CHAPTER 1

Purpose and Need

This chapter summarizes the basic information for the I-70 First Tier Environmental Impact Statement (FTEIS) including what the project is about, where it is located, and why improvements are needed to I-70 on the Missouri side of the Kansas City Metropolitan Area (KC Metro). In review of the comments received on the Draft FTEIS, no new information was submitted relating to the purpose and need for improvements to I-70. Consequently, this Condensed Final FTEIS references the Draft FTEIS for detail. MoDOT has updated the crash analysis to reflect the most recent data available. This does not change any of the conclusions regarding the purpose and need for improvements.

What is a Purpose and Need?

A Purpose and Need identifies the reasons a proposed project is needed.

What is the I-70 First Tier Study About?

The Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) are proposing to improve the I-70 corridor from the Kansas state line to east of I-470. The I-70 FTEIS in the KC Metro is following a tiered process consisting of a First Tier EIS and multiple Second Tier environmental studies and documents. Generally, First Tier documents address the transportation problems to be solved and potential corridor improvement strategies in an initial, higher level environmental impact analysis. First Tier documents frame and narrow the boundaries and scope for future, smaller Second Tier Studies. The Second Tier environmental document process will occur after this study is complete and will likely consist of several documents based on logical termini and independent utility for sections of the corridor. A full discussion of the First Tier process can be found in **Chapter 1** of the **Draft FTEIS**.

What is meant by improvement strategies?

Improvement strategies are general, high level transportation improvement opportunities to address transportation issues, such as traffic congestion, existing pavement, bridge, and interchange ramp deficiencies, and/or insufficient transit projects.

What is the I-70 FTEIS Study Area?

The I-70 FTEIS Study Area is located entirely in Jackson County, Missouri. The Study Area is approximately 18 miles in length from the end of the last ramp termini east of the Missouri and Kansas state line to east of the I-470 Interchange, including the downtown loop. I-70 is a four- or six-lane

What are logical termini?

Logical termini are rational beginning and ending points for a transportation improvement and for a review of the environmental impacts.

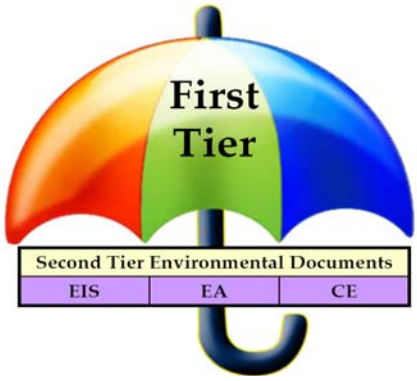


Illustration of the Tiered Environmental Process. The First Tier Study covers a corridor that will be broken down into multiple future Second Tier environmental studies.

divided and fully access-controlled interstate facility. The Study Area includes all land within 100 feet of the existing highway right of way along the corridor and within 300 feet of the existing highway right of way at interchanges along I-70. An expanded Study Area consisting of 1,000 feet on either side of the highway including the downtown loop is being evaluated for land use and socioeconomic studies. The extended Study Area is needed for land use and socioeconomic evaluations to properly assess the potential impacts. The I-70 FTEIS Study Area is shown in **Figure 1.1** at the end of this chapter.

Why is I-70 in the KC Metro Important?

The 18 mile I-70 corridor and the entire downtown loop are vital to serving regional transportation demands including commuters, transit, and freight movements. In addition to serving regional needs, I-70 in the KC Metro is also the main artery for traffic traveling to and from other cities and places across the state and nationally. Some of the I-70 traffic traveling through Kansas City is bound for major cities and towns in Missouri or the adjacent states of Kansas, Nebraska, Iowa, and Illinois.

Why are Improvements needed along I-70 in KC Metro?

What is a bottleneck?

A bottleneck is a section of a road where movement of traffic is limited by the road design. This is often a section of road with a fewer number of lanes, a sharp curve, or traffic joining the road at an interchange. A bottleneck is the most vulnerable point for congestion in a road network and is also referred to as a chokepoint.

The overall purpose for studying I-70 is to determine an improvement strategy for the corridor that is consistent with the Mid-America Regional Council's (MARC) Long Range Transportation Plan (LRTP) policy goals and environmental constraints. The I-70 FTEIS is in MARC's 2010-2014 Transportation Improvement Program. Full details on the reasons why improvements are needed to I-70 are found in the Purpose and Need Technical Memorandum located in **Appendix B** of the **Draft FTEIS.** The improvement strategy will address the following items:

- Improve Safety: Reduce crash rates and crash severity on I-70 and the downtown loop.
- Reduce Congestion: Remove key bottlenecks; reduce the potential for ramp back-up onto the freeway; and improve multi-modal travel times in coordination with plans put forward by local and regional agencies.

- Restore and Maintain Existing Infrastructure: Improve bridge and pavement conditions on I-70 and the downtown loop and implement cost-effective investment strategies.
- Improve Accessibility: Provide travel options for all residents; increase safe access across I-70 and the downtown loop for non-motorized travel; support local and regional land use plans.
- Improve Goods Movement: Improve the efficiency of freight movement on I-70 and the downtown loop.

I-70 Eastbound at the Jackson Curve

Summary

The purpose of the I-70 FTEIS is to determine an improvement strategy for the corridor, including future capacity and mode choices, that addresses the key needs outlined in this document.

The Study Team developed, refined, and evaluated potential I-70 corridor strategies based on the needs outlined in this document while seeking to minimize impacts to the human and natural environment. This development, refinement, and evaluation of the strategies are summarized in the following chapters of this Condensed Final FTEIS.

What Changes Were Made to the Draft FTEIS?

The legend on **Figure 1.1** was revised from "Hydrology" to "Water Features"

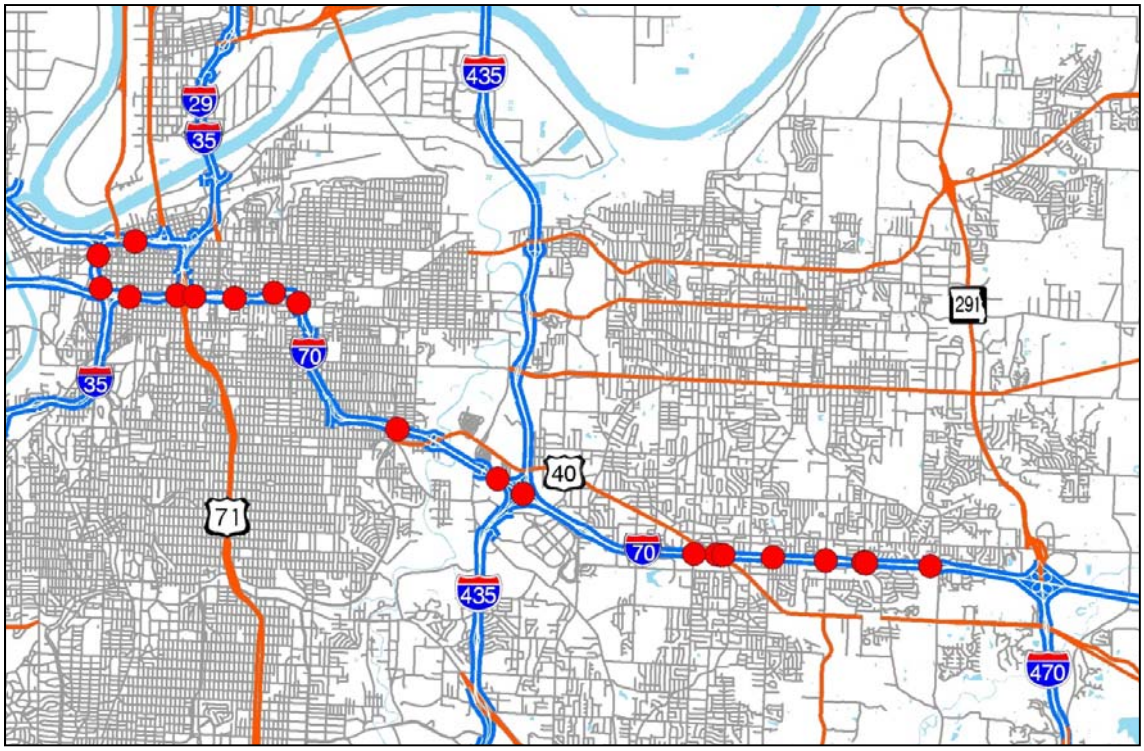
Updated Crash Data – The Improve Safety section of the Purpose and Need has been update to include more recent crash data.

Improving safety within the I-70 FTEIS Study Area must be a key element of improvement strategies. Traffic crashes cost the travelers of I-70 in a variety of ways. Some crashes cost lives, cause severe injury or result in property damage. Traffic crashes also create congestion from blocked travel lanes resulting in increased gas consumption and lost time. I-70 improvements should work to reduce the crash rates compared to the statewide average and to reduce the crash severity.

The Draft FTEIS contained crash rates from 2003 to 2007 using MoDOT data. These have been updated for years 2005 to 2009 using MARC crash data. Both datasets (from MoDOT and MARC) came from the same master database. The new crash data were evaluated and five year crash rates were developed across the corridor. The Study Team identified rates that were more than 150% of the statewide average as undesirable. Rates between 100% and 150% of the statewide average are defined to be approaching undesirable characteristics. Any rates equal to or less than the statewide average were categorized as adequate, but the Study Team will look at potential improvements that will reduce crash rates throughout the corridor.

In the five year period from 2005 to 2009, 21 crashes on I-70 within the study area involved a fatality. The locations of those fatal crashes are shown in **Figure 1.2**. This is comparable to the 20 fatal crashes reported between 2003 to 2007.

Figure 1.2: Fatal Crash Locations in the I-70 Corridor 2005 to 2009



The locations with the highest crash rates between 2003 and 2007 were the downtown loop, westbound from the Benton curve to the downtown loop, eastbound from the Jackson curve to I-435, and the I-435 interchange. New 2005 to 2009 data shows the same segments with the highest crash rates with one exception. The crash rate for westbound I-70 at the Manchester Interchange nearly doubled, likely due to recent lane closures and construction on and around the Manchester viaduct.

The latest data also shows a drop in the crash rate at the U.S. 40 West interchange and a simultaneous increase in the crash rate at the U.S. 40 East interchange. This is likely more a result of the processing of the crash location than the actual locations of the crashes. The algorithm used by MARC to geocode crash locations likely located some of the crashes meant for the U.S. 40 West interchange to the U.S. 40 East interchange instead. The Study Team believes that, similar to the 2003 to 2007 data, eastbound I-70 at the U.S. 40 West interchange still has an undesirable crash rate while U.S. 40 East interchange is approaching the undesirable crash rate, but is not as high as the data indicates.

A crash analysis summary from 2005 to 2009 is provided in **Table 1.1**. Undesirable rates – those greater than 150% of the statewide rate – are highlighted in red.

Table 1.1: FTEIS Crash Rate Summary

	Analysis Sections	Length (miles)	2005 to 2009 Crash Rate (Crashes Per 100 Million Vehicle Miles of Travel)		5 Year Crash Rate versus Statewide Average Crash Rate* (130.62)	
			Eastbound	Westbound	Eastbound	Westbound
1	Downtown Loop	3.45	223.51		171%	
2	Paseo Interchange	0.86	110.34	163.75	84%	125%
3	Benton Curve	1.20	145.82	191.59	112%	147%
4	23rd Street Interchange	0.67	59.32	44.37	45%	34%
5	Jackson Curve	0.88	262.34	93.24	201%	71%
6	Van Brunt Interchange	0.73	217.16	121.29	166%	93%
7	U.S. 40 West Interchange	0.59	74.37	44.77	57%	34%
8	Manchester Interchange	0.57	165.04	206.48	126%	158%
9	I-435 Interchange	0.96	169.00	196.09	129%	150%
10	Blue Ridge Cutoff Interchange	1.28	97.76	109.61	75%	84%
11	U.S. 40 East Interchange	1.60	215.05	135.70	165%	104%
12	Noland Road Interchange	1.50	146.44	131.71	112%	101%
13	Lee's Summit Road Interchange	1.35	97.63	96.76	75%	74%
14	I-470 Interchange	1.51	94.41	90.84	72%	70%

* Statewide average crash rate for urbanized interstates.

In general, the crash rates in the study area from 2005 to 2009 are lower than those calculated from 2003 to 2007. There are several likely factors contributing to this trend:

1. With higher gasoline prices and the economic recession over the past two years, fewer vehicles have been on the roadways. Fewer vehicles and less congestion contributes to a lower crash risk.
2. Construction on I-29/I-35 northeast of the downtown loop, which began in 2008, has temporarily shifted traffic patterns, particularly around the downtown loop and along I-70 from the downtown loop to I-435. In many of these locations, traffic volumes and crash risk have decreased.
3. MARC's algorithm for locating crashes is not able to locate 100 percent of reported crashes, meaning that it is likely that some of the crashes are not included in the data. This would have also been true with the 2003-2007 MoDOT data.

The comparison to the statewide crash rate has changed since the 2003-2007 analysis. The 2003-2007 crash rates were compared to the five-year statewide urban interstate crash

rate, which in 2007 was reportedly 107.82 crashes per 100 million vehicle miles traveled (HMVMT). The new 2005-2009 crash rates are instead being compared to the five-year statewide urbanized interstate crash rate, which in 2009 was 130.62 crashes per HMVMT. An urbanized area is one with a population greater than 50,000, whereas an urban area has a population of 5,000 to 50,000. The urbanized crash rate is more representative of the study area in the Kansas City metropolitan area. For comparison purposes, the five-year statewide urbanized crash rate in 2007 was 138.13 crashes per HMVMT, so this rate has also decreased in the last two years. Based on the 2009 statewide urbanized crash rate, the downtown loop and an additional three sections eastbound and two sections westbound are defined as undesirable because the crash rate exceeds 150% of the rate of 130.62 crashes per HMVMT.

Based on 2005 to 2009 data, the majority of the crashes involve multiple vehicles (79%) while 17% are a collision with a fixed object. Of the crashes involving multiple vehicles, most (63%) are rear end. 22% are sideswipes due to passing, and 10% are angle collisions. Rear end collisions often occur in congested areas as drivers fail to stop for slow moving traffic. About 77% of the total crashes cause property damage only and about 22% cause injury. About 24% of all crashes occur in dark conditions and about 20% occur in icy/snow/wet pavement conditions. All of these observations are consistent with the 2003 to 2007 data. The time of day of the crashes could not be determined for the 2005 to 2009 data because it was unavailable through MARC. From the 2003 to 2007 data, approximately 30% occur during the weekday peak period of traffic (7-9 am and 4-6 pm), which has the largest effect on delay for motorists.

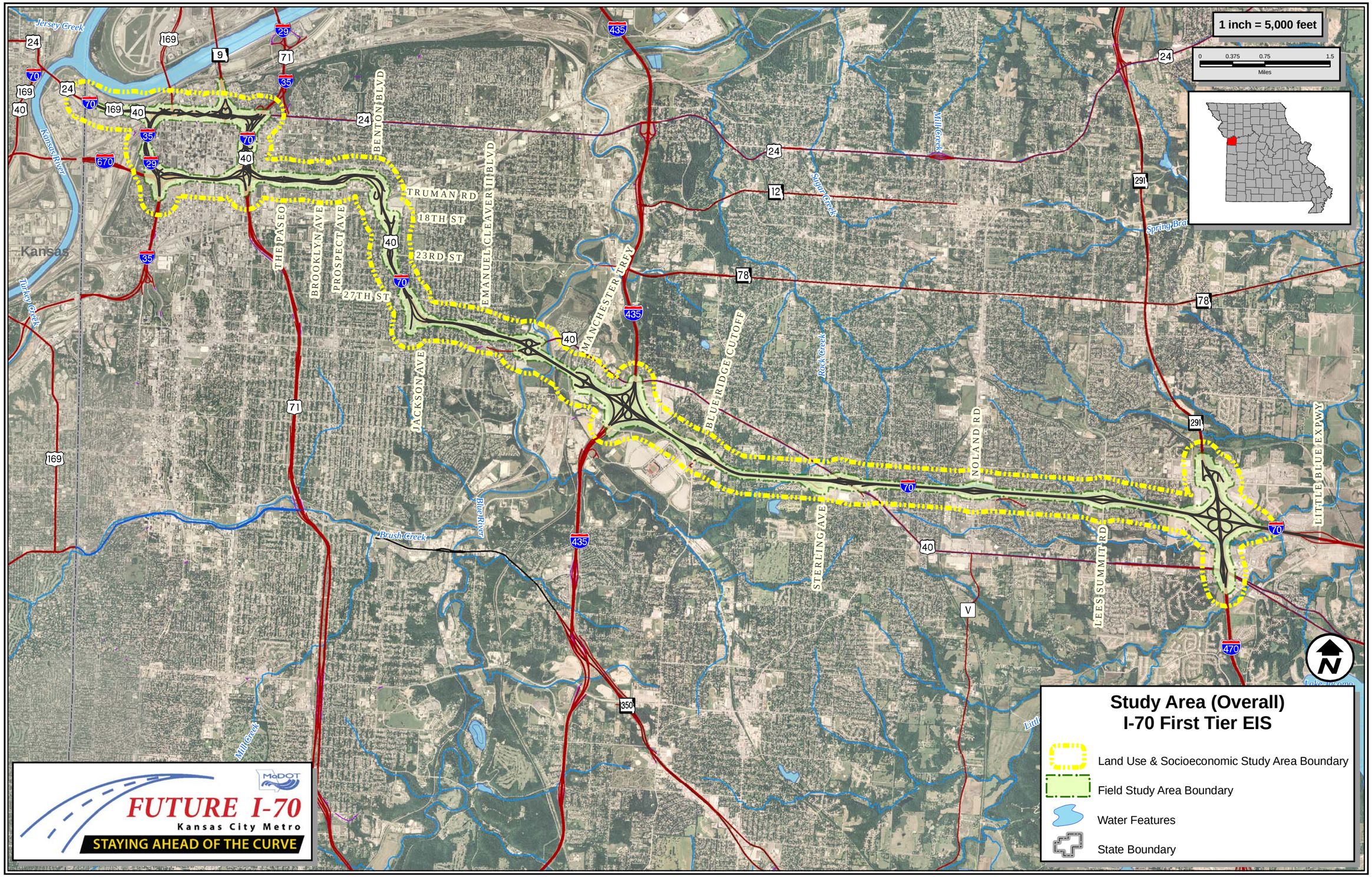
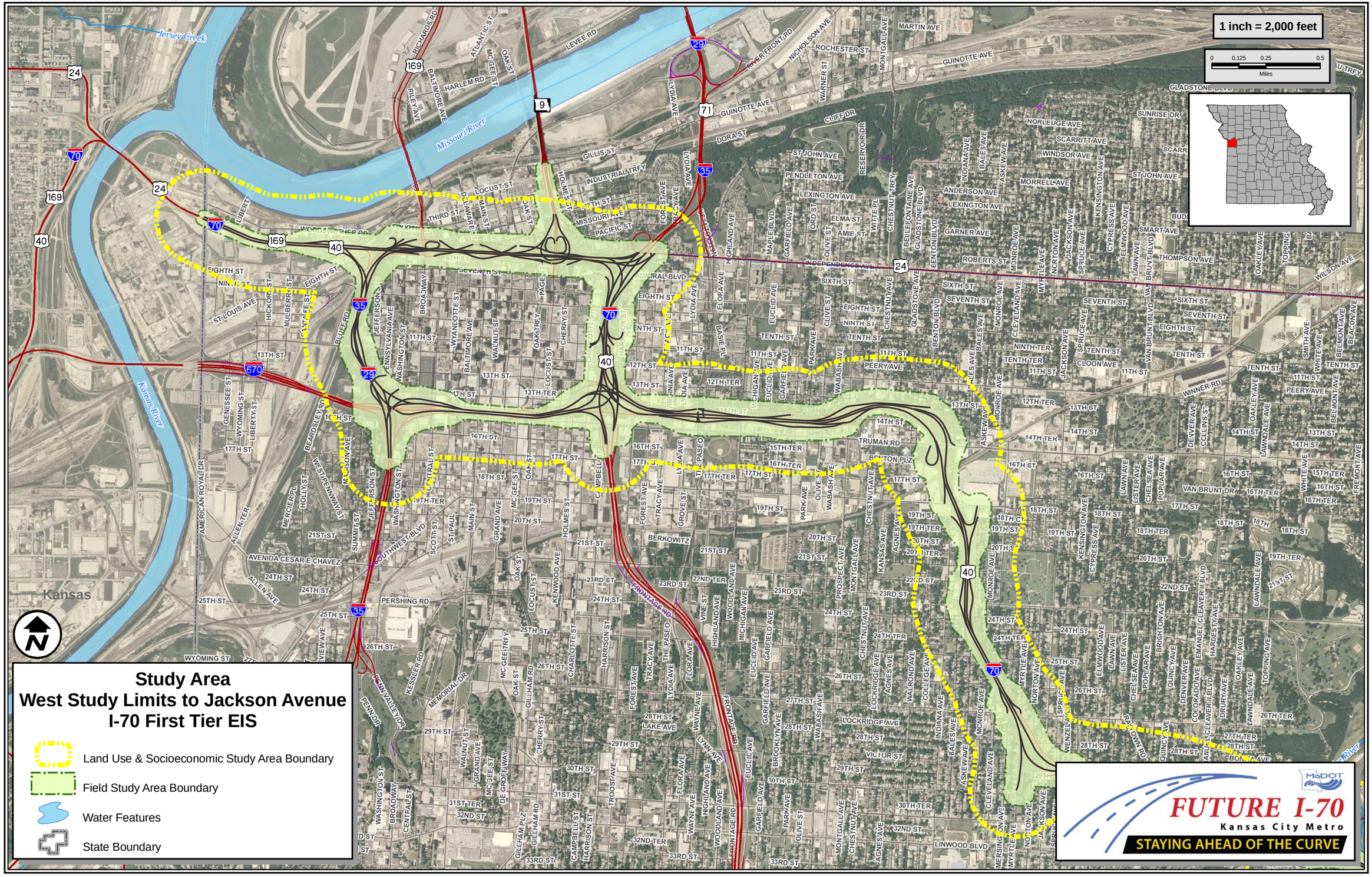


Figure 1.1 Study Area - Overall



I-70 First Tier Condensed Final EIS - Purpose and Need

Figure 1.1 Study Area - West Study Limits to Jackson Avenue

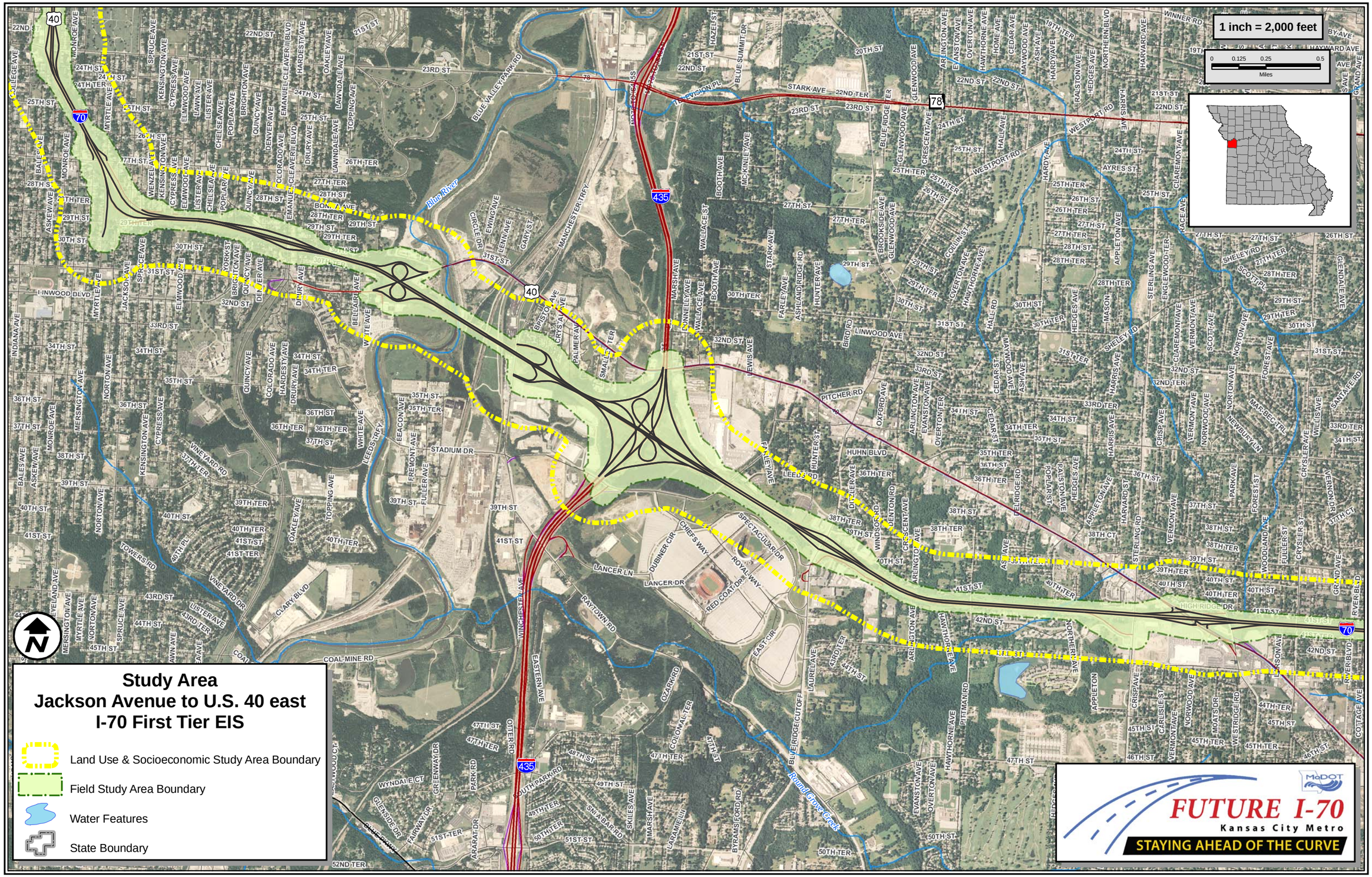


Figure 1.1 Study Area - Jackson Avenue to U.S. 40 east

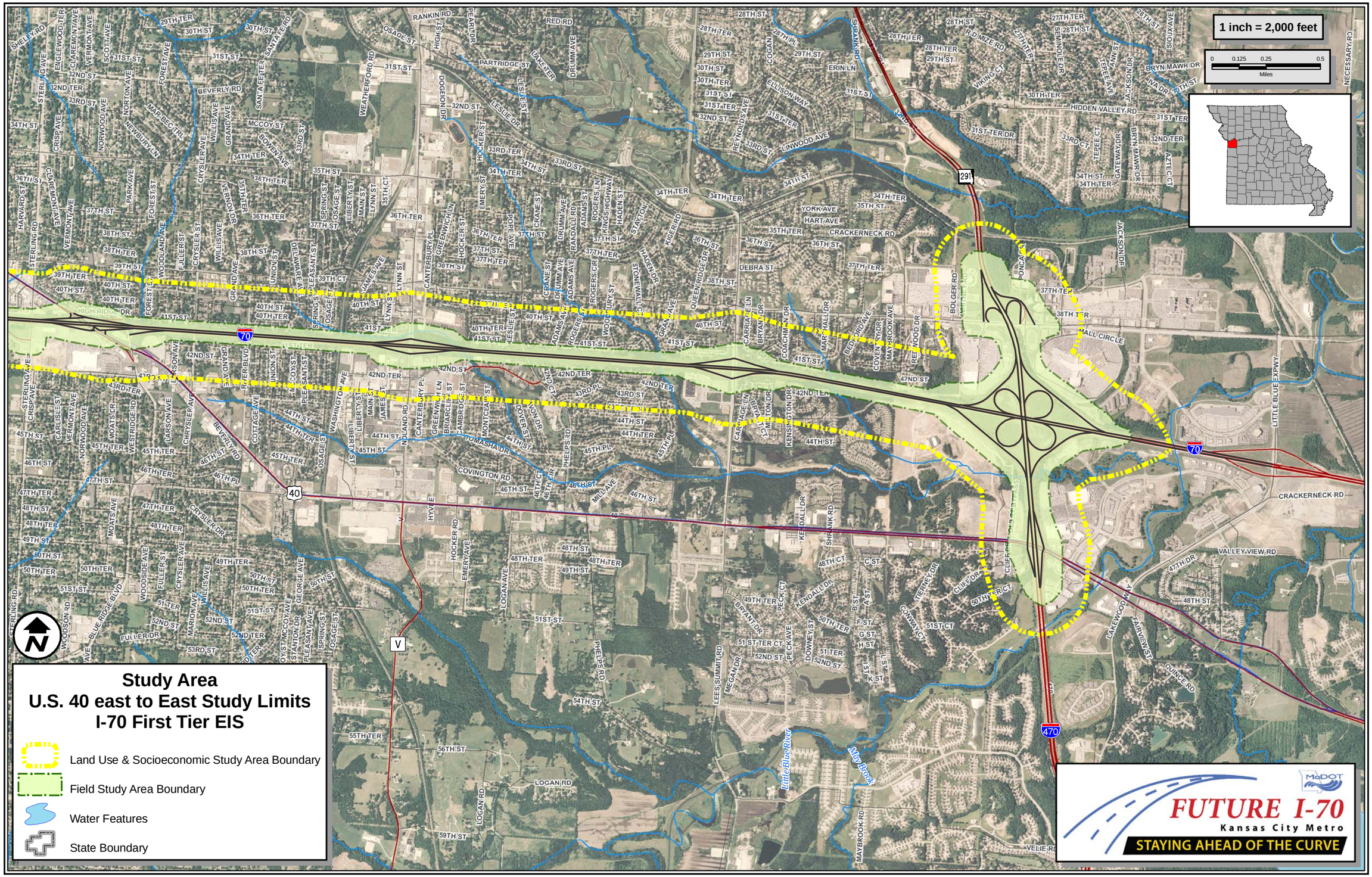


Figure 1.1 Study Area - U.S. 40 east to East Study Limits