2020 – 2045

Kansas Long Range Transportation Plan

July 2021

WELCOME FROM THE SECRETARY

Dear Transportation Partner –

Welcome to the Kansas 2045 Long Range Transportation Plan. Hundreds of citizens and stakeholders across Kansas have invested energy and creativity in helping us produce responsive and flexible recommendations to guide the state's multimodal transportation system through a changing world over the next 25 years.

I am proud of the transportation system we Kansans have built together and how it seamlessly connects our businesses and citizens to markets and jobs, and serves essentials like education, recreation, and healthcare. We also have a duty, however, to be prepared to overcome challenges and to take advantage of new opportunities in transportation. In this long-range plan, we identify policies and processes that will enable Kansas to rise to the challenges and opportunities on the road ahead.

Thank you to everyone who contributed to the production of this plan including many Kansas citizens, and the Department's transportation partners. Your participation helped us create a plan for Kansas to meet the mobility and connectivity needs of all transportation system users in the future.

Sincerely,

Secretary Lorenz

KDOT's Vision:

Kansas will be a national transportation leader with a modern, efficient, and resilient system that serves all users, businesses, and partners.

KDOT's Mission:

To provide a safe, reliable, and innovative statewide transportation system that works for all Kansans today and in the future.

Statewide Long Range Transportation Plan's Goals:

Safety and Security - Enhance the safety and security of the transportation system for all users and workers.

Transportation System Management - Maximize performance of the existing system by investing in transportation choices and intelligent transportation systems.

Asset Preservation - Address risks and maintain assets through investments that provide high-value returns and make the best use of limited funds.

Freight and Economic Vitality - Improve reliability and increase flexibility for cost-efficient movement of people, goods, and information to strengthen the Kansas economy.

Stewardship - Continuously improve the quality of the transportation system and surrounding communities and the natural and historic environment through strong partnerships and focused, lower cost, and higher value improvements that avoid or minimize adverse impacts

Workforce - Get the best from our workforce by attracting and retaining talent, modeling diversity, supporting professional development, and inspiring action.

IKE Program's Goals:

Safer roads

Economic growth

More options for Kansans & resources for communities

IKE Program's Guiding Principles:

Leverage Partnerships

Provide More Options

Problem Solving

Transparency and Accountability

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EXECUTIVE SUMMARY

Every day, Kansans living and working across the state rely on good transportation to connect businesses and people to markets and jobs and for access to essentials like education or healthcare. This Kansas 2045 Long Range Transportation Plan (LRTP or Plan) reviews influences on the future of the state's transportation in the next 25 years and offers a set of flexible and responsive strategies that leverage partnerships among stakeholders to support prosperity and quality of life for all Kansans.

This plan was mostly developed during the COVID-19 pandemic of 2020. While the long-term priorities established for the Plan were not shifted by the pandemic, KDOT placed a greater emphasis on virtual engagement techniques. In addition, the pandemic reinforced two of the Plan's focus areas on using transportation to help Kansas adapt to economic change and the importance of equitable access to broadband internet.

Transportation in Kansas

The extent and performance of the multimodal transportation system in Kansas is examined in the LRTP's **Chapter 2 – Transportation in Kansas** and in the Plan's **Chapter 3 – System Performance Report** including:

- **Highways –** Kansas has the fourth-largest public highway and local road system by miles in the United States.
- **Active transportation –** Kansas supports a statewide active transportation system that integrates local and regional multi-use trails, bicycle routes, and sidewalks.
- **Transit –** 145 transit and para-transit operators operate in Kansas, covering most of the state's 105 counties.
- **Freight & passenger rail –** Kansas is served by a comprehensive freight rail network and intercity passenger rail service is provided by Amtrak's Southwest Chief.
- **Ports & waterways –** Kansas has direct access to one inland barge navigable waterway, the Missouri River with five private commercial terminals.
- **Aviation –** Kansas is home to 138 public-use airports, including six commercial service facilities and more than 200 private airports that serve general aviation.

Kansas Transportation Trends & Issues

Future changes in six categories of external influences that will affect transportation in Kansas are examined in the LRTP's **Chapter 4 – Trends & Issues**:

- **Changing demographics –** The future demographics of communities across Kansas will mean more congestion at system bottlenecks – particularly in urban areas where population growth concentrates, but also a need to serve changing mobility needs of a growing senior population and to help sustain the vitality of rural communities in the state.

- **New transportation technologies –** Electric vehicles, 'smart' transportation infrastructure, mobility-as-a-service options, and connected and automated vehicles will change vehicle ownership and travel patterns, affect safety, and create new models for mobility in Kansas, but could also jeopardize sustainability of statewide infrastructure funding.
- **Bridging a digital divide –** High speed internet will be a necessity for both communities and the next generation of transportation infrastructure in Kansas. As a rural state, Kansas must avoid a 'digital divide' between urban and rural areas that could hinder economic opportunities, education, health care, civic engagement, and mobility in rural portions of the state.
- **Linking transportation and health –** Health has not historically been a major consideration in transportation policy; however, transportation increasingly is understood to be an important influence on the health of people and communities. With the population of Kansas aging, the transportation needs of a growing share of the population are likely to shift.
- **System resiliency –** Risks to the transportation network in Kansas from stressors like weather-related natural disasters or human threats are growing. Infrastructure resilience is therefore critical to reducing the severity and duration of disruptive events. Strategic investments are needed in certain locations to retrofit aging infrastructure and engineer new assets to withstand the impacts extreme weather and help safeguard against human threats.
- **Economic changes** – Changing economic opportunities in Kansas are driving a new set of transportation needs and transportation professionals must be ready to make the next generation of investments that will sustain prosperity in Kansas.

By considering these influences in the LRTP, KDOT and its partners can better align direction of the state's future transportation projects, programs, and policies with anticipated needs.

Public Engagement

As described in **Chapter 6 – Public & Stakeholder Engagement,** the LRTP reflects feedback from a series of 'local consult' dialogues hosted by KDOT in all six KDOT districts and in the Kansas City and Wichita metro areas. KDOT also conducted a student-focused meeting at Donnelly College to receive input from a younger generation who traditionally think about transportation and travel differently than older generations. Over the course of the local consult dialogues, several priorities emerged among stakeholders about the state's transportation system including:

- **Safety** — Safer movement of people and goods is a top concern.
- **Dialogue —** Stakeholders want interaction with KDOT on a regular basis.
- **Preservation —** Funding for preservation should be a priority.
- **Flexibility —** KDOT must adapt to shifts in technology, the economy, and demographics and tackle transportation needs holistically while tailoring solutions to local needs.
- **Revenue —** Kansas needs to explore new, more diverse revenue sources.

- **Practical improvements —** Adopting 'practical improvements' solutions will stretch scarce funding further.
- **Modal choices —** Transit and active transportation have growing roles in the state along with continuing importance of aviation and railroads.
- **Digital connections —** Stakeholders seek opportunities to build fiber into projects in the future where applicable.
- **Economic development —** Transportation must connect people with jobs, move goods to market, support healthy communities, and attract businesses.

Goals & Performance Measures

The 2045 LRTP's goals, objectives, and performance measures described in **Chapter 7 – Goals, Objectives & Measures** provide a strategic framework for KDOT to make future transportation decisions and investments which align broadly with the goals, objectives, strategies, and outcomes established by the state's six MPOs. Goals established in the LRTP are as follows:

- **Safety and security -** Enhance the safety and security of the transportation system for all users and workers.
- **Transportation system management -** Maximize performance of the existing system by investing in transportation choices and intelligent transportation systems.
- **Asset preservation -** Address risks and maintain assets through investments that provide high-value returns and make the best use of limited funds.
- **Freight and economic vitality -** Improve reliability and increase flexibility for cost-efficient movement of people, goods, and information to strengthen the Kansas economy.
- **Stewardship -** Continuously improve the quality of the transportation system and surrounding communities through strong partnerships and focused, lower cost, and higher value improvements.
- **Workforce -** Get the best from our workforce by attracting and retaining talent, modeling diversity, supporting professional development, and inspiring action.

Moving Forward

This Plan does not contain a list of future projects. Rather, in **Chapter 8 – Moving Forward,** and based on analysis of trends and issues in transportation and dialogue with stakeholders about transportation needs, the 2045 LRTP formulates recommendations for how KDOT and its partners can continue to work together to maintain and enhance their transportation system with strategies spread across nine major areas:

- Making travel safer
- Preserving the system
- Creating a more responsive project pipeline
- Delivering programs more effectively
- Designing practical improvements
- Leveraging KDOT's partnerships with stakeholders
- Preparing for the future of tech-enabled infrastructure
- Continuing commitments to multimodal programs; and
- Supporting economic development and job growth

CHAPTER 1 – INTRODUCTION

PURPOSE OF THE PLAN

Every day, Kansans living and working across the state rely on good transportation. It seamlessly connects businesses and people to markets and jobs, and Kansans rely on it for access to essentials like education, healthcare and much more.

The Kansas Department of Transportation (KDOT) – working with many partners – plays a critical role in planning, building, and supporting the statewide multimodal transportation system composed of highway, transit, rail, air, bicycle, and pedestrian elements that help people, goods and services move safely and easily around Kansas and connect to the world.

This Kansas 2045 Long Range Transportation Plan (LRTP or Plan) reviews important influences on the future of the state's transportation – like technology, the economy, demographics, and resiliency risks – and how changes are necessitating new problem-solving approaches. In response, it offers flexible and responsive solutions that leverage partnerships among stakeholders to support prosperity and quality of life for all Kansans. This Plan was mostly developed during the COVID-19 pandemic of 2020. While the long-term priorities established for the Plan were not shifted by the pandemic, KDOT placed a greater emphasis on virtual engagement techniques during plan review including webinar meetings for stakeholders. In addition, the pandemic reinforced the importance of two of the Plan's focus areas: using transportation to help Kansas adapt to economic change and the importance of equitable access to broadband internet.

Developing the Kansas 2045 LRTP

In accordance with state and federal requirements, KDOT updates the Kansas LRTP about every five years to reflect changing transportation challenges and conditions. The LRTP development process includes:

- Public engagement with Kansas citizens, Metropolitan Planning Organizations (MPOs) and other planning organizations, and transportation stakeholder groups.
- Technical analysis of trends, data, and other transportation-related plans.
- Consideration of issues that will shape future conditions and the performance of the Kansas transportation system.

KDOT's 2045 LRTP update was guided by an external advisory committee composed of diverse statewide stakeholders who primarily supported public engagement aspects of the plan's development.

This Plan does not contain a list of future projects. Rather, based on analysis of trends and issues in transportation and dialogue with stakeholders about transportation needs, the 2045 LRTP formulates recommendations for how KDOT and its partners can continue to work together to maintain and enhance their transportation system by:

- Making travel safer
- Preserving the system
- Creating a more responsive project pipeline
- Delivering programs more effectively
- Designing practical improvements
- Leveraging KDOT's partnerships with stakeholders
- Preparing for the future of technology
- Continuing commitments to multimodal programs; and
- Supporting economic development, job growth, and transportation equity.

A TRANSPORTATION PLANNING LEGACY

In Kansas, long range transportation planning is a well-established tradition. Over the last 30 years, Kansas has benefited from a series of well thought out transportation programs. In each program, KDOT has worked in partnership with the Kansas Legislature and stakeholders across Kansas to guide vital outlays that have helped preserve the transportation system, while generating mobility improvements and strong economic and quality of life returns on investment. Key milestones in the state's transportation planning and programming legacy include:

- The **Comprehensive Highway Program** established an 8-year program of highway construction between 1989 and 1997. Overall funding of $3.8 billion was largely dedicated to building a pre-defined list of highway projects across the state that were selected based on sound engineering criteria embodied in KDOT's data-driven project 'priority formula' system first created in the mid-1980s. This multi-year program structure proved to be a model for collaboration, direction-setting, and predictability that has enabled Kansas to make important investments in its transportation infrastructure.
- Beginning in 1999, Kansas embarked on the largest public works program in state history – the 10-year **Comprehensive Transportation Program (CTP)** – with $5.62 billion in funding, which included support not just for highways, but for transit, rail, and aviation. Created under the guidance of the *Transportation 2000* statewide taskforce, the CTP's success was based on providing certainty about how regions of the state would benefit from scheduled completion of specific project needs announced at the outset of the CTP.
- In 2010, following a report produced by the *Transportation Leveraging Investing in Transportation (T-LINK)* Task Force, the Kansas Legislature passed an innovative and strategic follow-up 10-year program to the CTP called **Transportation Works for Kansas (T-WORKS)**, which provided $4.7 billion for projects designed to preserve the system, make it safer, and promote economic opportunity. Notably, T-WORKS legislation authorized KDOT to move

beyond relying only on engineering-based priority formulas to choose projects. With T-WORKS, KDOT began to integrate right-sizing, regional priorities identified at 'local consult' sessions across the state and economic modeling of projected benefits from investments into investment choices.

- In 2018, the Kansas Legislature appointed a **Joint Legislative Transportation Vision Task Force** to evaluate progress on T-WORKS, solicit local input on transportation needs, and examine the health of transportation funding in Kansas among other objectives. Some of the Joint Task Force's key findings included providing "*consistent, stable* [transportation] *funding,*" and establishing a new multi-year program to support "*preservation, modernization, and expansion"* projects.
- In March 2020, the Kansas Legislature approved, and Governor Kelly signed into law, the **Eisenhower Legacy Transportation Program (IKE),** which builds on the 2018 Joint Task Force's recommendations and is a 10-year transportation program that preserves, modernizes, and expands the existing system and provides flexibility to address current and future opportunities and challenges. The $9.9 billion IKE program uses existing revenue to invest in safety, highway preservation, broadband, and multimodal transportation with transit, aviation, rail, bicycle, and pedestrian elements.

The legacy of long-range planning in Kansas means back-to-back multi-year comprehensive investment programs have created a network of well-maintained highways, bridges, and transit that enables Kansas workers to get to their jobs safely and allows Kansas businesses to get their goods and services to market efficiently.

When KDOT's business was driven by fixing gaps and deficiencies in highways, bridges, and other modal infrastructure, it made sense to work over decades to complete a long list of important upgrades. Today, as T-WORKS ends and IKE begins, powerful influences like technology, demographics, economics, and system resiliency are changing in ways that necessitate flexibility. This Plan will help KDOT steer the IKE program in coming years.

FEDERAL PLANNING REQUIREMENTS

Federal requirements have shaped statewide transportation planning by states for the last 30 years. Since the Intermodal Surface Transportation Efficiency Act (ISTEA) became law in 1991, five federal surface transportation bills have become law, and each has incrementally advanced how states plan for their multimodal transportation systems. These advancements include new processes like linking planning and project programming, performance-based plans, and broadening outreach. They also include a heightened focus on critical issues of national importance like safety, congestion, freight movement, intermodal connectivity, protection of the environment, regional economic development, and transportation system resiliency and reliability.

To meet federal LRTP requirements, KDOT coordinated with the public, local governments, metropolitan planning organizations, regional development organizations, tribal governments, and other transportation partners during the planning process to produce this 25-year plan that sets statewide policy direction and guidance.

PLAN OVERVIEW

The 2045 LRTP begins with a complete inventory of the state's multimodal transportation system for which KDOT and the Kansas Turnpike Authority (KTA) share responsibility. Key elements of that system include highways, bridges, rail, public transportation, aviation, active transportation, intelligent transportation systems (ITS), ports of entry, and turnpikes. This system inventory is presented in **Chapter 2 – Transportation in Kansas**, which is followed by the federally mandated **Chapter 3 – System Performance Report**, which documents progress toward meeting the state's national performance targets in safety, infrastructure conditions, and system performance and reliability.

> The KTA and KDOT are separate entities, but work together to serve Kansans' transportation needs, avoid duplication, and provide cost savings. The KTA is responsible for constructing, operating, and maintaining projects on the Turnpike's 236 miles, overseen by a five-member board on which the Kansas Secretary of Transportation serves.

In addition to an inventory of the transportation system, the 2045 LRTP includes an examination of how trends in technological, demographic, economic and other influences could spur changes in transportation in Kansas over the next 25 years in **Chapter 4 – Trends & Issues.**

Supporting the examination of trends and issues conducted as part of the 2045 LRTP, **Chapter 5 – Revenue Forecast** examines the future of transportation revenues in Kansas and at the national level to demonstrate how the recommendations in the 2045 LRTP can be supported with resources that are reasonably expected to be made available over the next 25 years from federal, state, and local sources.

Gathering public and stakeholder input on transportation priorities, values, and factors to consider is a vital part of the LRTP development process. KDOT engaged with the public and stakeholders at a series of 'local consult' meetings around the state that featured information gathered as part of the system inventory and trends and issues development. Feedback from the public and stakeholders informed development of the 2045 LRTP vision, goals, and objectives, which are intended to provide high-level direction for the transportation planning, construction, and delivery process throughout the state. The results of this review are included in **Chapter 6 – Public & Stakeholder Engagement**.

Based on comprehensive consideration of public engagement feedback, internal review, as well as trends and issues investigated in the planning process, goals, and objectives for the LRTP were updated. Federal and state performance measures were then aligned with the goals and objectives to create a performance-based plan. The 2045 LRTP's goals, objectives, and performance measures are presented in **Chapter 7 – Goals, Objectives & Measures**.

Based on input from the public, stakeholders, and KDOT staff and leadership, policies and strategies were identified to guide the development, management, and operation of Kansas multimodal transportation system, and address the majority of the federal requirements. Emphasis was placed on identifying polices and strategies to successfully implement the 10-year IKE program. The policies and strategies are presented in **Chapter 8 – Moving Forward**.

CHAPTER 2 – TRANSPORTATION IN KANSAS

KDOT and its partners at KTA, as well as the state's six metropolitan planning organizations (MPOs), regional and local governments across the state, and various private sector organizations are responsible for the state's multimodal transportation system. Key system elements inventoried in this chapter include highways and local roads, active transportation (bike and pedestrian sidewalks and trails), public transit, freight and passenger rail, bridges, intelligent transportation systems, aviation, technology, and ports of entry.[1] This chapter also highlights KDOT's commitments to safety and technology, along with the agency's efforts to promote alternative fuels across the multimodal transportation system.

SAFETY

Improving safety is a vital consideration in everything KDOT does; the agency's safety activities range from efforts to modify driver behavior through to improvement of physical roadway characteristics for better safety. The new Strategic Safety Initiative (SSI) exemplifies KDOT's efforts to continuously improve safety for all transportation users. The SSI, which is part of the IKE program, provides $10 million per fiscal year for spot safety enhancements anywhere along the state highway system with an emphasis on:

- Intersection improvements such as turn lanes, traffic signals, intersection lighting, or roundabouts;
- Corridor improvements such as rumble strips, shoulder widening, signage, or updated pavement markings; and
- Passing lane improvements to reduce risks of unsafe driving on two lane roadways.

The SSI program is flexible and supports low cost countermeasures that can be implemented quickly versus traditional expansion or modernization projects, which can take years to move from planning to construction.

HIGHWAYS AND LOCAL ROADS

Kansas has the fourth-largest public highway and local road system by miles in the United States, ranking only behind Texas, California, and Illinois.[2] The system includes more than 142,200 miles of state highways and local roads, of which about 100,000 miles (70 percent) are unpaved.[3,4] KDOT is responsible for 10,294 miles of the state's total roadway system, including City Connecting Links.[5] Nine primary or auxiliary Interstate highways and 29 U.S. highways (not including business routes) within Kansas reflect the state's central location in the national transportation system.[6] Kansas also has designated State Freight Corridors of Significance, which are routes of statewide and regional importance for freight movement.[7]

Complementing the state's public road system, the KTA maintains 236 miles of user-fee supported roadway from the Oklahoma border to Topeka and Kansas City, including six service areas.[8] Since 2013, KTA has operated in partnership with KDOT under the direction of the Secretary of Transportation and with oversight by a five-member Board, which includes the Secretary as a member. Nearly 39 million vehicles use the Turnpike annually, and more than 90 percent of its users report being satisfied with roadway conditions.[9,10] The KTA is working to convert the Turnpike to

cashless tolling on all segments of roadway; about 62 percent of users rely on electronic tolling to pay their tolls.[11]

ACTIVE TRANSPORTATION

Kansas supports a statewide active transportation system that integrates local and regional multi-use trails, bicycle routes, and sidewalks designed to promote user health, safety, and mobility options for accessing recreation, jobs, and amenities. Many of the state's largest cities and counties have active transportation plans that, when complete, will bring several thousand miles of on- and off-road active transportation facilities into existence. (About 24 counties in Kansas have active transportation policies, along with three multi-county consortiums with such policies.)[12] The state's role in active transportation is to support local efforts through project coordination, funding, and technical assistance, and to coordinate efforts to reduce transportation gaps in state-owned transportation facilities that may negatively affect active transportation.

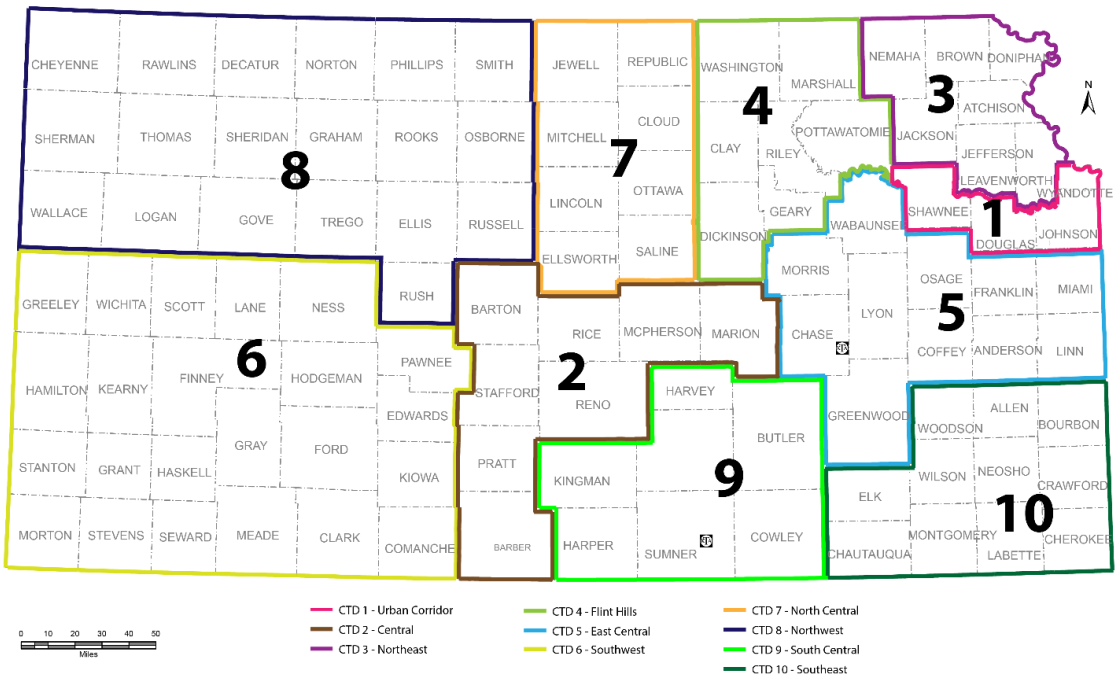
Most recently, a new annual KDOT funding set aside program has been established as part of the IKE program primarily to pay for low-cost measures that improve active transportation crossing conditions at uncontrolled highway intersections. The program is based around guidance resources developed for the FHWA's Safe Transportation for Every Pedestrian (STEP) program.

Kansas is also traversed by nationally recognized bicycle routes that cross the state and span the country: United States Bicycle Routes 66 and 76, the American Discovery Trail, the Lewis & Clark Trail, and the TransAmerica Trail. These routes are identified and managed by KDOT's partners including city and county governments working individually or in regional collaborations.

PUBLIC TRANSIT

Kansas public transportation services are integrated and promoted through Kansas Coordinated Transit Districts (Figure 1). In 2019, public transit across the state accommodated more than 9.8 million annual unlinked trips (the number of times passengers boarded public transportation vehicles).[13] About 145 transit and para-transit operators operate in the state, covering most of the state's 105 counties.[14],[15] Transit operations are funded by a combination of farebox revenues and local funding. KDOT also administers state and federal funding. The greatest number of public transportation trips take place in the state's four largest metropolitan areas of Kansas City, Wichita, Lawrence, and Topeka.

Figure 1: Kansas Coordinated Transit Districts



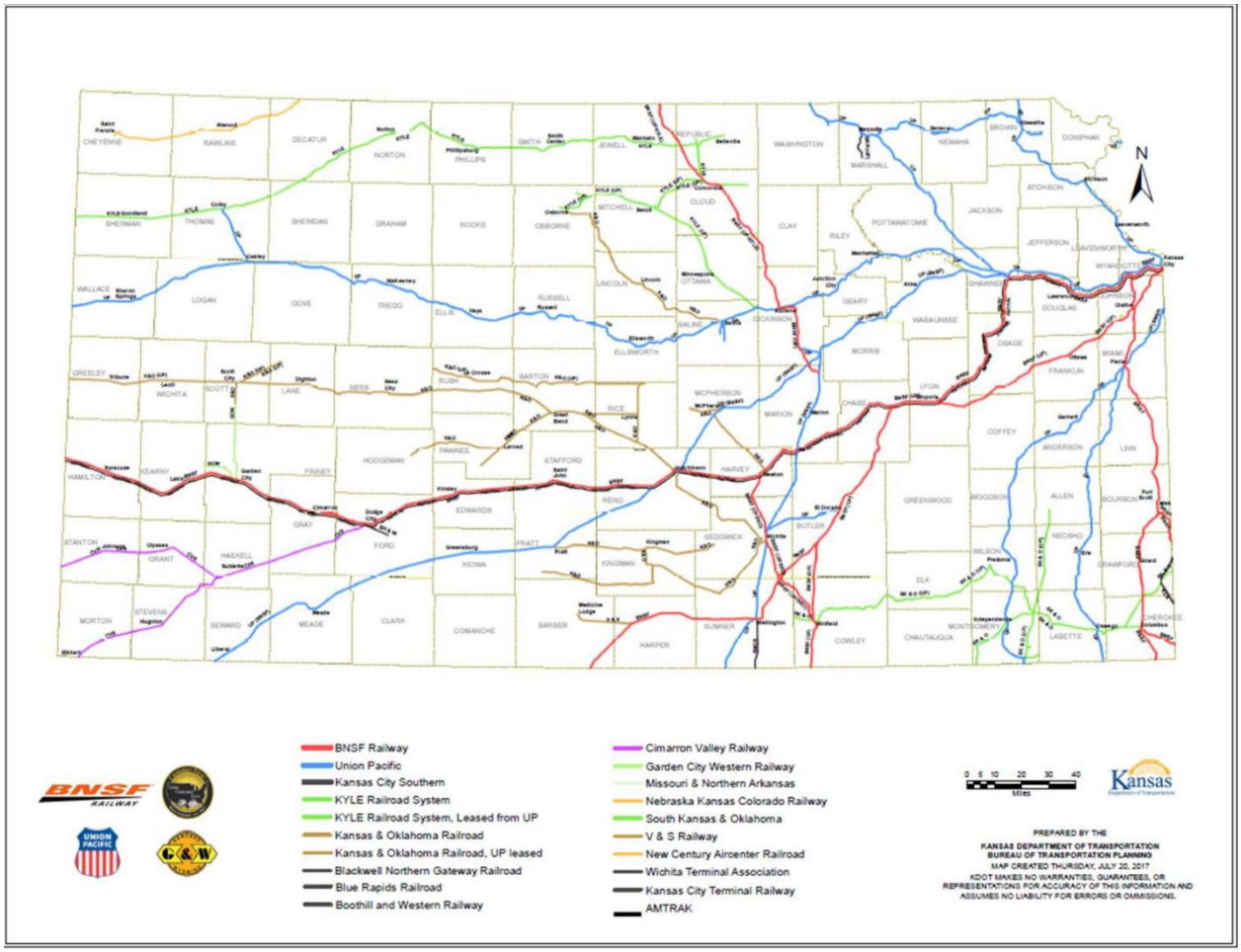
Source: University of Kansas Transportation Center[16]

FREIGHT & PASSENGER RAIL

Kansas is served by a comprehensive freight rail network comprised of 4,216 miles of total track, the sixth-largest statewide network in the nation (Figure 2**Error! Reference source not found.**)[17],[18]. More than 900 incorporated and unincorporated cities are located along Kansas tracks, which service regional, national, and international markets.[19] The state has four Class I railroads, 11 Class III (short line) railroads and three switching/terminal railroads administering more than 105 freight transfer facilities and terminals in Kansas.[20] The Class I railroads that own and operate trackage in Kansas are BNSF Railway, Kansas City Southern Railway (KCS) and Union Pacific (UP) Railroad. The fourth Class I railroad, Norfolk Southern Railway (NS), operates in Kansas over trackage rights. The short line rail network makes up about 40 percent of rail infrastructure in the state. [21]

Kansas intercity passenger rail service is provided by Amtrak's long-distance train, the Southwest Chief. The Southwest Chief operates between Chicago and Los Angeles, with west- and east-bound train stops at six stations in Lawrence, Topeka, Newton, Hutchinson, Dodge City and Garden City. Passengers are also able to use the Thruway bus service to transfer between Amtrak's Southwest Chief and Heartland Flyer, which operates between Oklahoma City and Fort Worth, Texas.[22]

Figure 2: Kansas Freight Rail Network



Source: KDOT State Rail Plan, 2017[23]

BRIDGES

Kansas ranks fifth nationally in number of bridges and 18th in bridge square footage. The proportion of Kansas bridges in Good condition is also better than the national average. [24] KDOT and KTA have prioritized maintaining, repairing, and replacing the 24,934 bridges in the state (Table 1).

Table 1: Bridges by Number, Type and Ownership

Number of Bridges	State	Local	KTA	Other	Total
Slab	1,337	3,843	7	37	5,224
Beam/Girder	2,005	8,510	328	50	10,893
Truss/Arch	9	349		3	361
Culvert	1,772	6,586	29	33	8,420
Other	5	31			36
Total	**5,128**	**19,319**	**364**	**123**	**24,934**

Source: Kansas Department of Transportation[25]

In 2019, Kansas ranked first in the country in terms of the number of state-owned bridges in good or fair condition, with 99.4 percent of its bridges in good or fair condition. As a result of the state's stewardship, the inventory of state-owned bridges in Poor condition in Kansas has remained below 2% for the 10 years prior to 2020. However, between 2012 and 2020, the number of state-owned bridges in Good condition fell due to the overall age of the system, reduction of state maintenance forces, and reduced spending on bridge preservation.

INTELLIGENT TRANSPORTATION SYSTEMS

KDOT's ITS assets include traffic management centers (TMCs), traffic cameras, dynamic message signs, traffic flow sensors, and a supporting fiber optic communications network. These assets are used to implement Transportation Systems Management & Operations (TSMO) strategies that cost-effectively improve the safety, reliability, and capacity of the Kansas transportation system. KDOT has also recently sponsored a cooperative regional TSMO plan with the Wichita Area MPO.

The KC Scout TMC monitors and manages traffic in the Kansas City metropolitan area. It is jointly funded and operated by KDOT and the Missouri Department of Transportation for the bi-state region. KDOT's WICHway TMC monitors and manages traffic in the Wichita metropolitan area. In Kansas City and Wichita, traffic cameras, dynamic message signs, and traffic flow sensors provide coverage of all major freeway facilities.

KDOT also operates a TMC in Wichita that manages KDOT's ITS assets outside the Kansas City and Wichita metropolitan areas; traffic cameras and dynamic message signs are strategically deployed along interstate routes and other primary highways. KDOT also has a Truck Parking Information Management System (TPIMS) deployed at public rest areas along I-70 and I-135. KDOT's communications network that supports these ITS field devices is based primarily on fiber optics with use of wireless communications limited to locations without access to fiber. The fiber optic network cabling is a mix of KDOT owned and shared use with a telecom company.

PORTS AND WATERWAYS

Kansas has direct access to one inland barge navigable waterway, the Missouri River. Kansas has access to 122 miles of the Missouri River along the northeast corner of the state.[26] Private commercial terminals on the Missouri River are located near Atchison, Leavenworth, Lansing, White Cloud, and Kansas City.[27] The Port of Kansas City terminal is within a mile of downtown Kansas City on the south bank of the Missouri River. Foodstuffs, fertilizer, scrap steel, cement, and machinery compose the bulk of shipments at this terminal.

AVIATION

Kansas is home to 138 public-use airports, including six commercial service facilities and more than 200 private airports that serve general aviation for either public or private use.[28] Kansas public-use airports are strategically located across the state, meaning that more than 94 percent of the state's population is located within 30 minutes of air-ambulance service and 45 minutes of ticketed or chartered passenger service.[29]

Air freight accounts for a small component of the state's overall freight universe. Within Kansas, Wichita's Dwight D. Eisenhower Airport (ICT) is the only airport that handles substantial freight

movements. Air cargo providers include DHL, Federal Express Corp., United Parcel Service, UPS Supply Chain Solutions, UPS Flight Forward, Empire Airlines, and Integrated Airline Services.[30]

KDOT also is leading Unmanned Aircraft Systems (UAS), or drone, research, including convening a multi-sector task force whose key accomplishments include conducting the first ever commercial beyond-line-of-site drone operation in the United States, as well as the first inspection of an international airport using drones.

TECHNOLOGY

Kansas is planning for and developing new and emerging connected and automated vehicle (CAV) technologies. Kansas has created a statewide CAV vision, one of the first in the country that created 'blueprints' for most state agencies. Kansas also has an initiative underway to develop a statewide CAV pilot project program to expand the type and number of CAV safety pilots underway.

The new IKE program establishes for the first time an Innovative Technology Program to fund state-of-the-art technology projects that improve safety and equity and help both rural and urban areas of the state improve the transportation system.

Kansas also serves a leadership role in fielding new aviation technologies including unmanned aerial systems (UAS), urban air mobility (UAM), supersonic transportation (SST) and other modes of advanced air mobility.

ALTERNATIVE FUELS

The Kansas transportation sector accounts for 24 percent of the state's greenhouse gas (GHG) emissions. Nationwide, transportation GHGs have increased 28 percent between 1990 and 2018. In 2016, the U.S. Department of Transportation called on state and local agencies to nominate routes where drivers can find alternative fuels. These "zero-emission" and "alternative fuel" corridors fulfill a directive in the "Fixing America's Surface Transportation" (FAST) Act. This directive is designed to build a national network of alternative fuel corridors that improve the mobility of alternative fuel vehicles and reduce GHG emissions.[31] In recent years, KDOT has partnered with FHWA's KS Division and other stakeholders to designate eligible corridors to promote and encourage infrastructure investments for plug-in electric vehicle charging stations and fueling stations for vehicles fueled by propane and natural gas. To date, Kansas has designated alternative fuel corridors along stretches of Interstates 35 and 70, and on State Route 400.[32] Supporting lower-emitting vehicles and alternative fuel corridors will help to reduce vehicle exhaust which is a significant contributor to greenhouse gas (GHG) emissions. KDOT will work with partners and stakeholders to identify ways to increase electric vehicle charging stations and compressed natural gas (CNG) fueling stations to increase the number of miles of alternative fuel corridors in Kansas.

KDOT also partners with the Federal Aviation Administration and general aviation aircraft manufacturers to incorporate sustainable aircraft fuel options at public-use airports, identify aviation fuel alternatives for supersonic applications, and explore sustainable options to address polyfluoroalkyl containment issues at National Plan of Integrated Airport Systems (NPIAS) airports.

CHAPTER 3 – SYSTEM PERFORMANCE REPORT

As part of its performance-based planning and programming efforts, KDOT works with its partners to set and make progress towards targets for national transportation performance measures for safety, infrastructure condition, and system performance and reliability (as specified under 23 USC 490. These transportation system measures summarize the overall performance of Kansas transportation system and transit assets and indicate where improvements are needed to achieve future targets.

This system performance report reflects the most recent Kansas-wide targets and performance data for its nationally mandated performance measures in the areas of safety, pavement and bridge condition, system performance and reliability, and transit asset management.

Kansas has either achieved or made significant progress toward many of the targets initially set in its 2018 State Performance Report, transit asset management plans, and Highway Safety Improvement Program (HSIP) and is on track to either make significant progress toward or meet future targets through upcoming projects and programs. KDOT has reviewed the infrastructure condition and system performance targets through the mid-period performance report process. Through coordination with MPOs, KDOT has chosen not to change the original targets identified in the 2018 State Performance Report in line with its core values of accountability and continuous improvement.

To make progress toward its pavement and bridge targets, KDOT has several activities underway:

- KDOT has developed the IKE program with a funding structure that focuses on projects addressing preservation and 'preservation plus,' which include safety or technology elements;
- KDOT has resurfaced an increasing number of state highway system miles; 829 miles in 2016 to 1,885 miles in 2020[33]; and
- KDOT is conducting contract maintenance activities designed to preserve elements of the state highway system until major modification work is required.

KDOT is also taking steps to improve safety through various safety-related strategies and countermeasures, including addressing rural run-off-the-road crashes, evaluating the effectiveness of safety investments, and analyzing safety-benefit-to-cost ratios when selecting projects. KDOT is also focusing on improving safety in the near term through implementing strategies identified in the 2020 HSIP, and KDOT's 2020-2024 Strategic Highway Safety Plan includes a chapter addressing pedestrians and cyclist safety. In addition, KDOT has developed new programs to allocate more resources to safety improvements such as pairing safety treatments with traditional preservation actions and allocating state dollars to projects with high safety needs and/or high anticipated crash reduction-to-cost ratio.

Several goals included in the 2045 LRTP will help support improved performance in safety, asset preservation, and reliability measures, including:

- Enhance the safety and security of the transportation system for all users and workers;

- Maximize performance of the existing system by investing in transportation choices and intelligent transportation systems;
- Address risks and maintain assets through investments that provide high value return and make the best use of limited funds; and
- Improve reliability and increase flexibility for cost-efficient movement of people, goods, and information to bolster the Kansas economy.

SAFETY, CONDITION, AND RELIABILITIY PERFORMANCE MEASURES

The following tables illustrate for each federally mandated measure the most recent baseline, the performance target set by KDOT in coordination with the state's MPOs, an indication of whether significant progress has been made toward the target, and the 2021 target.

Table 2: Safety Performance

Federal Performance Measure	How It's Measured	2019 Outcome	2019 Target	Achieved Target or Made Significant Progress?	2021 Target*
Fatalities	Number of Fatalities (five-year rolling average)	411.6	389.0	☐	364
Fatality rate	Number of fatalities per 100 million VMT (five-year rolling average)	1.286	1.200	☐	1.160
Serious injuries**	Number of serious injuries (five-year rolling average)	1,161	980	☐	1,190
Serious injury rate**	Number of serious injuries per 100 million VMT (five-year rolling average)	3.628	3	☐	3.726
Non-motorized fatalities and serious injuries	Number of non-motorized fatalities and serious injuries (five-year rolling average)	139.8	136	☐	138

**PM 1 targets based on 2020 HSIP Report*

*** Kansas definition of "serious injury" was revised effective January 1, 2019*

Table 3: Pavement and Bridge Condition Performance

Performance Measure	How It's Measured	2019 Outcome	2019 Target	Achieved Target or Made Significant Progress?	2021 Target
Pavement condition	% of interstate pavement in good condition	60.7%	65.0%	☐	65.0%
	% of interstate pavement in poor condition	0.3%	0.5%	☑	0.5%
Pavement condition	% of non-interstate NHS pavement in good condition	56.3%	55%	☑	55.0%
	% of non-interstate NHS pavement in poor condition	1.5%	1.5%	☑	1.5%
Bridge condition	% of deck area in good condition	70.2%	70.0%	☑	70.0%
	% of deck area in poor condition	1.70%	3.0%	☑	3.0%

Table 4: System Performance and Reliability Performance

Performance Measure	How It's Measured	2019 Outcome	2019 Target	Achieved Target or Made Significant Progress?	2021 Target
Travel time reliability	% of the person-miles traveled on interstate that are reliable	94.8%	95.0%	☐	95.0%
Travel time reliability	% of the non-interstate person-miles traveled that are reliable	95.7%	95.0%	☑	95.0%
Truck travel time reliability	Truck travel time reliability index	1.18	1.16	☐	1.16

TRANSIT ASSET CONDITION PERFORMANCE MEASURES

In addition to tracking performance on safety, highway and bridge condition, and reliability, KDOT and transit agencies in Kansas annually review and measure the condition of their physical assets through Transit Asset Management (TAM) plans. TAM plans inventory transit agencies' assets (including transit vehicles, equipment, and facilities), assess their condition, and set targets for the future condition of assets as required by the Federal Transit Administration (FTA). Transit agencies began reporting asset conditions for 2018 and set targets beginning in 2019. TAM helps transit agencies strategically manage how they operate, maintain, and improve public transit assets throughout each asset's life cycle.

Table 5: Facility Transit Economic Requirements Model Scale

TERM Rating	Condition	Description
Excellent	4.8-5.0	No visible defects, near-new condition.
Good	4.0-4.7	Some slightly defective or deteriorated components.
Adequate	3.0-3.9	Moderately defective or deteriorated components.
Marginal	2.0-2.9	Defective or deteriorated components in need of replacement.
Poor	1.0-1.9	Seriously damaged components in need of immediate repair.

Transit agencies set "useful life benchmarks" (ULB) to represent the maximum useful life of each kind of vehicle asset in years. Agencies then measure the percentage of each vehicle type which are older than their ULB and set targets for future years. Facilities are assessed based on the Transit Economic Requirements Model (TERM) Scale (**Table 5**), which ranges from Poor to Excellent on a 5 point scale. Transit agencies report what percentage of their facilities are rated in worse condition than 3 or "Adequate" and set targets for future years. Unlike the performance measures and targets for safety, pavement and bridge, and reliability performance, transit agencies do not report whether they have made significant progress towards asset management targets.

KDOT sponsors a Group TAM Plan by coordinating with Tier II transit agencies and some MPOs in Kansas. Tier II providers are those providers which own, operate, or manage 100 or fewer vehicles in revenue service during peak regular service across all non-rail fixed route modes or in any one non-fixed route mode, (2) are a subrecipient under the 5311 Rural Area Formula Program, (3) or are any American Indian tribe. The Group TAM Plan is designed to reduce the reporting and planning burden on smaller transit agencies. All transit agencies in Kansas were invited to participate in the Group TAM plan, and all but four accepted. KDOT reports the group plan's performance and targets to the National Transit Database (NTD) annually (**Table 6**).

Table 6: KDOT Group Transit Asset Management Performance

Asset Category	Asset Class	2018 Outcome	Targets 2019
		Percent of fleet that is older than the useful life benchmark	
Rolling Stock (Revenue Vehicles)	Automobile (1 vehicle only)	100.00%	100%
	Full-sized Bus	15.79%	25%
	Cutaway Bus	13.18%	25%
	Minivan	24.32%	25%
	Van	25.00%	25%
Equipment	Trucks and other Rubber Tire Vehicles	n/a	75%
		Percent of facilities that are rated less than 3.0 out of 5.0 on the Transit Economic Requirements Model Scale[34]	
Facilities	Administrative / Maintenance	0.00%	25%

The KDOT Group TAM plan (**Table 6**) indicates that in 2018, 15.79 percent of full-sized buses in the participating agencies were older than their expected lifespan (useful life benchmark or ULB), and that by 2019, no more than 25 percent of the buses were expected to be older than the useful life benchmark. Similar age assessments and targets were completed for cutaway buses, minivans, vans and one automobile.

Similarly, in 2018, none of the agencies' administrative or maintenance facilities were rated to be in worse than 'adequate' condition and by 2019, the agencies expect that no more than 25% of administrative or maintenance facilities will have deteriorated to marginal or poor condition.

KDOT regularly considers vehicle fleet condition prior to granting program applicants replacement vehicles. The KDOT Group TAM performance metrics are updated annually, and comprehensive plan updates are completed as required every four years.

In addition to the KDOT sponsored Group TAM plan, Wichita Transit and Kansas City Area Transportation Authority transit agencies independently develop and report their TAM plans' performance and targets to NTD (**Table 7**). Johnson County and the Unified Government of Wyandotte County are included in the Kansas City Area Transportation Authority transit asset management plan. Details about assets, management plans, and strategies may be found in each agency's annual transit asset management plan.

Table 7: Transit Asset Management Outcomes and Targets

Transit Asset Management Outcomes and Targets										
Measure		Asset Type	Wichita Transit		Kansas City Area Transportation Authority		Johnson County Transit		Unified Gov't of Wyandotte Co. and Kansas City Transit	
			2018 Outcome	2019 Targets	2018 Outcome	2019 Targets	2018 Outcome	2019 Targets	2018 Outcome	2019 Targets
Revenue Vehicles	Percent of fleet that is older than the useful life benchmark	Over-the-road Bus					0.00%	0%		
		Bus	9.01%	10%	17.06%	25%	0.00%	0%		
		Cutaway	12.07%	20%	87.50%	25%	18.18%	0%	0.00%	0%
		Van	0.00%	20%			0.00%	0%	0.00%	0%
Equipment		Automobiles	100.00%	30%	34.00%	25%	100.00%	100%	0.00%	0%
		Trucks and other Rubber Tire Vehicles	53.33%	25%	14.29%	25%	33.33%	100%	0.00%	0%
Facilities	Percent of facilities that are rated less than 3.0 on the TERM Scale	Administrative / Maintenance Facilities	0.00%	0%	0.00%	50%	0.00%	0%	0.00%	0%
		Passenger / Parking Facilities	0.00%	0%					0.00%	0%

CHAPTER 4 – TRENDS AND ISSUES

Today, demographics, technology, and the economy are changing fast. In this chapter of the 2045 LRTP, we examine how changes in six categories of external influences could spur changes in the path ahead for transportation in Kansas over the next 25 years. These influences shape the analysis and recommendations in the remainder of the LRTP:

- **Demographics** - Will people favor living in suburbs and city-oriented areas of Kansas, or in rural areas of the state – how will this equilibrium shift relative to today?

- **Transportation technology** - How might transformative breakthroughs help sustain and invigorate the prosperity of rural areas in Kansas and remake transportation in the state's more densely populated areas?
- **Digital access** - Will equitable, affordable, and abundant broadband internet access become the most critical infrastructure of our time, just like electricity and roadways were early last century?
- **Health care** - Could health needs and community quality of life for a population aging in place create pressure for new kinds of transportation mobility solutions?
- **Infrastructure resiliency** - How will transportation infrastructure hold up if weather extremes or other threats become more common?
- **Economic changes** – How might agriculture benefit from a tech revolution that raises productivity and strengthens economic viability? How can transportation support job creation, and what other changes in freight and the economy could be on the horizon?

By considering these factors in the LRTP, KDOT and its partners can better align the state's transportation projects, programs, and policies with anticipated changes in demographics, transportation technology, digital access, healthcare needs, resiliency, and the economy.

CHANGES IN DEMOGRAPHICS

The future demographics of communities across Kansas could affect where transportation improvements will be needed, the type of improvements that will best serve community needs, and the sustainability of revenues to pay for maintaining and improving transportation.

How Demographics in Kansas are Changing

- **Population growth** - The population of Kansas is expected to achieve growth of 11.6 percent through 2044.[35] This growth rate, however, is expected to be slower than growth for the United States as a whole and relative to the state's own historical growth rate.

  Transportation outcomes of more people - Population growth will increase demand for transportation, creating the prospect of more congestion at system bottlenecks and a continued emphasis on preservation and safety as top priorities given their correlation to travel volume.

- **Growth of Sedgwick and Johnson counties continues** - While the total population of Kansas is projected to grow, the distribution of population growth across the state is expected to be markedly uneven. Historically, population has been concentrated in the eastern portion of the state, but by 2044, almost half of Kansans are expected to live in either Sedgwick or Johnson counties.[36]

  Transportation outcomes of growing urbanized areas - As they grow in population, the state's most urbanized regions will bear the brunt of traffic growth and resulting congestion and wear and tear on infrastructure, whereas maintaining a large local road system in expansive rural areas with a shrinking local tax base will be challenging.

- **More seniors** - While the overall population of Kansas will grow slowly, the proportion of older Kansans - in line with national trends - is expected to jump upward as people live longer and population growth slows. By 2044, the over 65 population of Kansas is expected to reach 784,000, which is an 88 percent increase from 416,000 in 2016. In particular, rural portions of the state are projected to see their under 65 population shrink by up to a third by 2066, while their 65 and over population is projected to grow.[37]

  Transportation outcomes of an older population - An aging population will increase demand for non-drive alone modes, such as transit service (including on-demand service), while it may lower demand for peak hour travel and put stress on revenue sources for transportation that depend on gasoline taxes fueled, historically, by steady growth in commuter travel.

- **Generation Z's influence** – Over the next 25 years, generation Z (people born after 1996) 'digital natives' will have a growing influence on society as millennials (people born between 1981 and 1996) and generation X (people born between 1965 and 1980) reach retirement age and the boomer (born between 1946 and 1964) population shrinks. This younger generation is more comfortable with technology and marketers describe different attitudes from previous generations in terms of work and consumption.

  Transportation outcomes of a new generation's arrival – Generation Z has an inherent comfort with connected technology having grown up with smartphones and the internet. Generation Z is predicted to be the group that first embraces CAVs and mobility-as-a-service.

ADVANCES IN TRANSPORTATION TECHNOLOGY

Mass adoption of new technology can profoundly alter how the world works; for example, 20 years ago, no one owned a smartphone and fewer than half of adults across the U.S. had access to the internet. Rapid diffusion of new transportation technology in Kansas over the next 25 years could reframe safety challenges, alter vehicle ownership patterns, and create new models for mobility that upset the financial sustainability of revenues to pay for transportation. KDOT needs to plan and program tech-enabled infrastructure to prepare for and support future and emerging technologies to improve the safety of how people and goods move.

How Transportation Tech is Changing

- **Connected and Automated Vehicles** - Auto manufacturers have prototyped CAVs and are gearing up for mass production in the next decade. The National Highway Traffic Safety Administration says fully automated vehicles could begin sales around 2025.[38] By 2045, the Center for Transportation Research at the University of Texas at Austin estimates that nearly 25 percent of the light-duty vehicle fleet will be highly or fully automated.[39]

  Transportation outcomes of CAVs - CAVs offer long-term potential to improve congestion since such vehicles are predicted to operate safely while traveling closer together than today's vehicles; the convenience of CAVs, however, may accelerate growth of vehicle miles traveled (VMT). Over the long term, CAVs are likely to reduce crashes, however, in the shorter term, a mix of CAVs and human operated vehicles may increase safety problems. One potential barrier to adoption of CAVs is that the data they require to operate may limit their range in rural areas.

Furthermore, some physical infrastructure may need to be re-designed to accommodate CAVs; for example, to allow pedestrians to navigate streets full of CAVs.

- **An electric vehicle future** - Auto manufacturers around the world are moving from internal combustion engines to electrified vehicles. Each manufacturer has different time lines and a report from BloombergNEF (BNEF) estimates that, even with no new economic or policy initiatives put forth by global governments, EVs and other zero-emissions vehicles will account for 70 percent of new-vehicle sales by 2040, up from 4 percent in 2020.[40]
- **Transportation outcomes of an electric vehicle future** – Most electric vehicle owners will charge their vehicles at home. However, there is a growing need to increase public EV charging stations along public roadways as this will provide charging opportunities to EV owners or freight vehicles when they are on longer trips.
- **Mobility-as-a-Service (MaaS) and 'micro mobility'** - Enabled by the convenience of digital devices with built-in GPS and payment apps, MaaS, which is exemplified by ride hailing services like Uber, has drawn attention as a 'game changing' new transportation alternative to transit or traditional auto ownership, particularly in cities. Likewise, 'micro mobility' solutions that include shared-use fleets of small fully or partially human-powered vehicles such as bikes, e-bikes, and e-scooters are highly visible in many cities. Despite their high profile, MaaS and micro mobility account for a small fraction of total trips made today, but growth in use of these choices continues to be rapid.

  Transportation outcomes of MaaS and micro mobility - Ride-hailing services may generate more travel as trips are made to pick up or circulate while waiting for transportation users. Urban infrastructure may need to adapt to pick up and drop off preferences of users. MaaS and micro mobility may compete with traditional transit for riders. MaaS and micro mobility options are generally less workable in dispersed rural environments.
- **Smart corridors** - A growing universe of smarter vehicles and highways that work together is bringing about a greater capability to tame congestion and address safety challenges. Connected cars increasingly can share real-time data about road conditions and their surroundings, becoming sensors that feed smart corridors with valuable data and enabling incident response, traffic optimization, and traffic re-routing. Connected cars can also receive information from systems like smart traffic lights, streetlights, lane markers, street signs, and smart parking sensors. Advanced traffic management systems combine information from infrastructure like toll booths, traffic lights, and parking facilities to optimize traffic signals in real-time and relay traffic information to traffic control centers.

  Transportation outcomes of smart corridors - More weather emergencies, more truck traffic and more congestion are all challenges KDOT can expect in the future. Smart corridors may help offset the impacts of these challenges. Smart transportation corridors would help improve safety, relieve congestion, improve freight movement efficiency, and support emergency management on the most heavily traveled routes across Kansas.

BRIDGING A DIGITAL DIVIDE

For most of the population, high speed internet (often delivered via broadband or satellite) has become so commonplace that without it, life would be radically upended: workdays would look different, leisure time would be spent differently, and even personal relationships would exist differently. The next generation of transportation infrastructure must be compatible and integrated with high-speed internet – via a combination of fiber, Dedicated Short Range Communications (DSRC), and 5G that serves both transportation and wider community needs.

How Internet Access is Changing

- **The digital divide** - In rural areas of the United States, the Federal Communication Commission indicates only 65 percent of the population has access to broadband compared to 97 percent in urban areas and on Tribal lands, barely 60 percent of people have access.[41] As internet access has become the norm, the digital divide increasingly poses a hinderance to economic opportunities, job creation, education, health care, and civic engagement for rural Kansans. The impact of this divide became even more pronounced during the COVID-19 pandemic in 2020 and 2021 as even more critical connections to work and education became dependent on reliable, equitable access to broadband connections.

  Transportation outcomes of the digital divide - Utilities like energy, water and sewer lines are often accommodated within transportation rights of way. As Kansas works to bridge the digital divide, partnering transportation investment with digital communication capacity improvements is an obvious path to improve equitable access to opportunities.

- **Internet of Things (IoT) for transportation technology** - Looking ahead, internet connectivity is vital for adoption of technologies like CAVs, MaaS, smart corridor technologies, and new safety solutions that will only work when connected to a steady, reliable, and deep stream of data. The United States Department of Transportation (USDOT), for example, is partnering with car manufacturers on technology to make travel safer by sending drivers alerts of dangerous situations, such as someone about to run a red light as they are nearing an intersection, or an oncoming car, out of sight beyond a curve, or swerving into their lane to avoid an object on the road.

  Transportation outcomes of IoT - Transportation corridors without fiber, broadband, or other communications technology in the right-of-way could be at a disadvantage when it comes to the kinds of smart corridor solutions that are expected to benefit freight and personal travel in the future. A lack of connectivity would mean advances like real time traffic management during winter storms or crash reduction strategies that rely on vehicle to infrastructure communication could be missed.

HEALTH CARE ACCESS

Health has not typically been given great consideration in transportation policy and planning. However, transportation is one of the economic and social factors that influences peoples' health and the health of communities.

How Medical Needs are Changing

- **Aging in place in rural regions** - With the population of Kansas aging, particularly in rural portions of the state, the transportation needs of a growing share of the population are likely to shift. Staying healthy requires good transportation access to medical services and other staples of daily life. Unfortunately, many hospitals in rural areas are at risk of closure, which will make transportation for healthcare even more important to maintain or improve equitable access to healthcare.

  Transportation outcomes of aging in place - Rural transit and paratransit options or technology-driven MaaS solutions could become more important for a population aging-in-place.

- **Telemedicine solutions for health** - Technology is also changing how individuals receive healthcare. According to the American Hospital Association, 76 percent of hospitals in the U.S. use some degree of telehealth.[42] Telehealth – with some services considered telemedicine – covers a range of health care services that can include non-clinical training and education opportunities. Telehealth is seen as a potential solution to the challenges facing rural healthcare including shortages of physicians, closing of medical facilities, and the aging population. The COVID-19 pandemic further highlighted the importance and potential of telehealth to provide some healthcare services in rural or remote areas.

  Transportation outcomes of telemedicine – Telemedicine could help rural communities with aging populations sustain their quality of life.

RESILIENCE RISKS

Transportation resilience is the ability of a transportation network to avoid, adapt to, and recover from stressors on physical infrastructure and operations caused by natural disasters like extreme weather or by threats such as cybersecurity breaches or terrorism. Strategic investments are needed in certain locations to retrofit aging infrastructure and engineer new assets to withstand the impacts extreme weather and help safeguard against human threats. The long-term impact of extreme weather on Kansas is uncertain, but engineering advances mean KDOT is building longer lasting pavements and bridges today and prudent risk management suggests that KDOT should pay close attention to the design consequences of potential extreme weather-induced impacts such as wider temperature variations, increased precipitation, more powerful wind loads, and storm surges. Revised engineering standards and practices may be needed to build infrastructure capable of withstanding more frequent and more powerful storms and greater temperature changes.

How Resilience is Changing

- **Risk of extreme weather is increasing** - The threat of severe weather is not new for Kansas – winter storms, tornadoes, extreme heat, and more can cause catastrophic damage and disrupt movement. Kansas, however, is seeing more extreme weather events. Higher temperature extremes, for example, are leading to buckling of pavement and damage to rails, and flooding is leading to severe road damage even on major Interstate routes.[43]

Transportation outcomes of extreme weather - In the short run, catastrophic damage to road infrastructure can disrupt public mobility, freight traffic and supply chains, and emergency management. In the long run, KDOT must learn how to design and maintain infrastructure to handle extreme weather events, such as extreme heat and flooding. One academic paper estimates the U.S. may face $19 billion in extra paving costs by 2040 if engineering standards of practice for asphalt are not updated to reflect warmer average temperatures.[44]

- **Cyber security threats** – Over the last 20 years, access to computers, internet, and wireless technology has grown significantly, and transportation systems have become more reliant on advanced computer systems. As these technologies become a part of our daily lives, they also create opportunities for systems to be attacked. Cyber security has risen out of necessity to protect the data and information that are contained in the advanced computer systems on which transportation increasingly depends.

  Transportation outcomes of cyber threats – In exploring the potential of connected vehicles and other advanced technologies, USDOT recognizes that cyber security has an even more important role. State DOTs must protect their systems, devices, components, and communications from cyber threats, unauthorized access, damage, or other threats that can interfere with safety functions.

FREIGHT

Making smart investments in the freight transportation system provides cost competitive options for Kansas businesses to get products and goods to both domestic and global markets. An effective freight transportation system depends not just on efficient truck and rail movement, but also on seamless intermodal connections. An improved freight transportation system can lower transportation costs, provide economic development opportunities, and serve as a catalyst for job creation.

How Freight and the Economy in Kansas are Changing

- **Agriculture depends on good transportation** - Direct agricultural products alone contribute $19.6 billion annually to Kansas gross domestic product (GDP) – 3 percent of total GDP contributed by private industry. The Kansas Department of Agriculture estimates agriculture is the largest single economic driver in Kansas, valued at $64 billion in 2018.[45] Kansas is the nation's largest wheat producer and third largest livestock producer.[46] The agriculture sector in Kansas employs more than 238,000 people, almost 13 percent of the entire workforce in the state.[47] Agriculture in Kansas is not just about growing crops and raising animals. The Kansas agricultural sector includes renewable energy production, food processing, research and education, agribusiness and more.

  Transportation outcomes of a strong agriculture economy - With more than 230,000 agricultural jobs and farmland spread across rural Kansas, the prosperity of agriculture depends on an extensive network of local roads, state highways, rail lines, and transload and intermodal facilities which are able to bring products and commodities from rural areas to market, including large or oversized agricultural loads. The long distances and low densities of population and

economic activity that define rural areas of Kansas impose physical transportation challenges which differ sharply from those of more urbanized regions in the state.

- **More freight movement** - According to the 2017 Kansas Statewide Freight Plan, freight was associated with $180 billion in direct, indirect, and induced economic impacts in 2014. In addition, the freight transportation industry in Kansas is a large employer, supporting an estimated 446,600 full-time jobs and generating $22.2 billion in wage income in 2014. Truck freight tonnage across Kansas is forecast to increase 33.9 percent between 2014 and 2040.[48] Kansas is also a leading producer of wind energy, with more wind farms under construction.

  Transportation outcomes of more freight - As the Kansas population and economy grows, so will the demand for goods. Windmill components require permitted large loads to travel across Kansas highway and rail systems, specially routed to avoid geometric impediments. And, with the trucking industry preparing for a connected and automated fleet, there is the potential that even more goods will be transported on the Kansas highway system, which could worsen congestion, place more wear and tear on infrastructure, and create speed differentials on passing-limited roadways with passenger vehicles that can result in higher severity crashes.

- **Unmanned Aircraft Systems (UAS)** - In 2017, the White House initiated the Unmanned Aircraft System (UAS) Integration Pilot Program (IPP), which brought together state, local, and tribal governments with the private sector to test and evaluate how to integrate drone operations into the national airspace system. The program supported advanced UAS operations to gather data to inform rulemaking by USDOT and Federal Aviation Administration (FAA).[49] KDOT embraced this challenge by forming a collaborative, joint task force comprised of 44 corporate, university and state agency members. These members shared resources to pursue specific strategic objectives. Key accomplishments include Kansas conducting the first ever commercial beyond-line-of-site drone operation in the United States, as well as the first inspection of an international airport using drones.

  Transportation outcomes of UAS – KDOT operators are now using UAS to accomplish everyday tasks in a safer, more efficient manner. 40 KDOT UAS operators have served as foundation for projects using advanced infrared, LiDAR, multi-spectral and hyper-spectral sensors, and data processing algorithms which use artificial intelligence to provide information that will ultimately make transportation infrastructure in Kansas more efficient and cost-effective. UAS technology is helping improve the effectiveness and efficiency of surveying and inspecting assets. As UAS become more commonplace in different applications, new regulatory paradigms are necessary to accommodate them. UAS technology is helping improve the effectiveness and efficiency of specific KDOT mission areas, including surveying and inspecting assets.

- **Remote work** - The emergence of the 'gig' economy and the expansion of broadband are some of the factors driving the rise of remote work. Instead of commuting to an office each day to work from a designated desk, remote employees can execute their projects and surpass their goals wherever they please. The COVID-19 pandemic has further aided a cultural paradigm shift

in what society deems to be an appropriate workplace - and remote work has capitalized off that newfound freedom. However, this shift also highlights how important access to broadband connections is for economic opportunities, particularly in rural areas.

Transportation outcomes of remote work – Most organizations anticipate that the remote work will increase following the COVID-19 pandemic of 2020 and 2021.[50] This slow but steady shift carries numerous potential implications for transportation systems. For transportation systems, the most promising outcome of telecommuting is the removal of cars from the road during peak-travel periods. While people are not driving into work, however, they may run errands or make additional trips outside of rush hour. Given the option to work from home, some may opt to live further away from their jobs, leading to longer commutes when they do drive to the office. On the other hand, the increased reliance on broadband for work may require innovative strategies and partnerships to provide equitable access to broadband and remote work opportunities across both rural and urban areas of Kansas.

TRANSPORTATION AND THE KANSAS ECONOMY

Historically, public investment in transportation throughout Kansas has generated a tremendous statewide economic payoff. Building the state's portion of the United States Interstate system, for example, created a firm foundation for decades of economic growth. Today, however, changing economic opportunities are driving a new set of transportation needs. Transportation professionals must make the next generation of investments that will sustain equitable prosperity in Kansas.

The Kansas economy is forecast to sustain 1.278 million non-farm jobs in 2020.[51] Transportation — alongside workforce education and training, a business-friendly regulatory climate, technology advances, and entrepreneurial initiative — is fuel for the engine that drives economic growth across Kansas. Transportation's importance in sustaining the economy of Kansas is evident in the 88 million miles driven daily by vehicles on the state's highways in 2018. Goods valued at $397 billion move across the state's transportation network annually as exported, imported or domestic freight.[52] Every sector of the state's diverse economy - whether services, agriculture and agribusiness, or manufacturing - depends on an extensive and reliable transportation network to stay competitive:

- **Services** - The service sector generates about half of all jobs in Kansas. Major areas include education and health services (196,500 jobs); professional and business services (176,700 jobs); and leisure and hospitality (116,500 jobs).[53] Commuters employed in the service sector depend on transportation to get to and from work, and service sector businesses also make diverse demands on the transportation network.
- **Agriculture, food, and food production** - Kansas is a leading producer of wheat, grain sorghum, and beef.[54] According to the Kansas Department of Agriculture, this sector has a total direct output of $46.9 billion in 2019.[55] Agriculture-related production is transportation intensive. Large trucks and rail cars need a network that spans local farm roads and rail spurs to state highways and class one railroads to move bulky grains and livestock from dispersed rural Kansas farms and feed yards to markets and processing facilities and to ship finished products to market destinations across the United States and the globe.

- **Manufacturing** - Kansas retains a healthy manufacturing sector that is responsible for about 11 percent of jobs statewide, which is dominated by the Wichita region's hub for aerospace products and parts manufacturing.[56] According to a 2017 FAA economic impact study, the aviation sector alone represents $20.6 billion economic impact across the state.[57] Companies with a strong Kansas presence like Spirit, Textron, Airbus and Bombardier depend on transportation for access to specialized suppliers and markets that span the globe as well as to bring employees to and from work.

In short, good transportation keeps the Kansas economy on track and growing. Changes in regional, national, and global markets and rapid technological innovation will offer new economic opportunities; seizing them may require substantial investments to improve transportation accessibility, mobility, and equity.

Chapter 5 – Revenue Forecast

Between 2021 and 2045, KDOT is projected to receive $35.2 billion in revenues in 2020 constant dollars under current law. Of this amount, about 18 percent, or $6.4 billion will come from federal formula apportionments for highways and transit, and about 80 percent, or $28.8 billion will come from state sources. From 2021 through 2045, KDOT is committed to $2.3 billion in debt service on highway construction bonds and expects to transfer $4.3 billion, leaving $28.6 billion available for investments in the Kansas transportation system. As part of the LRTP, a revenue forecast spreadsheet model was built to predict future revenues for transportation in Kansas. Outputs from the model are discussed in this chapter.

FEDERAL SOURCES OF REVENUE

The federal government levies taxes on the sale of fuels, tires for commercial trucks, truck, and trailer sales, and on the use of heavy trucks above 55,000 pounds. Proceeds are deposited in the federal Highway Trust Fund, from which the federal highway and transit programs are funded. KDOT anticipates $288.8 million in federal highway funding in FY 2021, rising gradually to $300.6 million in FY 2030. Due to uncertainty around the long-term level of federal support for highways and transit, the model assumes annual federal highway funding will continue through FY 2045 at their FY 2030 level in current dollars. In 2020 constant dollars, this amounts to $7.4 billion in federal highway funds ($5.8 billion in 2020 constant dollars) to KDOT through 2045. In addition, the forecast projects $758 million in federal transit funds to KDOT, or $606.4 million in 2020 constant dollars.[58,59]

STATE SOURCES OF REVENUE

Three main sources of state revenue come to KDOT through the State Highway Fund: motor fuel taxes, fees on vehicle registrations and driver's licenses, and a portion of the state's sales and compensating use taxes specified in Kansas statutes. This forecast of state revenues to KDOT is calibrated to FY 2019 figures as reported by the Kansas Department of Revenue and the November 2020 adjusted consensus revenue estimates published by the Kansas Legislative Research Department and the Kansas Division of the Budget. Long range growth trends in these revenue

Figure 4: Revenue Mix in FY2021

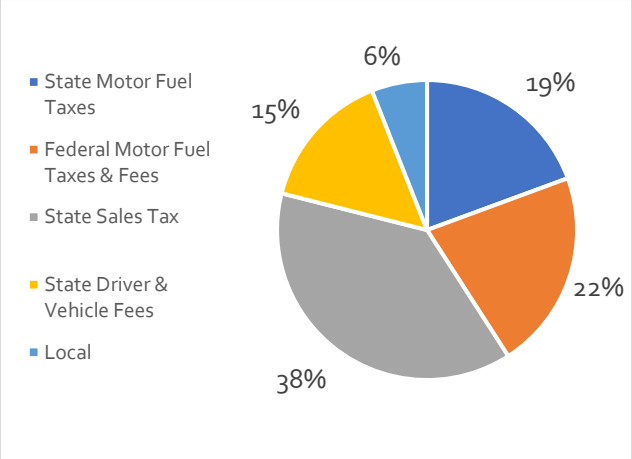
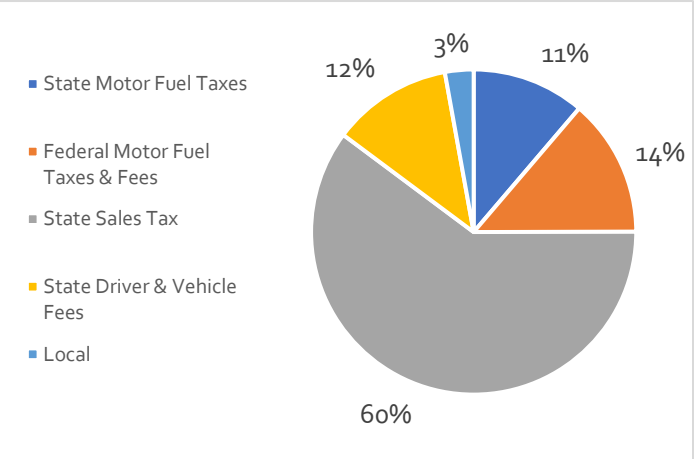


Figure 3: Revenue Mix in FY2045



sources are functions of forecasts for economic and demographic indicators such as population and economic growth, as well as a model of the evolution of taxable motor fuel consumption in Kansas based on trends in VMT, fuel economy, and the rate of adoption of electric vehicles.

In 2020 constant dollars, this forecast projects $5.5 billion in state motor fuel taxes, $4.7 billion in driver and vehicle fees (including registration surcharges for electric and hybrid vehicles under House Bill 19-2214), and $16.9 billion in formula allocations of sales taxes and compensating use taxes under sections 79-3620 and 79-3710 of the Kansas statutes, respectively.

Figures 3 and 4 above show that sales and use taxes are expected to become a larger share of KDOT's funding over time. While having a major source of funding that grows with inflation and the size of the Kansas economy is advantageous, the projected shift toward sales and use taxes as the primary revenue source for KDOT also reflects the long-term decline of motor fuel taxes as a revenue source. In addition, the projected disproportionate reliance on sales and use taxes presents a long-term risk to KDOT since sales and use taxes are general purpose revenues that a future legislature could redirect to the General Fund.

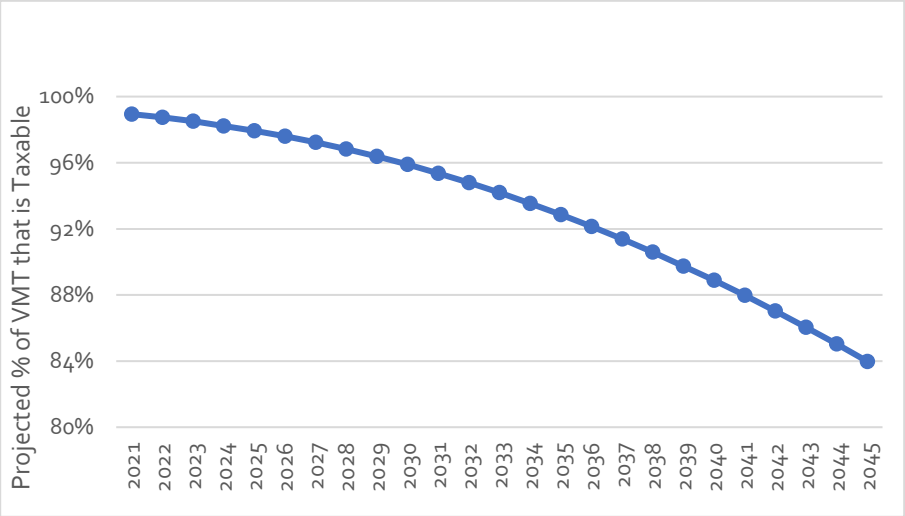
DEBT SERVICE

The forecast of available revenues to KDOT is reduced by the amount of annual principal and interest payments on highway construction bonds scheduled from FY 2021 through FY 2038. At present, this amounts to $1.68 billion in principal payments and $640.0 million in interest payments in constant 2020 dollars. In addition, the forecast projects the interest costs associated with four $300 million bond issuances in 2025 through 2028 as part of the Eisenhower Legacy Transportation Program (IKE). While the terms of the bond issuances are not known at present, 20-year maturities at 4.0% interest would yield approximately $566.0 million in interest payments, or $428.8 million in constant 2020 dollars.

LONG TERM TRENDS

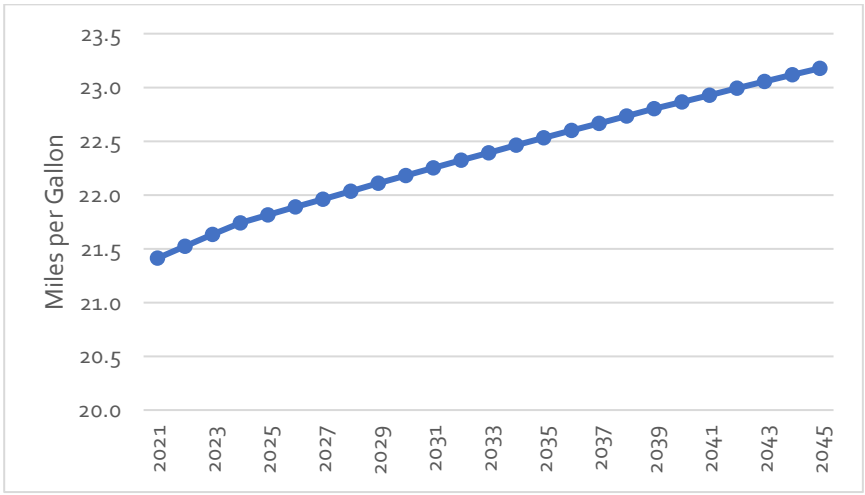
The model underlying the revenue forecast produced several other outputs that are of interest for long-term planning discussions. Under moderate assumptions about the adoption of electric vehicles into the Kansas fleet, the fraction of VMT that generates motor fuel tax revenue is projected to decrease from nearly 100 percent in 2021 to 84 percent in 2045.

Figure 5: Projected % of VMT that is Taxable



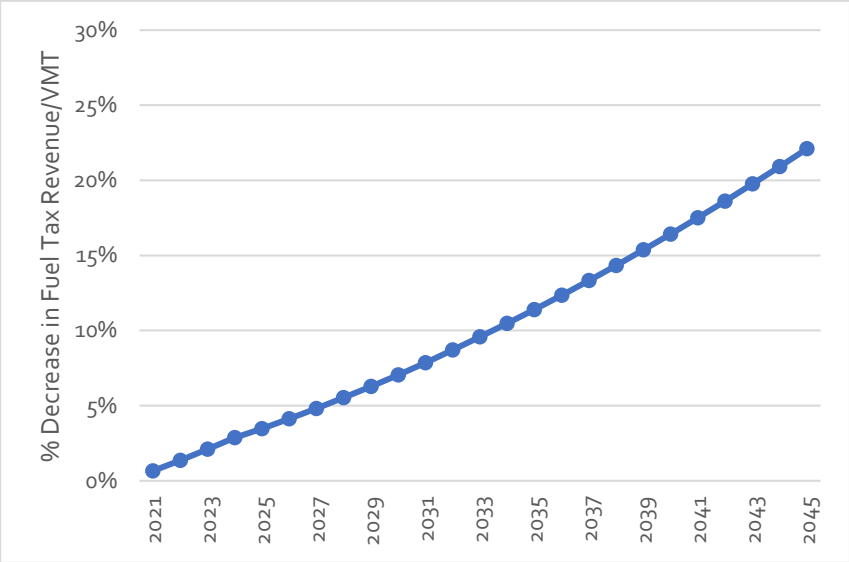
The model assumes that the trend of rising corporate average fuel economy of new passenger vehicles continues through 2045. Assuming no major change in the rate at which existing vehicles are retired from the fleet, the fuel economy of the Kansas passenger vehicle fleet is projected to increase from approximately 21.4 miles per gallon (mpg) to 23.2 mpg by 2045.

Figure 6: Projected Passenger Vehicle Fleet Fuel Economy (miles per gallon)



Combined with projected improvements in the fuel economy of commercial vehicles, the combination of electric vehicle adoption and improving fuel economy of non-electric vehicles is projected to reduce the amount of fuel tax revenue generated for any given level of VMT.

Figure 7: Fuel Tax Erosion (2020 Baseline) (% Decrease in Fuel Tax Revenue/VMT)



If annual construction cost inflation averages 2.0 percent between 2021 and 2045 (the discount factor used to present streams of future revenue in constant 2020 dollars), by 2045 the purchasing power of fuel tax revenues generated from any given level of VMT will be 52.5 percent lower in 2045 than in 2021.

CHAPTER 6 – PUBLIC & STAKEHOLDER ENGAGEMENT

OVERVIEW

The LRTP reflects feedback from a series of 'local consult' dialogues hosted in mid-2019 by KDOT in all six KDOT districts and in the Kansas City and Wichita metro areas (see Figure 8), and Donnelly College. Key objectives for these sessions included:

- Educating stakeholders about the Kansas transportation program;
- Exploring ways the state's transportation system and needs are changing;
- Considering ways Kansas transportation can better move people, goods, and information;
- Identifying challenges and opportunities that a new transportation program should address;
- Sharing new project ideas and affirming the importance of already-identified projects; and
- Envisioning scenarios for how Kansas may change by 2045.

Local consult attendees reflect a mix of city, county and state elected officials and staff; business owners and workers; economic development officials; metropolitan planning organizations; schools and colleges; representatives of statewide organizations such as the Farm Bureau; first responders; and special interest groups – such as highway coalition groups unique to each district – that share a common interest in transportation.

Due to the COVID-19 pandemic, KDOT conducted two virtual stakeholder webinars in 2020 and 2021 to update and receive input on the LRTP from statewide modal partners. The first virtual stakeholder webinar presented future trends that will impact multimodal transportation and the federal requirements and national goals that must be addressed and aligned with the LRTP goals. The interactive tool Poll Everywhere was used to receive input on the draft LRTP goals and objectives. Poll Everywhere captures feedback instantly during virtual meetings as participants provide feedback via their smartphones, tablets, or computers. During the second virtual stakeholder webinar, KDOT presented the draft 2045 LRTP to statewide partners to receive input on the LRTP and the implementation strategies during the public comment period.

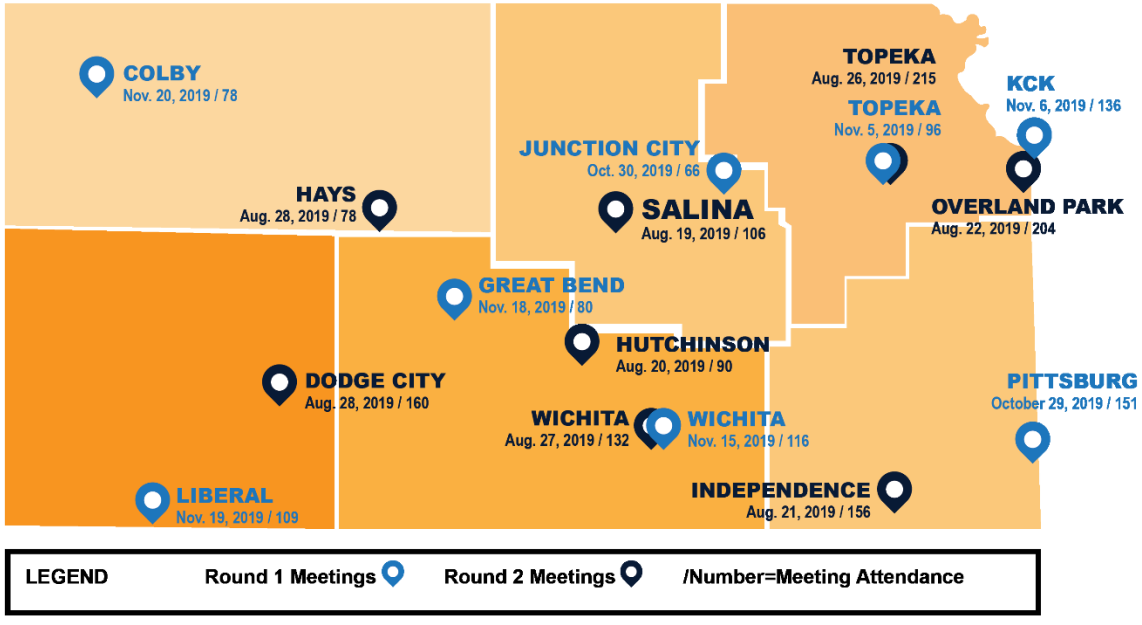
STAKEHOLDERS' PRIORITIES

Over the course of the local consult dialogues, several priorities emerged from the opinions stakeholders voiced about the state's transportation system:

- **Address safety** — Safer movement of people and goods is a top concern across all districts, although what safety looks like will vary depending on local conditions.
- **Importance of dialogue —** Stakeholders appreciate the opportunity that local consult meetings provide to make their regional priorities known and they express strong support for interacting with KDOT on a regular basis to discuss new opportunities to make the most strategic investments in the Kansas transportation system.
- **Prioritize preservation –** Like the 2018 Joint Task Force, many stakeholders believe a top transportation priority for the state must be to restore funding for preservation to protect the investment Kansans have made in their transportation system.

- **Need for a shorter, rolling program —** Stakeholders want communities to have reasonable certainty about how transportation programs will be structured over the next decade – yet they also recognize communities' needs change and flexibility is important to accommodate shifts in technology, the economy, and demographics.
- **Significance of flexibility —** Stakeholders recommend KDOT should look for ways to combine highway and modal program resources to tackle transportation needs holistically and allow tailoring of resources to local needs rather than forcing local jurisdictions to try to fit their transportation needs into specific program categories.
- **Review revenue sources** - All stakeholders are concerned about the need to explore new, more diverse revenue sources because they believe the current gas tax-based funding model is not keeping up with transportation needs. This includes acknowledging that local communities must commit more local resources to leverage state and federal transportation dollars.
- **Practical improvements** – Stakeholders across the state strongly support adopting a 'practical improvements' approach for transportation solutions that are developed in collaboration by state and local officials to stretch scarce funding further; for example, by utilizing passing lanes rather than four-lane expressways where applicable.
- **Support for modal choices** – Many stakeholders recognize the increasing roles of transit and active transportation in the overall Kansas transportation system and the continuing importance of aviation and railroads to the state. They also observe increased demand for transit and active transportation infrastructure in both rural and urban areas to connect Kansans with work opportunities and to services needed by everyone.

Figure 8: Meetings and Attendance by Local Consult Round



- **Leverage technology** – Stakeholders recognize that broadband is a catalyst for unleashing new transportation technologies and for supporting communities across Kansas and seek opportunities to build fiber into projects in the future where applicable.
- **Economic development** - Stakeholders emphasize that a transportation system which can connect people with jobs, move goods to market, and support healthy communities where businesses want to locate is key to state and local prosperity.

REGION-SPECIFIC ISSUES

Not surprisingly, some issues varied among the geographic regions. Some were matters of definition; personal mobility, for example, often took on a transit-related focus in urban regions of the state whereas in rural areas, it often was about how to help an older population age in place by providing alternative access to regional medical care or services. Differences among regions are summarized in Table 8 below.

Table 8: Variation Among Districts in Stakeholders' Principal Concerns

	Modal needs	Fulfill promises	Preservation	Project scoring approach	Practical improvements	Right-size local system	Regional collaboration	Priority corridors
District 1 – Northeast	✔		✔		✔		✔	✔
District 2 – North Central					✔	✔		✔
District 3 – Northwest		✔	✔				✔	✔
District 4 – Southeast			✔	✔	✔	✔		
District 5 – Southcentral		✔	✔	✔		✔		
District 6 – Southwest		✔	✔		✔		✔	✔
KC Metro	✔		✔		✔	✔	✔	✔
Wichita Metro	✔		✔		✔	✔		✔

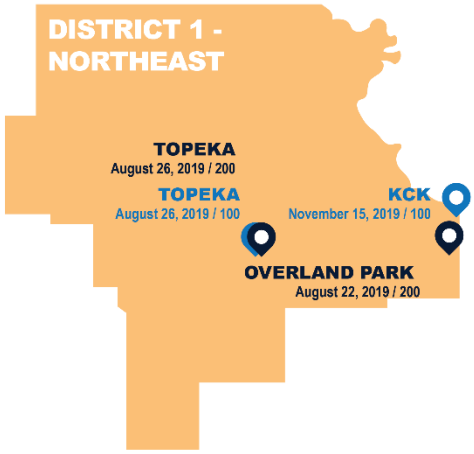


Figure 9: District 1 – Northeast Kansas

District 1 – Northeast Kansas is comprised of 17 counties in northeast Kansas and is the most populous area of the state (1.4 million people). The district has 5,704 miles of state highways connecting, among others, seven of the 10 most populous cities in the state, including the state capitol.[60] It is the most rapidly urbanizing area in Kansas.

Area stakeholders stressed the need for **regional collaboration**, particularly on priority corridors that help move workers to and from regional employment centers. Stakeholders also highlighted the need to deliver more **mobility options** for residents to sustain the kind of quality of life that helped the area recruit and retain business. For example, increasing connectivity by **investing in pedestrian and bike paths** to enable current residents to access more services and to attract new residents to Kansas. Recognizing that funding is limited, attendees emphasized the importance of regional collaboration to deliver seamless trips regardless of the mode of transportation.

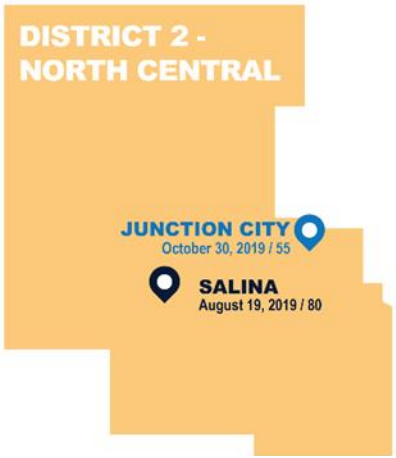
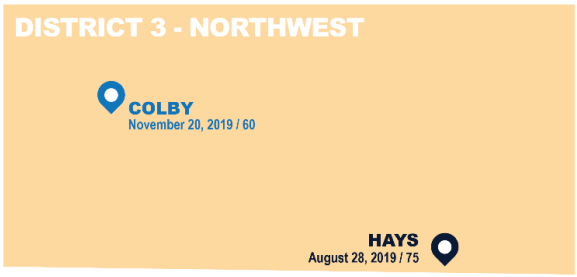


Figure 10: District 2 – North Central Kansas

District 2 – North Central Kansas consists of 16 counties in north central Kansas crisscrossed by 4,345 miles of state highways.[61] The economy of the region is primarily driven by agriculture, education, and the U.S. military base at Fort Riley. About seven percent – 205,171 – of Kansas residents live here.[62]

Stakeholders focused on making sure that transportation planning and **investments are flexible and adaptable to changing needs** and conditions ranging from being resilient in the face of severe weather events to longer-term considerations such as economic or demographic changes. As many stakeholders noted, the Kansas economy's reliance on agriculture and manufacturing means that its priority freight corridors and modes must be built to withstand flooding, bad winters, and other weather challenges. They also noted the need to **consider all transportation modes** – and new goals for them – to generate economic growth and they emphasized that the state should **invest in broadband** and in multimodal opportunities (transit, aviation, and short line rail) to generate more economic opportunities and improve equity and quality of life across Kansas.

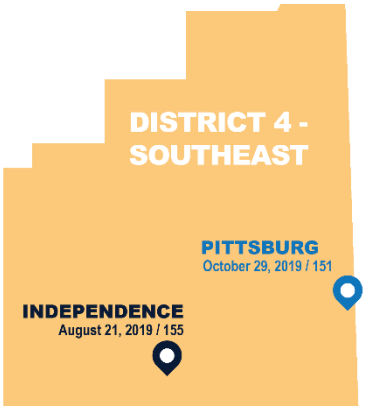
Figure 11: District 3 – Northwest Kansas



District 3 – Northwest Kansas covers 18 counties in northwest Kansas served by 3,869 miles of state highways.[63] This is one of the least populated areas of the state – 94,881 people live here (about three percent of the state's population).[64] The regional economy is focused primarily on agriculture.

Stakeholders said the pace of change is accelerating in agriculture and therefore the state must make sure transportation investments serve Kansas well now and in the future. Given the region's reliance on agricultural products and its short-term infrastructure needs, it depends upon on good, **safe highways and local roads** to move goods to markets and residents to jobs, services, and amenities at regional hub cities. Concerned about the need for **stabilizing transportation revenue sources** for both current and future needs, stakeholders noted the need to **preserve existing infrastructure** and to look at **practical, incremental safety and efficiency improvements,** before investing in new, more costly solutions.

Figure 12: District 4 – Southeast Kansas



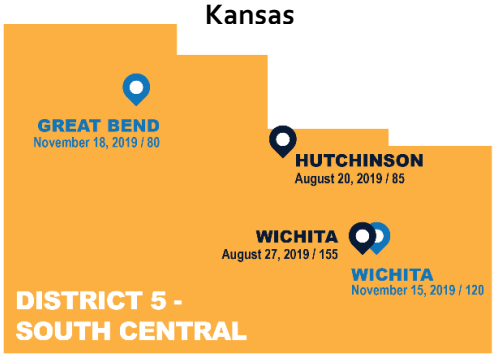
District 4 – Southeast Kansas encompasses 17 counties in southeast Kansas. The region's 3,958 miles of state highways enable it to serve as a light manufacturing and agricultural hub for regional and national industries and markets.[65] About nine percent of the state's population – 263,058 people – live there.[66]

Stakeholders made it clear that finding ways to **improve safety** should be a top priority and they were open to multiple approaches for how to do so. For example, participants said that while four-lane highways are ideal, it is not always fiscally feasible to expand highways and pointed out that constructing passing lanes or adding/expanding shoulders can improve highway safety at a lower cost.

These **cost-efficient solutions** would allow for more needs to be met across the region, which is an important consideration given the growth and changing infrastructure needs posed by important components of the region's economy including agriculture, construction aggregates, and oil and gas. Stakeholders also discussed how technology could bring new opportunities – such as telework – that will more closely tie together rural and urban areas. They cautioned transportation planners not to define urban areas or hubs solely by traditional considerations of population or density and, instead, consider hubs as locations providing great value to a region's economy. In District 4, for example, the community of Sedan, while not a major retail or population center, serves a lot of traffic related to the oil and gas industry in the area. Such commodity movements also sparked

much discussion regarding the **importance of short line railroads** to the state and the need for more transload facilities in Kansas.

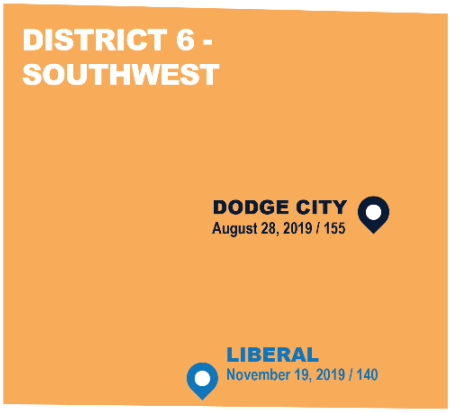
Figure 13: District 5 – South Central Kansas



District 5 – South Central Kansas incorporates 18 counties in south central Kansas with 818,392 residents – about 28 percent of the state's population.[67] Nearly 5,000 miles of state highways service the largest city in Kansas, the largest cluster of Kansas manufacturing jobs, especially in aviation, and a vibrant agricultural sector.[68]

Local consult stakeholders underscored the need for the region – and the state – to **think regionally, invest multimodally, and preserve existing infrastructure**. There was strong recognition that because transportation funding is not unlimited, state and local leaders must work together to **prioritize needs** and identify ways to **streamline projects** and reduce their overall cost. Attendees observed that the region's growing participation in global aviation, manufacturing, and agriculture markets are imposing new infrastructure demands. Stakeholders said it was critically important to **expand broadband access** for residents and businesses seeking to succeed in the digital economy. And as the region recruits new residents and businesses, participants said it needs to be able to **expand mobility options**; increasing access to transit, rail, aviation, and bike/pedestrian improvements is critically important.

Figure 14: District 6 – Southwest Kansas



District 6 – Southwest Kansas combines 19 southwest Kansas counties serviced by 3,349 miles of state highways.[69] It is one of the state's most lightly populated regions with 147,006 people, about five percent of the state's population.[70] Its economy primarily centers on agriculture, food processing, distribution and logistics, and energy sectors.

Southwest Kansans attending the meeting were concerned about creating **better connections to regional and area hubs** – as well as other regions across the state – to support the area's economic growth but participants said the connections that are needed depend upon more than just better highways. Stakeholders noted that currently some areas of southwest Kansas are unable to receive same-day delivery of mail and goods, and some families must subscribe to multiple internet providers to guarantee reliable service. In addition to addressing these challenges, attendees underscored the importance of making sure that infrastructure investments create a beneficial ripple effect throughout the regional economy. Participants also stressed the need to **make sure state, regional, and local planners work together** so that an investment in one location also unlocks growth potential in surrounding areas. Many participants in District 6 raised safety as an important issue too.

CHAPTER 7 – GOALS, OBJECTIVES & MEASURES

The 2045 LRTP's goals, objectives, and performance measures provide a strategic framework for KDOT to make future transportation decisions and investments and they align broadly with the goals established by the state's six MPOs. The 2016 Kansas Legislature and Governor signed a House Bill (2739) which created a performance-based budgeting initiative in Kansas. As a state agency, KDOT is responsible for reporting on performance measures for the annual budget report. In addition, KDOT reports a number of key performance indicators (KPI) to the State as part of the Executive Order 18-07. These KPIs are reported through KanTrack, a performance dashboard.

In addition to these existing KDOT performance reporting efforts, consideration and guidance from KDOT's statewide plans and programs, other state departments of transportation, the six Kansas MPO Metropolitan Transportation Plans, federal Moving Ahead for Progress in the 21st Century, and Fixing America's Surface Transportation Act requirements, national planning factors, agency staff, senior leadership input, and public input collected during local consult meetings held in 2019 contributed to the development of the 2045 LRTP goals, objectives, and performance measures.

KANSAS METROPOLITAN PLANNING ORGANIZATION PLAN REVIEW

MPOs are responsible for coordinating the transportation planning efforts for their local communities. Kansas has six MPOs and each has a Metropolitan Transportation Plan (MTP) that serves as a blueprint for managing its regional transportation system. Since MPOs are important stakeholders and partners for KDOT, the six MTPs' goals, objectives, and performance measures were reviewed for consideration and alignment during the development of the 2045 LRTP goals, objectives, and performance measures. The relationship between the MTPs' goals and the 2045 LRTP goals are shown in Appendix I. Reviewed plans include:

- Flint Hills Metropolitan Planning Organization: Connect 2040
- Lawrence-Douglas County Metropolitan Planning Organization: 2040 Transportation Plan
- Metropolitan Topeka Planning Organization: Futures 2040
- Mid-America Regional Council: Connected KC 2050
- St. Joseph Area Transportation Study Organization: 2045 MTP
- Wichita Area Metropolitan Planning Organization: Move 2040

What are Goals, Objectives, and Performance Measures?

Goals	Objectives	Measures
Goals capture the most important outcomes resulting from KDOT's work, which then set the direction for the rest of the planning process.	*Objectives further define each goal and illustrate what success looks like. They are the strategies that KDOT can implement to achieve goals.*	*Measures in the LRTP inform long-range investment strategies and tell KDOT if they are on track to achieve their goals.*

PLAN GOALS

Safety and security - Enhance the safety and security of the transportation system for all users and workers.

Transportation system management - Maximize performance of the existing system by investing in transportation choices and intelligent transportation systems.

Asset preservation - Address risks and maintain assets through investments that provide high-value returns and make the best use of limited funds.

Freight and economic vitality - Improve reliability and increase flexibility for cost-efficient movement of people, goods, and information to strengthen the Kansas economy.

Stewardship - Continuously improve the quality of the transportation system and surrounding communities and the natural and historic environment through strong partnerships and focused, lower cost, and higher value improvements that avoid or minimize adverse impacts.

Workforce - Get the best from our workforce by attracting and retaining talent, modeling diversity, supporting professional development, and inspiring action.

PLAN OBJECTIVES & PERFORMANCE MEASURES

Goal: Safety and Security	
Objectives	Performance Measures
Use education, enforcement, and engineering to reduce the severity of crashes and reduce the number of travel-related deaths towards zero. Explore and invest in existing and emerging technology to improve the safety of the transportation system. Secure critical transportation infrastructure and information technology assets to protect system users, investments, and surrounding communities. Encourage a culture of safety with internal and external partners to create safe work environments.	1. Number of Fatalities* 2. Fatality Rate per hundred million vehicle miles traveled on all public roads in Kansas* 3. Number of Serious Injuries* 4. Serious Injury Rates per hundred million vehicle miles traveled on all public roads in Kansas* 5. Number of Non-Motorized Fatalities and Serious Injuries* 6. Percent of miles (primary freight network or other) covered with broadband access or including fiber optic lines
Transportation System Management	
Objectives	Performance Measures
Provide the information, infrastructure, and services that keep people and goods moving. Prepare for and reduce the impact of disruptive events to make the movement of people and goods more reliable. Enhance transportation choice for users of all modes throughout the state. Leverage technology to improve the efficiency of the existing transportation system. Make travel easier and more convenient through efficient connections between and within modes. Support a safe and reliable multimodal transportation network.	7. Percent of the person-miles traveled on the Interstate that are reliable* 8. Percent of the person-miles traveled on the non-Interstate NHS that are reliable* 9. Percent of the state system that has sidewalks or similar sidewalk measure (measure under development) 10. Total PC/mobile KanDrive users 11. Percent of the population within a quarter mile of a fixed-route transit station (measure under development) 12. Miles of sidewalk and bicycle paths/lanes within ¼ mile of a transit stop (measure under development) 13. Percent of population within 30 minutes of an airport capable of supporting air ambulance service
Asset Preservation	
Objectives	Performance Measures
Provide cost-effective maintenance and rehabilitation to the state highway system using flexible, streamlined resources.	14. Percent of Bridges, by Deck Area, on the State Highway System in "Good" condition* 15. Percent of Interstate State Highway System miles that are Classified as "Good" for pavement condition* 16. Percent of Non-Interstate State Highway System miles that are Classified as "Good" for pavement condition*

Strategically prioritize road and bridge preservation investments to make best use of limited funds. Identify infrastructure vulnerability to extreme events and make future-proof investments that lessen risk and improve response.	17. Percent of Bridges, by Deck Area, on the State Highway System in "Poor" condition*
	18. Percent of the Interstate pavements in Poor Condition*
	19. Percent of the non-Interstate NHS pavements in Poor condition *
	20. Total level of service for ancillary highway assets (signage, rest areas, etc.).
	21. Percent of transit revenue vehicles that have either met or exceeded their useful life benchmark (ULB)**
	22. Percent of NPIAS airports with primary runways, ramps, and aprons meeting a minimum pavement condition index (PCI)
Freight and Economic Vitality	
Objectives	Performance Measures
Reduce freight costs and support the economy by improving reliability.	23. Interstate Highway Truck Travel Time Reliability (TTTR) Index*
Improve access to jobs, services in, and products from existing and emerging economic and social centers.	24. Year-to-year change in statewide average job accessibility (auto) (measure under development)
	25. Year-to-year change in statewide average job accessibility (transit) (measure under development)
Strengthen partnerships with local communities, businesses, and other sectors to identify and understand transportation improvements for local economies.	26. Percent of projects with cost-sharing (measure under development)
Stewardship	
Objectives	Performance Measures
Address community problems, equity issues, and capture emerging opportunities through partnerships that provide input, collaboration, and funding.	27. Percentage of programmed local road and street projects that are let in the programmed year
Utilize all agency resources to their greatest value.	28. Percentage of programmed state highway system projects that are let in the programmed year
Act as a good neighbor and steward for our natural, cultural, and environmental resources. Collect and maintain vital transportation data that is usable and accessible to transportation partners and the public. Maximize value by directing resources to the most pressing community needs through fast, flexible, easy, and streamlined project delivery.	29. Number of federally designated alternative fuel corridor miles.

Workforce	
Objectives	Performance Measures
Empower staff and improve outcomes with work that allows innovation, flexibility, and stewardship. Target employee development to improve organizational performance.	30. Agency Turnover Rate
Foster a culture and environment that makes safe decisions the first, easiest, and most rewarding option.	31. Number of crashes in work zones per calendar year (normalize based on miles of work zones) (measure under development)
Build diversity through processes that seek, engage and value different opinions. Enhance the performance of our workforce by contracting diverse and experienced vendors	32. Percent of DBE Participation (measure under development)

*Indicates a Federal Highway Administration (FHWA) Transportation Performance Management (TPM) measures
**Indicates a Federal Transit Administration (FTA) Transit Asset Management Performance Measure

In October 2020, KDOT conducted a 2045 LRTP webinar with modal stakeholders. The goal of the webinar was to bring together a rich variety of transportation partners and stakeholders to provide an update on 2045 LRTP progress, receive input on the goals and objectives, and discuss strategic initiatives:

- **86%** Strongly agreed or agreed that the Safety and Security objectives met the Safety and Security Goal.
- **94%** Strongly agreed or agreed that the Transportation System Management objectives met the Transportation System Management goal.
- **86%** Strongly agreed or agreed that the Asset Preservation objectives met the Asset Preservation goal.
- **84%** Strongly agreed or agreed that Economic Vitality objectives met the Economic Vitality goal.
- **80%** Strongly agreed or agreed that Stewardship objectives met the Stewardship goal.
- **100%** Strongly agreed or agreed that Workforce objectives met the Workforce goal.

CHAPTER 8 – MOVING FORWARD

Prior chapters of this plan document KDOT's transportation program legacy, profile the Kansas transportation system, describe trends and issues that are most likely to influence future transportation needs in Kansas, discuss resources available to address them, and identify strategic goals, objectives, and measures for the agency. Together, these findings illustrate the need for KDOT to be both more responsive to changing customer needs and to improve transparency and accountability. In short, KDOT must become more flexible to take advantage of emerging technologies, better leverage partnerships, and respond to a changing landscape.

This long-range planning effort fostered development of the Eisenhower Legacy Transportation Program (IKE), a new $9.9 billion 10-year program passed by the Kansas Legislature and signed into law by Governor Laura Kelly. Like prior transportation programs in Kansas, the IKE program makes a strong commitment to preservation and incorporates input from the local consult process to identify specific investment priorities. Rather than creating a fixed list of projects for the next decade, the IKE program centers on maximizing flexibility, options, and responsiveness. This will enable KDOT to meet shifting needs, address safety concerns, and capture emerging opportunities, all while maintaining a stable construction pipeline.

Delivery of the IKE program also provides KDOT an opportunity to achieve the 2045 LRTP's goals and objectives through improved business processes, policies, practices, and relationships –described in the following sections and including:

- Making travel safer,
- Preserving the system,
- Creating a more responsive project pipeline,
- Delivering programs more effectively,
- Designing practical improvements,
- Leveraging KDOT's partnerships with stakeholders,
- Preparing for the future of technology,
- Continuing commitments to multimodal programs, and
- Supporting economic development, job growth, and transportation equity.

MAKE TRAVEL SAFER

KDOT will continue to make safety its highest priority by expanding efforts to reduce crashes and their severity via a mix of engineering, education, and enforcement strategies. The Kansas Strategic Highway Safety Plan (SHSP) drives the Department's strategic investments that reduce traffic injuries and deaths though a collaborative process with a wide range of highway safety stakeholders. The SHSP priorities are implemented through the Highway Safety Improvement Program (HSIP), which is the core federal safety funding program.

Table 9: Kansas and National Safety Data

	2015	2016	2017	2018	2019
Kansas Fatalities	355	429	461	405	410
National Fatalities	33,484	37,806	37,473	36,835	36,096
Kansas Disabling or Serious Injuries*	1,195	1,176	1,032	1,003	1,401*
Kansas Fatality Rate (per 100 million VMT)	1.13	1.34	1.43	1.26	1.29

**Kansas adopted a new nationally standardized definition for a disabling injury (also called suspected serious injury) as of January 1 2019.*

The IKE program also includes funding for safety improvements through two newly created programs:

- The Strategic Safety Improvement (SSI) Program provides $10 million annually for safety improvements to the state highway system. Projects funded through the program will be selected each Spring through a data-driven safety screening analysis, with local input.
- The Preservation+ Program establishes resources that can be used to fund enhancements to preservation projects that address safety issues or broadband capacity.

Implementation Strategies

The following are activities KDOT's new Bureau of Transportation Safety is undertaking or will initiate to improve transportation safety in Kansas.

Table 10: Safety Implementation Strategies

Strategy/Action	Description
Improve program implementation	KDOT is developing new performance-based analytical processes to improve its identification and evaluation of candidate safety projects.
Adopt a systemic approach to safety	KDOT is updating safety related policies for topics such as rumble strip installation and use of cable median barriers to adopt cost effective safety measures across the state highway system.
Improve safety data	KDOT is undertaking several initiatives to improve the availability and use of data to help incorporate safety into project design. This includes using embedded consultants and developing a LIDAR based system inventory.
Engage the Executive Safety Council	KDOT will reengage the Executive Safety Council to assist with implementing the new SHSP.
Streamline work processes	KDOT will refine safety analysis activities such as right-sizing safety audits scopes based on project development information needs.

PRESERVE THE EXISTING SYSTEM

Modernizing and expanding the transportation system is clearly important to Kansans, but the existing system is a critical asset and it is even more important that KDOT make investments in preservation and safety. The IKE program prioritizes preservation and commits KDOT to adequately maintaining the system. The focus on preservation also limits the environmental impacts of the program by maintaining existing infrastructure. In fact, KDOT's estimated "minimum spending" on preservation through the IKE program equates to $4.4 billion, four times the estimated minimum commitment to expansion and modernization.

Implementation Strategies

Cost effective system preservation requires skilled management approaches, new techniques and technologies, and well-informed decision-making. The following are strategies and actions KDOT currently has underway or will undertake in the next few years.

Table 11: Preservation Implementation Strategies

Strategy/Action	Description
Use a risk-based approach to managing and maintaining the state highway system	KDOT will implement the 2019 Transportation Asset Management Plan (TAMP) to keep the quality of Kansas highways and bridges maintained in a state of good repair.
Select preservation projects based on performance	KDOT will improve its use of performance-based prioritization project evaluation and selection process for bridge and pavement preservation projects.
Implement and refine asset management tools	KDOT will continue to improve its pavement and bridge management tools and other data-related asset condition resources, including implementation of the new Bridge Management (BrM) System and efforts to better understand annual and long term preservation spending needs.
Enhance coordination with other KDOT investment goals	Through the Preservation+ Program, KDOT will work to incorporate safety improvements and broadband deployment in conjunction with preservation projects to deliver these investments more cost effectively.

CREATE A MORE RESPONSIVE PROJECT PIPELINE

A core theme from the local consult process is the need for KDOT to be more flexible and responsive to meet shifting needs. In response, one of the key components of the IKE program is that it is a rolling program with highway modernization and expansion projects being selected for development (e.g., survey, design, and right-of-way acquisition) and construction every two years. Decisions on which projects will move to construction will be based on funding availability and evolving state and local investment priorities. Anticipated benefits of this new approach include:

- Allowing the state to address the most pressing needs and adjust to fluctuating revenues.
- Establishing a stable project development pipeline that will enable Kansas to leverage federal funds and improve the state's transportation business climate.

- Providing a faster, more responsive mechanism to address community needs and capture emerging opportunities.
- Allowing communities to shift priorities and project scopes to better address current and future needs.

Implementation Strategies

Going forward, KDOT will need to undertake the following strategies and actions to both update the project pipeline and refine how projects are selected for development and construction under IKE.

Table 12: Project Pipeline Implementation Strategies

Strategy/Action	Description
Create construction advancement methodology	KDOT will work to develop an objective, balanced 'second gate' approach for determining which projects in the development pipeline should move to construction.
Conduct ongoing local consult	Every two years, KDOT will conduct a series of local consult meetings get input on the next set of projects to be selected for development.
Refine project development selection process	KDOT will continue to improve the effectiveness and transparency of its project selection process.
Improve project development status information	KDOT will work with the IKE program manager consultant (PMC) to gather data during the project development phase to both expand the information available to managers and communicate better with the public to improve transparency and accountability.

DELIVER PROGRAMS MORE EFFECTIVELY

It is one thing to envision a new transportation initiative like the IKE program, but without a robust strategy for delivering it, the program will not succeed. In the past, KDOT has largely relied on internal resources to deliver programs, oversee consultants, and manage construction. While this has worked well historically, times have changed – KDOT neither has the internal staff resources needed to deliver a large new program, nor can it quickly recruit and develop a significant number of technical staff. KDOT is transitioning to using a Program Manager Consultant (PMC) who will work as an extension of KDOT staff to help deliver the IKE program on-time and on-budget.

Implementation Strategies

In July 2020, KDOT selected a firm to serve as the IKE PMC. The following are additional strategies and actions KDOT will undertake in coming years to help make this initiative a success.

Table 13: Program Delivery Implementation Strategies

Strategy/Action	Description
Establish a program tracking methodology	KDOT will develop a mechanism for tracking and reporting on IKE program implementation to improve accountability and transparency.
Develop applicable policies and guidance	KDOT will develop new policies and guidelines to define how the Department works with and oversees the PMC.
Improve project cost estimating practices	KDOT will work with the PMC to develop and implement enhanced project cost estimating practices to improve their accuracy and facilitate financial management practices.
Expand project delivery strategies	KDOT will identify project delivery strategies to deliver projects more quickly and efficiently without excessive added cost.
Develop processes and workflows	KDOT and the PMC will work together to establish approaches for improving the administration of projects.
Improve resource management tools	KDOT will explore options to develop workload projections and improve the allocation of staff to projects.

MAKE PRACTICAL IMPROVEMENTS

To deliver the IKE program as cost effectively as possible, KDOT will emphasize project designs characterized by practical improvements that tailor the size, function, and composition of infrastructure solutions to better reflect project needs, goals, environmental concerns, and economic realities. This does not imply sacrificing quality, safety, or other system performance factors; but it does mean that projects' designs will focus on maximizing the value per dollar of transportation investment. Examples of practical improvements include building passing lanes and climbing lanes where appropriate rather than expanding to four lanes across the system.

Implementation Strategies

KDOT has already been conducting some level of project right sizing and practical improvements for several years. The following are strategies and actions KDOT will initiate to take these efforts to the next level.

Benefits of Practical Improvements

KDOT applied practical improvement concepts to significantly reduce the cost of improvements to K-177 from Council Grove to I-70. The selected strategy cost $25 million (compared to the estimated $67 million to conduct a conventional reconstruction project) and achieved the following results:

- A projected 13 percent decrease in the expected number of crashes compared to a no-build approach
- A high level of mobility with a 14 percent increase in passing opportunities on the associated corridor compared to a no-build approach

Table 14: Project Design Implementation Strategies

Strategy/Action	Description
Implement a practical improvements initiative	KDOT is working with a consultant to develop performance-based practical improvements approaches and implement them through a system-wide approach to right-size projects to fit needs and reduce overall program delivery costs.
Streamline design guidance and standards	KDOT is revising its design manuals to simplify and standardize guidance, which will lead to more consistent design approaches across the state and potentially reduce both design and construction costs.
Leverage new technologies to improve project designs	KDOT will use data collected from drones and new information from the LIDAR-based system inventory to support better, more cost-effective project designs.

LEVERAGE KDOT'S PARTNERSHIPS WITH STAKEHOLDERS

KDOT has a long history of working with communities to provide Kansans with best transportation system possible. The IKE program builds on this past collaboration through three new partnership programs:

- **Cost Share** – Provides funding for construction projects that improve safety, leverage state funds, and help both rural and urban areas of the state. Improvements can be on all modes on the state or local system, and require a minimum 15 percent non-state cash match.
- **Local Bridge Improvement Program** – Provides $5M available annually for improvements to structurally-deficient or functionally-obsolete bridges owned by cities or counties, with local governments providing a minimum 10 percent funding match.
- **City Connecting Link Improvement Program (CCLIP)** – Provides up to $15 million in fiscal years 2021 and 2022 (increasing to $18 million per fiscal year beginning in 2023) for improvements to city streets that carry a state highway designation. Candidate projects can be for surface preservation, pavement restoration, and geometric improvements and must include a local match.

These programs will help improve system performance by leveraging partnerships with local communities to generate more local match and utilize project phasing to stretch dollars further. In return, KDOT will give additional consideration for construction selection to projects where communities provide a local match, phase a project, or use practical improvements. Anticipated benefits from these programs include (1) increased funding to address more needs statewide; (2) added opportunities for local communities to provide input and tailor projects to fit current and future needs; and (3) strengthened local engineering partnerships with communities.

Implementation Strategies

The following are KDOT strategies and actions associated with the new IKE partnership programs.

Table 15: Partnership Strategies

Strategy/Action	Description
Update eligibility guidelines	KDOT will regularly review and update eligibility requirements for partnership programs.
Develop local community outreach strategies	KDOT will conduct ongoing dialogues with communities throughout project development activities.
Help local governments solve problems	KDOT is helping local governments solve transportation problems by providing technical assistance and advising them on potential funding programs and sources that can help them address a need.
Increase access to alternative fuels	KDOT will work with partners and stakeholders to identify ways to increase electric vehicle charging stations and compressed natural gas (CNG) fueling stations to increase the number of miles of alternative fuel corridors in Kansas.
Update performance measures	KDOT will continue to develop, refine, and review performance measures for the transportation system in collaboration with statewide partners.

PREPARE FOR THE FUTURE OF TECHNOLOGY

As emerging technologies are more widely deployed and new technologies that improve mobility and safety are created, it will become increasingly important for KDOT to put the right infrastructure in place to leverage technology benefits. To prepare Kansas for both anticipated and unexpected developments in the future, the IKE program includes three important technology-related initiatives:

- **Innovative Technology Program** – Provides $2 million per fiscal year in financial assistance to partners for innovative technology projects that improve safety, increase total technology investment, and help both rural and urban areas of the state improve the transportation system. Eligible projects are those not addressed through other KDOT programs and that meet an important transportation need such as promoting safety, improving access or mobility, and advancing transportation technology. All transportation system projects are eligible, including those associated with roadway (on and off the state system), rail, aviation, Unmanned Aerial Systems (UAS), alternative fuels, public safety data, bicycle/pedestrian, and public transit.
- **Broadband Program** – Provides grants for construction projects that expand and improve broadband service in Kansas. Jointly administrated by KDOT and the Kansas Department of Commerce, the Broadband Program will be funded at $5 million per in year in fiscal years 2020-2022, and $10 million per year from fiscal years 2023- 2031. Grant recipients can receive up 50 percent of construction costs to expand broadband service.
- **Preservation + Program** – Establishes resources that can be used to fund enhancements to preservation projects that address safety issues or deploy broadband technology.

Implementation Strategies

KDOT will develop and conduct the following strategies and actions to implement the new IKE program technology elements.

Table 16: Technology Implementation Strategies

Strategy/Action	Description
Implement the Kansas Statewide Connected and Automated Vehicle Vision Plan	KDOT will develop and implement strategies to advance the multi-agency blueprint established by the CAV Vision Plan. This will include establishing at least three pilot projects and working to integrate CAV considerations into project development and design.
Improve data exchange	KDOT is working with local governments and neighboring states to facilitate the exchange of data needed to support technology initiatives.
Advance multimodal technology initiatives	KDOT is exploring potential strategies to promote technology deployment for non-highway modes such as coordinating with aviation stakeholders on UAS use, piloting rural CAV transit vehicles, supporting applications at intermodal freight facilities, and providing planning support for MaaS activities.
Leverage broadband investments	KDOT will explore opportunities for cost sharing and in-kind contributions from public and private sector interests by collocating broadband pipes in Department-owned right of way.

CONTINUE COMMITMENTS TO MULTIMODAL PROGRAMS

As the state's primary transportation agency, KDOT is concerned about the health and performance of all transportation modes in Kansas. Accordingly, the IKE program continues KDOT's legacy of supporting different transportation system elements through the following programs:

- **Kansas Airport Improvement Program** – Provides $5 million per fiscal year (local match required) to assist airports in the preservation and enhancement of the Kansas airport system with improvements that minimize travel time for air ambulance and improve safety.
- **Rail Service Improvement Fund** – Provides $5 million per fiscal year (a minimum 40 percent local match required) to assist with major rehabilitation and construction/ expansion projects that improve the condition or expand the capacity of the state's railroads.
- **Short Line Program –** Provides $5 million per fiscal year (a minimum 30 percent local match required) for at least fiscal years 2021 – 2023 for maintenance, reconstruction, or replacement of railroad track. Funds can support short line railroads and any partnering industry with track located on or adjacent to a short line railroad.
- **Coordinated Public Transportation Assistance Fund –** Provides $11 million per fiscal year (local match required) in financial and administrative assistance to local public transportation systems which provide coordinated transportation.
- **Transportation Alternatives Program (TAP) –** Provides $7.5 million per fiscal year in federal funding (20 percent local match required) for projects such as bicycle/pedestrian facilities, trails, historic transportation facilities, etc.

- **Bike/Ped Program –** Provides $2 million per fiscal year for projects that addresses safety while improving livability, connectivity, health, prosperity, and tourism in both rural and urban areas.

Implementation Strategies

The following are strategies and actions KDOT will undertake to continue to improve its support of the state's multimodal system.

Table 17: Multimodal Support Implementation Strategies

Strategy/Action	Description
Update the Kansas Statewide Freight and Rail Plans	KDOT will develop plan updates to better understand freight and rail issues and investment needs, refine the state's freight corridors of national significance, and identify new ways to incorporate freight considerations into project selection processes.
Implement rail programs	KDOT has revamped the Rail Service Improvement Fund Program to make it more attractive to applicants. It also has begun implementing the Short Line Program and will continue to refine it.
Support local transit programs	KDOT will continue to implement the Access, Innovation, and Collaboration Program to support local transit agencies.
Conduct statewide bicycle and pedestrian planning	KDOT is developing the first comprehensive update of the Kansas Active Transportation Plan since 1995 to better understand bicycle and pedestrian issues and investment needs and will refine the TAP project solicitation process.

SUPPORT ECONOMIC DEVELOPMENT, JOB GROWTH, AND TRANSPORTATION EQUITY

Transportation investment is important for mobility but is also critical to fostering economic development, retaining, and increasing employment in Kansas, and improving transportation equity for all Kansans. In many ways, all the IKE programs discussed above contribute to the Kansas economy by supporting construction and consulting jobs, improving business and employee access, increasing productivity, and improving transportation equity. In addition, the IKE program builds on T-WORKS' accomplishments and includes a targeted Economic Development Program that provides $20 million annually (local match expected) for improvements on the state and/or local transportation system that addresses infrastructure needs to recruit businesses and encourage growth. Eligible projects under this program must meet the following requirements:

- Improvement projects must address a transportation problem, such as promoting safety, improving access or mobility, or relieving congestion.
- The new or expanding business must be non-speculative; this program is not intended to fund improvements for future recruitment of businesses.
- Other basic infrastructure must be in place or eminent, such as water and other utilities.
- Improvement projects must create new jobs and capital investment in Kansas, not just transfer business from one part of the state to another.
- Improvement projects must have the support of local leaders, such as elected officials and the chamber of commerce.

Implementation Strategies

The following are strategies and actions KDOT will undertake so that the Department's programs do as much as possible to enable economic development, job growth, and transportation equity.

Table 18: Economic Development and Equity Implementation Strategies

Strategy/Action	Description
Refine the KDOT Economic Development Program	KDOT will continue to improve implementation of the program to maximize economic opportunities and job growth for local communities.
Consider economic benefits in project selection processes	KDOT will explore ways to integrate economic development and job growth considerations into its project prioritization process.
Consider transportation equity in the planning development process	KDOT will work with stakeholders across Kansas to define and understand transportation equity in order to provide an equitable transportation system that provides affordable transportation, supports quality jobs, promotes safe and inclusive communities, and focuses on results that benefit all Kansans.

APPENDIX I – KDOT AND MPO STRATEGIC ALIGNMENT

★ KDOT and MPO Strategic Alignment

Kansas Department of Transportation **LRTP 2020-2045**	Mid-America Regional Council **Connected KC 2050**	Lawrence-Douglas County MPO **2040 Transportation Plan**	Wichita Area Metropolitan Planning Organization **Move 2040**	Metropolitan Topeka Planning Organization **Futures 2040**	St. Joseph Area Transportation Study **2045 MTP**	Flint Hills MPO **Connect 2040**
Safety and Security: Enhance the safety and security of the transportation system for all users, employees	**Public Health and Safety:** Foster healthy communities and individuals by providing safe and secure places to live, walk, bike, ride the bus and drive with clean air to breathe.	**Preservation, Safety & Security:** Prioritization preservation, safety, and security of the transportation network	**Safety and Health:** Addressing increases in roadway fatalities is a major regional focus area. Addressing this trend, paired with increased demand for technology, alternative transportation modes, and demands for improved public health and environment can change the future of transportation	**Increase safety for all modes of transportation**	**Safety:** Provide a safer transportation system that balances the travel needs of all users, including the general public and area businesses	**Safety:** Provide a safe and secure multimodal transportation system
Transportation System Management: Maximize performance of the existing system by investing in transportation choices and smart assets.	**Transportation Choices:** Provide a range of transportation choices for communities across the region to allow for ease of travel as well as public health and environmental benefits.	**Access & Choices:** Enhance Transportation options and choices for improved system performance	**The Multimodal Network:** A connected transportation network allows people and goods to travel safely, efficiently, and comfortably by the mode chosen, including on foot, bicycle, or transit. Increasing demands from freight traffic and people who do not or cannot drive may change the landscape of the future transportation system.	**Improve mobility and access**	OBJECTIVE-Improve the operating efficiency of the existing infrastructure and transportation assets."	**Mobility:** Maintain system performance and enhance modal choice for the efficient movement of people, goods, and freight.
Asset Preservation: Address risks and maintain assets through investments that provide high value return and make best use of limited funds.	STRATEGY-**System Preservation:** Allocate adequate funding and employ effective asset management practices to preserve and maintain the region's transportation systems in a state of good repair.	**Preservation, Safety & Security:** Prioritization preservation, safety, and security of the transportation network	OUTCOME-**Expanding the Economy Through Mobility:** Roadway projects emphasize preserving and maintaining our existing infrastructure and the region's low levels of congestion while targeted improvements address identified bottlenecks.	**Maintain existing infrastructure**	**System Management:** Preserve and maintain the existing transportation system.	**Preservation:** Invest in the preservation and maintenance of our existing transportation infrastructure and assets.
Economic Vitality: Improve reliability and increase flexibility for cost-efficient movement of people, goods, and information to bolster the Kansas economy.	**Economic Vitality:** Maintain a multimodal transportation system that supports the efficient movement of people and goods and promotes economic development	**Mobility and Prosperity:** Efficient movement of people, goods, and freight	**Mobility and Economy:** An efficient, reliable system to transport workers, move goods, visitors, and residents is essential to grow the economy regionally and globally. When woven together, elements of mobility and the economy are powerful mechanisms for a region to achieve broader community goals.	**Promote economic development**	**Economic Vitality:** Ensure the St. Joseph metropolitan area's economic growth and competitiveness by providing a safe, secure, reliable and efficient transportation system	**Prosperity:** Create an equitable, affordable, sustainable, and integrated transportation system for all users.
Stewardship: Continuously improve the quality of the transportation system and surrounding communities through strong partnerships and focused, lower cost and higher value improvements.	**Public Health and Safety:** Foster healthy communities and individuals by providing safe and secure places to live, walk, bike, ride the bus and drive with clean air to breathe.	**Sustain & Enhance:** Minimize adverse social, economic, and environmental impacts created by transportation	**Quality of Place & Transit:** The quality of place can be defined by the physical characteristics of a community, specifically the way it is planned, designed, developed, and maintained. All of these affect the quality of life for people who are living, working, and visiting the community now and in the future.	**Enhance quality of life**	**Regionalism:** Support local and regional transportation and land use planning needs. **Public Involvement:** Support community involvement in the transportation planning process.	VISION-**Strengthen Communities:** Through sustainable choices and strategic investments, we can create livable and economically sound communities for years to come.
Other MPO Goals ▶	**Access to Opportunity:** Support a connected system that enables access to all activities, allowing people to succeed by removing transportation barriers. **Healthy Environment:** Prioritize and support investments that reduce pollution and greenhouse gas emissions and preserve and restore ecosystem health		**Equity & Diversity:** A strong and connected regional transportation system increases accessibility to jobs, medical care, recreation, and other destinations -- regardless of age, race, economic status, or ability		**Accessibility:** Promote alternative transportation options for area residents and employees that are reliable and accessible to all users. **Funding:** Develop innovative funding sources and strategies for transportation improvements. **Transportation/Land Use:** Improve transportation and land use coordination. **Environmental Protection:** Protect the environment, promote energy conservation, increase safety and improve the quality of life.	

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[10] (Kansas Turnpike Authority 2019)
[11] (Kansas Department of Transportation 2019)
[12] (Public Health Law Center n.d.)
[13] (Federal Transit Administration 2019)
[14] (Kansas Department of Transportation n.d.)
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[16] (University of Kansas Transportation Center 2020)
[17] (Kansas Department of Transportation, Kansas Turnpike Authority 2017)
[18] (Kansas Department of Commerce n.d.)
[19] (Republic County Economic Development Corporation n.d.)
[20] (Kansas Department of Transportation, Kansas Turnpike Authority 2017)
[21] (Kansas Department of Transportation, Kansas Turnpike Authority 2017)
[22] (Amtrak 2017)
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[27] (Kansas Department of Commerce n.d.)
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[29] (Aircraft Owners and Pilots Association 2016)

[30] (Kansas Department of Transportation, Kansas Turnpike Authority 2017)
[31] (Federal Highway Administration n.d.)
[32] (Federal Highway Administration n.d.)
[33] (Kansas Department of Transportation 2020)
[34] TERM is a tool developed by USDOT's FTA to assess physical condition and future investment needs of transit assets
[35] (Institute for Policy & Social Research 2020)
[36] (Institute for Policy & Social Research 2020)
[37] (Institute for Policy & Social Research 2020)
[38] (National Highway Traffic Safety Administration n.d.)
[39] (Bansal and Kockelman 2017)
[40] (BloombergNEF 2021)
[41] (Federal Communications Commission n.d.)
[42] (American Hospital Association 2019)
[43] (United States Environmental Protection Agency 2017)
[44] (Underwood 2017)
[45] (Kansas Department of Agriculture 2019)
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[47] (Kansas Department of Agriculture 2019)
[48] (Kansas Department of Transportation, Kansas Turnpike Authority 2017)
[49] (Federal Aviation Administration 2020)
[50] (The Conference Board 2020)
[51] (The Center for Economic Development and Business Research - Wichita State University 2020)
[52] (Kansas Department of Transportation 2019)
[53] (U.S. Bureau of Labor Statistics 2020)
[54] (Bounds 2019)
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[56] (U.S. Bureau of Labor Statistics 2020)
[57] (Kansas Department of Transportation Division of Aviation 2017)
[58] (Federal Transit Administration n.d.)
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