

Executive Summary

Nearly a quarter of a million people each day rely on the I-435/I-35/K-10 interchanges to enable them to move safely, efficiently and conveniently through Johnson County. Millions of dollars of goods move through this network every day heading to nearby stores and businesses. This makes Johnson County an economic powerhouse benefiting all Kansans. Growing congestion, however, threatens the ability of the interchanges to provide the kind of safe and timely travel that best serves the transportation and economic development needs of the region and the state. As a result, the Kansas Department of Transportation (KDOT) in conjunction with its local partners of Lenexa, Olathe, Overland Park, Johnson County, and the Mid-America Regional Council (MARC) embarked upon a study to determine what improvements should be made to safely handle future traffic demands and to support economic development.

Purpose of the Study

The purpose of this study was to develop an ultimate interchange concept which addresses traffic congestion and can be implemented in phases supporting both economic development and quality of life. Due to the anticipated increase in the movement of people and freight in and through the interchange area, the study considered a range of multimodal approaches to meet current and future transportation needs through the year 2040. The study responded to these needs in a cost effective manner that improves safety, mobility, and access.

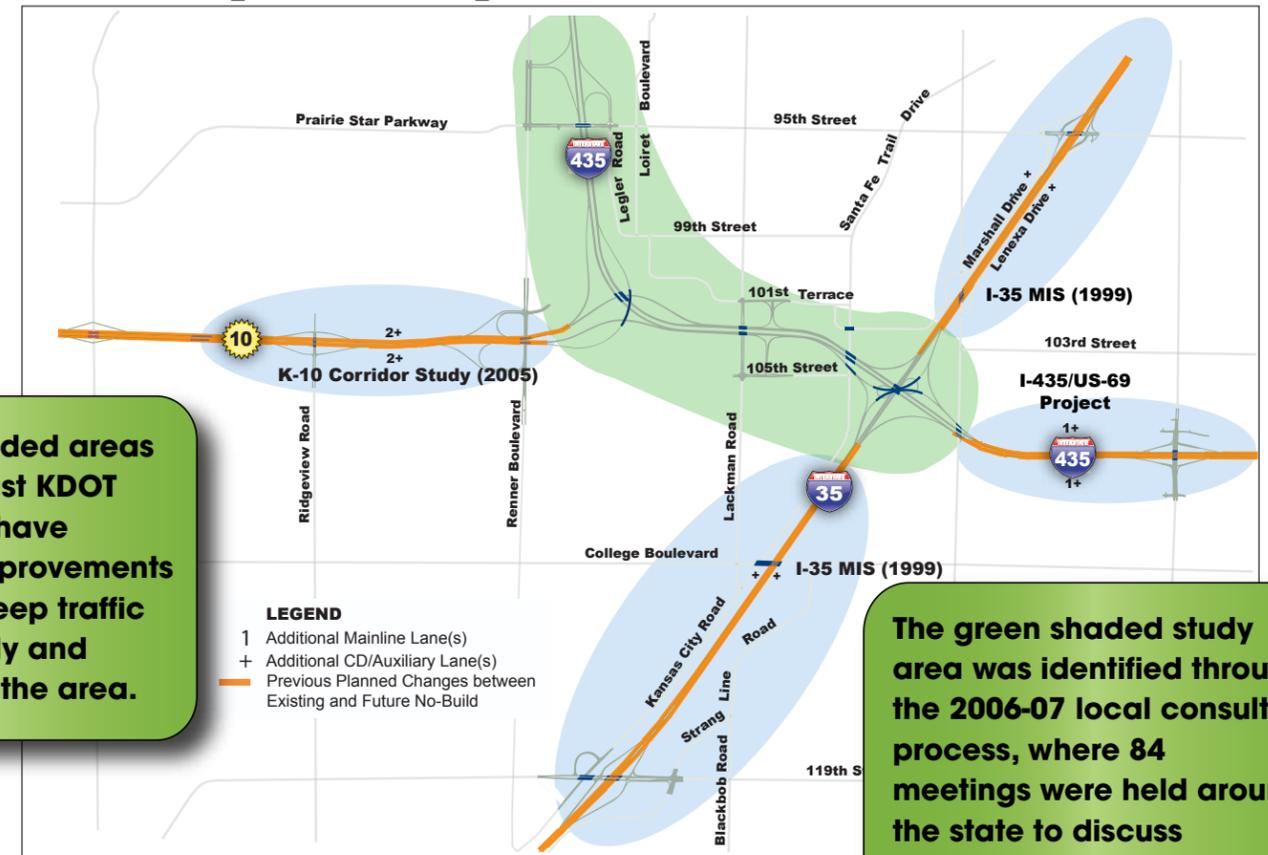
Why Study This Area Now?

Past KDOT studies have identified improvements within corridors leading to the I-435/I-35/K-10 study area. However, there has not been a study conducted to address the needs of the I-435/I-35/K-10 area itself. The I-435/I-35/K-10 study area was identified as one of eight priority projects through KDOT's 2006-2007 local consult process. The process consisted of 84 meetings around the state, designed to listen to local and regional transportation needs. Due to the magnitude of the anticipated projects, KDOT decided to begin Preliminary Engineering (PE) activities immediately, even though no Right-of-Way acquisition or construction funds have been allocated. KDOT will then be better positioned to begin construction as funds become available.

New Name for the Interchange

Given the complex nature of all the interchanges included in the study area, KDOT decided the I-435/I-35/K-10 Interchange Concept Study should be given a new more identifiable name. The name "Johnson County Gateway" was selected because of its regional significance and because many of the major highways serving southern and western Johnson County pass through the interchange area. Therefore, the I-435/I-35/K-10 Interchange Concept Study will also be referred to in this report as the Johnson County Gateway.

Why study this area now?



The blue shaded areas represent past KDOT studies that have identified improvements needed to keep traffic moving safely and efficiently in the area.

The green shaded study area was identified through the 2006-07 local consult process, where 84 meetings were held around the state to discuss important projects. This study was selected because of regional significance.

- Previous Studies:
- I-35/US 69 Major Investment Study (1999)
 - K-10 Corridor Study (2005)
 - I-435 and US 69 Interchange Improvements (Ongoing)
 - I-35 Bus-on-Shoulders Study (Ongoing)
 - MARC LRTP: Outlook 2035

Study Phases

The I-435/I-35/K-10 Interchange Concept Study was divided into three phases. The Phase 1 – Regional study evaluated the existing and future conditions of the intersection of the I-435, I-35 and K-10 corridors in Johnson County from a regional and local perspective, Phase 2 included developing an ultimate concept for the interchange and Phase 3 identified a phasing plan for construction.

Regional Study

The purpose of the Phase 1 Regional Study was to (1) better understand the existing conditions of the interchange and determine areas for improvement, (2) better understand the influence of regional and localized traffic generators on the interchange, (3) better understand future traffic levels and travel patterns, and (4) develop a simulation model within the immediate limits of the proposed interchange area. This model was used to evaluate both the existing and future no-build conditions as well as the future build condition with the ultimate concept.

The following bullets summarize the existing conditions.

- With the exception of bridge surface maintenance, the bridges within the interchange area are in good condition.
- Most of the roadway pavement has experienced significant rehabilitation in recent years with pavement patching and overlays. Despite this rehabilitation, very little remaining service life is left in the pavement.
- Sections of the interchange area do not meet current design criteria. This includes several horizontal curves, ramp acceleration/deceleration lengths, weave distances and local service interchanges in close proximity to system interchanges.
- 230,000 drivers use the interchange every day.
- Severe congestion levels exist in both the AM and PM peak hours on portions of the I-435, I-35 and K-10 corridors. Today, 20 percent of the interchange is congested. A drive through the interchange that should take 3 minutes actually takes, on average, 4 minutes due to congestion.
- The K-10 and I-435 highway crash rates are higher than the Kansas statewide average for similar facilities. The highest density of crashes occurs on I-435 from K-10 to Quivira. Rear end crashes are the most prevalent crash type.
- Transit plays an important role in the interchange area. Johnson County Transit operates a number of fixed route and flexible route (paratransit) services through the interchange.
- The SCOUT system is operated in part of the interchange area.
- Ramp metering was added along I-435 from Metcalf Avenue to State Line Road in November, 2009.

The following bullets summarize the future no-build conditions.

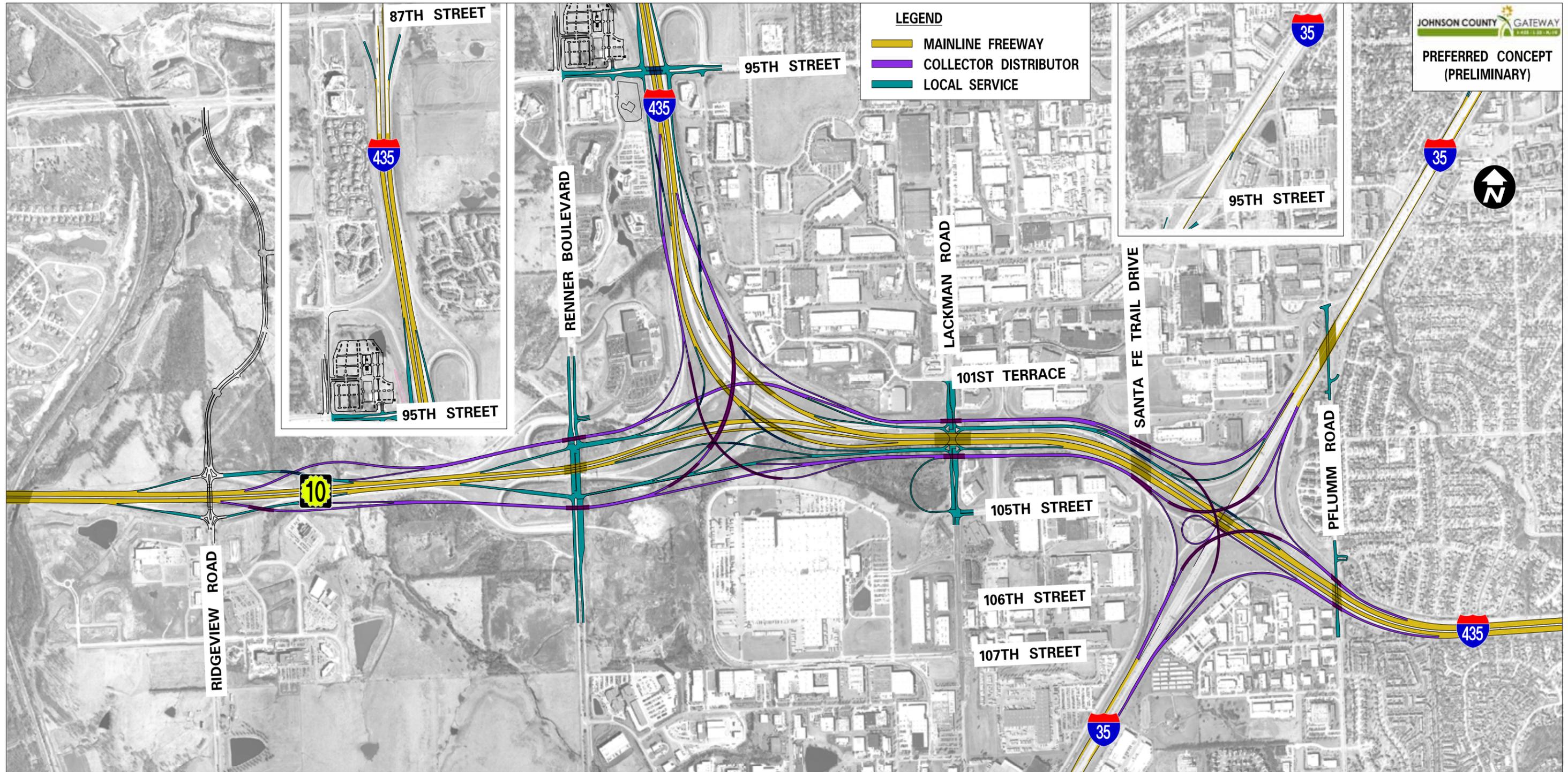
- Regional historical growth patterns have shown a southerly and westerly development pattern along the I-35 and K-10 corridors. This growth pattern is expected to continue in the future. See Figures 20 through 21.
- Regional traffic generators surround the study interchange and rely on the interchange area for access to the interstate system.
- 360,000 drivers are expected to use the interchange by 2040.
- Severe congested conditions are expected to occur in much of the AM and PM peak hours on portions of the I-435, I-35 and K-10 corridors. By 2040, 50 percent of the interchange is expected to be congested. A typical drive through the interchange that should take 3 minutes in uncongested conditions is expected to take 16 minutes at the peak hour by 2040.
- As traffic demand and congestion increase, the number of crashes is also expected to increase.

Ultimate Concept

The purpose of the Phase 2 Ultimate Concept was to develop an improvement concept to address the needs identified in the Regional Study. Four basic concepts were initially evaluated Concepts 1, 2, 3, and 4 with Concept 4 determined to best meet the needs within the study area. Concept 4 was comprised of three basic elements:

- Mainline Freeway – Additional lanes were added to improvement through traffic capacity.
- Collector Distributor (CD) Roads – CD roads were added parallel and separate from the mainline traffic to take traffic from one freeway system to another freeway system thereby eliminating the heavy weaving movements experienced today.
- Local Service Ramps – Ramps taking traffic from the mainline to the local street system were redistributed over the length of the entire interchange area. Braided ramps were utilized to further reduce the weaving of traffic on these ramps and the CD Roads.

Several variations of Concept 4 were further evaluated with each one providing a different level of direct access to the local street system. Concept 4A, which maintained and redistributed the same level of existing access to all the local interchanges, was ultimately selected as the Preferred Improvement Concept since it provided the best level of operational service and received the best public feedback.



Conceptual cost estimates were developed to determine the cost of each colored phase of the Johnson County Gateway interchange improvements. These costs were inflated to 2016 dollars to coincide with the project costs included with other T-WORKS candidate projects. These costs also take into account a number of practical improvements which resulted in savings to the total project of \$25 million dollars. A summary of the costs are shown in the following Table.

Construction Element	Yellow Project	Orange Project	Green Project	Red Project	Total Project
Total Construction Cost (2010 Dollars)	\$13,000,000	\$203,000,000	\$159,000,000	\$110,000,000	\$485,000,000
Total Construction Cost (2016 Dollars)	\$16,000,000	\$244,000,000	\$191,000,000	\$132,000,000	\$583,000,000

Phasing Plan

The purpose of the Phase 3 Phasing Plan was to develop a phased approach to constructing the Preferred Improvement Concept since the improvements were too large to be built as one construction project. Each construction project needed to have independent utility, result in a significant benefit to the traveling public, and be constructed within four years. The focus was to sequence the projects to address the most significant problems first. The recommended Phasing Plan included constructing four projects:

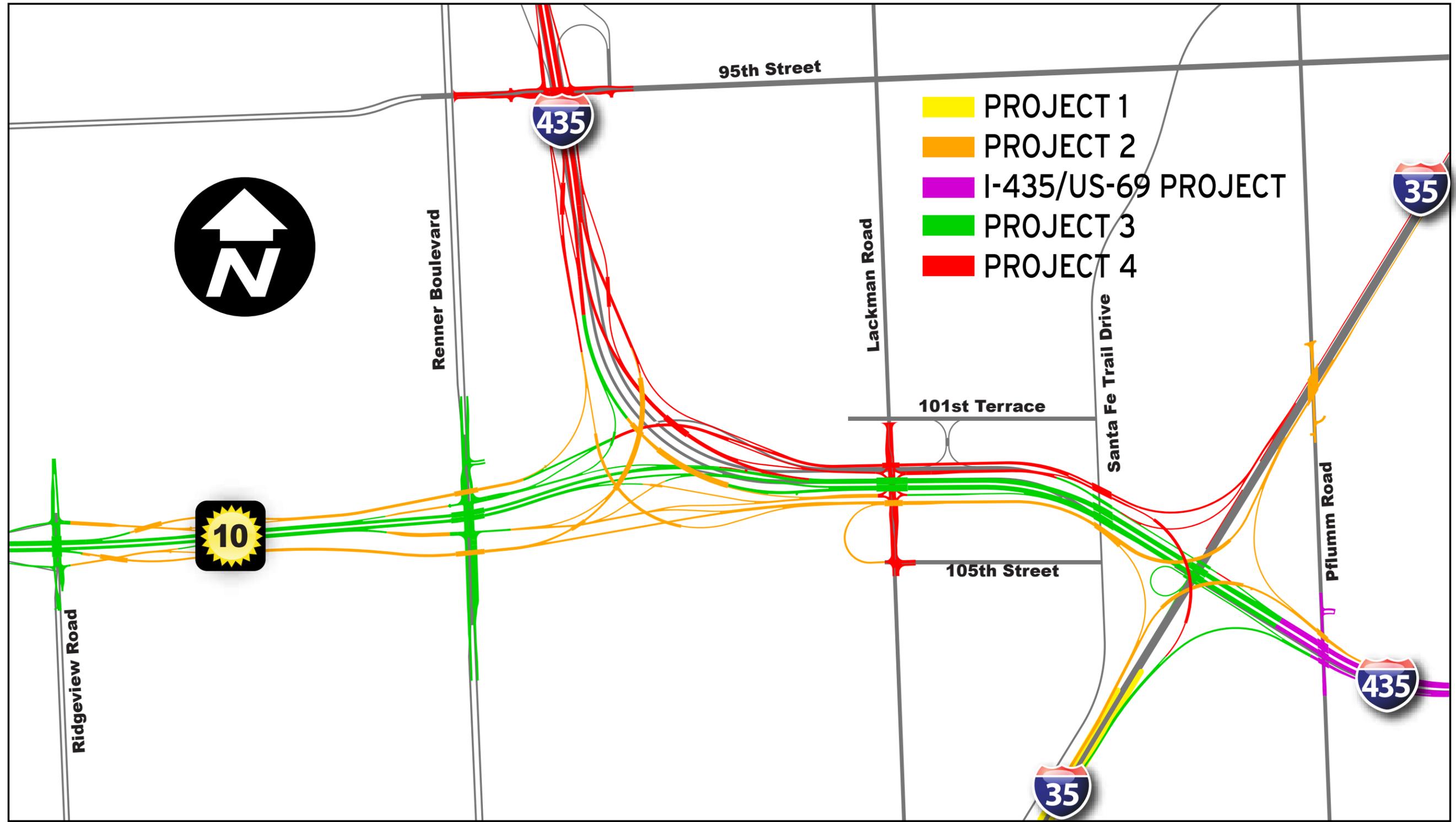
- Project 1 (Yellow Project) – The Yellow Project will address the back-up of traffic on the existing WB I-435 to SB I-35 flyover ramp. It will also address the heavy SB and NB I-35 traffic between 119th Street and I-435.
- Project 2 (Orange Project) – The Orange Project will address the EB traffic congestion between K-10 and I-35. It will also address the heavy traffic on NB I-35 just north of I-435. The Orange Project, in conjunction with the Yellow and I-435 & US-69 Red Project, addresses nearly 80 percent of today’s problems within the interchange area.
- Project 3 (Green Project) – The Green Project, in combination with the Orange and Yellow Projects, addresses nearly 70 percent of the future anticipated problems within the interchange area. This assumes the I-435 and US 69 Red and Purple Projects have already been constructed.
- Project 4 (Red Project) – The Red Project completes the improvements addressing all the remaining traffic issues identified within the interchange area.

It is important to note that the sequencing of the Johnson County Gateway interchange improvements need to be coordinated with the sequencing of the I-435 and US 69 interchange improvements just to the east. Both interchanges need to work together to address the needs of the region.

Stakeholder Engagement

In order to meet local, regional and statewide needs, KDOT looked to the public for feedback regarding the interchanges. Input received throughout the study process augmented the technical analysis and helped the transportation planners and engineers develop recommendations to meet current and future transportation needs. Regional Study activities included:

- Community Interviews were conducted with transportation stakeholders, area businesses and interested citizens.
- The top three issues identified were:
 1. Safety – improving access to ramps and reducing congestion delays
 2. Funding
 3. Construction delays and management
- An Advisory Group (AG) was established to provide insight on key issues throughout the study.
- A website (www.jocogateway.com) and project blog were launched in February 2009 to provide information and on-going updates about the study.
- Three online surveys were conducted. Survey 1 – Interchange Use; Survey 2 – Alternative Transportation Considerations; and Survey 3 – Access and Mobility
- Two Issues Workshops were held to work through complex topics. The first Issues Workshop was held January 8, 2010 to review the alternative improvement concepts and the second Issues workshop was held on June 30, 2010 to review the phasing plan options.
- Focus Groups were held February 2 – 4, 2010 with random commuters who use the interchange to get feedback on the improvement concept alternatives.
- An initial public meeting was held to present the regional study information on May 14, 2009. A final public meeting was held on November 18, 2010 to present the final study recommendations including the preferred improvement concept and phasing plan.



Summary

The recommendations within this report will serve as a road map for future improvements to the Johnson County Gateway Interchange. The timing of these improvements is dependent upon available funding and the completion of design, right-of-way acquisition, and utility relocations. When completed, the Johnson County Gateway projects have the potential to increase safety, reduce congestion, and promote economic development in this vital region and the State of Kansas.