responsible Agencies: City of Springfield and MoDOT  
Coordination: Springfield MPO

3. Design future local and collector streets intersecting parkways by extending parkway treatments into and across adjacent neighborhoods in order to extend its positive impression and leverage the public investment.

Responsible Agency: Metropolitan Area Jurisdictions  
Coordination: Springfield MPO

3. Improve streetscape, landscaping and lighting on Benton-Kimbrough and Boonville-South Avenues to help define and accentuate their role in connecting and integrating Center City.

Responsible Agency: City of Springfield  
Coordination: Springfield MPO and Missouri Department of Transportation

## **Transit and Paratransit**

1. Evaluate all proposals for service improvements or reductions in relation to the adopted guidelines before any official action is taken.

Responsible Agency: City Utilities  
Coordination: Springfield MPO

1. Maintain a marketing program on a continuing basis and conduct periodic surveys of both transit riders and non-riders to identify attitudes toward the bus system and opportunities for customer-oriented improvements. Design services that meet identified needs and implement and promote such services. Maintain and publicize customer information services and conduct frequent safety sensitivity training sessions for bus operators.

Responsible Agencies: City Utilities and Southwest Missouri State University  
Coordination: Springfield MPO

1. Consider a new marketing position to supervise, coordinate, and expand the actions called for in the Transportation Plan.

Responsible Agency: City Utilities  
Coordination:

1. Continue to promote transit services through various promotional opportunities in the community. SMSU should explore new methods to promote the campus shuttle system for the entire community, by joining with various promotions conducted by City Utilities Transit.

Responsible Agencies: City Utilities and Southwest Missouri State University  
Coordination:

1. Review transit capital and support needs annually through the budgeting process. The needs must be included in the Springfield Area Transportation Study Organization's Transportation Improvement Program and in the Transportation Plan.

Responsible Agencies: City Utilities and SMSU  
Coordination: Springfield MPO

1. Include transit planning activities in the Springfield Area Transportation Study Organization's annual Unified Planning Work Program.

Responsible Agencies: City Utilities and SMSU  
Coordination: Springfield MPO

1. Investigate opportunities for coordination of shuttle, van, and special needs transportation services. The MPO can assist providers with information on the area's transportation needs and facilitate public/private agency discussions.

Responsible Agencies: Not-for-profit transportation providers  
Coordination: Springfield MPO

1. Develop an implementation plan for sidewalk and ramp improvements to help improve the accessibility to and from the City Utilities fixed-route transit bus stops, providing connections to major destinations along these routes.

Responsible Agencies: City of Springfield, City Utilities, and MoDOT  
Coordination: Springfield MPO

2. Improve the MPO review procedures for the Federal Transit Administration (FTA) Section 5310 program that generally provides funding for one to two vans. There are always more needs in the community than there is funding. Future funding decisions should continue to stress the importance of sharing transportation resources between agencies and investigate the possibility of shared fleets.

Responsible Agency: Springfield MPO  
Coordination: Springfield MPO and Federal Transit Administration (FTA)

2. Facilitate the use of transit and shuttle services as attractive alternatives to the automobile through the following planning activities:
- Effective land use planning, street network planning, and site plan review;
  - Increasing density at activity centers served by fixed route public transit;
  - Siting buildings to encourage transit use, in addition to accommodating driving and parking;
  - Work with developers to provide pedestrian amenities such as sidewalks and shelters in all major developments near transit and shuttle lines;
  - Pursuing transit and shuttle route restructuring in response to future demands, including innovative service programs;
  - Coordinating public transit with the implementation of Travel Demand Management techniques; and,
  - Monitoring the community for future transit opportunities.

Responsible Agencies: Metropolitan area jurisdictions and transportation providers

Coordination: Springfield MPO

2. Investigate the feasibility of additional transit operational improvements such as the use of intermodal parking facilities and intelligent transportation system techniques, such as traffic signal timing to accommodate bus movements. Continue to build transit coordination improvements at the interface between the City Utilities fixed route transit system and the SMSU shuttle system.

Responsible Agencies: City Utilities, SMSU, Not-for-Profit transportation providers, and inter-city bus

Coordination: Springfield MPO

2. Improve customer service outreach and investigate methods for advertising transit operations through innovative methods such as bus wraps.

Responsible Agencies: City Utilities and Southwest Missouri State University

2. Work on re-locating the transit transfer facility to the Jordan Valley Park intermodal parking facility and study the possibility of re-locating the City Utilities bus maintenance facility and offices to a Center City location in proximity to the transfer facility.

Responsible Agencies: City of Springfield and City Utilities

Coordination: Springfield MPO

2. Coordinate future shuttle service possibilities in the Jordan Valley Park, thus encouraging a pedestrian “auto-free” environment.

Responsible Agencies: City of Springfield, City Utilities, SMSU, and area not-for-profit transportation providers

Coordination: City of Springfield and the MPO

2. Consider the use of subsidized taxi scripts, monthly bus passes based on income levels, and other equity programs for individuals when they do not have an alternative means of transportation.

Responsible Agencies: City Utilities and Not-for-Profit transportation providers  
Coordination: Springfield MPO

2. Investigate the feasibility of establishing an organization such as a transportation authority to operate in the Springfield metropolitan area. This type of agency could be part of a freestanding MPO or act as a separate entity. The significant number of legal and practical barriers inherent in this proposal would need to be addressed prior to an extensive amount of investigation into the option.

Responsible Agency: Springfield MPO  
Coordination: Springfield MPO

3. Review the fare structure annually, modify if needed.

Responsible Agencies: City Utilities and Springfield City Council  
Coordination: City Utilities and City of Springfield

3. Continue and enhance the existing rideshare-matching program. The present program is located in the Planning Department but could easily be transferred to another department, to City Utilities, or even to a private not-for-profit agency. The minimal level of activity should include continuation of the telephone line and the ability to provide match-lists to the public. Whenever sharp rises in fuel costs occur efforts to contact major employers would be initiated.

Responsible Agency: Springfield MPO  
Coordination: All member agencies

3. Upon request, consider providing technical assistance to not-for-profit transportation providers in the annual Unified Planning Work Program (UPWP). Such assistance shall be subject to funding availability, unless there is staff expertise available.

Responsible Agency: Springfield MPO  
Coordination: Springfield MPO

3. Continue to research transportation options that might include contracting paratransit transportation, shuttles, or other special transportation needs in the community. Such a contract could be with an individual company or a not-for-profit transportation provider, which could operate some or all of the service.

Responsible Agency: Springfield MPO  
Coordination: Springfield MPO

3. Identify any legal barriers, which may prevent private transportation operators from providing paratransit and special needs transportation services in the area.

Responsible Agency: Metropolitan Area Jurisdictions  
Coordination: Springfield MPO

## Bicycle System

1. Provide convenient connections between bicycle paths, multi-use paths and streets designated as bicycle routes.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Implement a bicycle plan that addresses how a bicyclist can safely cross freeways, railroads, major drainage corridors, and other barriers. When additional streets are required to address connectivity, make appropriate changes on the Major Thoroughfare Plan. When connectivity is best provided by pedestrian and bicycle facilities, determine the location and type of crossing needed.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Establish and implement a maintenance plan for bicycle routes. This plan should schedule routes for continuous maintenance including sweeping, marking and pavement maintenance.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Stripe bicycle lanes on designated bicycle routes whenever space allows.

Responsible Agencies: Metropolitan area jurisdictions

1. Continue to use signs to designate bicycle routes in the Springfield-Greene County area. City, county and state traffic departments should adopt signage consistent with the MUTCD and work together on creating continuous routes throughout the area based on this plan.

Responsible Agencies: City of Springfield, Greene County, and Missouri  
Department of Transportation  
Coordination: Springfield MPO

1. Modify roadway design standards and subdivision requirements to accommodate bicycle friendly practices in the construction of a wide outside travel lane:

1. Retrofit existing storm water inlet drains to models that are “bicycle safe.”
2. The gutter also serves as a buffer to keep pedals from hitting the curb. Use a design for new inlets that has the drop in the curb and no grate in the street.

Responsible Agencies: City of Springfield, Greene County, and Missouri  
Department of Transportation  
Coordination: Springfield MPO

1. Coordinate bicycle plan implementation to ensure that the portions of the bicycle system being developed by each organization are done so in concert.

Responsible Agencies: Springfield and Greene County Planning Departments, the Springfield Public Works Department, the Greene County Highway Department, the Springfield-Greene County Parks and Recreation Department, Ozark Greenways and other MPO jurisdictions  
Coordination: Springfield MPO

1. Implement a systematic program for the bicycle route system, providing continuous connections to the major employers and attractions from all neighborhoods.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Develop the bicycle network as set forth in **Figure 20-15** that accommodates commuting.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Redesign roadways to accommodate bicyclists.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Bicyclists should be provided with maps that outline the bicycle route system. The bicyclists should be encouraged to select marked or unmarked routes that incorporate suitable routes, as indicated on the Bicycle Suitability Map (**Figure 20-13**).

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Implement design policies that protect the outside travel lane where bicycle traffic normally operates. The lane should be free of longitudinal seams, bumps, holes, joints or drop-offs. These areas should be kept clean of debris as well. Examples of protective measures include rumble strips.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Use proper design and safety considerations for any bicycle path or bicycle route that crosses rails.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Only bicycle compatible drainage grates should be used along a bicycle path or bicycle route. If existing grates along these routes are incompatible, provisions should be made to make the grates safe until such time as they can be replaced.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Roadway pavement patching projects along bicycle facilities should be smoothed to the surface level to avoid unsafe conditions.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

1. Explore the feasibility of creating a new Bicycle/Pedestrian Coordinator position.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

2. Investigate all existing and innovative financing techniques available to aid in the implementation of the bicycle route plan and its coordination with the Springfield-Greene County greenway system.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

2. Permit use of paths developed in the Springfield-Greene County area by each kind of user that can operate safely together with respect to traffic volume and path design.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

2. Provide safeguards for the Springfield-Greene County bicycle paths, routes, and lanes that minimize liability through warnings, procedures for calling-in hazards, and having a quick-response maintenance system.

Responsible Agency: Metropolitan area jurisdictions

2. Manhole covers along bicycle facilities should be installed at the surface level. Any manhole covers along bicycle facilities that have a raised surface should be corrected or the bicyclist should be provided with warning information prior to the impediment.

Responsible Agencies: Metropolitan area jurisdictions

2. Bicycles should be considered in the selection of traffic control devices. Although most traffic control devices apply equally to motorists and bicyclists, bicyclists have distinctive needs in two initial areas:

1. Signal timing and detection; and
2. Bicycle-related signing and marking.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

2. Modify zoning ordinances to include provisions for storage and security of bicycles associated with commercial and industrial development in the same manner that parking provisions are now included.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

2. Coordinate the needs for bicycle transportation and bicycle recreation in the Springfield-Greene County area. The Greenway system should include separate paths for bicyclists and pedestrians except in very low volume situations.

Responsible Agencies: Metropolitan area jurisdictions and Springfield MPO  
Coordination: Springfield MPO

2. Modify roadway marking standards to provide additional width on the outside travel lanes on roadways that are included on the Springfield-Greene County Bikeway Map.

Responsible Agencies: City of Springfield and Greene County  
Coordination: Springfield MPO

2. If a bridge is on a route determined to be essential for bicycle and pedestrian transportation and cannot be improved to a reasonable standard, convenient alternative access should be provided, such as:
  1. Routing bicyclists and/or pedestrians to an alternative, accessible and direct route;
  2. Developing a second, bicycle/ pedestrian bridge; or
  3. Using an existing route as an alternative or developing a short-cut transportation route such as a bicycle/pedestrian underpass.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

2. Provide for lighting requirements along bicycle facilities.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

2. Develop a risk management procedure for the area-wide bicycle system as a comprehensive effort to ensure that the bicycle route system is both accessible and safe to use.

Responsible Agencies: City of Springfield and Greene County  
Coordination: Springfield MPO

2. Coordinate transportation system management policies that can add both efficiency and capacity to the area's future transportation system.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

3. Consider adding paved shoulders to Farm Roads that frequently carry bicycle traffic.

Responsible Agency: Greene County  
Coordination: Springfield MPO

3. The Bicycle Plan should be reviewed periodically and updated as necessary.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

3. Provide wide curb lanes of 14-feet or more for commuter bicycle travel in Springfield-Greene County, especially along those facilities that are designated as part of the bicycle route system.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

3. Bridges can be designed for both bicycle traffic and pedestrian traffic. Exceptional attention must be taken to ensure bicycle safe expansion joints are utilized. In some cases, it might be necessary to retrofit a bicycle path onto an existing bridge.

Responsible Agencies: Metropolitan area jurisdictions  
Coordination: Springfield MPO

## Pedestrian System

1. Amend the City's subdivision ordinance to require five-foot sidewalks on both sides of all streets in residential areas except: (a) where the design density is less than three dwelling units per acre, or (b) on cul-de-sacs serving six dwelling units or less.

Responsible Agency: City of Springfield

1. Amend Greene County's subdivision ordinance to require five-foot sidewalks on both sides of all streets in residential developments in the Urban Service Area except: (a) where the design density is less than three units per acre, or (b) on cul-de-sacs serving six dwelling units or less. Within the Urban Service Area (the portion of the county expected to be urbanized in the future), sidewalk requirements should be the same as for the city.

Responsible Agency: Greene County

1. Amend subdivision regulations so sidewalks are required along open-ditch sections where adequate right-of-way is available.

Responsible Agencies: City of Springfield and Greene County  
Coordination: Missouri Department of Transportation

1. Explore various funding sources in order to finance the construction of these sidewalk segments.

Responsible Agencies: Metropolitan Area Jurisdictions  
Coordination: Springfield MPO

1. Work with school districts to help develop a sidewalk accessibility and priority plan for elementary, middle, and high schools.

Responsible Agencies: Metropolitan Area Jurisdictions  
Coordination: Springfield MPO, Parent-Teacher Associations

1. Subdivision regulations should be revised to:
  1. Require sidewalks, not only along arterial and collector streets, but also along local roadways;
  2. Require sidewalks along all streets in commercial areas;
  3. Require sidewalks along internal private streets where appropriate; and,
  4. Amend regulations to provide incentives for pedestrian friendly site plans (e.g., reduced parking requirements).

Responsible Agencies: Metropolitan Area Jurisdictions  
Required Coordination: MPO

1. Investigate funding mechanisms to implement a sidewalk priority plan.

Responsible Agencies: City of Springfield, Greene County, and Missouri  
Department of Transportation  
Coordination: MPO

1. The City, County, and State should coordinate their efforts to provide pedestrian ramps and sidewalk improvements to substandard segments, particularly targeting areas around elder care facilities, hospitals, etc. where the need for ADA accessibility is substantial.

Responsible Agencies: City of Springfield, Greene County, and Missouri  
Department of Transportation  
Required Coordination: City of Springfield, City Utilities, Greene County, and Missouri Department of Transportation

1. Find funds for pedestrian improvements.

Responsible Agencies: Metropolitan Area jurisdictions  
Coordination: MPO

1. Encourage proprietors of all major businesses to provide enhanced pedestrian connections from the front door, through the parking areas, to connect to adjacent activity areas.

Responsible Agencies: Metropolitan Area jurisdictions  
Coordination: MPO

1. Ensure that safe pedestrian connections are provided to all public facilities, from their designated parking areas.

Responsible Agencies: Metropolitan Area jurisdictions  
Coordination: MPO

2. Set a high funding priority for improving sidewalk connections in community development block grant (CDBG) eligible areas.

Responsible Agencies: City of Springfield  
Coordination: MPO

2. Coordinate with City Utilities transit to provide pedestrian and transit stop improvements throughout its service area.

Responsible Agencies: City of Springfield, and Missouri Department of Transportation  
Coordination: MPO

2. Establish specific guidelines for pedestrian amenities, as part of the Planned Development District and Plot Assignment District requirements, for areas that are designated as activity centers in the Springfield-Greene County Comprehensive Plan.

Responsible Agencies: City of Springfield and Greene County  
Coordination: MPO

2. Using the criteria in the Pedestrian section, staff from the City of Springfield, Greene County, and MoDOT should identify areas that lack continuity of accessibility.

Responsible Agencies: City of Springfield, Greene County and Missouri Department of Transportation  
Coordination: MPO

## **Transportation System and Demand Management**

1. Work with large area employers to look at various programs for implementing Transportation Demand Management (TDM) mechanisms, especially in areas where the transportation system meets or exceeds its capacity.

Responsible Agency: Springfield MPO  
Coordination: MPO

1. Consider funding a new position to implement actions within this chapter.

Responsible Agencies: City of Springfield, Greene county, and MoDOT  
Coordination: MPO

1. Jurisdictions should utilize driveway ordinances to implement the access standards for major streets.

Responsible Agencies: Metropolitan Area Jurisdictions  
Coordination: Springfield MPO

1. Work together to develop Traffic Flow Management Corridor Plans for major streets in the MPO Transportation Planning Area.

Responsible Agencies: Metropolitan Area Jurisdictions  
Coordination: Missouri Department of Transportation

1. Continue to modernize existing signal systems.

Responsible Agencies: City of Springfield and Missouri Department of Transportation

1. Encourage traffic calming methods in appropriate locations. Developers should be given the option to implement traffic calming methods, where appropriate.

Responsible Agencies: City of Springfield and Greene County  
Coordination: MPO

2. Work together to develop an official policy for gated communities.

Responsible Agencies: City of Springfield and Greene County

2. Develop an Intelligent Transportation System Deployment Plan with the assistance of all potential users in the region. This plan should ensure that the system would be in compliance with the national architecture, along with being tailored to local needs.

Responsible Agencies: Metropolitan Area Jurisdictions and MoDOT  
Coordination: MPO

2. Subdivision ordinances should incorporate improved access standards for major streets, in order to control access to future streets.

Responsible Agencies: City of Springfield and Greene County  
Coordination: Springfield MPO and Missouri Department of Transportation

2. Encourage coordination between the City Utilities fixed-route transit system and the Southwest Missouri State University shuttle system to maximize transit system efficiency in the metropolitan area.

Responsible Agencies: City Utilities and Southwest Missouri State University  
Coordination: Springfield MPO

2. Increase community awareness of the rideshare program through additional advertising, promotion, and other means.

Responsible Agencies: Springfield MPO and Metropolitan Area Jurisdictions

3. Identify appropriate locations for park and ride facilities along U.S. 65, which could further facilitate carpooling between Springfield and Branson.

Responsible Agencies: Metropolitan Area Jurisdictions and MoDOT  
Coordination: MPO

3. Explore Advanced Transportation Management Systems options in the metropolitan area and investigate all potential funding sources to help implement these strategies.

Responsible Agencies: Metropolitan Area Jurisdictions and MoDOT  
Coordination: MPO

## Airports

1. Examine zoning patterns for vacant land around Downtown Airport (the primary private/public Springfield community airport) and encourage only compatible uses within the approach paths of the runways.

Responsible Agency: City of Springfield

1. Implementation of the Airport Master plan is the responsibility of the Airport Board and the Springfield-Branson Regional Airport staff. A schedule of proposed capital improvements is prepared annually, based on identified needs and funding availability, and is incorporated into the MPO Transportation Improvement Program. Planned future capital improvements are included in the Fiscal Plan. The Transportation Plan should be amended to include future airport projects that are not included in the Fiscal Plan.

Responsible Agencies: Springfield Airport Board and Springfield-Branson  
Regional Airport staff  
Coordination: Springfield MPO

1. It is critical that the City of Springfield and Greene County follow existing practices for protecting noise levels, the environmental quality, and the land use compatibility of the Springfield-Branson Regional Airport area. The city and the county should continue the existing zoning patterns in effect around Springfield Regional Airport. No rezoning of agricultural land to noise-sensitive uses should be allowed within the noise contours (65-75 Ldn) unless a detailed noise analysis is made and noise control features are included in the building design.

Responsible Agencies: City of Springfield and Greene County

3. The Springfield Airport Board and the Springfield-Branson Regional Airport staff are responsible for assuring that the Master Plan is current. In the event that a major update of the plan is needed, the Airport Board should appropriate funds and retain a consultant or hire additional staff to conduct the study.

Responsible Agency: Springfield Airport Board  
Coordination: MPO

## Trucking

1. As a general rule, deny a rezoning request if the proposed use would result in truck travel through a residential area.

Responsible Agencies: City of Springfield and Greene County

1. Design subdivisions to provide for streets that channel truck traffic to the arterial system without passing through residential areas.

Responsible Agencies: City of Springfield and Greene County

1. Identify streets with potential or existing truck traffic problems. Then, using the criteria discussed in the trucking section, determine whether or not truck traffic should be limited or prohibited on those streets.

Responsible Agencies: City of Springfield and Greene County  
Coordination: MPO

1. Locate major activity centers requiring extensive goods and service movements near major highway interchanges and along major arterial streets, so that truck traffic will not impact residential neighborhoods.

Responsible Agencies: City of Springfield and Greene County  
Coordination: MPO

1. Work with Emergency Management, MoDot, and others in the community to plan and carry out responses to Hazardous Materials incidents.

Responsible Agencies: Emergency Management, Metropolitan Area Jurisdictions, MoDOT and other emergency response agencies

1. Include a representative of the trucking industry on the Metropolitan Planning Organization (MPO) Technical Committee.

Responsible Agency: Springfield MPO

2. Encourage development of a multimodal or inter-modal ground transport park that accommodates the movement of freight by rail and by truck.

Responsible Agencies: City of Springfield, Greene County, Missouri  
Department of Transportation, and Burlington Northern  
Railroad

Coordination: MPO

2. Work with railroads for development of a new intermodal rail facility that is easily accessible by interstate trucking.

Responsible Agencies: City of Springfield, Greene County Missouri  
Department of Transportation, and Burlington Northern  
Railroad

Coordination: MPO

2. Provide more efficient freight transfer points.

Responsible Agencies: City of Springfield, Greene County and Missouri  
Department of Transportation

Coordination: MPO

2. Provide a multimodal or inter-modal terminal at the airport and coordinate development of land and transportation facilities in the vicinity of the airport.

Responsible Agencies: Springfield Airport Board, City of Springfield, Greene  
County and Missouri Department of Transportation

Coordination: Springfield MPO

2. Use traffic-calming devices available to deal with traffic problems in existing neighborhoods.

Responsible Agencies: Metropolitan Area Jurisdictions

Coordination: MPO

2. Develop measures (e.g., noise walls, berms, increased setbacks, etc.) to mitigate adverse noise impacts of major transportation facilities on adjacent less intense land uses.

Responsible Agencies: MoDOT and Metropolitan Area Jurisdictions

2. Determine those areas where traffic congestion occurs due to truck deliveries and, working with neighborhood and merchant groups, determine the most effective method of dealing with the problem.

Responsible Agencies: City of Springfield, Greene County and Missouri  
Department of Transportation

2. Ensure that stringent provisions concerning the transport of hazardous materials are included in local regulations for the City of Springfield, Greene County, and the other incorporated cities within Greene County.

Responsible Agencies: City of Springfield, Greene County and Missouri  
Department of Transportation

3. Provide annual code review and updates to ensure that provisions remain current.

Responsible Agencies: City of Springfield, Greene County and Missouri  
Department of Transportation

3. Determine if there is a need for additional requirements for provision of off-street loading spaces in Greene County and the City of Springfield.

Responsible Agencies: City of Springfield and Greene County

## **Intercity Buses**

1. Work with intercity bus companies to find locations for terminals that facilitate connections with other transportation providers.

Responsible Agencies: City of Springfield and Springfield MPO

1. Continue fixed-route transit service to the location of the inter-city bus terminal.

Responsible Agency: City Utilities  
Coordination: MPO

2. Follow up on the Springfield/Branson Corridor Study proposal for an interregional and express bus service to meet the travel needs of people in the area.

Responsible Agencies: Springfield MPO, Metropolitan Area Jurisdictions, and  
MoDOT

2. Consider a satellite intercity bus terminal in the proposed Jordan Valley Park Intermodal Parking Structure.

Responsible Agency: City of Springfield  
Coordination: MPO

3. City and County departments and agencies should monitor potential and existing problems with use of local streets by intercity buses. If a problem is identified, representatives from the City or County should discuss the issue with the appropriate company.

Responsible Agencies: City of Springfield and Greene County  
Coordination: MPO

3. Encourage intercity bus companies to make stops at the Springfield/Branson Regional Airport.

Responsible Agencies: Springfield MPO and Airport Board

## Railroads

1. Identify street crossings of railroad lines and recommend maintaining safety and accessibility as rail and motor traffic increase.

Responsible Agencies: MoDOT and railroads  
Coordination: MPO

1. Through subdivision review, try to provide that all new developments with adequate access to the major thoroughfare system without crossing railroad tracks.

Responsible Agencies: Metropolitan Area Jurisdictions

1. Provide adequate warning devices at railroad crossings where grade separation is not feasible. This should be implemented through negotiation between the railroads and local municipalities, Greene County, or the Missouri Department of Transportation, as appropriate. Hazardous rail crossings should continue to be identified through the existing process with the appropriate state agencies.

Responsible Agencies: Metropolitan Area Jurisdictions  
Coordination: Railroads and local municipalities, Greene County, or the Missouri Department of Transportation

1. Provide representation on the Metropolitan Planning Organization (MPO) Technical Committee for a representative of the railroad industry.

Responsible Agency: Springfield MPO

2. Include in the ITS Implementation Plan a priority for providing location of trains and status of at-grade crossing protection equipment to applicable users such as emergency vehicle dispatch, traffic operations systems, and train dispatchers throughout Springfield and Greene County.

Responsible Agencies: Springfield MPO and Metropolitan Area Jurisdictions

2. The appropriate local government would negotiate with the railroads concerning the location and funding of future grade-separated crossings.

Responsible Agencies: Metropolitan Area Jurisdictions and MoDOT  
Coordination: MPO and railroads

2. Amend zoning ordinances to include requirements for bufferyards between rail facilities and less-intense land uses, even when Planned Development District provisions are not used.

Responsible Agencies: City of Springfield and Greene County

2. Reduce the hazards involved in the presence of railroad tracks within street rights-of-way where feasible. Removal of obsolete facilities can be achieved through negotiation between the city and the railroads, as has occurred in the past. In some cases, federal funds are available to assist with the removal and repair of at-grade crossings.

Responsible Agencies: City of Springfield, Greene County, and MoDOT  
Coordination: Railroads

2. Identify appropriate locations and obtain funding for multimodal freight facilities at the airport.

Responsible Agencies: Springfield MPO and Airport Board  
Coordination: Railroads and Trucking Firms

3. Work with representatives of state and national government to explore the possibility of Amtrak service (rail or connecting bus service) to the Springfield area.

Responsible Agencies: City of Springfield, Greene County, and MoDOT  
Coordination: MPO

3. Provide for industrial areas that are accessible to one or more of the following regional transportation facilities: airports, railroads, and the arterial roads or the interstate highway system.

Responsible Agencies: City of Springfield and Greene County  
Coordination: MPO

## **Fiscal Plan**

1. Explore the creation of a road fund derived from general obligation bonds to provide the initial costs of street improvement projects, which would be repaid through tax-billing the abutting property owners.

Responsible Agencies: Metropolitan Area Jurisdictions

1. Jurisdictional policies should be reviewed to consider an option for private development to assist in undertaking a street improvement. If this development also benefits another landowner, the initial project contributor could be partially reimbursed through the tax-billing procedure. The initial contributor would be required to provide the construction costs, but the other affected property owners would be assessed in proportion to their frontage along the street and would repay the initial contributor over a period of 15 or 20 years.

Responsible Agencies: Metropolitan Area Jurisdictions

1. Work together to secure the various innovative funding sources for transportation improvements outlined in this section. Specific projects should be outlined as part of a package that is compiled for each funding source sought. All projects listed for funding through a particular source should be feasible to complete with the projected revenue stream that the funding source will produce.

Responsible Agencies: Metropolitan Area Jurisdictions and Missouri  
Department of Transportation  
Coordination: MPO

1. Implement needed road system improvements. These improvements address major transportation needs in the Springfield-Greene County urban area. They do not, however, mitigate all deficiencies. Hence, alternative transportation improvements shall also be encouraged as part of the overall transportation system improvement program.

Responsible Agencies: City of Springfield, Greene County, and Missouri  
Department of Transportation  
Coordination: Springfield MPO

1. The MPO should work with local jurisdictions to identify funding sources for key transportation projects.

Responsible Agency: Metropolitan Area Jurisdictions and MoDOT  
Coordination: Springfield MPO

2. Participate in efforts to ensure that an appropriate share of state and federal resources for roadways are allocated to the area.

Responsible Agencies: Metropolitan Area Jurisdictions and MoDOT  
Coordination: MPO



# Appendices

# Appendix to the Bicycle System

## Bicycle Route Suitability Assessment

### 1. Methodology Assessment Results

#### Parameters for Bicycle Suitability Measurement

##### Traffic Speed

<u>Stress Level</u>	<u>Motor Vehicle Speed</u>	
1	<30 mph	Street daily traffic volume < 1,000 and a 30 mph speed limit
2	30 - 34 mph	Street daily traffic volume > 1,000 and a 30 mph speed limit
3	35 - 39 mph	Streets with a 35 mph speed limit
4	40 - 44 mph	Streets with a 40 mph speed limit
5	≥45 mph	Streets with a speed limit > 45 mph

##### Curb Lane Width

<u>Stress Level</u>	<u>Curb Lane Width</u>
1	>15 feet
2	14 feet
3	13 feet
4	12 feet
5	< 11 feet

#### Comments

Curbside lane width is the distance from the joint between the curb and gutter and the lane line to the left of the first full travel lane. With parked vehicles, it is measured from the side of the car from a line six-feet from edge of gutter or eight-feet from face of curb. When a paved shoulder is adjacent to the travel lane, the curb lane width is the travel lane width plus the width of the paved shoulder. On two-lane streets with a center two-way left turn lane, subtract two-feet from required curb lane width for each stress level. On streets with no escape zone such as a non-mountable curb (more than 6") or deep drop-off, add four-feet to the required lane width for each stress level. Where on-street parking exists, measure from a line six-feet from edge of gutter or eight-feet from face of curb. When a paved shoulder is adjacent to the travel lane, the curb lane width is the travel lane width plus the width of the paved shoulder. On two-lane streets with a center two-way left turn lane, subtract two-feet from required curb lane width for each stress level. On streets with no escape zone such as a on-mountable curb (more than 6") or deep drop-off, add four-feet to the required width for each stress level.

**Traffic Volume**

<u>Stress Level</u>	<u>Curb Lane Volume</u>	<u>Comments</u>
1	<50 veh/hr/lane	Street daily traffic volume <1,000
2	50-200 veh/hr/lane	Street daily traffic volume 1,001 to 4,000
3	201-350 veh/hr/lane	Street daily traffic volume 4,001 to 7,000 for 2-lane streets or 8,001 to 14,000 for 4-lane streets
4	351-500 veh/hr/lane	Street daily traffic volume 7,001 to 10,000 for 2-lane streets or 14,001 to 20,000 for 4-lane streets
5	>500 veh/hr/lane	Street daily traffic volume >10,000 for 2-lane streets or >20,000

**Roadway Crossing Width**

<u>Stress Level</u>	<u>Crossing Width</u>
1	≥16 feet
2	17-28 feet
3	29-40 feet
4	41-52 feet
5	≤53 feet

**Comments**

Add to the crossing width range for each stress level 12 feet for a traffic signal, an additional 12 feet for bicycle actuation or fixed time signal or six feet for push buttons, and 12 feet if there are no opposing left turns during the crossing interval.

**Perception**

Perception deals with other stressors that are not included in data bases. Such stressors include street and non-residential driveway intersections, railroad grade crossings, non-traversable grates, rough or uneven surface, short sight distance, stop signs requiring the bicyclist to stop, intimidation and complications at street crossings, and other parameters not related to speed, lane width, or traffic volume.

<u>Stress Level</u>	<u>Motor Vehicle Speed</u>
1	0-5 stressors/quarter-mile
2	6-10 stressors/quarter-mile
3	11-15 stressors/quarter-mile
4	16-20 stressors/quarter-mile
5	continuous stress

**Comments**

Add number of occurrences of the parameters listed for this measure. Where conditions are particularly intimidating or complicated, the parameter can be given two or three points for each occurrence.

The stress level for each roadway segment for each of the four parameters is added and divided by four to determine the cumulative stress level for the roadway segment. The bicycle committee can then determine at what stress thresholds the map should show the roadway to determine suitability. Terms that can be used to describe suitability are "slight risk", "low risk", "moderate risk", and "not suitable."

**Crossing Traffic Volume**

<u>Stress Level</u>	<u>Roadway Volume</u>
1	<100 veh/hr or 1,000 veh/day
2	101-800 veh/hr or 1,001 to 8,000 veh/day
3	801-1,600 veh/hr or 8,001 to 16,000 veh/day
4	1,601-2,400 veh/hr or 16,001 to 24,000 veh/day
5	5>2,400 veh/hr or 24,000 veh/day

**Comments**

Roadway volume is that volume crossing between refuge points such as edge of street, channelization island, traversable median greater than six feet in width.

**Major Intersections**

Intersections that have stop signs are considered major intersections. The parameters for evaluating intersection crossing stress are traffic speed, curb lane width and traffic volume of the street with the bike route and roadway width and traffic volume of the crossing street. The parameters for measurement of the street with the bike lane are the same as listed above. The parameters for measurement of the other two parameters are discussed below.

Roadway volume includes opposing left turning movements. Right turning traffic from the left not in a channelized right turn lane counts at one-half the rate of crossing and opposing vehicles. At signalized intersections, all movements count at one-half the rate of non-signalized intersections.

The stress level for each major intersection crossing for each of the five parameters is added and divided by 5 to determine the cumulative stress level for the major intersection crossing. The bicycle committee can then determine at what stress thresholds the map should show the intersection to be suitable and marginally suitable.



# Appendix to the Pedestrian System

## Introduction

The *Vision 20/20* comprehensive planning process recognized a desire in the community to improve pedestrian facilities in the Springfield metropolitan area. One way to accomplish this would be to develop a safe, high-quality, continuous, barrier-free pedestrian network that would function as an integral part of Springfield-Greene County transportation system. These facilities could be either on-street or off-street.

Communities throughout the country are developing methods of improving pedestrian access and movement. Some possible approaches for improving the pedestrian system in the Springfield metropolitan area are illustrated in this appendix.

## Design Considerations

### Pedestrian Crossing Considerations

#### Safety

Citizens in the Springfield metropolitan area need to have convenient, safe, and continuous sidewalks available in areas where pedestrian activity is likely. These sidewalks must also be of adequate width, free of intrusions, and be accessible to all citizens with an ability to use the system. For safety reasons sidewalks need to be setback from major arterial and provide aesthetically pleasing landscape strips when feasible. There also needs to be appropriate street crossing provisions and considerations made for walking speeds of senior adults when setting the phasing for crossing signals.

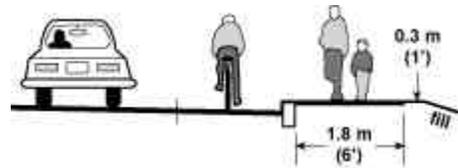
#### Security

Sidewalks should be clearly visible to passers-by and provide a sense of personal security.

### Standard Sidewalk Width

Sidewalks in the Springfield metropolitan area should be constructed in the Springfield metropolitan area to a width between five and six-feet, exclusive of curb and obstructions. This width allows two pedestrians (including wheelchair users) to walk side by

side, or to pass each other comfortably. It also allows two pedestrians to pass a third pedestrian without leaving the sidewalk. Where it can be justified and deemed appropriate, the minimum width may be five-feet. On local streets, considerations for width requirements may include a combination of width constraints or low potential usage. The Community Physical Image and Character Element of the Springfield-Greene County Comprehensive Plan, which was adopted by the Springfield City Council in 1998, calls for "sidewalks with a minimum width of five-feet along both sides of residential streets." The AASHTO (American Association of State Highway and Transportation Officials) policy on geometric design of highways and streets

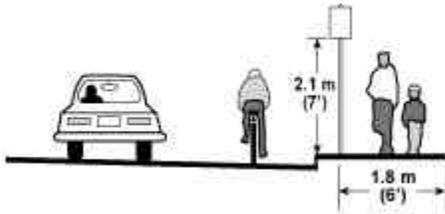


recommends that sidewalks in residential areas vary from four to eight-feet depending on the types of usage anticipated. It goes on to state that where sidewalks are placed adjacent to the curb, the widths should be approximately two-feet wider than those widths used when a planted strip separates the walk and curb. However, it is recommended that a planting strip be placed between curb and sidewalk.

**Obstructions**

The standard sidewalk width is clear of obstructions such as sign posts, utility and signal poles, mailboxes, parking meters, fire hydrants, trees and other street furniture. Obstructions should be placed between the sidewalk and the roadway, to create a "buffer" for increased pedestrian comfort. Movable obstructions such as signboards, tables and chairs must allow for a 6-ft clear passage. Obstructions should not be placed in such a manner that they impair visibility by motorists.

Clearance to vertical obstructions (signs, trees, etc.) must be at least 7 ft:



**Sidewalk Clearances**

Cars parked perpendicular or diagonally to sidewalks can be obstructions if there is excessive overhang. Blocks can be used to prevent narrowing the usable sidewalk width:



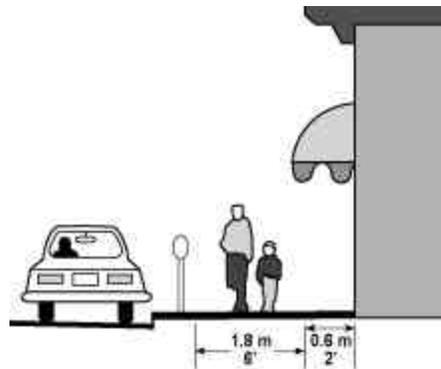
**Reducing Overhang from Parked Cars**

**Shy Distance**

An additional two-ft shy distance is needed from shoulder-high vertical barriers such as buildings, sound walls, retaining walls and fences:

**Sidewalk against wall**

*Note: ADA requires that "objects protruding from walls (e.g. signs, fixtures, telephones, canopies) with their leading edge between 27" and 80" (685 and 2030 mm) above the finished sidewalk shall protrude no more than 4" (100 mm) into any portion of the public sidewalk." (ADAAG 14.2.2)*



## Planting Strips

Well-designed streets include planting strips. A planting strip should be five-feet wide or greater (minimum three-feet), and landscaped with low-maintenance plantings.



**Street with Planting Strip**

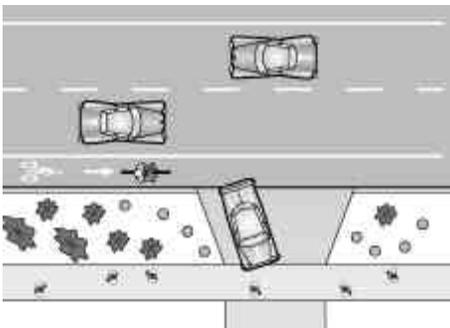
The extra separation from motor vehicle traffic decreases road noise, prevents water in puddles from splashing onto sidewalk users and generally increases a walker's sense of security and comfort. Planting strips offer many other benefits to pedestrians and motorists including, room for street trees which provide shade, slow traffic due to narrowed site lines, and create buffers between vehicles and pedestrians and residents. Planting strips also provide room for signposts, utility and signal poles, mailboxes, parking meters, fire hydrants, etc.:



**Sidewalk with Planting Strip**

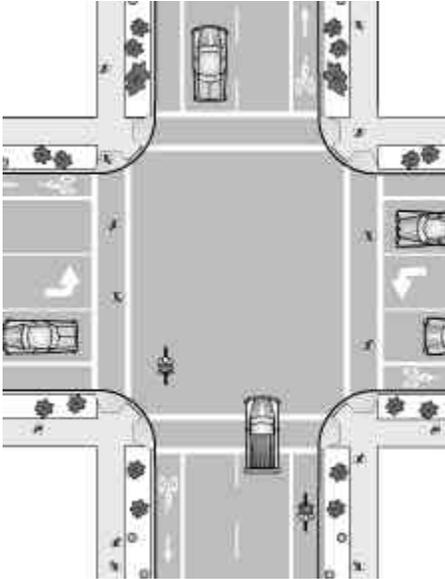
## Wide Planting Strips provide Room for Turning Movements

When wide enough, planting strips provide a place for a motor vehicle to wait out of the stream of traffic while yielding to a pedestrian in a driveway:

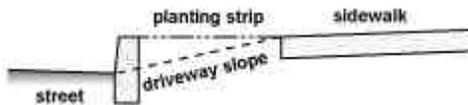


**Wide Planting Strips Provides Room For Turning Movements**

**Planting strips allow sidewalks, curb cuts and crosswalks at intersections to line up.**



An enhanced environment for wheelchair users, as the sidewalk can be kept at a constant side slope, with the slope for driveways built into the planting strip section:



**Planting strip at driveway  
(and effect on cross-slope)**

- An opportunity for aesthetic enhancements such as landscaping (plants should be selected that require little maintenance and watering, and whose roots will not buckle sidewalks);
- Less runoff water, decreasing overall drainage requirements; and,
- A place to store snow removal during the winter.

Where constraints preclude the use of the same width throughout a project, the planting strip can be interrupted and resume where the constraint ends:

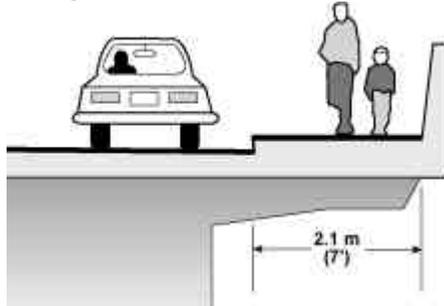


**Planting Strip Constraints**

## High Speed Corridors

Sidewalks must not be placed directly adjacent to a high-speed travel lane (design speed 45 MPH and above). Acceptable buffers include a planting strip, a shoulder barrier, a parking lane or a bike lane. Buffers are also beneficial on lower speed facilities.

## Bridges



## Sidewalk on Bridge

The standard width for sidewalks on bridges is seven-feet (min. six-feet), to account for a shy distance from the bridge rail (some pedestrians feel uncomfortable walking close to a high vertical drop). The bridge sidewalk must not be narrower than the approach sidewalk; in instances where the approach sidewalks are of differing widths, the lesser of the two widths may be used on the bridge. Sidewalks on bridges with design speeds greater than 40 MPH require a vehicle barrier at curb line.

## Surfacing

The preferred material for sidewalks is Portland Cement Concrete (PCC), which provides a smooth, durable finish that is easy to grade and repair.

Asphaltic Concrete (A/C) may be used if it can be finished to the same surface smoothness as PCC. A/C is susceptible to break up by vegetation, requires more frequent maintenance and generally has a shorter life expectancy (15-20 years versus 40 years or more for PCC).

Brick pavers can provide an aesthetically pleasing effect if the following concerns are addressed:

- They should be laid to a great degree of smoothness;
- The surface must be slip-resistant when wet; and,
- Long-term maintenance costs should be considered.

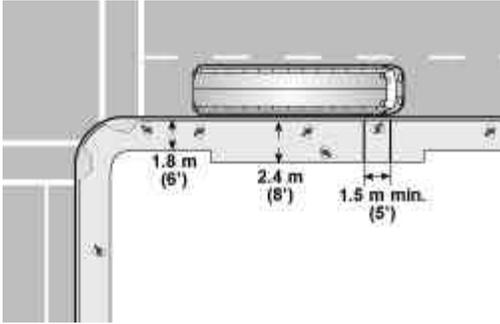
## Paths

In general, the standard width of a path is the same as for sidewalks. A path should not be constructed where a sidewalk is more appropriate. The path should either be paved or have a surface material that is packed hard enough to be usable by wheelchairs and children on bicycles (the roadway should be designed to accommodate more experienced bicyclists).

Recycled pavement grindings provide a suitable material: they are usually inexpensive and easy to grade (this should be done in the summer, when the heat helps pack and bind the grindings).

## Transit Pedestrian Considerations

### Sidewalks



### Bus Stop Pad

At transit stops, sidewalks should be constructed to the nearest intersection or to the nearest section of existing sidewalk. It may be necessary to wrap a sidewalk around a corner to join an existing sidewalk on a side street. If a transit route does not have complete sidewalks, it is still important to provide a suitable area for waiting pedestrians.

ADA requires an eight-foot by five-foot landing pad at bus entrances and exits. To avoid the choppy effect this creates at permanent bus stop locations, it may be preferable to construct a continuous eight-foot wide sidewalk the length of the bus stop, or at least to the front and rear bus doors.

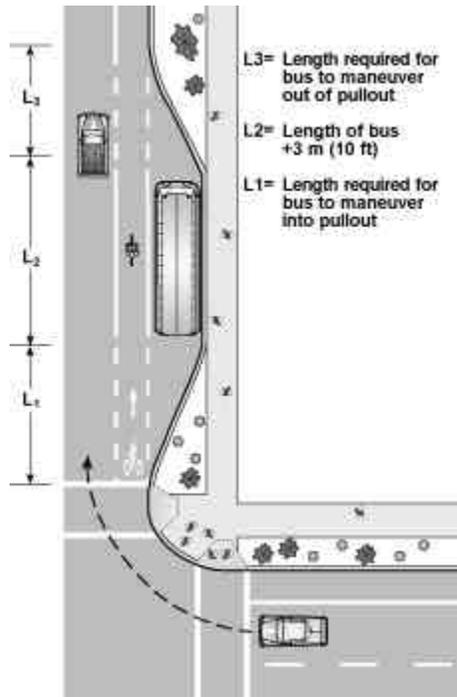
At stops in uncurbed areas, the shoulder should be 8 ft wide to provide a landing pad.

### Shelters

A standard-size bus shelter requires a (6 x 10 ft) pad, with the shelter placed no closer than two-feet from the curb. The adjacent sidewalk must still have a 6-ft clear-zone. Orientation of the shelter should take into account prevailing winter winds. Bike racks should be considered at bus stops in urban fringe areas.

*Each transit agency may have its own standards for bus shelter pads; walkway construction should be coordinated with local transit agencies to ensure compatibility.*

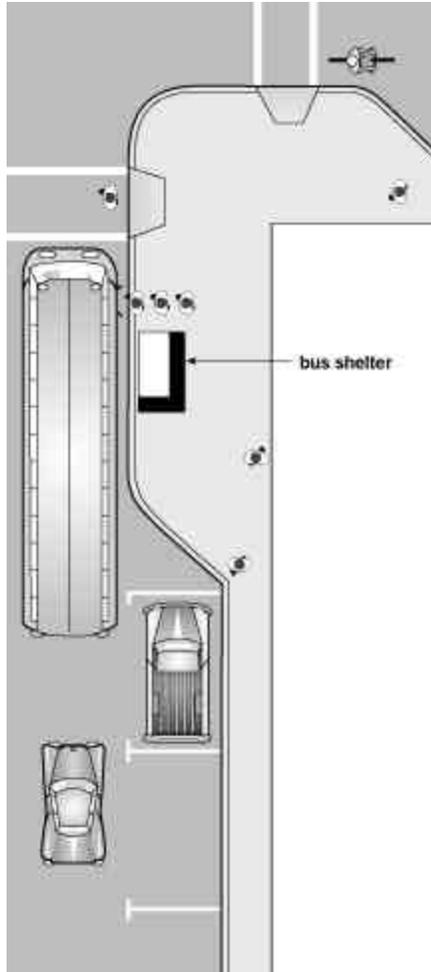
## Bus Pull-Outs



### Far side bus pullout at intersection

Where traffic conditions warrant a bus pullout at an intersection, a far-side location is preferred. The needs of passengers boarding or exiting a bus should not conflict with the needs of pedestrians and bicyclists moving through the area. A curb extension helps pedestrian crossing movements, prevents motorists from entering the bus pullout area and reduces conflicts with through bicyclists. Each pullout should be designed to meet roadway conditions and bus characteristics.

On streets with parking, near-side bus stops also benefit from curb extensions, so passengers can board or dismount the bus directly without stepping onto the street; this also makes it easier to meet ADA requirements (the bus pulls up right next to the curb):



### Near-Side Curb Extension At Intersection

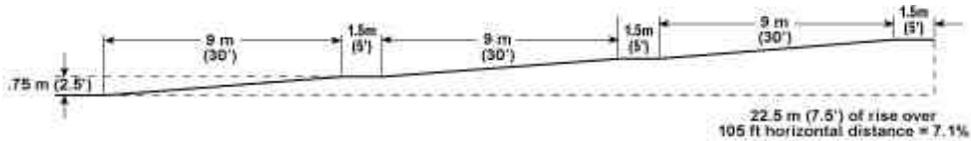
#### ADA Considerations

##### Wheelchair Accessibility

**Width:** ADA requires a minimum passage of three-feet. *Vision 20/20* recommended a standard sidewalk width of five to six-feet, which exceeds the ADA requirement. If a three-foot sidewalk must be used, five-foot by five-foot passing areas are required at intervals no longer than 200 feet.

**Grades:** The following standards pertain mostly to the grade of separated paths on independent alignments (sidewalk curb cuts have their own requirements). Where sidewalks are directly adjacent to a roadway, they may follow the natural grade of the land.

ADA requires that the grade of ramps and separated pathways not exceed five percent. A maximum grade of 12:1 (8.33%) is acceptable for a rise of no more than 2.5-feet if a level landing at least five-feet long is provided at each end.

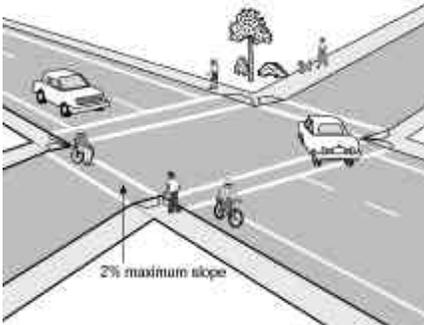


### Maximum Allowable Grades

While this may be suitable for short distances, such as a ramp to the entrance of a building, a 12:1 slope followed by a level landing over a long distance creates a choppy effect that is difficult to construct. The overall grade achieved by this configuration is 7.1 percent. It may be preferable to extend the length of the facility to achieve a constant five percent grade.

### Cross-Slope

The maximum allowable cross-slope for a walkway is two percent. At driveways, curb cuts and road approaches (in crosswalks, marked or unmarked), a three-foot minimum wide area must be maintained at two percent.



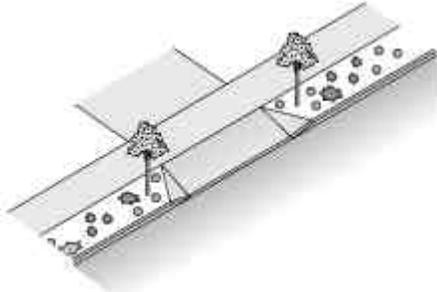
### Two Percent Cross-Slope Maintained Through Crosswalk

To facilitate wheelchair movement at driveways, the following techniques prevent an exaggerated warp and cross-slope:

- Reducing the number of accesses reduces the need for special provisions; this strategy should be pursued first;
- Constructing wide sidewalks avoids excessively steep driveway slopes; the overall width must be sufficient to avoid an abrupt driveway slope:

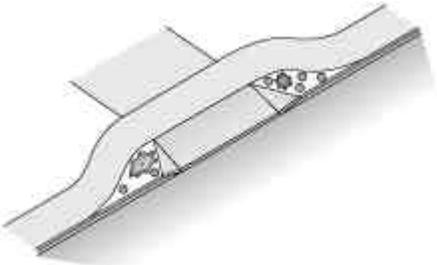
### Wide Sidewalk at Driveway

- Planting strips allow sidewalks to remain level, with the driveway grade change occurring in the planting strip:



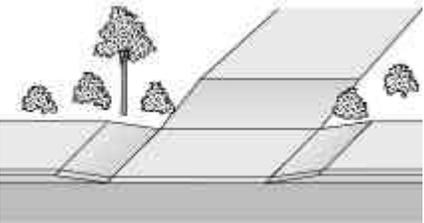
### Driveway with Planting Strip

- Where constraints don't allow a planting strip, wrapping the sidewalk around driveway entrances has a similar effect (this method may have disadvantages for the vision-impaired who follow the curb line for guidance)



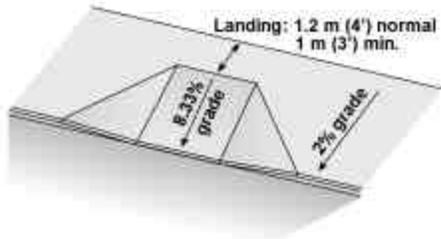
### Sidewalk Wrapped Around Driveway

- When constraints allow for only minimal sidewalks behind the curb, dipping the entire sidewalk at approaches keeps the cross-slope at a constant grade. This may be uncomfortable for pedestrians and may create drainage problems behind the sidewalk.



### Entire Sidewalk Dips at Driveway Curb-Cuts

ADA requires two curb cuts per corner at intersections for new construction (one oblique cut may direct users into the travelway). A three-foot wide passage with a cross slope of two percent must be maintained behind curb cuts.



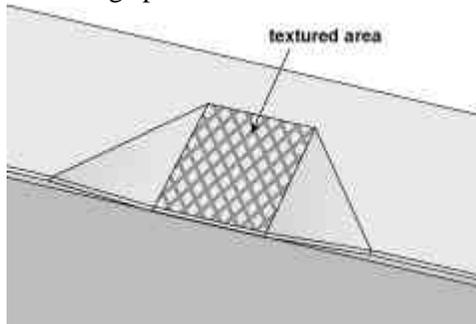
### One Meter (3 ft) Wide Area at Two Percent Cross-Slope on Sidewalk

#### Visually Impaired

Pedestrian facilities should be designed so people with impaired vision can track their way across approaches and through intersections. Most recommended practices for sidewalk construction satisfy these requirements.

The most critical areas for the vision impaired are locations where the crossing points may not be readily apparent to motorists, for example at a corner with a large radius. There are several techniques that enhance the environment for the vision-impaired:

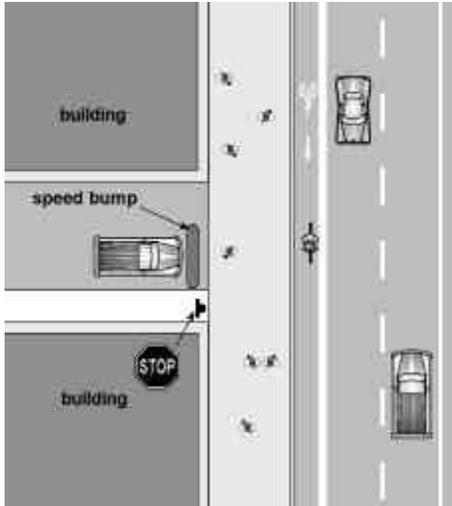
- Placing crosswalks in areas where they are expected (in line with curb cuts and sidewalks);
- Providing audible pedestrian signals at busy intersections; and,
- Using special surface texture at curb cuts to identify the placement of the crosswalk.



#### Textured Ramp Alleys

Alleys in urban areas can present problems for pedestrians if sight distance is limited and if buildings adjacent to the sidewalk surround the alley. Frequently, drivers exiting an alley do not notice pedestrians. Several measures can be taken to improve pedestrian visibility:

- Continuing the surface design (texture and color) of the sidewalk through the alley crossing, so motorists know they are entering a pedestrian zone;
- Placing stop signs;
- Placing a speed hump before the front of a vehicle protrudes onto the sidewalk; and,
- Placing mirrors so drivers can see approaching pedestrians.



**Alley Approaching Sidewalk**

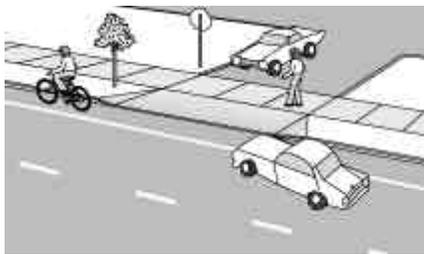
**Driveway Configurations and Their Affect on Pedestrians**

Accesses onto private property can be built as conventional driveways, or with designs that resemble street intersections. For pedestrian safety and comfort, the conventional driveway type is preferred, for the following reasons:

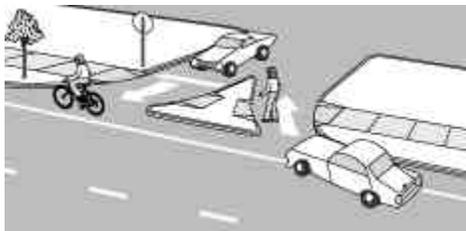
- Motorists must slow down more when turning into the driveway; and,
- The right of way is clearly established, as motorists cross a sidewalk.

Intersection-type driveways have the following disadvantages for pedestrians:

- Motorists can negotiate the turn at faster speeds; and,
- The right of way is not as clearly established, as the roadway appears to wrap-around the curb line.



**Conventional Driveway Slows Turning Vehicles**



**The Style of Driveway May Encourage High Speed Turn**

Where an intersection-style driveway is used (such as to implement a "right-in, right-out" policy), the following techniques can be used to alleviate the above concerns:

- The street surface material should not carry across the driveway - rather, the sidewalk should carry across the driveway, preferably at sidewalk height, so motorists know they are entering a pedestrian area;
- The radius of the curb should be kept as small as possible;
- Driveway widths should be the minimum needed for entering and exiting vehicles; and,

Where the volume of turning vehicles is high, right-turn channelization should be considered, to remove slower turning vehicles from the traffic flow, allowing them to stop for pedestrians; or a traffic signal should be considered where the turning movements are very high.

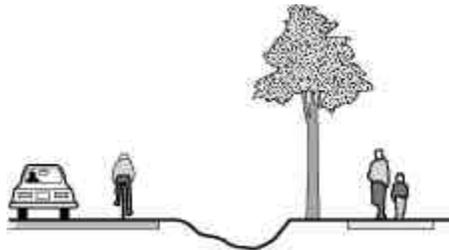
## **Innovative Design**

### **Sidewalks without Curb and Gutter**

#### **Sidewalks Behind the Ditch**

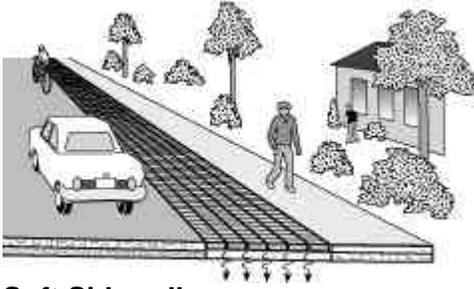
On roads with a rural character, where drainage is provided with an open ditch, and where there is sufficient right-of-way, sidewalks may be placed behind the ditch.

The sidewalk should be built to the same standard as curbed sidewalks: 6 ft wide (5 ft min.). If the traffic on the road is high, bicyclists should be accommodated with on-road bike lanes or shoulders. Gravel driveways should be paved back 15 ft to avoid debris accumulation on the sidewalks.



#### **Sidewalk Behind the Ditch**

**Soft Sidewalks:** A "soft sidewalk" has no curb separating the roadway from the walkway. This treatment may be appropriate in areas of moderate precipitation and low traffic volumes and speeds. A brick paver strip, gravel or other permeable material separates sidewalks, so runoff water can percolate. A change in surface texture is needed for vision-impaired pedestrians to detect the edge of walkway with a cane.



**Soft Sidewalk**

### **Additional Pedestrian Facilities**

**Benches:** People walking want to sit down and rest occasionally. In an urban setting, wide sidewalks and curb extensions provide opportunities for placing benches outside of the pedestrian traffic stream.

**Shelters:** At bus stops, transfer stations and other locations where pedestrians must wait, a shelter makes the wait more comfortable. People are more likely to ride a bus if they don't have to wait in the rain.

**Awnings:** Where buildings are close to the sidewalk, awnings protect pedestrians from the weather and can be a visual enhancement to the shopping district.

**Landscaping:** The outer edge of a roadway is often neglected and unpleasant although this is where pedestrians are expected to travel. Landscaping can greatly enhance the aesthetic experience, making the walk less stressful or tiring. Landscaping can increase the effectiveness of a planting strip as a buffer between travel lanes and sidewalks, as well as mask features such as soundwalls.

Choosing appropriate plants and ground preparation is important. The following guidelines should be considered:

- Plants should be adapted to the local climate and fit the character of the surrounding area - they should survive without protection or intensive irrigation, and should require minimal maintenance, to reduce long-term costs.
- Plants must have growth patterns that do not obscure pedestrians from motor vehicles, especially at crossing locations, and they should not obscure signs.
- Plants should not have roots that could buckle and break sidewalks (root barriers should be placed to prevent such buckling).
- Planting strips should be wide enough to accommodate plants grown to mature size.
- The soil should be loosened and treated (with mulching materials) that are deep enough that plants can spread their roots downward, rather than sideways into the walk area.

**Water Fountains and Public Rest Rooms:** Strategically placed water fountains make it easier for pedestrians to be outdoors for a long time and to walk long distances. Well-placed public rest rooms make it easier for pedestrians to stay outdoors without worrying about where to find a business that will accommodate their needs.

**Maps:** Local walking maps make it easier for pedestrians to find their way to points of interest in a new urban environment. They are especially useful when combined with transit maps. So far, no standards have been developed.

### **Practices to be Avoided**

**Obstructions in Sidewalk:** The full sidewalk pavement width should be maintained to the extent possible. Permanent fixtures such as mailboxes, poles and sign posts should be placed outside of the sidewalk, or the sidewalk should be enlarged or wrapped around to avoid these obstructions.

**Narrow Sidewalks:** Though ADA does specify a three-foot minimum clear passage, this is inadequate for pedestrian use. A five-foot minimum standard should be applied wherever possible.

**Discontinuous Sidewalks:** Sidewalks must link up to each other, or to a defined origin or destination point.

**Steep Cross-Slope:** Severe cross-slopes hinders movements of wheelchair users. Where the ADA two percent minimum cannot be achieved, attempts should be made to reduce cross-slope as much as possible.

**Broken Pavement:** Sidewalks in poor repair are difficult for wheelchair users to negotiate. Even able-bodied pedestrians have difficulty walking through badly broken pavement.

**Encroaching Vegetation:** Bushes, shrubs and trees can reduce sidewalk width and obscure visibility. Maintenance should be scheduled to ensure that plants are trimmed on a regular basis.

**Inaccessible Sidewalks:** Any open leg of an intersection should lead to a sidewalk



## Appendix to Transportation System and Demand Management

### Traffic Calming - Stop Signs and Speed Limit Signs

The City of Springfield, Greene County, and MoDot generally do not install stop signs as a way to slow traffic. To prevent crashes, stop signs are installed where there might be a question about who should have the right-of-way. When stop signs are installed to slow down speeders, drivers may, in fact, increase their speed between signs to compensate for lost time, creating an even more dangerous situation. Stop signs placed where traffic does not warrant them could result in more drivers running stop signs and speeding through neighboring streets.

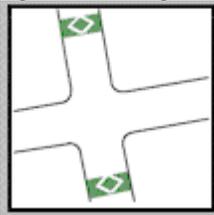
Installing speed limit signs may seem to be a logical solution to remind drivers not to speed, studies suggest that speed limit signs do not seem to change people's driving behaviors. The City, County, and State should only install speed limit signs where the speed limit changes to a higher or lower speed.

### Creative Approaches - Traffic Calming Purchase Program

Street improvements such as traffic calming methods are sometimes costly and funds are not always available for government entities to construct them. Neighborhoods may want to have a traffic calming method installed on one of their streets, but may need to wait months or years for the jurisdiction to locate funding. One method that residents and businesses in an area may employ is a Speed Bump Purchase Program. This would allow residents to raise funds in their neighborhood to pay for speed bumps, traffic circles, or any other traffic calming method accepted by the jurisdiction and allowed through their ordinances. If implemented, these programs could be funded through mechanisms such as neighborhood improvement programs.

### Traffic Calming Methods

#### Speed Bumps



Speed bumps are asphalt mounds constructed on streets and spaced 300 to 600 feet apart. Two different types of speed bumps that are recommended:

**Residential Streets:** On residential streets where speeds of 25 mph are desired, speed bumps that are 14-foot wide and ramp up to a height of three-inches might be used.

**Transit Line Streets:** On streets where speeds of 30 mph are desired, 22-foot speed bumps could be used.

**Other Streets:** On streets that are considered primary emergency vehicle response routes or are routes with exceptionally high vehicle volumes, the 22-foot speed bumps would be more appropriate than the 14-foot speed bump.

The intent of using a speed bump is to reduce vehicle speeds. Fourteen-foot speed bumps are very effective at encouraging 25 mph vehicle speeds, whereas 22-foot speed bumps are very effective at encouraging 30 mph vehicle speeds. Some of the advantages of using a speed bump as a method of traffic calming include: reduction of vehicle speeds, no loss of parking spaces, no restrictions for bicycles, and no impact on intersection operations. Some of the disadvantages of speed bumps may include: a possibility of increased traffic noise from the braking and acceleration of vehicles, particularly buses and trucks, and they could slow emergency vehicles.

Speed bumps can cost approximately \$1,000 to \$1,500 each. Another consideration for neighborhoods that install a speed bump is the need to monitor the area to ensure that the device is not diverting traffic to other internal streets. Speed bumps should not be constructed at grades greater than eight percent.

### **Traffic Circles**



Traffic circles are raised islands placed in an intersection. They are often landscaped with ground cover and street trees. Traffic circles require drivers to slow to a speed that allows them to comfortably maneuver around them. The primary benefit of traffic circles is they reduce the number of angle and turning collisions. An additional benefit is they slow traffic.

Traffic circles are very effective at lowering speeds in their immediate vicinity. Traffic circles are most effective when they are constructed in a series on a local service street.

Some of the advantages to choosing traffic circles as a traffic calming measure, include: they effectively reduce vehicle speeds, they improve safety conditions (for example, there are fewer left-hand turn crashes involving other vehicles), and they are visually attractive. Some of the disadvantages to using traffic circles include: they require some parking removal, they can cause bicycle and automobile conflicts at intersections because of the narrowed travel lane, and they can restrict emergency or transit vehicle movement if vehicles are parked illegally near the circle.

A minimum of 30-feet of curbside parking must be prohibited on the through street at each corner of the intersection, in order to safely install a traffic circle. Fire trucks can maneuver around traffic circles at slow speeds, provided that vehicles are not illegally parked. This slower speed can deter their response time to an emergency. Therefore, design of the traffic circles should be done to minimize impacts on emergency response vehicles and safe routings for emergency vehicles shall be maintained through all neighborhoods.

Note, traffic circles are less effective at T-intersections and difficult to design for offset intersections. Other methods of traffic calming should be considered in these situations.

### **Chicanes**

A chicane changes a street's path from straight to serpentine. A chicane may be constructed to give the illusion, from a distance that a street no longer continues. A chicane is intended to reduce vehicle speeds with less impact on emergency vehicles.

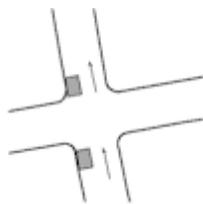
It is estimated that the cost of constructing a chicane could range from \$5,000 to \$10,000. These amounts could also vary, depending on the size of the area chosen to construct the chicane and if there is a need to obtain right-of-way or if any utility work may need to be performed. Construction of a chicane may involve parking removal but it would not be expected to affect transit scheduling. In terms of emergency service impacts, a chicane is preferred to speed bumps on emergency service routes. Chicanes are not widely used in the United States at this time.

### **Entrance Treatments**

Entrance treatments consist of physical and textural changes to streets and are located at key entryways into neighborhoods. Entrance treatments create visual, and occasionally audible cues that tell drivers they are entering a residential area or that the surrounding land uses are changing. The intent of entrance treatments is both to create a sense of place and to reduce vehicle speeds.

However, it has been determined that entrance treatments have minimal influence on drivers' routine behavior. Overall speeds and total volumes are not influenced, but it is believed that drivers are made more aware of the environment, in which they are driving and are more considerate of pedestrians. Entrance treatments typically cost between \$5,000 and \$20,000 and the costs are generally borne by the neighborhood residents. If textured pavement is used as part of the entrance treatment, there will likely be some new noise from vehicles on the new surface.

### **Semi-Diverter**



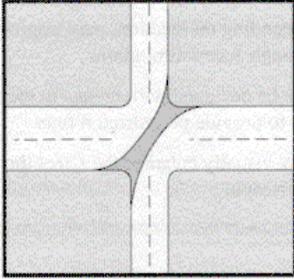
Semi-diverters are curb extensions or islands that block one lane of the street. The purpose of semi-diverters is to prevent drivers from entering or exiting certain legs of an intersection. Strategically located, semi-diverters can effectively reduce traffic volumes on a street.

Semi-diverters are very effective in reducing volumes. The construction of a semi-diverter could cost between \$5,000 and \$20,000. A disadvantage to semi-diverters is that they may affect curbside parking opportunities opposite the device, in order to permit emergency vehicle access. Semi-diverters allow a higher degree of emergency vehicle

access than cul-de-sacs or diagonal diverters. Semi-diverters can be designed to allow emergency vehicle access, but careful consideration needs to be given to their use on primary fire response routes.

Very special care must be taken to consider the availability, capacity, and appropriateness of the alternative routes that drivers might use if a semi-diverter is constructed. Semi-diverters should be prohibited on streets along the City Utilities transit route system.

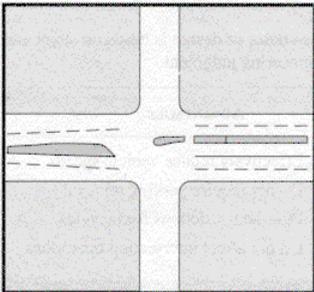
### Diagonal Diverters



Diagonal diverters place a barrier diagonally across an intersection, disconnecting legs of the intersection. Strategically located, diagonal diverters reduce traffic volumes on a street. Diagonal diverters prevent through traffic at an intersection. Some of the advantages of diagonal diverters include: they effectively reduce traffic volumes, and they restrict vehicle access, while retaining bicycle and pedestrian access. A disadvantage of diagonal diverters is that they prohibit or limit access and movement. While this is the purpose of diversion devices, some drivers consider it a disadvantage. Some diagonal diverters may also restrict access for emergency and transit vehicles. The cost of a diagonal diverter can range from \$15,000 to \$35,000, subject to location. Diagonal diverters should not be considered on transit streets.

Generally, the turn restrictions imposed by a diagonal diverter would apply to emergency vehicles as well and are typically not used on primary fire response routes. However, diagonal diverters can be designed and installed to provide for emergency vehicle access. Very special care must be taken to consider the availability, capacity, and appropriateness of the alternative routes drivers will use if a diverter is constructed. In addition, provisions should be made to make diverters passable for pedestrians and bicyclists.

### Median Barriers



A median barrier is a concrete curb or island that is located on the centerline of a street and continues through the street's intersection with a given cross street. The purpose of median barriers is to reduce traffic volumes on a street, prevent left turns from the

through street, and left turns and through moves from the cross street. Median barriers are very effective in reducing volumes.

Some of the advantages of median barriers are:

- They separate opposing vehicle travel lanes;
- They prevent a vehicle from passing other vehicles;
- Depending on location, they may improve safety through limiting access;
- They can be designed with breaks in the landscaping to provide pedestrian refuge; and,
- They may visually enhance the street if landscaped.

Some of the disadvantages of median barriers are:

- they may require parking removal;
- they prohibit or limit access and movement from driveways;
- they may have a negative impact on emergency services because of access limitations; and,
- Median barriers can cost between \$10,000 and \$20,000.

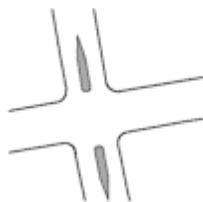
Medians may not significantly affect curbside parking opportunities, but sometimes parking would be prohibited to accommodate the remaining turning movements or to make room for a wider median barrier. Medians would prevent transit service on the blocked street and they should be prohibited on City Utilities transit line routes. The turn restrictions imposed by a median barrier would apply to emergency vehicles and are not typically used to block a primary fire response route.

### **Choke Point**

Choke points are curb extensions placed mid-block to narrow the roadway to 14-feet or the equivalent of one travel lane. They are intended to reduce traffic volumes by making the roadway narrow so that only one car at a time can pass through it. Choke points could cost between \$7,000-\$10,000 each.

Parking would not be allowed at the choke point. This would only remove one parking space, or 20-feet, from each side of the road. They should not impede transit but might affect scheduling. The affect of choke points on emergency vehicle response is not known. Choke points are not widely used in the United States, at this time.

### **Slow Points or Pedestrian Refuges**



Pedestrian refuges or slow points are small islands in the middle of the street. They serve to narrow the vehicle travel lanes. They can be installed either at intersections or at mid-block. Slow points are used to enhance pedestrian crossing points and provide a visual narrowing along the roadway. Depending on their location, they may also provide small to moderate traffic speed reductions. Pedestrian refuges narrow the roadway available to

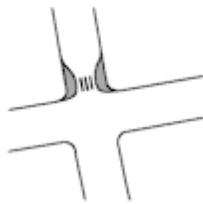
a driver, provide a visual cue to drivers that they are in a pedestrian area, and provide a refuge for pedestrians so they can cross a street one half at a time.

Some of the advantages of slow points or pedestrian refuges are:

- They allow pedestrians to cross half of the street at a time, stopping in the refuge before crossing the other half of the street;
- They make pedestrian crossing points more visible to drivers;
- They prevent vehicles from passing other vehicles that are turning; and,
- They may reduce travel speeds.

A disadvantage to this traffic calming method is that it does require some parking removal. Pedestrian refuges are effective pedestrian amenities but have minimal influence on a driver's behavior. Pedestrian refuges have usually been used to supplement a pre-existing crosswalk, as compared to creating a new crosswalk location. The cost of constructing a pedestrian refuge will generally cost between \$8,000 and \$15,000.

### **Curb Extensions**



Curb extensions narrow the street by widening the sidewalk or the landscaped strip. These devices are employed to make pedestrian crossings shorter and to narrow the roadway. Curb extensions effectively improve pedestrian safety by reducing the street crossing distance and improving sight distance. They may also influence driver behavior by changing the appearance of the street. They can be installed either at intersections or mid-block.

Some advantages to curb extensions include:

- They make pedestrian crossing points more visible to drivers;
- They reduce pedestrian crossing distance and time;
- They prevent vehicles from passing other vehicles that are turning;
- They may visually enhance the street through landscaping; and,
- They do not slow emergency vehicles.

Some disadvantages to curb extensions include the possibility of having to remove some parking and difficulty accommodating full bicycle lanes, if desired.

Curb extensions do not adversely affect transit service. At transit stops they enhance service by moving the curb so that riders step directly between the sidewalk and the bus door. Where crowns of the street are steep, curb extensions may actually go “uphill” because the new curb is higher than the original curb. If poorly designed, this can result in puddles on the sidewalk. The cost of curb extensions can range from \$7,000 to \$10,000.

## **Raised Crosswalks**



Raised crosswalks are crosswalks constructed three to four inches above the elevation of the street. They typically have a profile similar to a 22-foot or larger speed bump. Raised crosswalks are intended to reduce vehicle speeds, specifically where pedestrians will be crossing a street. Raised crosswalks are very effective in reducing traffic speeds.

Experience shows that raised crosswalks should not impeded transit service or scheduling. However, raised crosswalks selected for a street must take into consideration whether it is used as an emergency response route.

Consideration for visually impaired persons dictates not placing the raised cross walk at the same elevation as the sidewalk. Though the crosswalk is raised from the street surface, a pedestrian should also be able to tell when they are entering an area shared with automobiles. Raised cross walks cost approximately \$2,000 to \$5,000.

## **Cul de Sac/Dead End**



Cul-de-sacs close one end of a street and are intended to change traffic patterns. They are very effective at reducing traffic volumes.

Parking is usually lost near the cul-de-sac to provide adequate turn-around clearances without modification to the existing right-of-way. Cul-de-sacs should not be placed on transit routes. Emergency vehicles could be impeded by cul-de-sacs. Therefore, cul-de-sacs should only be considered in areas that are not on the City Utilities transit line, are not extensions to adjacent developments, and where emergency access can be ensured. Another possibility is to design the cul-de-sac for emergency access, using breakaway posts.

Cul-de-sacs reduce access to all vehicle operators included in the local neighborhood. The resulting inconvenience may not be acceptable to all residents of a neighborhood.