Section 2:
Regional Challenges

What are the transportation-related issues facing the 5-County region over the next three decades?

Transportation is an essential part of life for residents and businesses of the 5-County region. In order to plan for the future transportation system and to create strategies that will have a positive impact on the movement of people and goods, it's important to understand the challenges that the region will face.

The 5-County Study, through combined efforts of the study sponsors, a stakeholder/public engagement process and technical analyses, has identified transportation-related challenges the region will face over the next three decades. Identifying these challenges today will help in creating a successful transportation system for the future.

During Phase 1 of the 5-County Study, the Advisory Panel and Working Groups developed a list of 9 Desired Outcomes for the study region. These outcomes provide a framework for discussing the challenges that the region will face in the coming years. Table 2-1 summarizes these challenges which are discussed in more detail on the following pages.

Table 2-1: 9 Desired Outcomes and Regional Challenges

Desired Outcome	Challenges
Mobility	• **Recurring and Non-Recurring Congestion –** understanding and addressing the types and causes of congestion • **Access Management –** protecting the public investment in the mobility function of major roads while supporting economic activity (balance traveler safety, system efficiency and economic activity) • **Latent Travel Demand –** this short-term travel growth is difficult to predict and may result in design year traffic volumes being reached in less time as people change their travel behaviors (time of travel, route choice, mode choice, trip chaining, etc.) • **Corridor Widening Constraints –** existing right-of-way, development, and complex interchanges make further widening of some corridors cost-prohibitive • **Funding Limitations –** the need for transportation improvements far outpace the funding that is and will be available • **Understanding the Benefits of Non-Capacity Strategies –** educating stakeholders on the benefits of new Transportation System Management (TSM) and Transportation Demand Management (TDM) strategies
Safety	• **Identifying Effective Countermeasures –** identifying the causes of crashes in the region and finding effective strategies
Regional Prosperity	• **Coordinating Land Use and Transportation Planning –** major developments must coordinate as early as possible with transportation agencies • **Family Budgets –** the average household in the Kansas City Metropolitan area spends between 14% and 27% of their income on transportation costs
Efficient Use of Resources	• **Limited Transportation Funding –** spending the limited available funding for transportation in a manner to achieve the greatest benefits • **Multiple Agencies –** with many different agencies being part of the decision-making process, significant coordination is a must
Choice	• **Recognizing the Regional Need for Transportation Options –** many of the region's population groups desire a more robust transit system for longer trips and improved bicycle and pedestrian facilities for shorter trips • **Coordinating Transit Services –** coordinating the services of the five transit agencies that serve the 5-County region • **Funding Limitations –** providing additional funding to address transit needs • **Choice Ridership –** making transit more attractive to choice riders, those who have a choice of transportation modes and choose to ride transit
Environment	• **Air Quality –** maintaining a reasonable level of air quality is a challenge with the current transportation system, mode choice options could provide a benefit
Public Health	• **Lack of Transportation Mode Options –** the lack of diversity in transportation options has an impact on public health • **Access to Medical Facilities –** lack of all-day transit in many areas makes it difficult for some citizens to have adequate access to medical facilities • **Air Quality –** the current transportation system that relies heavily on automobile travel has a negative impact on air quality
Social Equity	• **Balance the Benefits of Transportation Improvements –** transportation investments must be distributed throughout the region so that all population groups benefit
Livability	• **Integrating Transportation with Community Goals –** balance mobility goals with community goals for livability

CHALLENGE TO PROVIDING AN EFFICIENT, RELIABLE ROADWAY SYSTEM

Mobility: *Move people and goods in an efficient manner where they want to go, when they want to go. Focus on minimizing person delay across modes rather than focusing exclusively on minimizing vehicle delay.*

A future highway and street system needs to provide reliable, safe, and efficient movement of people and goods. This is essential to support the economic well being and the quality of life in the 5-County region. In the future, roadways will continue to serve drivers, transit users, and freight movement with automobiles the dominant mode of travel. The key corridors analyzed during the 5-County Study provide the backbone of the roadway system needed for the future.

Challenges

The challenges to maintaining a reliable roadway system are many. Travel demand exceeds capacity in many areas during peak periods resulting in congestion and vehicle delay. Other challenges include effectively managing access, accommodating latent demand for travel, recognizing that roadway widening is cost-prohibitive in some corridors, insufficient funding for capacity improvements, and educating decision makers regarding Transportation System Management and Demand Management strategies.

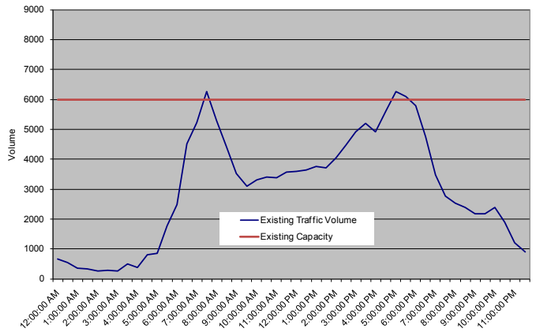
Congestion

The challenges in addressing congestion are in understanding what the causes are and what are the most cost-effective strategies to keep traffic moving. Congestion creates environmental damage, increases energy consumption, and decreases economic productivity and quality of life.

Recurring congestion takes place regularly as a result of commuter traffic. It usually occurs at the same time of day and is fairly predictable. Currently, segments of the region's major road system experience about 30 minutes of congestion in the AM peak and about 45 minutes in the PM peak. Traffic operations during the remaining 22 hours of the day are not typically congested.

Figure 2-1 illustrates the hourly traffic volume on one of the region's most heavily traveled corridor, the I-35 Corridor. The blue line shows the traffic volumes per hour of the day in 2010, the red line in the figure is the capacity of the roadway. Other than the peak periods, the highway has adequate capacity for free flowing traffic.

Figure 2-1: I-35 Peak period roadway congestion 2010



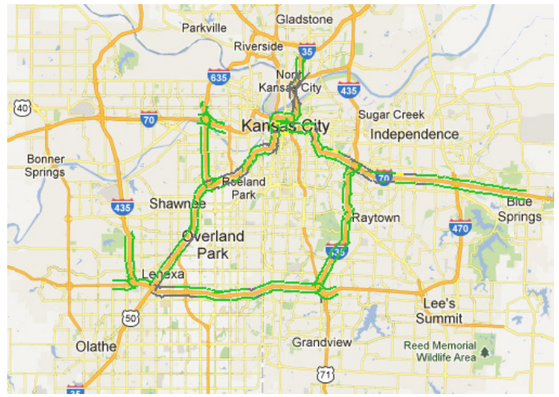
Source: 5 County Regional Travel Demand Model

Recurring congestion is an aspect of the transportation system that can be clearly identified and managed with a variety of tools, which are described in Section 11 and the Appendices.

Non-recurring congestion is one of the most frustrating aspects of a transportation system for travelers. Non-recurring traffic congestion occurs as a result of collisions, vehicle breakdowns, road construction, or other incidents. There is little a traveler can do once he or she is ensnared in non-recurring congestion. It is important to implement transportation strategies that identify and manage incidents as quickly and efficiently as possible to minimize the negative impact to travelers. ITS technology can help drivers avoid areas where non-recurring congestion has developed.

From October 2011 to September 2012, KC Scout reported 7,373 incidents on roads monitored by their traffic management system. Figure 2-2 shows a map of the roads monitored by the KC Scout system. With the benefit of KC Scout coordination, it took an average of 22 minutes to clear incidents on the region's roadways and an average of six minutes to restore traffic flow to pre-incident conditions. Major incidents take additional time to clear and can cause long, unpredictable delays for travelers.

Figure 2-2: Roads monitored by KC Scout



Source: KC Scout

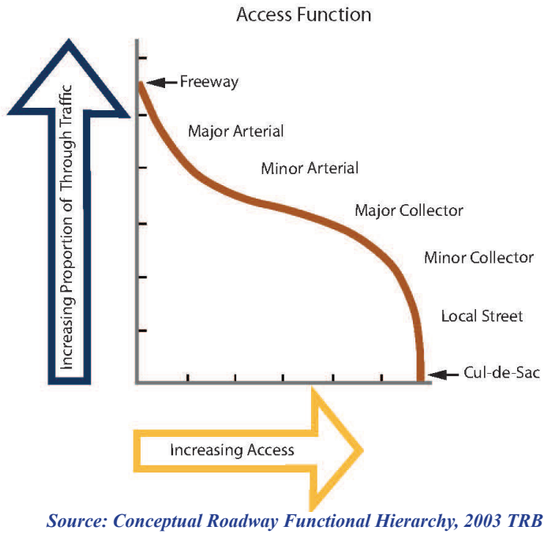
Managing Access

The challenge for access management on highways and major streets is protecting the public investment in the mobility function of these roadways by not allowing too many access points.

The Transportation Research Board (TRB) Access Management Manual defines access management as "the systematic control of the location, spacing, design, and operations of driveways, median openings, interchanges, and street connections to a roadway."

The number of access points and their location along major roadways can significantly impact the ability of major roads to move traffic efficiently. Figure 2-3 shows the primary function of highways and major arterial streets is the movement of traffic. Managing access along these roadways is important to traffic flow because each access along a roadway, whether a driveway, an intersection, or a freeway ramp, introduces potential for conflict and friction within the traffic stream and slows traffic speeds.

Figure 2-3: Access related to road function

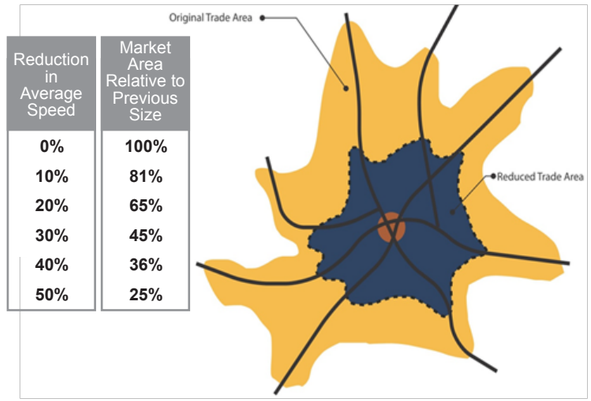


Source: Conceptual Roadway Functional Hierarchy, 2003 TRB Access Management Manual

Access management supports economic activity by preserving the efficiency of the highway and major street network and facilitating safe design. An efficient roadway allows motorists to travel at a reliable speed, without encountering reoccurring congestion, and reach their destinations in a time that meets their expectations. Figure 2-4 illustrates the impact that a reduction in average speed has on the market area for businesses.

The region's freeway system carries the highest percentage of daily vehicle-miles traveled. Therefore, it is critical to maintain a reasonable flow of traffic during peak periods. The flow of traffic is negatively impacted if too many interchanges are provided at less than desirable spacing.

Figure 2-4: Affect of travel speed reduction on market area



Reduction in Average Speed	Market Area Relative to Previous Size
0%	100%
10%	81%
20%	65%
30%	45%
40%	36%
50%	25%

Source: Florida Department of Transportation

As can be observed on the region's freeway system, congestion develops first at interchanges. The close spacing of interchanges has reduced the service life of some freeways, and led to the need to widen these roadways in a shorter amount of time. In particular, allowing new interchanges to be built within two miles of a "systems" interchange (an interchange between two freeways) will have significant negative impacts on the roadway's ability to move vehicles. Future construction to maintain traffic flow at a reasonable level of service then becomes very costly.

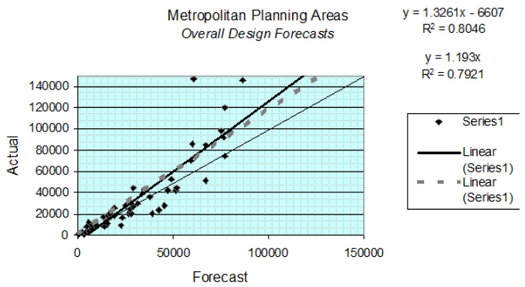
Access to freeways is only permitted via grade-separated interchanges. Guidelines for interchange spacing can be found in KDOT's Standard Operating Manual (SOM). Desirable interchange spacing is a minimum of four miles apart in rural areas and two miles apart in urban areas.

At interchanges, access control should be extended down intersecting roadways so that adjacent side road intersections do not interfere with interchange operations. Access control along the intersecting roadway ideally will extend one-half mile from the ramp intersection to the nearest full movement side road intersection or access point. If a traffic study shows that the distance on the side road from an on- or off-ramp to a full-movement intersection should be more or less than one-half mile, this information should be taken into consideration before a final decision is made.

Latent Demand

Latent traffic demand creates a challenge for realizing the full expected value from a roadway capacity project. When lanes are added to a freeway, the traffic-carrying capacity is increased and therefore congestion and travel time decrease. Long-term traffic growth is expected based upon land use changes in the region; however, increased travel on the improved facility often comes more quickly than expected due to latent travel demand. Latent demand includes the drivers that would like to use the freeway, but have chosen not to due to congestion or other constraints. When the freeway is widened, the route becomes more desirable and trips are diverted from parallel roadways. As shown in Figure 2-5, "design-year" (future) traffic forecasts in urban areas are often significantly greater than the volumes predicted using changes in land use and employment growth, due to latent demand which is very difficult to predict.

Figure 2-5: Metropolitan Planning Areas Overall Design Forecasts



Source: Kansas Department of Transportation Study

Constraints to Corridor Widening

A challenge to adding lanes on parts of the I-35 and I-435 corridors is that existing right-of-way, development, and complex interchanges make further widening cost-prohibitive.

Insufficient Funding

Funding necessary to implement improvements recommended by corridor studies within the region totals between $2 and $3 billion. The 5-County Study considered capacity improvement strategies for the 17 key corridors that totaled $11 billion. Funding for these types of projects available during the 10-year T-WORKS transportation program is less than $1 billion in the 5-County region. Without a momentous change in funding, capacity (roadway widening) projects alone cannot result in a roadway system that can reliably provide efficient flow of traffic.

Educating the Public and Stakeholders Regarding the Benefits of TSM and TDM Strategies

A final challenge is educating the public and stakeholders regarding the benefits to Transportation System Management (TSM) and Transportation Demand Management (TDM) strategies and how these strategies address congestion.

CHALLENGE TO PROVIDING A TRANSPORTATION SYSTEM THAT MAXIMIZES TRAVELER SAFETY

Safety: *Reduce crash rates, severity of crashes (fatalities, serious injury crashes), and reduce conflict points. Improve the perception of safety and user-confidence.*

Transportation Safety is a complex issue that requires a comprehensive approach in order to make positive impacts for both drivers and pedestrians. Motor vehicle crashes are consistently one of the leading causes of death in America[1]. In 2011, there were 351 fatal crashes in Kansas. Eighteen percent of those fatal crashes occurred within the 5-County region. But, fatalities are not the only safety concern for travelers. Vehicular crashes more often result in injury or property damage. As the number of people using the road system increases, the number of crashes also increases.

1 Centers for Disease Control, Ten Leading Causes of Death and Injury. Accessed October 21, 2012.

Challenges

The challenge is identifying strategies that will lower the crash rates on roadways within the 5-County region. Many of the crashes are speed-related; therefore, strategies that reduce the difference in speeds between vehicles should be effective in enhancing the safe operation of the region's roadways. On the freeway system, this could include various Transportation System Management (TSM) strategies such as ramp metering and active lane-use control as well as geometric design features such as the spacing of interchanges and the lengths of acceleration and deceleration lanes.

In the 5-County region, two Transportation Safety Programs are working hard towards reducing fatalities and serious injuries in Kansas.

The "**Destination Safe**" Coalition is a regional transportation safety program that includes all counties in the MARC Area and includes four of the five counties included in this study (minus Douglas County). It includes a partnership between local agencies involved in improving transportation system safety. The Coalition provides a means for various community sectors (law enforcement, engineers, safety advocates, public health officials, citizens, trauma room nurses, transit coordinators, public works managers, emergency services providers, bicycle/pedestrian advocates, local officials, planners and others) to discuss transportation system safety in the Kansas City region.

KDOT's **Strategic Highway Safety Plan** (SHSP) which was adopted on July 1, 2011, under the "SafeKan" Program, is KDOT's statewide transportation safety program. The Mission of the SHSP is "to drive strategic investments that reduce traveler casualties and the emotional and economic burdens of crashes, utilizing the 4E's (education, enforcement, engineering and emergency medical services) in a collaborative process". The Goal of "SafeKan" is to reduce the number of fatalities and disabling injuries by half within the next 20 years (from base years of 2005 – 2009 to future years of 2015 – 2029). The Vision of the "SafeKan" Program is for a time when no life will be lost, and no person disabled, as a result of a traffic crash.

CHALLENGE TO SUPPORTING CONTINUED ECONOMIC GROWTH

Regional Prosperity: *Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets. Provide access to systems, facilities, and modes. Support sustainable economic development through transportation investments.*

The 5-County region is growing and will continue to expand and develop over the next 30 years. This growth is often located at new major activity centers along freeway corridors. Figure 2-6 maps the locations of current activity centers and potential future activity centers. The map illustrates that the highway network provides a backbone for major regional attractions, such as employment, shopping and entertainment centers.

Challenges

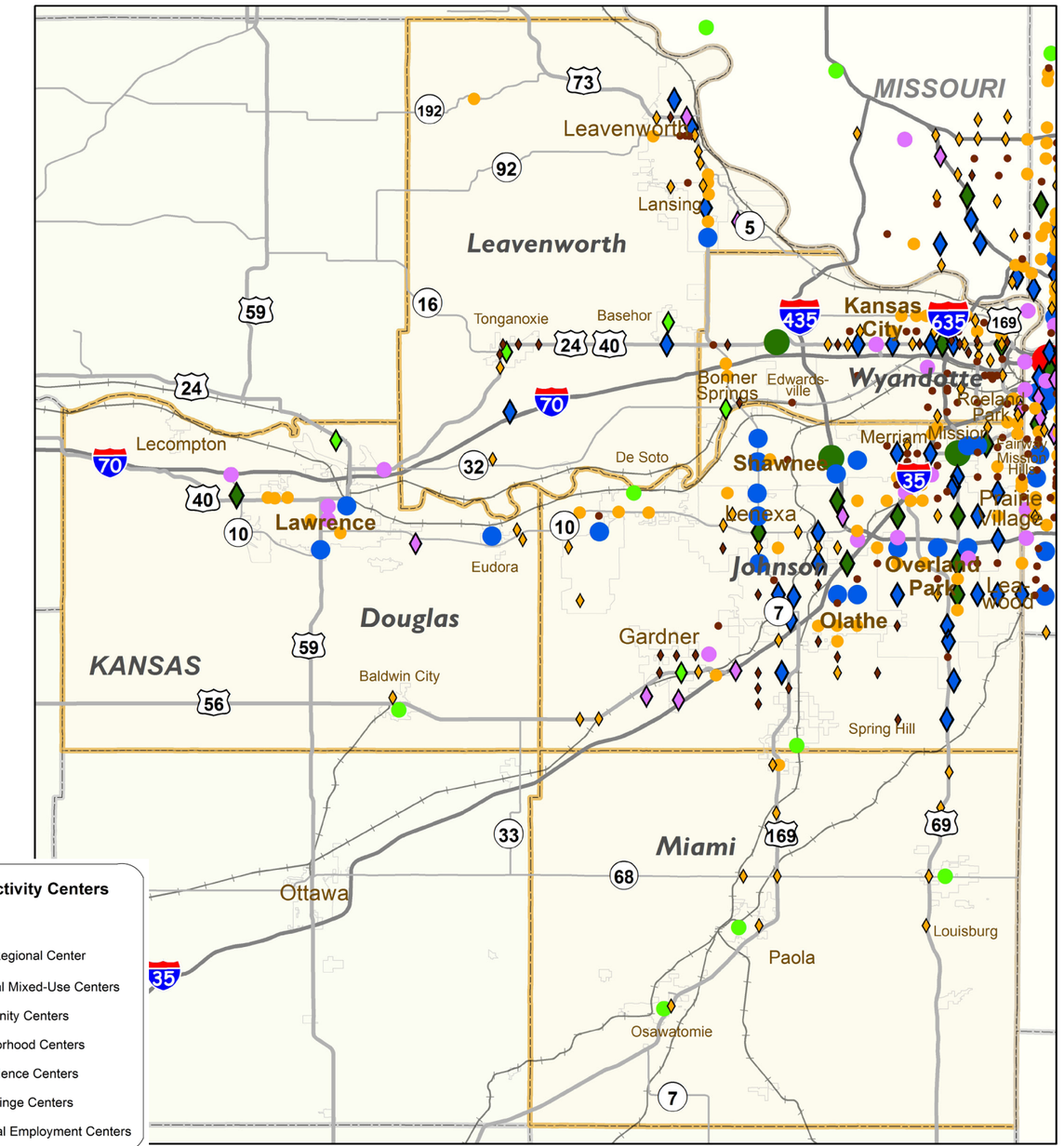
Transportation impacts economic growth at the regional level, as well as an individual resident level. For the region as a whole, coordination between land use planning and transportation planning is essential to support continued economic growth. The challenge from a transportation standpoint is to become aware of major developments with sufficient time to work with the developers, MPOs, cities, counties, and transit agencies to plan the transportation infrastructure/services needed to support the development. From the standpoint of the region's residents, the cost of transportation has a significant impact on family budgets.

Phase 1 of this study identified a number of major traffic generators within the region. As economic growth continues, travel patterns will be impacted and strategies will need to be developed to accommodate that growth in a sustainable way. Communities and developers should be encouraged to look for opportunities to bring new development to locations already served by existing infrastructure to lessen the demand to build additional new infrastructure.

Following is a list of major developments that are planned or are under construction. A more detailed discussion of these developments is included in Section 14: Key Corridors.

- BNSF Intermodal Facility, under construction north of I-35 between Edgerton and Gardener
- New Century Air Center, located along I-35 near US-56
- I-35 & 119th Street Retail Area
- Major retail development at I-70 & I-435, includes the Kansas Speedway, Sporting Park (Sporting Kansas City - Major League Soccer), Community America Ballpark (Kansas City T-Bones - Independent Professional baseball), Cabela's, Nebraska Furniture Mart, Great Wolf Lodge, Hollywood Casino, Legends Shopping Center, Cerner Corporation and Schlitterbahn Vacation Village
- Lawrence Airport
- Park Place – a mixed-use development in Leawood
- Mission Farms – a mixed-use development on both sides of the Leawood/Overland Park city limits
- The Lenexa City Center - a pedestrian friendly mixed-use development located at 87th Street Parkway and Renner Blvd.
- Corbin Park - open air retail village along 135th Street between Metcalf and Lamar Ave.
- Erickson Retirement Community – a retirement community located at 138th & Metcalf
- Deer Creek Woods - a corporate center located along US-69 in Overland Park
- Fort Leavenworth expansion
- East Hills Business Park - located along K-10 on the eastern side of Lawrence

Figure 2-6: Current and potential activity centers in the 5-County region



Source: Kansas Department of Transportation, Kansas GIS, US Census

From the standpoint of the region's citizens, another challenge being faced is the cost of fuel. The average household in the Kansas City Metropolitan Statistical Area spends between 14 percent and 27 percent of their income on transportation costs, with fuel prices making up the greatest portion of the total transportation cost[2]. Over the past 10 years, fuel costs have spiked and wild price fluctuations have become the norm, as shown in Figure 2-7. There is increasing evidence that travelers change their transportation behavior during fuel price spikes. Figure 2-8 shows that nearly two-thirds of the survey respondents in the 5-County region changed their travel habits when fuel costs rose sharply. Strategies that enhance access to public transportation or bicycle and pedestrian facilities would provide residents more affordable transportation options.

CHALLENGE TO USING FUNDING RESOURCES EFFICIENTLY

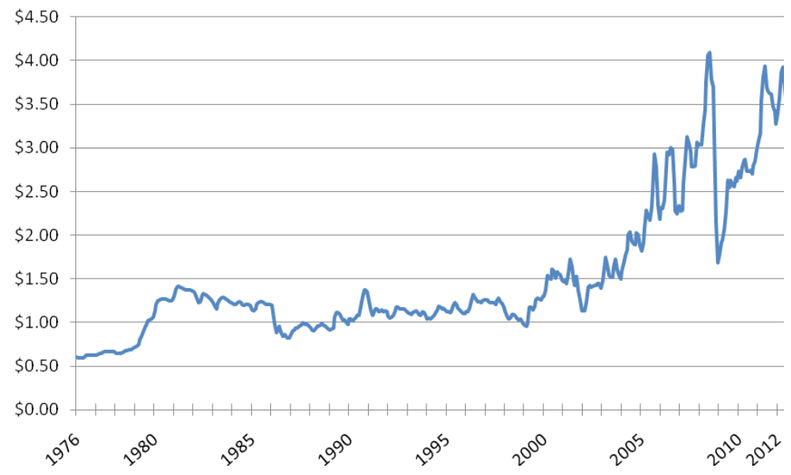
Efficient Use of Resources: *Evaluate the affordability of transportation investments by considering the initial investment to plan, design, and construct; the life-cycle costs to maintain and operate; and the economic benefits to the community. Enhance and maintain the existing transportation system.*

Funding for transportation infrastructure and services is significantly less than the transportation needs facing the 5-County region. For that reason, funds must be used judiciously and a true understanding of the life-cycle costs of an infrastructure or service improvement must be considered.

Challenges

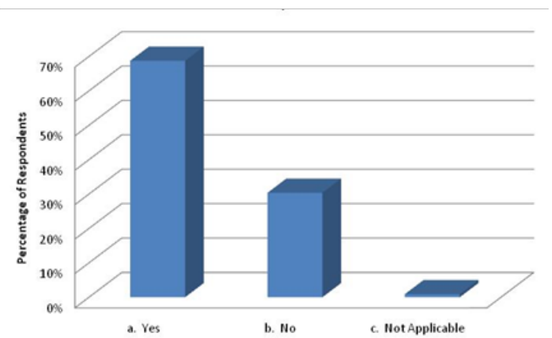
The challenge is spending limited transportation funds wisely so that the greatest benefit is achieved for moving people and goods, safely and efficiently. This challenge also includes transportation agencies working together to achieve these benefits.

Figure 2-7: Unleaded regular U.S. City average retail price (1976-2012)



Source: U.S. Energy Information Administration. Motor Gasoline Retail Prices, U.S. City Average.

Figure 2-8: Survey Question: When gas prices increased or when the economy worsened, did you adjust your travel habits?



Source: 5-County Regional Transportation Study Phase 1 Survey

Funding resources must first be allocated to maintaining and operating the existing transportation system. Subsequent decisions for transportation funding decisions should consider the true cost to implement and maintain the proposed infrastructure improvement/service, as well as address the 9 Desired Outcomes determined by stakeholders in the region. The true cost of an improvement includes not only the costs associated with planning, designing, and construction/implementation, but the costs to maintain and operate the improvement over the course of its service life.

KDOT, MARC, Lawrence-Douglas County MPO, cities, counties and transit agencies all plan for transportation improvements. The 5-County Study is an example of these agencies working together to create a seamless, integrated transportation system.

CHALLENGE TO DEVELOPING A MULTIMODAL TRANSPORTATION SYSTEM THAT PROVIDES MODE CHOICE

Choice: *Invest in a multimodal transportation system that maintains our existing primary roadway system but also allows individuals the choice of using other modes of transportation such as sharing a ride, using public transportation, bicycling, or walking. Support the independence of persons with disabilities through transportation investments.*

As we move into the future, the public desires a transportation system that provides more choice in the modes by which they travel through the region. Young adults are showing a trend for living in urban, mixed-use neighborhoods where they can walk, bicycle, or use transit. Older citizens are looking for alternatives to travel by personal automobile. A segment of the population is transit-dependent and relies on non-automobile modes for their transportation needs. Also, there is evidence that as fuel prices increase, the use of transit, carpooling, and bicycle travel increases as well.

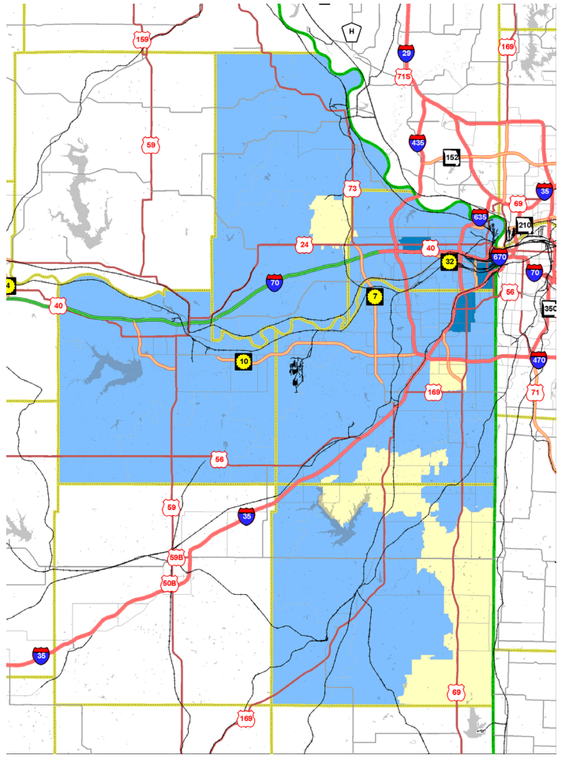
2 Haas, Peter M. et al. (2006). Housing and Transportation Cost Trade-offs and Burdens of Working Households in 28 Metros. Center for Neighborhood Technology.

Challenges

The challenges to creating a multimodal transportation system include recognizing that many of the region's population groups desire a more robust transit system for longer trips and improved bicycle and pedestrian facilities for shorter distance trips. Additional challenges are planning for and providing better connections between modes, coordinating the various transit systems within the region, reviewing transportation policy to consider additional funding for these types of services and facilities, and making transit more convenient and attractive to choice riders.

Figure 2-9 shows the results of a survey of the region's citizens that was conducted during Phase 1 of the Study. Sixty-three percent of respondents to the survey expressed the opinion that a regional transit system is needed. The areas of the map shaded in blue represent agreement with the need for region transit services while areas shaded in yellow represent a neutral response.

Figure 2-9: Survey Results Regarding Regional Transit



Source: 5-County Regional Transportation Study Phase 1 Survey

Nationally, young adults are increasing their travel by transit and bicycle. Older citizens also desire alternatives to the personal automobile to improve their quality of life. A segment of the population is transit-dependent and requires these services to access jobs.

Making transit a more convenient and attractive mode of transportation will increase the number of choice riders. Park & Ride lots provide a logical connection between personal automobiles and transit, amenities such as Wi-Fi on buses can allow riders to use their commute time productively, and a more regionally connected transit system will allow the users of each of the five separate transit services to travel across these systems.

CHALLENGE FOR THE ENVIRONMENT

Environment: *Rather than mitigate the impacts upon the environment, transportation system investments should seek to enhance air and water quality, reduce climate impacts and the region's carbon footprint, and protect high priority natural resources.*

Challenges

Air quality in the region is an environmental challenge. The 5-County region has had numerous days over the past year where air quality has not met national standards. While this is not only due to the transportation system (higher than average summer temperatures and the burning in the Flint Hills also effect regional air quality), changes in the transportation system that increase mode choice could have a great benefit to air quality.

In addition to air quality challenges, the continued sprawling development patterns lead to increasing environmental challenges, including the conversion of key farmland and other natural resources to development. Figure 2-10 shows the water, parks and protected areas in the 5-County region.

Figure 2-10: Water, Parks and Protected Areas

CHALLENGE TO PROVIDING A TRANSPORTATION SYSTEM THAT IMPROVES PUBLIC HEALTH

Public Health: *Reduce the impacts to public health by improving traffic safety, improving air quality, promoting physical activity and fitness, increasing community cohesion, improving access to medical services, and increasing transportation affordability.*

The 5-County Study's Stakeholder Advisory Panel recommends that future transportation investment decisions also consider the impacts on public health.

Challenges

The 5-County region has numerous challenges related to public health that can be directly impacted by the transportation system. All the challenges relate back to the lack of diversity in mode in the region. An overwhelming majority of the trips made in the region are by automobile. The limited choice that is offered leads to public health challenges. For instance, the continued obesity epidemic relates back to a lack of physical activity. Using a daily commute as an opportunity to get physical activity is an effective and consistent way to improve the public health of the region. Unfortunately, lack of bicycle facilities or connectivity across key travel corridors limits the ability for users to see this option as a possible choice.

Additionally, the lack of all-day public transportation in portions of the region causes public health challenges. As the population ages and as the cost to own a car continues to be prohibitive, access to medical facilities and grocery stores via public transportation needs to be enhanced.

Finally, the current transportation system in the study region has negative air quality impacts that can lead to public health challenges. Poor regional or localized air quality has been shown to cause a greater number of asthma related health incidents, especially among children.

CHALLENGE TO MAINTAIN SOCIAL EQUITY

Social Equity: *Consider the investment benefits and impacts on all population groups within communities. Support civil rights through transportation investments. Create jobs through transportation investments. Minimize personal transportation expenses in ways that support wealth creation. Look for opportunities to employ economically disadvantaged persons in the development of the transportation system.*

As identified in federal regulation, it is unlawful to implement a project that has a specific and significant impact on a specific population subgroup without providing remediation.

Challenges

The challenge to maintain social equity is always important in the development of transportation strategies. For the 5-County region, those population subgroups that are specifically targeted in federal regulation (minority and low income populations) are located throughout the region, but with the most prominence in the urban core areas. It is essential in planning for the region that investments in transportation be distributed throughout the region, so that positive impacts can be felt by all users.

CHALLENGE TO BALANCE MOBILITY GOALS WITH COMMUNITY GOALS

Livability: *Integrate the transportation system with the community desires. Balance mobility goals with the livability of the community including social equity.*

Finally, the region has significant challenges related to livability. The current pattern of sprawling development in the region lacks the qualities of "livability" that are seen as attractive or in keeping with the needs of the growing younger and older populations in the region. With limited growth in the 35-60 year old households expected in the region, it is essential that diversity in land developments be provided that better meet the needs of smaller households.