



Chapter 5

Integration of Transportation Modes and Technologies

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TEA-21 presents seven factors for states to consider in their long-range transportation planning. One of those factors is to

“enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight...”

This chapter seeks to address the integration of the various modes, and also the technologies supporting and enhancing those modes, so that all places and facilities in the state become more accessible to its citizens and travelers.

KDOT’s Role and Partners

KDOT is just one piece of the transportation puzzle in Kansas. KDOT works with many different partners in varying capacities. KDOT works with the federal government, local units of government and the Kansas Turnpike Authority on planning, funding, constructing, and maintaining transportation facilities. KDOT consults with trade groups, utility companies, environmental groups, other advocacy groups, as well as the general public through the decision-making process. KDOT works cooperatively with the five metropolitan areas in Kansas for planning purposes. While KDOT’s involvement varies by mode of transportation, it also deals with many different partners in rail, aviation, transit, and bicycle/pedestrian modes to facilitate the movement of people and freight, and to ensure the safest, most reliable transportation system for Kansas.

KDOT coordinates with numerous state and federal resource and regulatory agencies to obtain input and authorize construction projects through permitting requirements. This effort includes coordination with the US Army Corps of Engineers, Natural Resource Conservation Service, Environmental Protection Agency, Department of Interior, Kansas Department of Agriculture, Kansas Department of Health and Environment, Kansas Department of Wildlife and Parks, Kansas State Historical and Preservation Office.

United States Department of Transportation (USDOT)

The USDOT is a cabinet-level federal agency headquartered in Washington, D.C. Kansas receives a significant share of its transportation funding in most modes from USDOT agencies. The Federal Highway Administration (FHWA) oversees funding for not only highways but also transportation enhancements such as bicycle and pedestrian facilities. FHWA has a division office in Topeka that works very closely with the staff of KDOT. The Federal Transit Administration (FTA) distributes funds for capital and operation costs of rural public transportation to KDOT. FTA has a regional office located in Kansas City that oversees the many public transportation agencies in Kansas via KDOT’s Office of Public Transportation. The National Highway and Traffic Safety

Administration (NHTSA) distributes safety funds for use in Kansas for awareness and enforcement projects. Currently, the Federal Railroad Administration has limited involvement with KDOT. Future rail grant and/or loan programs may require a different level of involvement with KDOT.

Metropolitan Planning Organizations (MPOs)

Federal legislation requires that Metropolitan Planning Organizations be created for all urbanized areas with populations greater than 50,000 to determine transportation priorities for the metropolitan area. They act as regional decision-making forums for local, state and federal transportation issues. KDOT benefits from a solid relationship with the MPOs in that they provide a consensus voice for a region instead of the many voices of sometimes competing interests within a metro area.

The FHWA and FTA provide MPOs with Consolidated Planning Grant funding for regional planning. USDOT stipulates that planning activities address seven planning factors. These are presented below.

1. *Support the **economic vitality** of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency;*
2. *Increase **the safety and security** of the transportation system for motorized and non-motorized users;*
3. *Increase the **accessibility and mobility** options available to people and for freight;*
4. ***Protect and enhance the environment**, promote energy conservation, and improve quality of life;*
5. *Enhance the **integration and connectivity** of the transportation system, across and between modes, for people and freight;*
6. *Promote **efficient system management** and operation; and*
7. *Emphasize the **preservation** of the existing transportation system.*

Further, MPOs are required to develop three specific planning products. Briefly, these include a Unified Planning Work Program that identifies transportation planning initiatives on an annual basis, a Long-Range Transportation Plan that has a planning horizon of at least 20 years, and a Transportation Improvement Program that identifies all federally funded and regionally significant transportation projects planned over a five-year period, or every three years for metropolitan areas not in attainment of air quality standards.

Transportation decisions and the project selection process within metropolitan areas work through the following process:

- Needs and/or deficiencies for the metro area are identified. For roadways, this may be done by an inventory that tracks pavement condition, or by a congestion management system that tracks travel times and traffic volumes. For bridges, an inventory of structural condition can be used. Travel demand modeling is also

used to help identify future needs. For public transportation, access to facilities may be measured by walking distance to transit stops. Needs identified by the public are also considered.

- From these needs, the MPO or a subcommittee develops a Long-Range Plan with at least a 20-year horizon. Unlike, statewide Long-Range Transportation Plans, MPO plans must be project specific. All regionally significant projects must be included in the Plan. The Metropolitan Long-Range Plan must also estimate future transportation funds over that time horizon, in order to develop a fiscally constrained list of projects. KDOT submits its list of committed projects (in the current case, all projects funded over the 10-year life of the Comprehensive Transportation Program) that are located within the metro region to be included in the Long-Range Plan. KDOT reviews projects by others for impacts on the State Highway System and may request projects be dropped, modified or have conditions added as warranted. Major Investment Studies or Corridor Studies may identify future projects beyond the CTP, but due to the uncertain nature of state and federal transportation funding, specific years for those projects are not assigned by KDOT.
- From the projects listed in the Metropolitan Long-Range Plan, the MPO creates a 3-year (5-year for areas over 200,000 population) list of projects called the Transportation Improvement Program (TIP). This document specifically lists the scope and phases of each project. Once the TIP is approved by the MPO, KDOT approves it and incorporates those projects into the State Transportation Improvement Program along with all of the rural projects from the CTP.

MPO Long-Range Transportation Plans

The five metropolitan planning organizations in Kansas are

- **Mid-America Regional Council (MARC) – the Kansas City area**
- **Wichita-Sedgwick County Metropolitan Area Planning Commission**
- **Topeka-Shawnee County Metropolitan Planning Commission**
- **Lawrence-Douglas County Planning Commission**
- **St. Joseph Area Transportation Study Organization**

A map showing the location of each MPO is found on page 5-4.

Each Metropolitan Long-Range Plan has been coordinated with the State Transportation Plan, and KDOT participates regularly in all phases of the metropolitan transportation planning process. Since each area is unique and has its own set of goals, each individual MPO plan is likewise unique in format and content. A few of the important transportation issues of each MPO are listed on the following page.

The Mid-America Regional Council oversees planning activities in the Kansas City metropolitan area, and works closely with KDOT, the Missouri Department of Transportation (MoDOT), and three transit providers. The Greater Kansas City area has a population exceeding 1.7 million within the two states, eight counties, and 113 city jurisdictions. MARC's 30-year Long-Range Plan, adopted in 2000, has the objectives of "encouraging local land use decisions that promote a regional development pattern focused on multiple centers of development within the region and encouraging local governments to consider appropriate policies...to achieve a desired future land use pattern." The Kansas City metropolitan area has more miles of freeway per capita than any other metro region in the U.S., and system preservation has become a top priority, which agrees with the emphasis of KDOT's program and plan. MARC has actively investigated alternative modes of travel, such as coordinating transit initiatives through the Regional Transit Alliance, planning for bicycle and pedestrian facilities through the Metro Green Plan, and exploring inter-city rail through the Commuter Rail Initiative. The update for their long-range plan is expected February 2003.²⁰

The Wichita-Sedgwick County Metropolitan Area Planning Department has created a plan for its metro area with a population exceeding 400,000. The plan addresses, among other issues, the lack of critical links on the far west and far east of Wichita, substandard interchanges and the need for additional arterial crossings over the Wichita-Valley Center Floodway and I-235. The Census Bureau has expanded the Urbanized Area to include parts of Butler and Sumner Counties, which will require a redesignation of the MPO, and the planning department has taken initial steps to investigate such a shift. Wichita completed an update to their long-range plan in January of 2000.²¹

The Topeka-Shawnee County Metropolitan Planning Commission's plan stresses the importance of additional investments in the transportation infrastructure of Topeka and Shawnee County, population 170,000. A lack of resources for transportation improvements has resulted in a transportation system that will not be able to support expected future growth. Topeka's updated plan was approved in March of 2002.²²

Lawrence's plan, being updated at this writing, predicts continued growth in population and traffic, especially in western Lawrence. A severe deficiency in capacity of the east-west corridors is forcing Lawrence to look at not only roadway improvements but also transit and bicycle/pedestrian improvements. A plan to complete the South Lawrence Trafficway between K-10 and US-59 has consumed a lot of planning time on behalf of KDOT and Lawrence-Douglas County planning staff. A resolution is still pending on this issue. The Lawrence-Douglas County Planning Office will have completed an update to their long-range transportation plan by the end of 2002.²³

Wathena, Elwood and the unincorporated area between them comprise the Kansas area for the St. Joseph Area Transportation Study Organization. Some of the Kansas issues addressed in the MPO plan, produced in 1999, include the strong industrial, commercial and residential growth in this area. This growth may have an impact on US-36 that runs between these cities.²⁴

Coordination among Northeast Kansas MPOs

The three northeast Kansas MPOs (Topeka, Lawrence, and Kansas City) have experienced growth in population and opportunities for interaction among each other. Increased numbers of workers commute between the three areas along the Turnpike, K-10, US-24, and US-40. As the borders of the urban areas grow ever closer, more dialogue about cooperative planning will need to be undertaken. KDOT hopes to facilitate this discussion, and the Kaw Connects Major Corridor Study, completed in 1999, covering all facilities between Topeka and Kansas City, can serve as a valuable tool for analyzing transportation improvement alternatives. A corridor study of K-10 between Lawrence and the southern Kansas City metro area has been initiated. In addition, a feasibility study for commuter rail connecting Topeka, Lawrence, and Kansas City is nearing completion.

City and County Governments

Local units of government have responsibility for most of the state's transportation facilities. KDOT passes through federal and state funding for roads and bridges and other set-aside categories. Cities and counties, being the most local, accessible transportation entities, can provide excellent feedback from the public interest to KDOT. A recent example was the Transportation 2000 Task Force, which heard from numerous local governments in advance of the passage of the Comprehensive Transportation Program. Local governments were given an opportunity to submit significant projects through the System Enhancement program within the CTP.

KDOT's Bureau of Local Projects and Bureau of Program Management also work with cities and counties through the Local Partnership Programs. The Geometric Improvement program is designed to help cities widen pavements, add or widen shoulders, eliminate steep hills or sharp curves, and add needed turning, acceleration, and deceleration lanes on City Connecting Links (city streets that connect rural portions of the State Highway System). The Economic Development program is for highway and bridge construction projects intended to enhance the economic development of the state of Kansas. The KLINK Resurfacing set-aside program provides funding for resurfacing projects on City Connecting Links. Currently, KDOT is also considering providing small cities (under 50,000) with transportation planning assistance. This could include travel demand modeling, forecasting, technical studies as well as general planning assistance.

Construction funds that local governments receive from FHWA through KDOT's Bureau of Local Projects include Surface Transportation (STP) and Bridge (BR) funds. These funds allow for the local governments to develop five-year plans for improvement project.

Neighboring States

The transportation system needs to be connected not only within the state of Kansas, but also with its bordering states. The bordering states' departments of

transportation were contacted to find out about any improvements that might affect traffic patterns in Kansas. Traffic data is shared between states, and KDOT encourages professional contacts with neighboring DOT's.

Indian Nations

The reservations of four Indian Nations are located in Northeast Kansas: the Sac and Fox Nation of Missouri, the Iowa Tribe of Kansas and Nebraska, the Kickapoo Nation of Kansas, and the Prairie Band of Potawatomi Indians. The map on page 5-9 depicts the reservation areas. The Sac and Fox reservation is situated partly in Brown County, with the remainder in Nebraska. The Iowa Tribe also has land in Nebraska, as well as Brown and Doniphan County, Kansas. The Kickapoo Reservation is located in Brown County, Kansas and covers 30 square miles. The 121 square mile Potawatomi Reservation is located in Jackson County, Kansas. According to the 2000 Census, there were 23,049 Native Americans living in the State, with 1,448 living on the four reservations.

The four Indian Nations of Kansas receive funds to improve roads and bridges on reservation land from the Bureau of Indian Affairs (BIA). Most of the roads also serve as county section-line roads as well, but at least two tribes expressed concern that their respective counties neglected those roads for improvement in favor of others that were not eligible for BIA funds. All four reservations are small in geographic area, located in Northeast Kansas, and maintain a casino for economic development. The tribes are very concerned with the state highway system in the region because it connects them to supplies, labor, and tourists. Public transportation is also a concern for the tribes, in that there are many tribal members who have only one option for health care, that being the Bureau of Indian Affairs office in Horton.

KDOT consults with the four Kansas tribes in a variety of settings. During the project discovery phase, KDOT consults with the four Kansas Indian tribes as well as any other tribes that have ever inhabited a part of Kansas to notify them when projects are planned in their areas. KDOT has provided some mapping and demographics and technical assistance to each tribal government. KDOT's Bureau of Engineering Support also consults with the Indian Nations to ensure their projects are included in the State Transportation Improvement Program.

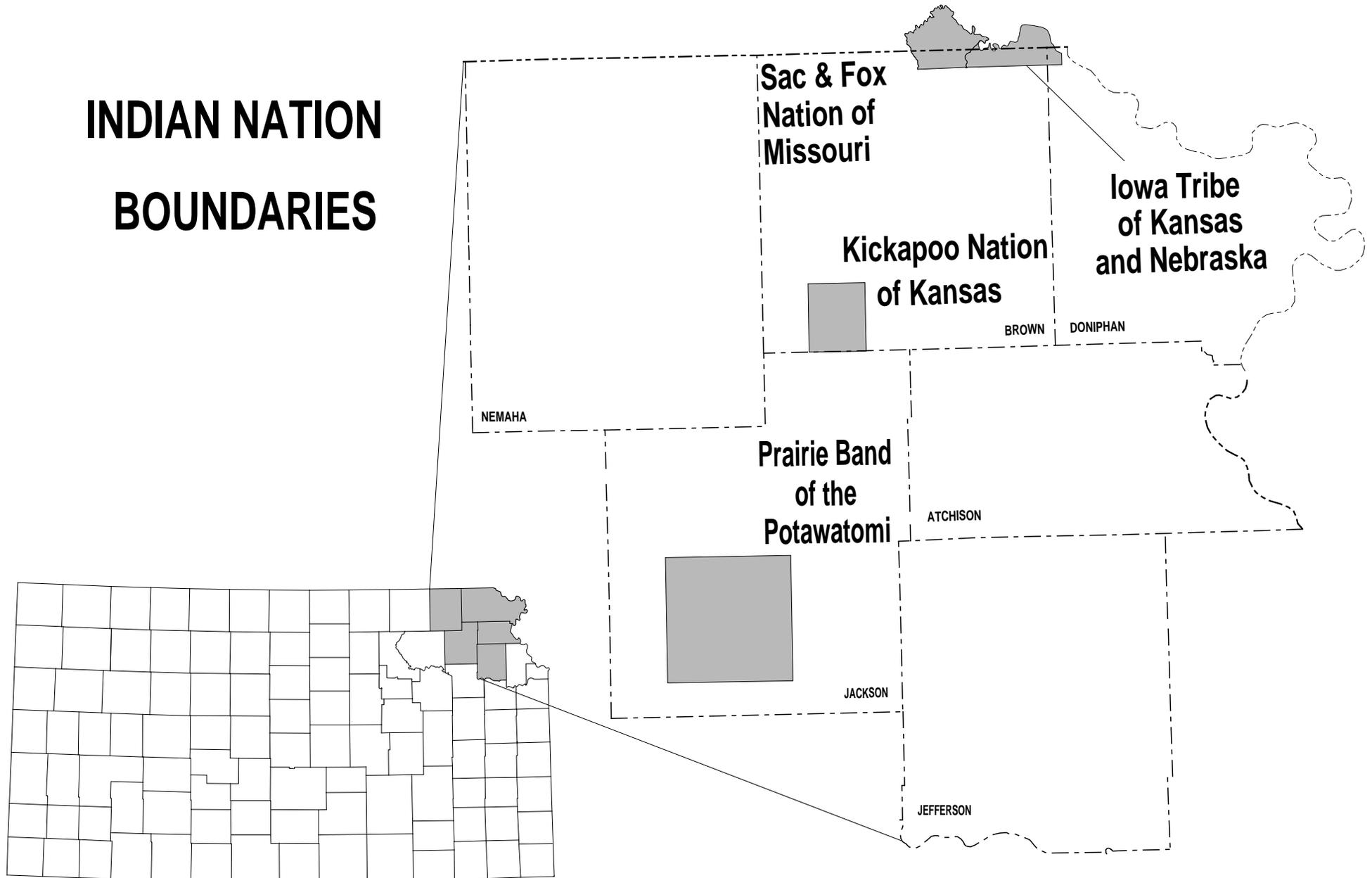
TEA-21 has provided funds, through the BIA, to the tribal governments to conduct planning activities and to develop a long-range transportation plan. An objective of each plan is to prioritize transportation projects.

Advocacy Groups

Meetings with several advocacy groups provided KDOT with insight for the Long-Range Plan update. Below is a sample of some of the comments that were received. A complete list may be found in Appendix D. The Sierra Club would like to

see KDOT move past the era of building highways in favor of alternative modes that may be friendlier to the environment. The Kansas ADA Coordinator stressed that the disabled wish to access the same public facilities (buses, vans) as the general population. Also, consideration of the disabled should be applied not only to transit vehicles but also to access to bus stops (sidewalks, curb cuts, etc.) The Kansas Motor Carriers Association expressed concern at the possible reduction in funding to the CTP by the Legislature and favors the implementation of new technologies for commercial vehicle operations and enforcement.

INDIAN NATION BOUNDARIES



KEY TO COUNTIES

Transportation and Land Use

It has long been recognized that there is a basic supply and demand relationship between transportation and land use. Development patterns influence travel demand and congestion levels, and the adequacy of the transportation system in turn influences development patterns. Coordination of transportation and land use is a primary objective of comprehensive planning. Many zoning controls and land use regulations are designed to match land use to transportation or to serve transportation objectives.

In urban areas, traffic congestion is a growing public concern, especially during the morning and evening commute periods. Fiscal limitations have constrained government's ability to respond by delivering new transportation facilities and services. Even when they can be provided, new facilities face scrutiny on environmental impact and efficiency. Because improvements often attract users that had been using alternate routes, building new facilities may not provide the congestion relief as planned. Alternative strategies for congestion relief are increasingly important.

In order to maximize the efficiency of the existing system, it is becoming increasingly important to avoid imbalances between supply (transportation) and demand (land use) that will degrade safety and reduce capacity. Land use practices, in fact, must change to help maximize the efficiency of the existing transportation system and eliminate or delay the need for large-scale expenditures. With increased emphasis in urban areas on redevelopment of existing property and infill of vacant land as a way to accommodate urban growth, incremental improvements to existing transportation systems become key elements in maintaining the existing quality of life, while supporting new investments and new jobs.

Responsibilities for transportation and land use are almost always separated not only by governmental department, but also by governmental level. Land use planning and regulation is almost entirely a local government responsibility and authority. Transportation planning and implementation is usually the responsibility of state or regional agencies as well as local governments. This separation frustrates efforts to coordinate transportation and land use management. Usually, mandates for one are not paralleled by mandates (and funds) for the other. Traditional concepts of the public's responsibility for providing transportation facilities have served to limit the scope of planning activities even more. Transportation has been viewed as a public utility to be provided on demand and not as a resource to which access should be carefully managed.

Transportation-related land use controls in Kansas are generally limited to the more traditional measures such as zoning, impact fees, benefit districts, and special assessments. However, more innovative ways of integrating land use and transportation are emerging. In Kansas City, MARC has facilitated community experiments with Transit-Supportive Development, and several design pilot projects have been initiated. This type of development encourages site designs that are pedestrian friendly and easily accessible by modes other than the automobile. Phases of development plans in Wichita and Lawrence have been tied to levels of transportation improvement (i.e. widening,

traffic signals, turn lanes). More exotic land use/transportation management techniques, such as growth control ordinances, development caps, and auto-restricted zones, have not been tried, as yet, in Kansas. Often land use restrictions and transportation are seen at odds with each other, but proper planning and land use controls can provide predictability, which is often attractive to larger developers.

Congestion pressures and concerns about urban sprawl have just reached the degree of magnitude in the State's urban areas to force greater attention to increased coordination between land development and transportation. Overall, in urban and non-urban areas alike, development and the benefits that accrue (jobs, tax revenue, etc.) are seen as highly desirable by the public and local governments, while negative effects to the transportation system are often overlooked.

Corridor Preservation

Corridor preservation entails identifying future new route corridors or existing routes that will need additional capacity in the future and taking some action to preserve the ability to build the facility when the need arises. Too often, a development creates demand for more highway capacity. However, because of that very development, it is impossible or economically infeasible to acquire the needed right-of-way (R/W) to improve the highway on its current alignment. There are various methods for accomplishing this preservation such as working with local governments to enforce minimum set back requirements, zoning and land use regulations, advance purchase of key parcels, particularly around future major intersections, or in some cases, advance purchase of all R/W needed for the future facility. Several of the projects in the Comprehensive Transportation Program contain provisions for corridor preservation. The improvement for US 54/400 is one example: while there was inadequate funding for construction of the entire route between Mullinville and Kingman, funds are allocated to preserve that corridor until a future date when construction funds become available. The communities along that route can now begin planning land use and development patterns with the relocation of the highway in mind.

Corridor Management

As part of the system preservation theme of the CTP and also this Long-Range Transportation Plan, existing corridors need to have their mobility preserved. One of the major accomplishments of the previous Plan was to recommend the establishment of a Corridor Management Program. As more businesses locate along a given section of highway, sometimes using existing access points intended for agricultural use, the traffic-handling performance degrades due to turning traffic and sometimes the addition of traffic signals. Poor access management leads to greater accident frequency on state highways, city streets, and county roads. The Corridor Management Program works with local units of government through agreements to combine or eliminate access points, thereby reducing the “turbulence” of turning traffic.

A major example of a corridor management project is the study of K-7 in Johnson and Wyandotte Counties. The study examines the current, varied status of K-7 from expressway to freeway to city street and projects how the facility will function in the future, and attempts to achieve a consensus among the local governments of what improvements should be made (e.g. upgrade to freeway, revert to city street). It should be completed in 2002, and more studies may follow on similar corridors.

Access Control for Freeways

When requesting a break-in access on Interstate highways, the Federal Highway Administration requires that a study of the effects on the Interstate and the surrounding area be performed prior to granting approval. KDOT has adopted similar guidelines for its non-interstate freeways. Currently, KDOT is considering guidelines for spacing between interchanges. Every time a ramp is added to a freeway, it includes an area of influence due to vehicles changing lanes, slowing, and merging or diverging. The closer interchanges are, the more severe interaction of these movements becomes, increasing accident frequency, while reducing the traffic-carrying capacity of the facility. As drivers' expectancy changes with setting, separate rural and urban standards for spacing will be proposed.

Economic Development

Transportation is a vital element in local, regional and national economic development. Although there are many factors that determine whether development takes place in a given location, transportation certainly is an important consideration. While the actual linkage between transportation improvements and economic development is subject to debate, few dispute there is a connection. Because the impacts of marginal improvements to an existing system are difficult to quantify, it is left to policy makers to determine how much emphasis to place on economic development when allocating resources.

When considering economic development, it is important to differentiate between short- and long-term gains. Short-term gains will normally occur as any transportation project is constructed. These benefits are produced as contractors purchase supplies from local businesses and the wages of construction workers are spent in the local area. While short-term gains are important, most economic development programs are aimed at long-term benefits. These long-term benefits occur as existing businesses expand and new business is attracted to an area. Benefits accrue to the state and the local economy as profits, wages, and values increase as a result of increased efficiency and productivity due to lower costs for transportation and better access to materials and markets.

From an economic development perspective, transportation projects provide an opportunity for reduced transportation costs, reliability, and increased safety. Lower transportation costs include reduced travel-time, lower operating expenses and savings due to lower accident rates, resulting in both direct and indirect savings to businesses. Direct savings include those savings due to reduced travel time, lower operating expenses and reduced accidents. In addition to direct savings, businesses also realize indirect savings in reduced travel time and more reliable service, which leads to greater market reach and the ability to operate with less inventory. These savings are important to businesses considering expanding or relocating. “All things being equal, businesses tend to locate and expand in locations where they have comparatively low costs and hence can be more productive and profitable.”²⁵ In addition, transportation improvements may further business productivity savings through economies of scale.

Because transportation projects contribute to lower costs or more reliable service, they have some impact on a state's economic vitality. But, to maximize the return, it is important to focus investments where the most benefit will accrue. The development of totally new transportation systems would have the most dramatic affect, as it would result in a fundamental change in accessibility and productivity. Due to the extensive transportation system in place, and the cost for new systems, this alternative is only rarely considered. An enhancement or expansion of an existing system will normally reduce costs and improve productivity and therefore positively impact business operations and competitiveness. These projects that improve the existing system are typical of the major projects in a state's transportation improvement program. To be most effective, these projects should be targeted for the most important transportation systems of the state and region. While not often viewed as investments for economic development, those projects that preserve and maintain the existing transportation system are vital to a state's economy. These projects allow companies to maintain reliable transportation, access to markets, and operate efficiently.

As programs and projects are considered which will positively impact a state's economic vitality, it is important that the investment be done in an efficient manner. To be efficient, an investment should generate benefits that exceed the cost of providing the service. The ability of an investment in a facility to contribute to economic development is dependent on the traffic, existing and future, that is served. The relationship between economic development and transportation improvements is complex and not fully understood. However, the surest way to foster economic development through transportation investments is to focus on cost savings to users and consumers.

Making Things Work Together

Integrating Technology

The previous Long-Range Transportation Plan recommended the dedication of staff and resources to implementation of Intelligent Transportation Systems (ITS). That recommendation was fulfilled when the ITS Unit was created within the Bureau of Transportation Planning. In addition to administering a new set-aside fund for ITS-related projects, a Statewide ITS plan was developed. It included five major goals:

ITS is the application of advanced sensor, computer, electronics, and communication technologies and management

- Mainstream ITS into standard KDOT business procedures
- Integrate existing ITS programs into the KDOT system
- Continue to educate KDOT and the Kansas public on ITS alternatives and benefits
- Identify potential ITS projects and funding sources, especially for rural areas
- Prioritize ITS project areas

One of the keys to having a successful ITS program in Kansas is integrating or mainstreaming ITS into the KDOT business process. In order for this to happen, funding, contracting, planning, design, operations and maintenance of ITS needs to be a consideration in all bureaus of KDOT. A formal procedure has been outlined in the Statewide ITS plan to help mainstream ITS into the KDOT design process. The most significant change to the traditional design process is the addition of an ITS Checklist. This Checklist will be developed by the ITS Unit and will contain criteria that when met would indicate an opportunity for ITS to be integrated into the project.

An ITS architecture provides the framework of a system outlining how the individual components, whether an element or an agency, communicate together and work with the other components of a transportation system. Kansas Statewide ITS architecture was developed to define the coordination of ITS applications in Kansas and their fit within the KDOT organizational structure and physical infrastructure. The architecture delineates the interaction between travelers, vehicles, the roadside, and the Traffic Operations Center, and ensures that future ITS systems, whether developed privately or by public institutions such as KDOT or local entities, will be compatible and allow different systems to communicate with each other.

Five program areas were used in the Statewide ITS Plan to analyze Kansas ITS projects.

- Priority Corridors - This program area includes rural ITS projects that are being deployed on a specific corridor. One priority corridor in Kansas is the I-70 corridor, and some of the ITS applications that are being include advanced traveler information systems, weigh-in-motion, and fiber optic communications.

- Commercial Vehicle Operations (CVO) - The State is currently developing a business plan that will define an architecture for CVO/ITS as part of the Commercial Vehicle Information Systems and Networks (CVISN) project sponsored by FHWA.
- Maintenance - The maintenance program area includes ITS-related projects that fall under the domain of the KDOT Bureau of Construction and Maintenance. Examples of these projects include road/weather information systems, the road condition reporting system, installation of automatic vehicle location and mobile data terminals in maintenance vehicles and automated anti-icing systems for bridges.
- Traffic Operations - This program area primarily refers to projects aimed at improving traffic operations in metropolitan areas. Examples include the design of the Wichita Traffic Operations Center (TOC) and the Kansas City Scout Project. This area also includes the planning and design of a statewide operations center that would link the metropolitan TOCs and house a statewide TOC and regional traveler information center.
- Rural Safety and Mobility - This program area includes all safety-related projects affecting the rural traveler, as well as rural transit. Examples include projects related to automatic collision notification/Mayday Systems, work zone applications, rural transit applications, at-grade rail crossings and the Intelligent Vehicle Initiative.

Cooperation and Planning between Modes

In the years since the automobile replaced other modes of personal transportation, such as inter-city rail or buses, the dominating emphasis on roadway improvements and other accommodations has in some cases, especially here in Kansas, left travelers with few alternatives to the personal automobile. While other travel modes are available, the connections between modes are not always adequate or convenient enough to connect origin to destination. For example, the mode accessible to the largest section of the population, walking, is not always practical, not only due to obvious hindrances of weather, but also because of a lack of key sidewalk connections or safe roadway crossings. Bicycling is a viable mode for not only recreation, but also for commuting and shopping, but many potential riders may be intimidated by the usually high traffic surrounding activity nodes such as shopping centers and office parks. KDOT has made a policy change to accommodate bicyclists on the non-interstate highway system through a more bike-friendly design of shoulder rumble strips.

Another connection between modes that requires cooperation is mass transit facilities. As suburban areas grow, it becomes harder to service individual neighborhoods with transit due to indirect street connections and lower population density. However, in some cases where auto commutes can be long and frustrating, commuters could be encouraged to use mass transit if the transit stop were a short, convenient drive, walk, or bike ride. These facilities need to include adequate parking and safe storage for bikes. KDOT could assist by locating park-and-ride facilities where

required along state highways. Two examples of possible park-and-ride or bike-and-ride applications could be in Johnson County, where commutes to downtown Kansas City and even to the College Boulevard activity centers are growing longer and more congested, and in West Wichita, where population continues to grow but traffic destined for downtown is constrained by the limited opportunities for crossing the Flood Control System.

Similar intermodal connection problems occur at Amtrak terminals in Kansas, and serve as barriers to the expansion of passenger rail. The transit system must be coordinated with the arrival of trains in order for passengers to complete their trips upon disembarking from the train. This is not feasible currently due to the late night arrival of the Amtrak train, which is not during operating hours of the transit systems in Topeka, Lawrence, and the Kansas City area. If a commuter rail route were to be set up between Kansas City, Lawrence, Topeka, and possibly Wichita, great improvement would have to be made in the transit service to the terminals so as not to discourage would-be train travelers.

Context-Sensitive Design

KDOT has considered the context of its highway projects for many years. Public meetings have long been a staple in determining the appropriate design. These are the principles as found on the FHWA Context-Sensitive Design website:

*Qualities of Excellence in Transportation Design*²⁶

- The project satisfies the purpose and needs as agreed to by a full range of stakeholders. This agreement is forged in the earliest phase of the project and amended as warranted as the project develops.
- The project is a safe facility for both the user and the community.
- The project is in harmony with the community and it preserves environmental, scenic, aesthetic, historic, and natural resource values of the area, i.e., exhibits context sensitive design.
- The project exceeds the expectations of both designers and stakeholders and achieves a level of excellence in people's minds.
- The project involves efficient and effective use of the resources (time, budget, community) of all involved parties.
- The project is designed and built with minimal disruption to the community.
- The project is seen as having added lasting value to the community.

KDOT strives to be sensitive to the needs and desires of the traveling public, the human environment and the natural environment. When addressing all of these concerns, one must balance accepted design criteria with the various desires of the community. Kansans have made it clear that their highest transportation concern is safety, followed by mobility, accessibility and the environment. Therefore, when evaluating how a project will fit into its surrounding environment, KDOT relies on these factors to help determine the appropriate design.