

COMPREHENSIVE PLAN

City of Derby, Kansas



Major Thoroughfare Plan

Chapter 7 - Major Thoroughfare Plan

The transportation system for Derby involves different modes of transportation to achieve the safe, efficient and convenient movement of persons and goods. This Chapter addresses the street and highway system of Derby. The Major Thoroughfare Plan identifies the projected major street network including highways, arterial and collector roads, and parkways/boulevards within the City and surrounding planning area.

Introduction

The Major Thoroughfare Chapter represents the existing and recommended transportation system for Derby and the surrounding planning area by street classification. The ability to transport people and goods from one place to another is one of the basic components the community's economic and social systems depend. Long range planning helps ensure the street system is able to expand efficiently to manage future growth and to remain consistent with the Future Land Use Plan.

7.1 Traffic Volumes

Traffic counts for major roadways in the Derby area were most recently provided by the Kansas Department of Transportation in 2003 and updated for Rock Road by Sedgwick County in 2005. State highway K-15 and the Rock Road corridor are the highest traveled roadways in the city, which reflects their importance as direct connections to major employment and retail centers to the north around McConnell Air Force base and in Wichita. The most heavily traveled east-west roadway in Derby is Madison Avenue, followed by the emerging 63rd Street South corridor.

K-15 highway has the highest traffic volumes in the Derby area located at its Madison Avenue intersection with more than 25,000 trips per day, closely followed by the intersection at 71st Street South which was slightly less than 25,000 trips per day. Traffic volumes along K-15 significantly decrease in the southern side of the city where the amount of trips, at approximately 12,000, is less than half of that on the northern side of the city.

Rock Road is the highest traffic volume arterial street in Derby, but generally averaging about 10,000 trips per day less than the volumes carried by K-15 highway. Traffic counts from late 2004 and early 2005 provided by Sedgwick County Department of Public Works, indicate that traffic volumes were the highest along Rock Road at the James Street intersection at about 17,000 trips. The amount of traffic at the 63rd Street and Madison Avenue intersections with Rock Road were slightly lower than the James Street intersection at approximately 16,900 trips and 14,300 trips respectively. Further

south at the Chet Smith Avenue intersection with Rock Road the traffic volumes are less than half of those in the northern portions of the city.

Madison Avenue is the heaviest traveled east-west roadway in the city, particularly in the eastern portion of the city, east of Dry Creek and at the Rock Road intersection where volumes were around 12,000 trips per day according to KDOT traffic counts. 63rd Street South had its highest traffic counts at the Rock Road intersection. Meadowlark Road had its highest volumes at the Woodlawn intersection, with about 8,800 trips. Kay Street and James Street, collector streets, have much lower traffic volumes for east-west travel through the city.

High Accident Rate Intersections

The intersection of Rock Road and Madison Avenue has the highest accident rate in Derby, primarily due to high traffic volumes and the significant number of access points that result in conflicting turning movements. Traffic safety improvements such as signalization, sight line protection, and turn lanes have been completed for this area. However any further roadway safety enhancements are limited due to the number and location of driveway access points in the area.

Another high accident rate major street intersection is located at Buckner and Meadowlark, with driver confusion over turning movements often cited as the cause of accidents in that location. Future improvements to be constructed by the city such as turn lanes and road geometrics may alleviate some driver confusion.

At the citywide level, driver confusion and accident rates in Derby should be addressed through enhanced access management policies. While options for safety enhancements may be limited in the developed portions of the community due to past development planning decisions, the future development areas will benefit from established policies for vehicular access to major roadways that preserve roadway capacity and enhance safety.

7.2 Access Management

As development occurs and vehicle traffic increases, the highest traffic volume roadways in Derby may deteriorate into highly congested routes that experience unacceptable delays and crashes. This deterioration is often due in part to improperly spaced and designed intersections and driveways, which cause crashes and conflicts with through traffic. Roadways in Derby serve a dual purpose of providing a means of transport between one place and another and providing access to adjacent property. Properly managing vehicular access to major roadways will balance the roadways' role of serving through traffic with the role of providing access to property.

Historically, most decisions in Derby allowing access to major roadways have been made relative to individual properties, rather than based on the function and characteristic of the entire street corridor to which access was allowed. This piece-meal approach to access planning frequently results in an illogical or excessive number of access points that can lead to increased congestion and accidents. Once the safety and efficient operation of a roadway is lost, it is difficult and expensive to restore.

Access management in Derby should be characterized as the strategic provision of access along street corridors. This is done to maintain the viability of the street network to safely and efficiently accommodate traffic volumes commensurate with its functions. The section-line arterial street network is critical to the long-term success of transportation within and around Derby, and it represents perhaps the greatest financial infrastructure investment. The net effect of access management along arterial streets is

that the supporting networks of collector and local streets, and even inter-parcel connectivity, become more critical to effective circulation and property access.

The benefits of access management at a broad scale include increased safety for motorists and pedestrians, decreased delay (through better operation), decreased emissions, and aesthetic improvements. The ideal situation would be to plan all arterial, collector, and local streets before development begins. Unfortunately this approach is impractical in Derby for many reasons. However, an access management policy on a broad level coupled with other street system policies can help achieve a safe and efficient street network through the piece-meal process of land development on individual properties. Basic principles for traffic operations that should be incorporated into an adopted access management policy for any street type include the following:

- Spacing of Traffic Signals
- Influence Area of Intersections
- Spacing of Intersecting Streets and Driveways
- Median Breaks
- Sight Distances

An access management policy should address issues at both the citywide level as well as at a more target level for major corridors such as Rock Road, 63rd Street, and other developing areas.

7.3 Functional Street Classifications

Derby's existing street and highway network is classified by its function, which is based on the type of land uses for which the roadway is intended to serve. Roadways are not classified by the amount of traffic they carry. However, higher traffic volumes are often consistent with upper level roadway classifications. The factors in roadway classifications are:

- The level of through-traffic movement; and
- Access to adjacent land or individual properties.

The functional street classification system assists the City and the development community in the planning, design, management and maintenance of the community's transportation facilities. These roadway classifications project the right-of-way and design standards for the ultimate construction of a roadway. Ultimately, however, the function of a roadway, traffic volume, and adjacent land use determine the type of roadway which should support daily traffic activity.

The functional classification for roadways uses a hierarchical structure to identify the operation of all roadways within Derby's transportation system (**Ref: Major Thoroughfare Plan Map**). The hierarchy of road types in ascending order is:

- expressways/freeways;
- arterial streets and parkways;
- collector streets; and
- local streets.

Expressway

Expressways are primary arterial roadways which are fully or partially access controlled facilities. These routes are typically the highest traveled corridors which serve as a primary means of access to the community and carry the major portion of trips entering or leaving the city. As such, they are divided, multi-lane facilities with a primary function of moving large volumes of through traffic at high speed and are primarily intended to serve long trips.

Urban Arterial

The main function of an arterial street is to move large volumes of traffic from one place to another at moderate- to high-speeds, provide continuous linkages between major traffic generators and serve as a transition roadway between collector streets and expressways. Planned access is its secondary function. Arterial streets in Derby require a minimum of 120-feet of right-of-way.

The arterial street is given preferential treatment over collector and local streets in signing and signalization of intersections. Access to private property along an arterial should be controlled to avoid hazards and the interference of traffic flow due to ingress and egress traffic movements. Access to such roadways should be controlled through access management standards or a detailed traffic analysis. A detailed traffic analysis is typically required for new nonresidential development along an arterial street, unless the transportation network has already been determined through a planning study.

Urban arterial streets in Derby may vary in their character and traffic carrying capacity due to adjacent land uses. A street classified as a major arterial is expected to carry 25,000 to 40,000 trips per day. This type of arterial street may have a design speed of up to 50 mph with careful control of access to the street. A standard arterial street is expected to carry less than 25,000 trips per day and has a design speed of up to 40 mph.

Parkway/Boulevard



A parkway or boulevard is conceived as a wide formally designed arterial street of distinguished character with a broad right-of-way (at least 20 feet additional for median), with an improved median that functions as linear open space, and with formal landscape effects. A parkway or boulevard standard may include an increased right-of-way dimension to accommodate a median of variable width for landscaping effects, linear open space, special median treatments and public art elements, and for access management controls. A parkway should also incorporate hike and bike trails.

With the City's planned growth to the east, an additional north-south arterial should be considered to compliment the existing north-south corridors of K-15 and Rock Road. The Greenwich Road area appears to be best suited for this use, as it is a continuous roadway across the majority of Sedgwick County, provides existing right-of-way (which can be re-used for a parkway at a lower cost than acquiring new right-of-way), and is located along the eastern portion of the City's growth area. This corridor is envisioned as an urban arterial with some parkway features where deemed appropriate. This location should take advantage of unique topographic features and vegetation along the northern portion

of this corridor near Hidden Lakes Golf Course, creating a special identity unique to Derby. The parkway concept may also be considered to enhance aesthetics on the east-west arterial of Madison as it is extended eastward in the future past High Park and Spring Creek.

Rural Arterial

The purpose of a rural arterial is to serve “suburban” residential land use areas, or as a temporary link in the circulation system until development warrants constructing the road to urban arterial or parkway/boulevard standards. Frequently, it is necessary to complete such a link years before the adjacent areas develop; therefore, their interim use is to connect presently developed areas with existing highways, commercial areas, etc. In addition, by designating these roads as rural arterials, sufficient right-of-way width can be acquired through appropriate dedications as an area develops. Rural arterial construction is similar to that of urban arterials except that curbs and gutters are absent.

Collector

Collector streets serve traffic desiring to travel between major arterials and local streets and are used mainly for traffic movement within residential, commercial and industrial areas. Collector routes provide the combined services of funneling traffic and protecting local roads from bearing unnecessary traffic volumes. Although intended to move traffic, collector roads are generally developed to discourage any long through trips which should more appropriately be carried by arterial roads. A collector roadway may be future classified as either a standard or major collector.

A standard collector street is typically designed to handle approximately 1,500 vehicle trips per day (150 dwelling units) with a design speed of 30 mph. The roadway is typically 36-feet in width, commonly with two travel lanes of 10-feet in width and two 8-foot wide parking lanes.

A major collector street typically serves more than 1,500 vehicle trips per day with a design speed up to 35 mph. The roadway has 80-feet of right-of-way and typically has a paved surface 40-feet in width, commonly with two travel lanes of 12-feet in width and two 8-foot wide parking lanes.

Collector street concept locations are identified on the **Major Thoroughfare Plan** and are generally located on half-mile lines. Webb Road is an exception since it is a section line road but due to floodplain lands is identified as a collector street south of Madison / 79th Street South.

Local Streets

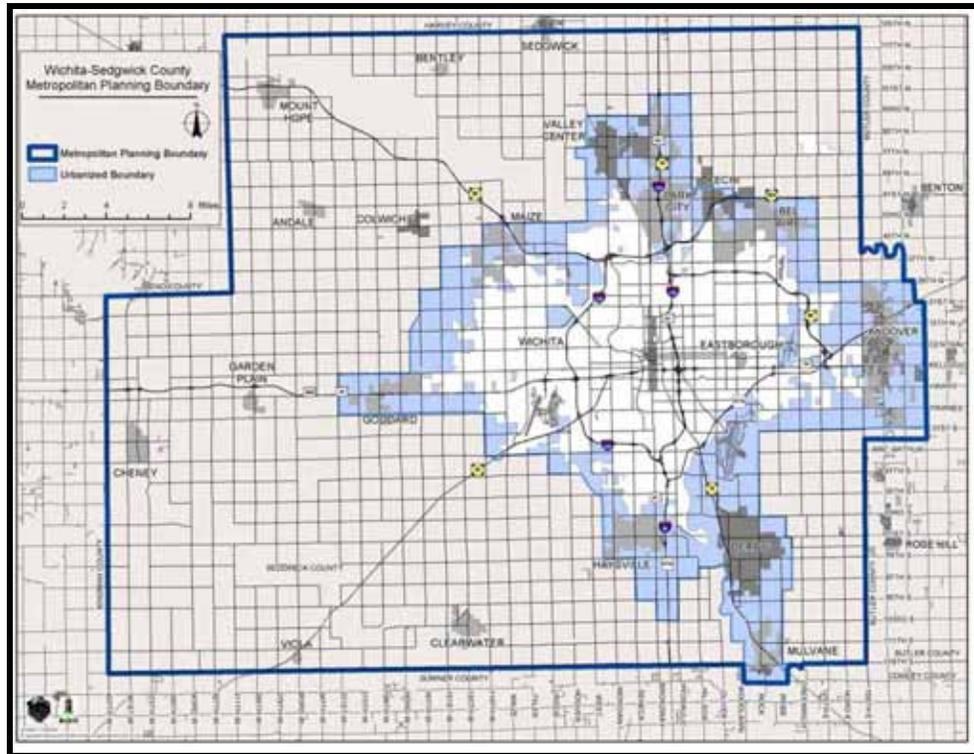
Local streets provide direct access to abutting properties (primarily residential uses) at low speeds within the immediate neighborhood. Generally, local streets should be designed to intersect with a collector street and provide easy access to adjacent property. Such streets are typically designed to carry daily traffic volumes of 1,000 trips or less.

7.4 Metropolitan Area Transportation Plan

The Wichita Area Metropolitan Planning Organization (WAMPO) is responsible for providing staffing, research, and policy analysis on a wide variety of transportation-related issues for elected and appointed officials in the metropolitan area. **Figure 7.1** identifies the area served by the Metropolitan Planning Organization which includes Sedgwick County, in addition to the City of Andover in Butler County and the Sumner County portion of the City of Mulvane.

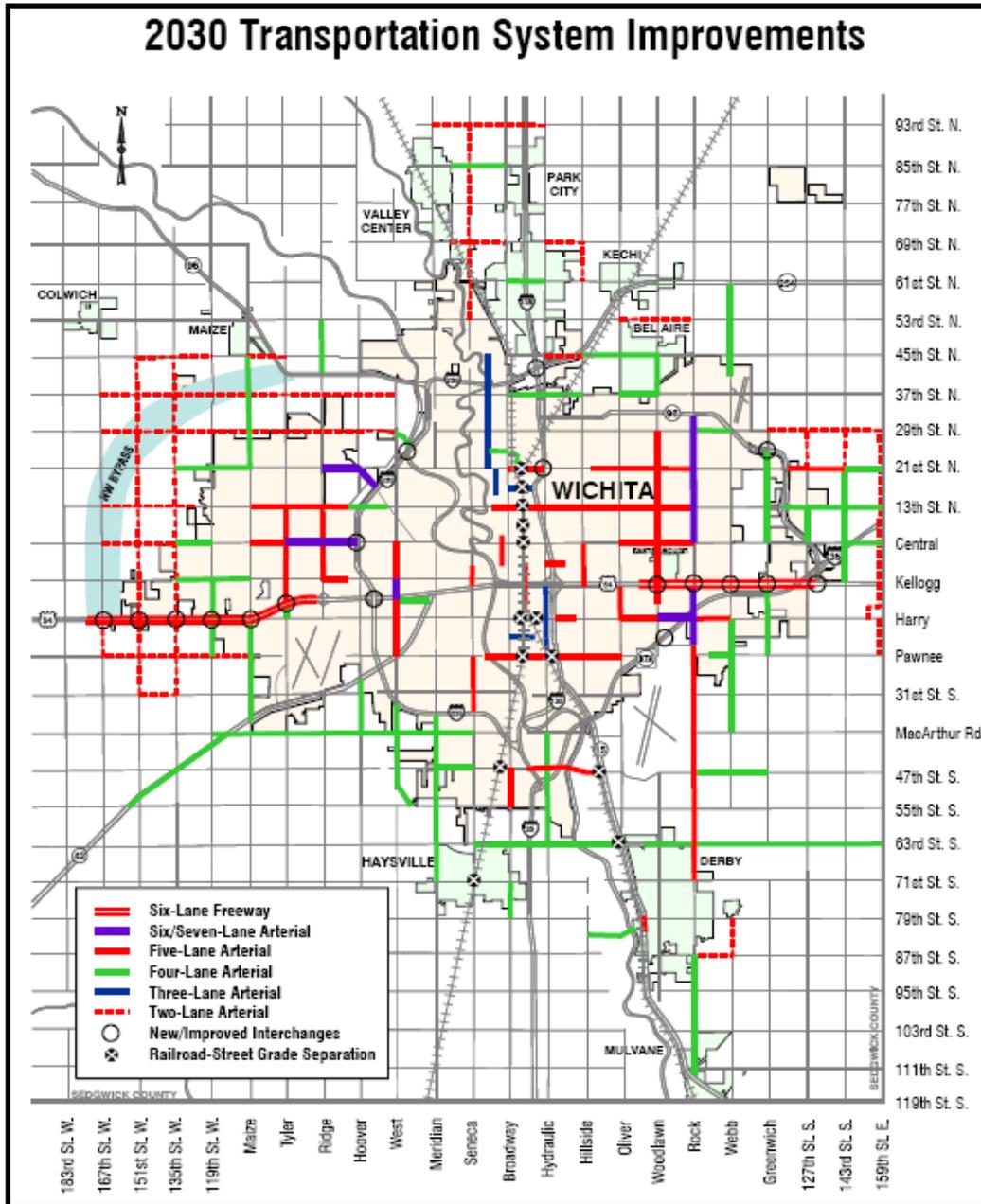
The WAMPO is involved in carrying on federally mandated activities, securing available state and federal transportation funds, conducting special road and highway planning studies, transit planning, and coordinating the development of a pedestrian/bicycle system. In the fall of 2005 WAMPO, Wichita Transit, and the Kansas Department of Transportation completed an update of the 2030 Long Range Transportation Plan (LRTP) which was previously adopted in 1994 and updated in 1999.

FIGURE 7.1: METROPOLITAN PLANNING ORGANIZATION TRANSPORTATION PLANNING AREA



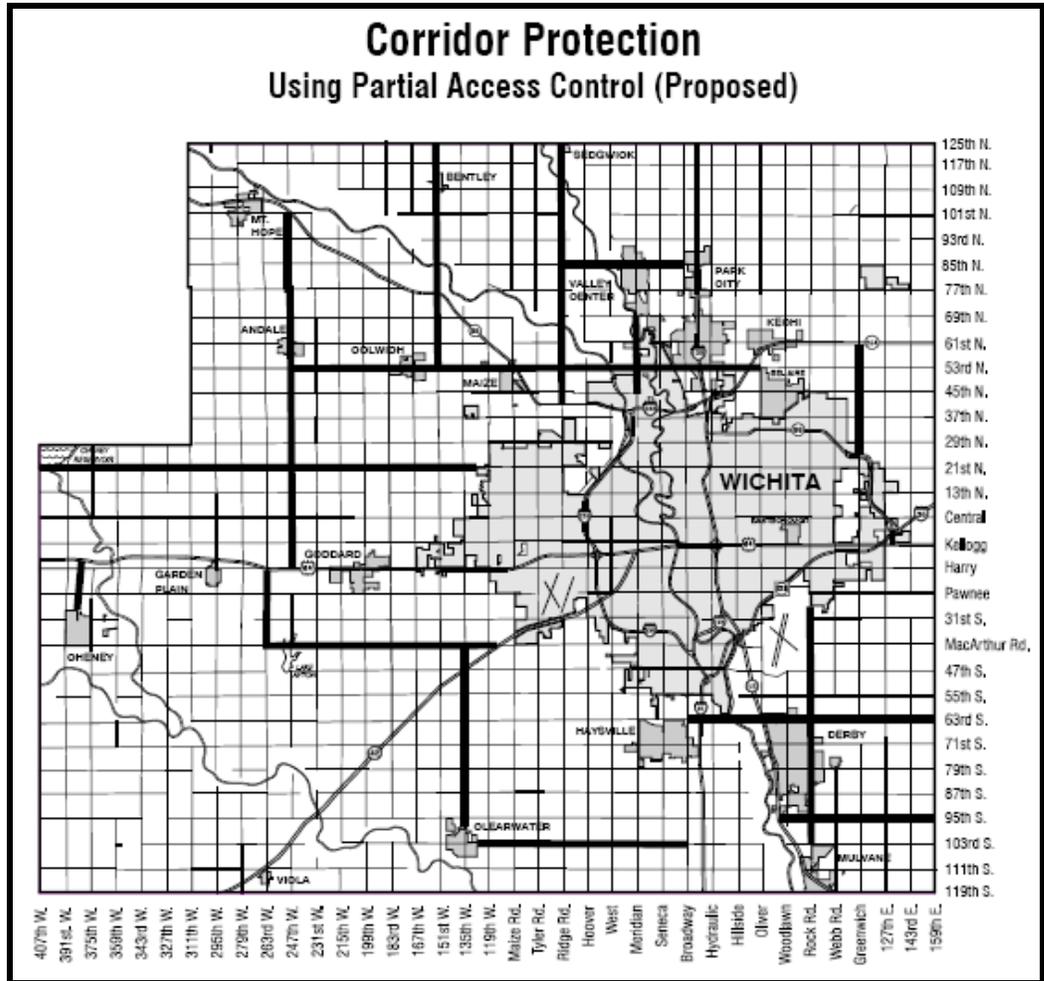
The Long Range Transportation Plan identifies several transportation system improvements, Proposed Corridor Protection (Using Partial Access Controls), Proposed 2030 Public Transportation Concepts, which include the Derby area (**Ref. Figures 7.2, 7.3, and 7.4**). Major improvements and corridor protection identified in the Derby area primarily are along the 63rd Street South and Rock Road corridors. The 2030 Plan also identified improvements for the 1-mile segment of 87th Street South (Chet Smith Ave.) between Rock and Webb Roads, as well as improvement to the 1-mile segment of Webb Road between 79th and 87th Streets.

FIGURE 7.2: 2030 TRANSPORTATION IMPROVEMENTS – 2030 TRANSPORTATION PLAN



(1999 Update)

FIGURE 7.3: CORRIDOR PROTECTION – 2030 TRANSPORTATION PLAN



2030 Long Range Transportation Plan (2005 Update)

The 2030 Long Range Transportation Plan (2005 update) emphasizes the preservation of existing transportation facilities, the effects of transportation on land use and development, and fiscal constraints.

The Long Range Transportation Plan includes several issues and recommendations to address or to further study throughout the metropolitan region, many of which could impact the Derby area. These issues include:

South Area Transportation Study: A “South Area Transportation Study” for the south part of the metropolitan planning area will be initiated in the Fall of 2005 to determine the benefits of a South Bypass or other transportation improvements, their impacts on land use, and a preferred alignment and right-of-way requirements if a bypass is recommended. New major roads could have a significant economic impact on the surrounding area through improving regional access, encouraging new development, and providing an opportunity for rejuvenating the area. A possible scenario is for the bypass corridor alignment to pass between Derby and Mulvane.

Preliminary discussions have also included a possible Kansas Turnpike interchange at 63rd Street and a “Southeast Expressway” that would originate at the east side of Wichita and connect to the Kansas Turnpike near Derby and Mulvane.

Access Control/Corridor Management: Key roadway corridors are identified for additional planning studies for access management/control to protect the mobility function of the roadway and provide the safe movement of traffic. Access to properties fronting these key transportation corridors should generally be provided from side streets. In some cases frontage roads may need to be constructed. **Figure 7.3** identifies the key roadways for corridor protection. In the Derby area, these roadways include 63rd Street South, 95th Street South, and Rock Road.

Access to Highways and Between Cities: Many communities stressed the importance of maintaining good roadway connections between cities and from each city to the highway system. The Transportation Plan indicates this will require the implementation of corridor management practices to control the number of access points along these routes to protect mobility.

Sidewalks Facilities: The transportation planning process noted support for providing sidewalks on both sides of all streets, and that sidewalks that complement the public transportation system should be a high priority. The Transportation Plan notes that Derby did not have any fatal pedestrian accidents from 2000-2005, but it did have a high percentage of pedestrian involved injury accidents. The Plan recommends communities address sidewalks that are too narrow and/or adjacent to moving lanes of traffic, and pedestrian crossings that are intimidating because of confusing signal locations, excessive crossing distances, or fast-turning vehicles, all of which directly impact the perceived and the actual safety of pedestrians.

Bicycle Facilities: A need was identified to connect existing sections of bicycle trails and to expand the facilities throughout the region. The Transportation Plan suggests developing a desired target rate standard of one trail mile per population, and making connections with a transportation focus. This may include a balance of both off-road and on-road facilities for the local and regional trails system.

Street/Railroad Grade Separations: Rail improvements are recommended to address concerns for both the delays to motor vehicle traffic caused by trains, as well as the safety of the crossings.

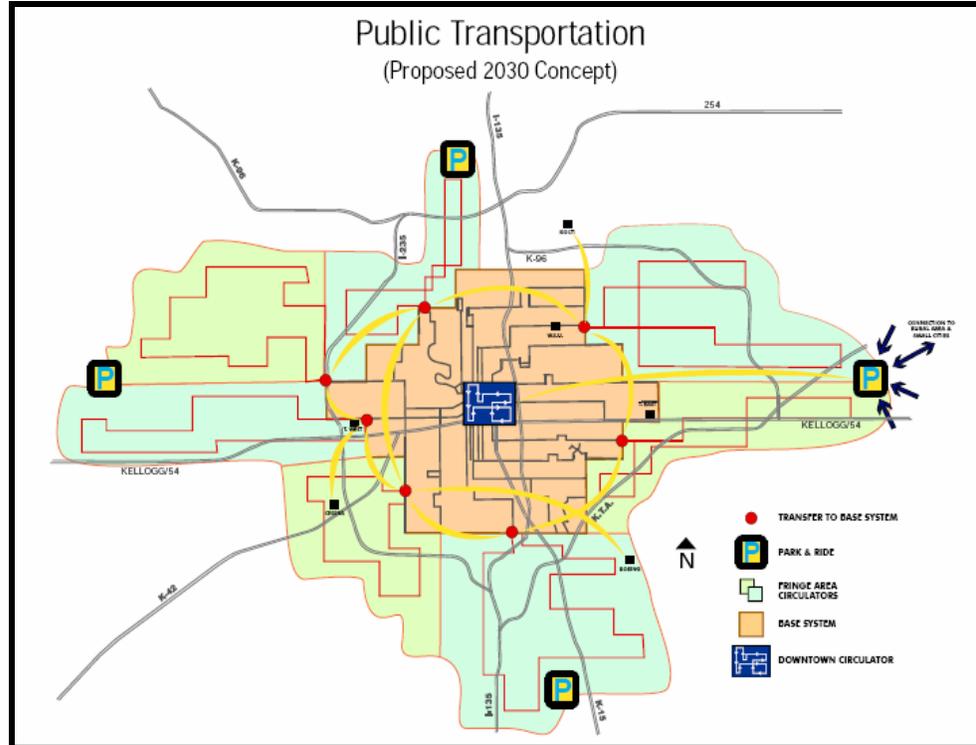
Intermodal Freight Facilities: The need to study and develop an intermodal freight facility within the region.

Public Transit:

The Transportation Plan noted that an aging population and overall regional population growth will likely lead to an increased demand for public transportation. In addition to road improvements, the 2030 Transportation Plan (1999 Update) identified a conceptual public transit improvements for the Wichita Transit system to serve Wichita and the City’s surrounding fringe including the northern portions of Derby. Future transit service to the Derby area may include a “connector/circulator” route that could provide more neighborhood type service providing connection to the main system in Wichita, and at points where the route connects with the main system provide connection to other adjacent connector/circulator routes. An additional measure is a possible “Park and Ride” location somewhere along K-15 which could provide express service to downtown Wichita and other employment centers, as well as connections to the main Wichita Transit system. The 2005 update to the 2030 Transportation Plan suggests

outlying cities such as Derby should investigate the availability of federal, state, or local funds to attract bus service to the area. An option would be to contract with Wichita Transit to provide this service.

FIGURE 7.4: PUBLIC TRANSPORTATION CONCEPT– 2030 TRANSPORTATION PLAN (1999 UPDATE)



7.5 Transportation Recommendations

Transportation / Access Management Policies

Regional roadways such as 63rd Street South, 95th Street South, and Rock Road are designated by the Metropolitan Area Transportation Plan as significant roadways that should be protected with partial access controls to preserve their traffic carrying capacity. The City of Derby should adopt access management policies for these and other major roadways in the community to guide development decisions through the planning process. The policies should address future development areas along major roadways to determine preferred access points and thus avoid properties with driveway cuts and uncontrolled turning movements onto arterial roadways. Such policies should also address the proper planning and design of points of access to the public roadway system to provide a street network that safely and efficiently accommodates traffic volumes commensurate with its functions. Where appropriate, the City should jointly study major roadways on the developing fringes of Derby with the Wichita-Sedgwick County Metropolitan Area Planning Department and other jurisdictions including Sedgwick County, Wichita, and Haysville.



Major Street Design

James Street east of Rock Road is designed and constructed with a landscape median however the use of medians is otherwise limited on Derby's major streets. The



increased use of medians on major roadways would accomplish several goals and objectives of the Comprehensive Plan. Medians allow for more landscape and beautification options, traffic signage, and enhancements for both aesthetics and safety.

A wider median standard should be adopted to provide for increased capacity for major streets and particularly at major street intersections. A wider median of no less than 16-feet should be provided in areas with high traffic volumes in order to accommodate a 11-12-foot wide center left turn lane while maintaining a minimum 5-foot wide median. The remaining median space will allow for traffic signage or object markers. The minimum 16-foot wide width would also allow for a 16-foot wide center turn lane (including one-foot of striping on each side) for dual traffic from both directions.

Parallel Collector Streets

Access management policies for the Rock Road corridor should be adopted for the area generally north of Meadowlark to identify appropriate access points along the roadway and to establish a supporting parallel collector system. Access should be permitted to Rock Road only at predetermined locations defined by the access management policies to maintain the high traffic volume nature of the roadway. In future development areas a parallel collector street system should be located between one eighth and one quarter mile on the east and west sides of Rock Road. The collector streets would provide a greater level of access to properties with frontage along Rock Road. This collector system, while conceptual as to the exact location, is essential in purpose to the overall street function, and should be implemented in the approximate locations as depicted by the **Major Thoroughfare Plan Map** and further refined by more detailed land planning efforts.

Arterial Street Enhancement Standards

Arterial street design standards for future roadway enhancements should be adopted and implemented as part of future roadway improvement projects. The standards may address landscaping and amenities, tree planting, utility poles, wires and cabinets, signage, and other appurtenants in the public right-of-way that impact the visual image of the community. Such enhancements should also address standards for preferred median island treatments and materials, pedestrian and off-street bike improvements, and on-street bike lanes based on the roadway functional classification.

Streetscape Standards

General streetscape standards should be applied to major roadways citywide, as well as corridor specific standards to promote beautification enhancements at focal points, key intersections, and major community corridors (**Ref, Chapter 6, Section 6.2 Streetscape Standards**).

Road Improvement Financing Mechanisms

The City should adopt a policy for an equitable financing mechanism to construct and upgrade the arterial roadways in a timely manner to serve new development as it occurs. As growth occurs to the east into the Spring Creek basin and other fringe areas around Derby, it will require upgrades to current rural section line roadways to urban standards. Many section line roads around the fringe of the city are either currently unpaved or improved to rural standards and will require significant upgrades to bring them up to urban standards including curbs, gutters, storm sewer, street lights, sidewalks, etc. Possible funding mechanisms may include excise tax or impact fees on new development, special assessments, or benefit districts.

Providing a “Connected” Community

Future transportation planning and improvements should address the need to provide and maintain connections throughout the community. This includes pursuing extension of streets and bridge construction to allow the prudent provision of police, fire, and emergency services. It also includes designing new neighborhoods with interconnected networks of pedestrian-friendly and attractively landscaped streets, trails, and sidewalks. A minimum number of street connections between neighborhoods should be provided in developing areas.

Coordinating with the Metropolitan Area Planning Organization

The future of Derby’s transportation system will involve coordination with the Wichita Area Metropolitan Area Planning Organization (WAMPO) and its activities related to regional transportation planning. This coordination should include transportation issues related to a possible South Bypass near Derby, access control/corridor management planning, possible neighborhood type transit options in Derby as well as possible connections between Derby and the main system in Wichita, and regional hike and bike trail projects.



Webb Road south of Madison / 79th Street South.

Unimproved rural roadways must be upgraded to serve new development.

Financing

While the City has worked effectively with developers to exact contributions and improvements in the past, new ways of financing major thoroughfares must be considered for long-term extension of arterial roads. As future growth occurs over the planning period, significant improvements will be needed to the major thoroughfare network. Rural Sedgwick County Roads within Derby’s planning area, such as Webb Road south of Madison / 79th Street South for example, are largely unimproved. As urban growth occurs such roads must be upgraded to serve new development and these major roadway improvements will require increased levels of financial commitment by the City of Derby in partnership with the private sector.