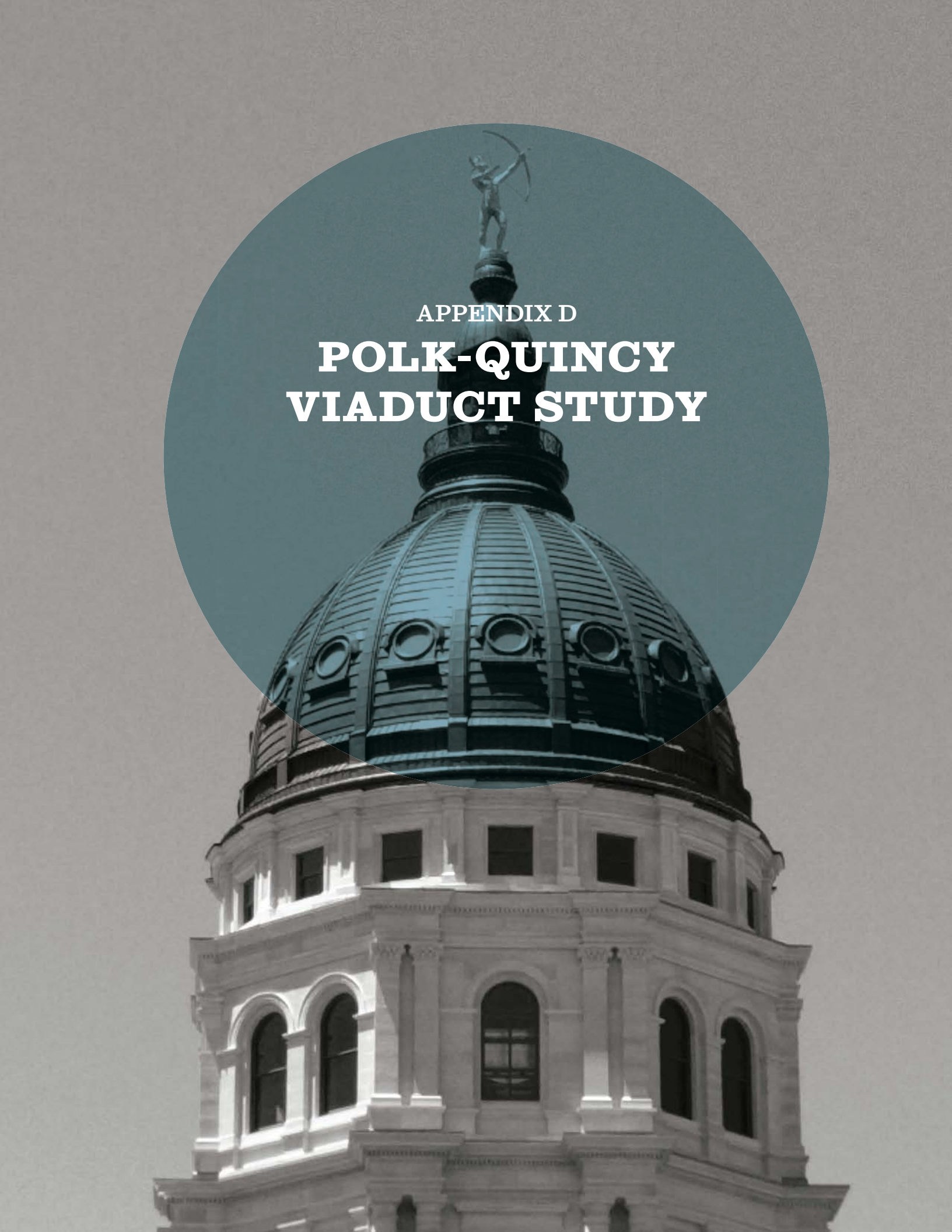


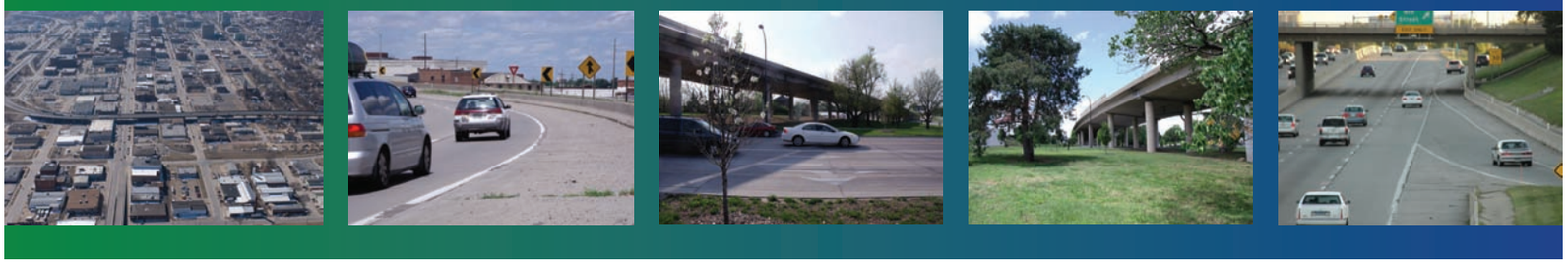
APPENDIX D

POLK-QUINCY VIADUCT STUDY

I-70 TOPEKA

Polk-Quincy Viaduct Study

I-70 Polk-Quincy Viaduct Concept Design Study | KDOT Project No. 70-89 KA-1266-01



Sponsored by:

Kansas Department of Transportation

MTPO

Metropolitan Topeka Planning Organization

August 2011

Prepared by:

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I-70 Polk-Quincy Viaduct

Design Concept Study

Kansas Department of Transportation

City of Topeka

Metropolitan Topeka Planning Organization

August 2011

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PARSONS BRINCKERHOFF

Executive Summary

Introduction

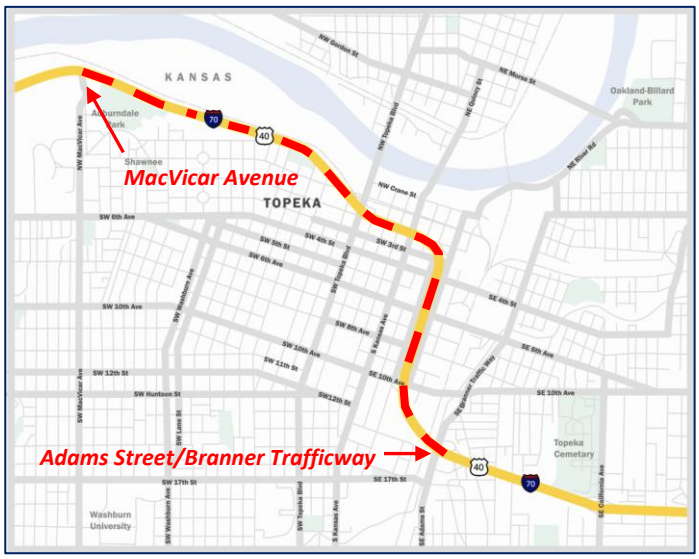
The I-70 Polk-Quincy Viaduct Concept Design Study was initiated by the Kansas Department of Transportation, the City of Topeka, and the Metropolitan Topeka Planning Organization to address transportation and community issues related to I-70 in and near Downtown Topeka. The study evaluated the need for, as well as the impacts, benefits, and costs of, transportation improvement options. The study provided the basis upon which a recommended alternative was selected.

I-70 through Downtown Topeka, KS

In Kansas, I-70 is a major trade and travel corridor that stretches 424 miles from Colorado to Missouri. Near Downtown Topeka, I-70 currently carries approximately 40,000 vehicles per day with roughly 12 percent trucks. In addition to serving through traffic, I-70 is a commuter route for the majority of the Downtown's 30,000 to 35,000 employees. I-70 serves four areas of potential development in and near Downtown.

Project History

The I-70 Polk-Quincy Viaduct and the segment of I-70 serving Downtown was designed and built in the late 1950s/early 1960s. At a length of almost 3,400 feet, the I-70 Polk-Quincy Viaduct spans from Polk Street on the west to Quincy Street on the east. After 50 years, the condition of the bridge has deteriorated, traffic volumes have increased, highway design criteria have changed, and the area around the viaduct is undergoing new development and redevelopment.



Study Area Description

The study area for the proposed improvement of I-70 extends from the MacVicar Avenue interchange (on the west) to the Adams Street/Branner Trafficway interchange (on the east), a length of approximately 3.8 miles.

Purpose and Need Summary

The purpose of the proposed actions to I-70 is to meet current roadway/bridge design criteria, improve safety, increase roadway traffic capacity, balance accessibility, and to support economic development in and near the Downtown area.

Specifically, the project addresses the following needs:

- Design: While appropriate for its time, the geometric features of I-70 do not meet current highway design criteria.
- Safety: The design of the current transportation infrastructure results in safety concerns for motorists entering and exiting I-70, traversing the 3rd Street curve, and crossing the Polk-Quincy Viaduct.
- Roadway Capacity: Designed in the 1950's, segments of the highway experience congestion during peak traffic flow periods.
- Accessibility: There are a number of key destinations in or near the I-70 corridor, but these locations are difficult to reach using the existing systems of ramps. Current connections between I-70 and city streets are located primarily on the east side of the Downtown area. No direct connections are provided to the two major north-south arterial streets (Topeka Boulevard and Kansas Avenue) that connect North Topeka, the Riverfront Area, and Downtown Topeka.
- Economic Development: Improvements to I-70 and its connections to city streets will support the current development/redevelopment efforts in Downtown Topeka and North Topeka as well as support proposed developments in the Entertainment District and the Riverfront area.

I-70 Polk-Quincy Viaduct in Topeka, KS looking south

Development of Project Goals and Evaluation Criteria

Project goals and evaluation criteria were developed prior to developing potential improvement alternatives for I-70. These goals and criteria were used in screening a full range of alternatives to determine three that would be carried forward for detailed analysis.

Project Goals: Based upon the input from the public and stakeholders, the Core Team and the Project Advisory Committee developed goals for the highway design and the community connections between I-70 and adjacent land use. The goals are to:

1. **Maintain safe, efficient operation and capacity for interstate trips.**
2. **Maintain safe, efficient operation and capacity for local trips.**
3. **Meet current geometric design criteria for design speed, shoulder width, ramp lengths, and interchange spacing.**
4. **Meet current bridge design criteria.**
5. **Consider facility maintenance issues/costs in the design of new highways, streets, and bridges.**
6. **Provide logical/reasonable connections to downtown Topeka, North Topeka, and the Riverfront area.**
7. **Consider the needs for modes of transportation other than automobiles and commercial trucks to cross or access I-70.**
8. **Consider urban design elements as part of future I-70 corridor design, including aesthetics, potential land use, public areas, and the overall connections between land use, city streets, and I-70.**
9. **Enhance economic development opportunities in areas near I-70.**
10. **Stage/phase construction to minimize disruption of traffic flow and to maximize financial feasibility**.

Public/Stakeholder Outreach Summary

A significant public and stakeholder outreach effort was a key part of the I-70 Polk-Quincy Viaduct Concept Design Study. Outreach efforts included stakeholder interviews, public meetings, a website, focus group meetings, presentations to stakeholder groups, and media releases.

Guidance for the study was provided by two groups, the Core Team and the Project Advisory Committee. The Core Team included members from the Kansas Department of Transportation, the City of Topeka, the Metropolitan Topeka Planning Organization, and the Federal Highway Administration. The project advisory committee (PAC) was an informed group of stakeholders representing a wide range of community organizations. The PAC was established to provide input and feedback during the concept design study.

Development of Alternatives

An iterative process was used to identify and narrow the potential improvement alternatives for I-70 and the Polk-Quincy Viaduct. Two components were analyzed: the alternatives for the horizontal alignment and the options for the vertical profile.

Alternatives for Horizontal Alignment: Initial definitions for a range of alternatives were developed and are shown below. Seventeen preliminary alternatives were identified based upon the initial definitions. The Core Team and Project Advisory Committee developed a set of evaluation criteria that were used to narrow the potential alternatives to three that were carried forward for more detailed analysis.

The three alternatives were presented to the public and stakeholders for comment. Based upon the comments received, each of the alternatives was revised to include access to and from 6th Avenue. The three revised alternatives were further analyzed and a preferred alternative was recommended.

Initial Definitions of Concept Alternatives

- No Build Alternative – develop a continued maintenance program for the I-70 Polk-Quincy Viaduct and adjacent segments of I-70. This alternative should include ITS applications to enhance safety at the 3rd Street Curve.
- Replace "In Kind" – reconstruct the viaduct on its current alignment with no widening for shoulders and minimal changes to other geometric features. Relocating the 3rd Street ramps to 4th Street would be considered. This alternative should include ITS applications to enhance safety at the 3rd Street Curve.
- Reconstruct I-70 on its existing alignment including capacity and other roadway geometric improvements. This alternative should include ITS applications to enhance safety at the 3rd Street Curve.
- Re-align I-70 and include increased capacity for traffic flow, roadway geometric improvements including the 3rd Street curve, and access improvements. Both a new viaduct and below-grade options should be explored for the section between Topeka Boulevard and Kansas Avenue.

Revised Alternatives: Each of the three alternatives was revised to include a connection to 6th Avenue.

Alternative #1 Revised provides three interchanges that serve the Downtown area. The first interchange serves the north side of the Downtown area, with ramps that connect I-70 to Topeka Boulevard and Kansas Avenue. The second services the northeast side of Downtown

with ramps that connect I-70 to Madison and Monroe Streets at 4th Street and 6th Avenue. An existing partial interchange serves 10th Avenue to access Downtown Topeka from I-70 to the east.

Alternative #2 Revised provides three interchanges that serve the Downtown area. The first interchange serves the north side of the Downtown area, with ramps that connect I-70 to Topeka Boulevard and Kansas Avenue. The second services the northeast side of Downtown with ramps that connect I-70 to Madison and Monroe Streets at 4th Street and 6th Avenue. An existing partial interchange serves 10th Avenue to access Downtown Topeka from I-70 to the east.

Alternative #2 differs from Alternative #1 in that it provides a pair of one-way collector-distributor roads that parallel I-70 from Topeka Boulevard to 10th Avenue.

Alternative #3 Revised provides three interchanges that serve the Downtown area. Full interchanges would be located at Topeka Boulevard and 6th Avenue with a partial interchange at 10th Avenue. The possibility of also providing a pair of ramps at 4th Street serving I-70 to and from the west was analyzed.

Vertical Profile between Topeka Boulevard and Kansas Avenue

The second major question raised by some stakeholders was whether the I-70 Polk-Quincy Viaduct should be replaced with a new viaduct or be reconstructed as a below-grade roadway similar to the section of I-70 between 10th Avenue and 6th Avenue. Visualizations are shown below of a new viaduct and below-grade options for I-70 between Topeka Boulevard and Kansas Avenue. The master plan for the Riverfront redevelopment area (also depicted in the figures) recommends a below-grade option for I-70.

I-70 New Viaduct Option

I-70 Below-Grade Option

The strengths and weaknesses of three different vertical profile options were studied for the section of I-70 from west of Topeka Boulevard to east of Kansas Avenue. They are:

- **Fully Below-Grade Option** – I-70 would be lowered approximately 25 feet below ground level to allow city streets to remain at current elevations. New bridges over I-70 would be provided at Topeka Boulevard, Van Buren Street, and Kansas Avenue.
- **Partially Below-Grade Option** – I-70 would be lowered approximately 10 feet and city streets would be raised approximately 15 feet to pass over I-70. New bridges over I-70 would be provided at Topeka Boulevard, Van Buren Street, and Kansas Avenue.
- **Above-Grade Option** – a new viaduct would be constructed to carry I-70 traffic over existing city streets. Harrison Street would likely be closed between 1st and 2nd Streets.

Socioeconomic and Environmental Considerations

The purpose of the environmental screening includes: 1) identifying potential significant adverse social, economic, or environmental impacts for each alternative, 2) determining whether mitigation measures are possible to reduce or to avoid any identified impacts, and 3) determining whether all environmental regulations and requirements can be satisfied during subsequent environmental studies.

Based upon this environmental screening, none of the three alternatives would result in significant adverse social, economic, or environmental impact.

Right-of-Way: Forty-five properties may be impacted by the relocation of I-70 depending upon the final design. Nine of those properties are residences. Right-of-way limits will be determined during preliminary design, the next phase of the project.

Construction Cost Estimate

The construction costs for improvements to I-70 from the MacVicar Avenue interchange to the Adams Street/Branner Trafficway interchange are estimated to be:

- Alternative #1 Revised – $ 197,900,000
- Alternative #2 Revised – $ 200,500,000
- Alternative #3 Revised – $ 191,700,000

Construction costs are in year 2010 dollars.

Preferred Alternative

The strengths and weaknesses of the three alternatives for horizontal alignment and the three options for vertical profile were compiled and presented to the public and stakeholders. As shown in the table below, the overall concept of an above-grade (new viaduct) option for Alternative #1 Revised is the preferred alternative for the improvements to I-70 near Downtown Topeka.

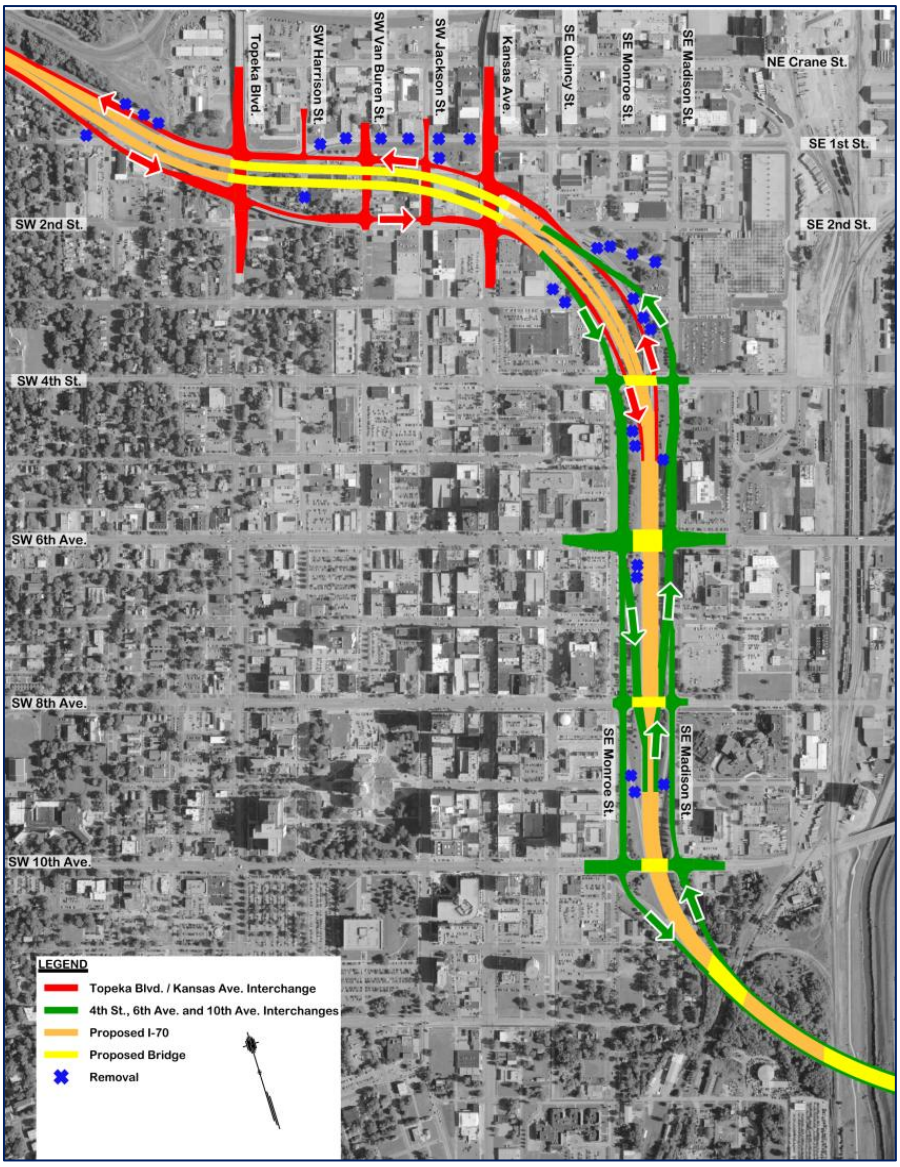
Group	Above-Grade or Below-Grade	Access Alternative Preference
Core Team	Above-Grade	Alternative #1 (revised)
Project Advisory Committee	Above-Grade	Alternative #1 (revised) (7 for Alt #1, 5 for Alt #3)
Greater Topeka Chamber of Commerce	Above-Grade	Alternative #1 (revised) - Investigate 3rd EB I-70 exit
Downtown Topeka, Inc.	Above-Grade	Alternative #1 (revised) - Investigate 3rd EB I-70 exit
Community Focus Groups	Above-Grade	All Alternatives are Acceptable
Metropolitan Topeka Planning Organization	Above-Grade	Alternative #1 (revised)
Riverfront Authority	Above-Grade	Alternative #1 (revised)
North Topeka Business Alliance	Above-Grade	Alternative #1 (revised)
City Council	Above-Grade	Alternative #1 (revised) - Investigate 3rd EB I-70 exit

The preferred alternative shown below creates an access system with two "split diamond" interchanges, one serving the north side of the Downtown area and one serving the east side. Six lanes are provided where needed on I-70.

On the **north side**, the existing 1st Street ramps are relocated so that they connect directly with Topeka Boulevard. These ramps serve traffic traveling to and from the west on I-70. A complementary set of ramps connect to Kansas Avenue and serve traffic traveling to and from the east on I-70. These ramps are joined by a pair of one-way connector roads to form a system that will provide access to Downtown from the north, the proposed Riverfront area, and North Topeka.

A similar system of ramps and connector roads will serve the **east side** of the Downtown area. The existing 3rd Street ramps will be relocated to 4th Street and will serve traffic traveling to and from the west on I-70. The existing 10th Avenue ramps will remain and be widened and new 6th Avenue ramps will be constructed, serving traffic traveling to and from the east on I-70. The 4th Street, 6th Avenue, and 10th Avenue ramps will be connected by the one-way, connector road pair of Madison and Monroe Streets. Other ramps between 10th Avenue and 4th Street will be removed.

Preferred Alternative

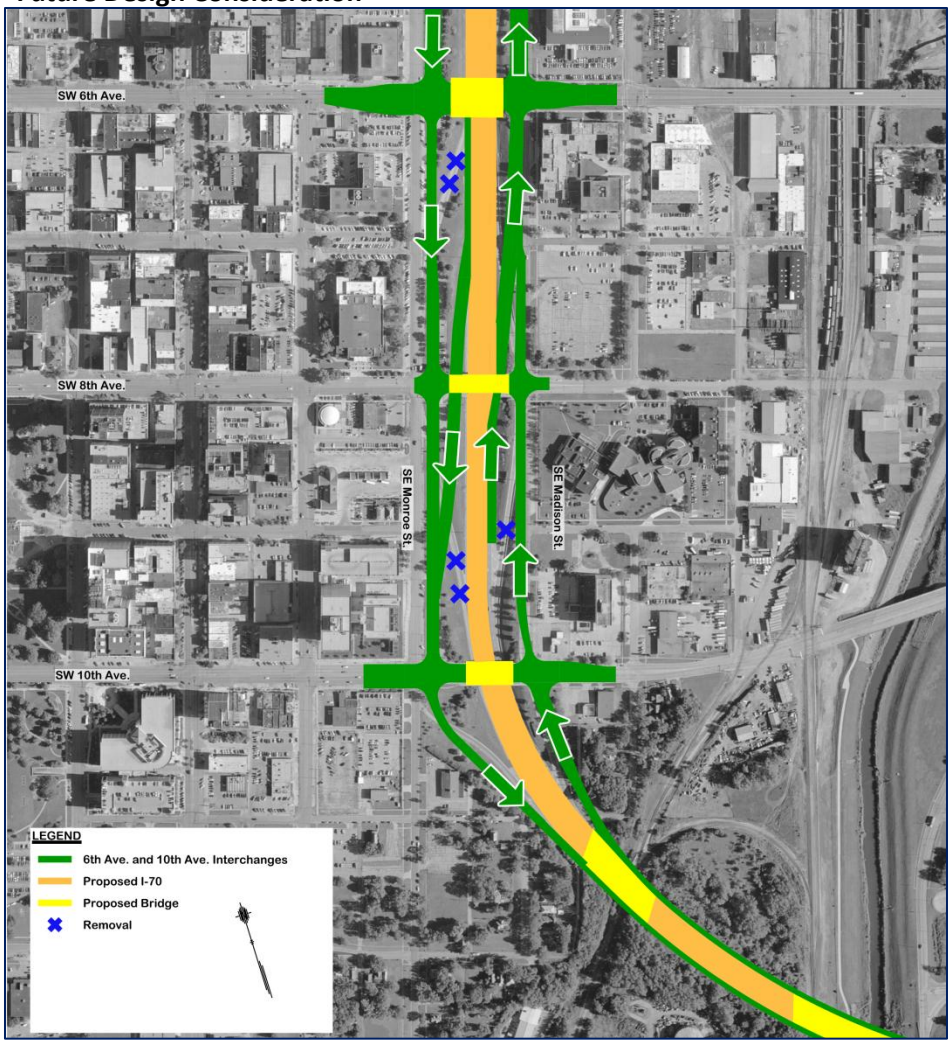


Future Design Consideration: The City Council, supported by the Greater Topeka Chamber of Commerce and Downtown Topeka, Inc., has requested that a "Future Design Consideration" be investigated as the project moves into preliminary design. The Preferred Alternative (Alternative #1 Revised), has three westbound exits from I-70 and two eastbound exits.

The **Future Design Consideration** would explore a third eastbound exit from I-70 by eliminating the eastbound entrance from 6th Avenue and adding an eastbound exit for 10th Avenue.

KDOT has agreed to analyze this modification of the preferred alternative during the next phase of the project.

Future Design Consideration



Environmental Documentation

The Kansas Department of Transportation and Federal Highway Administration reviewed the impacts of the proposed I-70 improvements on historic properties, parks, and communities of concern, as well as comments from the public and other stakeholders. They concluded that a "documented categorical exclusion" was the appropriate environmental document for the project as it moves forward into the design phase.

I-70 Polk-Quincy Viaduct Concept Design Study

I-70 TOPEKA

Polk-Quincy Viaduct Study

PARSONS BRINCKERHOFF

Section 1: Introduction to the I-70 Polk-Quincy Viaduct Design Study

Introduction

From a national perspective, I-70 is a major east-west transportation corridor connecting Interstate Highway I-15 near Cove Fort, Utah with Baltimore, Maryland. In Kansas, I-70 is a major trade and travel corridor that stretches 424 miles from Colorado to Missouri.

Near Downtown Topeka, I-70 currently carries approximately 40,000 vehicles per day with roughly 12 percent trucks. In addition to serving through traffic, I-70 is a commuter route for the majority of the Downtown's 30,000 to 35,000 employees. I-70 serves four areas of potential development. The first is the proposed Riverfront Development area which lies on the north side of I-70 between Topeka Boulevard and Kansas Avenue. The second is a proposed entertainment district that is located on the west side of I-70 and south of 10th Avenue. The third is Downtown itself, which is undergoing redevelopment, with much of the activity focused on Kansas Avenue. The fourth is the North Topeka Arts District located on North Kansas Avenue.

I-70 Polk-Quincy Viaduct in Topeka, KS looking south

Project History

The I-70 Polk-Quincy Viaduct and the segment of I-70 serving Downtown was designed and built in the late 1950s/early 1960s. At a length of almost 3,400 feet, the I-70 Polk-Quincy Viaduct spans from Polk Street on the west to Quincy Street on the east. After 50 years, the condition of the

bridge has deteriorated, traffic volumes have increased, highway design criteria have changed, and the area around the viaduct is undergoing new development and redevelopment.

Long Range Plans

The Kansas Department of Transportation's (KDOT) current Long Range Transportation Plan estimates that nearly 2,000 miles of highways statewide could be at or near congested levels by 2030, including I-70 through Topeka. The Plan documents the state's many transportation needs, examines trends which will impact transportation for the next 20 years, and makes policy recommendations to address those needs and trends.

Construction of I-70 through Downtown Topeka, KS looking north towards the Polk-Quincy Viaduct (1964, KDOT)

The Metropolitan Topeka Planning Organization's 2034 Long Range Transportation Plan is a guide for transportation decisions made for Topeka and a surrounding portion of Shawnee County. Comments were received from the public regarding their concerns for safety and growing traffic congestion at various highway interchanges. Specific comments were received regarding the need for additional lanes on I-70 and concerns about narrow shoulders and short ramp acceleration lanes on the I-70 Polk-Quincy Viaduct. Improvements to the I-70 Polk-Quincy Viaduct and a new interchange connecting I-70 to Topeka Boulevard were included on an "illustrative list" of transportation needs. This "illustrative list" identified transportation projects that were a priority, but were not financially affordable given the assumptions that were in place for transportation funding.

Purpose of the Study

The I-70 Polk-Quincy Viaduct Concept Design Study was initiated by the Kansas Department of Transportation, the City of Topeka, and the Metropolitan Topeka Planning Organization to address transportation and community issues related to I-70 in and near Downtown Topeka. The study evaluated the need for, as well as the impacts, benefits, and costs of, transportation improvement options. The study provided the basis upon which a recommended alternative was selected.

Participation by affected jurisdictions and other parties was accomplished through a Core Team including the Kansas Department of Transportation, the City of Topeka, the Metropolitan Topeka Planning Organization, and the Federal Highway Administration as well as a Project Advisory Committee with representatives from fourteen community organizations. Public participation was accomplished through a public and stakeholder outreach plan that was developed for the study and is documented in Section 3.

The study was initiated to determine the future of the 3,373-foot long Polk-Quincy Viaduct and adjacent sections of I-70. Possible options were to:

1. Rebuild the I-70 Polk-Quincy Viaduct in its current configuration.
2. Realign and widen I-70.
3. Reposition the entrance and exit ramps to provide better access to Topeka Boulevard and Kansas Avenue, which link Downtown, the proposed Riverfront Development and North Topeka.
4. Use other measures to improve traffic flow and safety.

The study reviewed the number of lanes on I-70; existing and projected future traffic volumes along I-70 as well as on the local transportation system that parallels I-70; the spacing, location and lengths of the entrance and exit ramps; the need for wider roadway shoulders; the design speed of the curve near 3rd Street; and access to Downtown Topeka and other areas. In addition to traffic on I-70 mainline, the study also considered other modes of transportation that use or cross I-70, including public transit, bicycles, and pedestrians.

Purpose of the Report

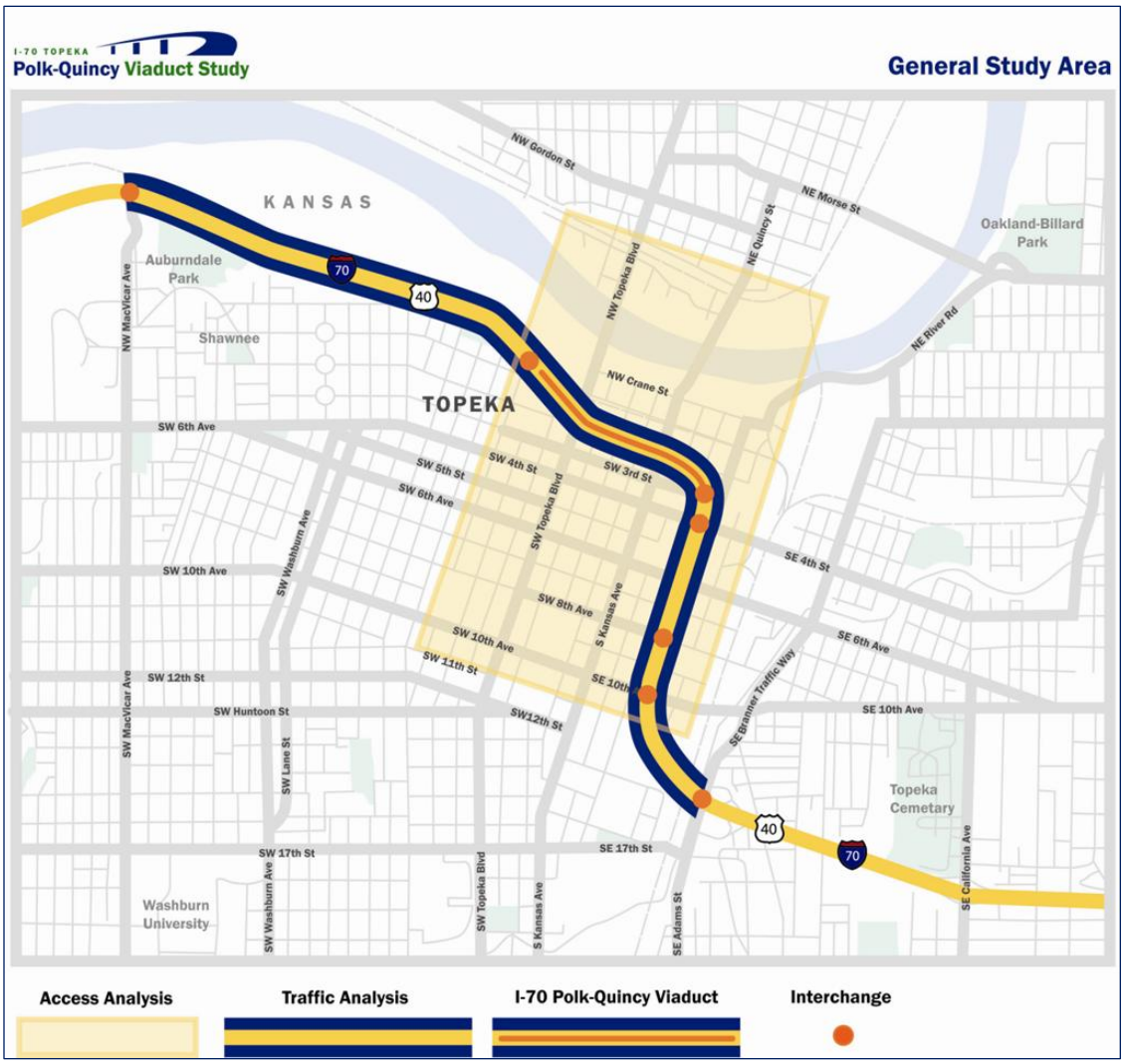
The primary purpose of the report is to document the work and products prepared during the course of the I-70 Polk-Quincy Viaduct Concept Design Study. A second purpose is to summarize in a single document, the major elements and analysis of the I-70 Polk-Quincy Viaduct Study in support of a recommended alternative which will be included in subsequent transportation plans for the region. The report documents existing and future transportation system characteristics and performance along I-70 from the MacVicar Avenue interchange through Downtown to the Adams Street/Branner Trafficway interchange.

Study Area Description

The study area for the proposed improvement of I-70 extends from the MacVicar Avenue interchange (on the west) to the Adams Street/Branner Trafficway interchange (on the east), a length of approximately 3.8 miles. This section of I-70 includes the Polk-Quincy Viaduct which spans from Polk Street (on the west) to Quincy Street (on the east).

As shown in Figure 1.1, the study analyzed 1) the I-70 Polk-Quincy Viaduct; 2) the conditions, alignment, and performance of I-70 from the MacVicar Avenue interchange through the Adams Street/Branner Trafficway interchange; and 3) the access to I-70 from Downtown, the proposed Riverfront area, North Topeka, and East Topeka.

Figure 1.1 General Study Area



Logical Termini

Federal guidelines for logical termini require project limits that have independent transportation utility. They must be of sufficient size to consider all environmental impacts that will result from the proposed improvement. This requires the termini of the study to have logical end points in the highway network and project limits that are of sufficient length and width that common environmental and social concerns can be addressed in a meaningful way. The logical termini for this project are rational end points for the transportation improvement and rational limits for the review of the environmental impacts resulting from the implementation of the improvement.

The logical termini for the project are:

- the I-70 and MacVicar Avenue interchange (west terminus) and
- the I-70 and Adams Street/Branner Trafficway interchange (east terminus)

These locations were selected as the logical termini for the project because they are existing interchanges that serve as points of access to major city streets. These are the first interchanges outside of the area where potential changes to ramp locations are being considered. A recommended improvement to this section of I-70 will not affect other projects.

Current Conditions

Polk-Quincy Viaduct: The existing structure was built in 1963 and is composed of multi spans of Reinforced Concrete box girders and steel plate girders supported by concrete columns on spread footing at the piers and HP piles at the abutments. The viaduct consists of 12 separate units with 9 RC box girder units and 3 steel plate girder units. The 9 concrete units consist of 34 spans and the 3 steel units consist of 10 spans. The overall Sufficiency rating of the structure is rated at 80.9 and the ADT is 35,300 VPD with 13% trucks. The overall deck condition is fair and rated at 6 based on the latest SI&A sheet.

The inspection report states that the deck has been patched and cleaned many times every year since 1996. Deck sealer and expansion joints repairs were also performed as shown in the maintenance history of the inspection report.

The deck geometry has been rated at 4 which is functionally obsolete due to the sharp curvature and the narrow shoulders. Fatigue cracks at diaphragms are developing and the columns started to show some deterioration. The structure is 2 years away from the 50 year life mark that it was intended for.

The existing drains and joints have been problematic for KDOT maintenance staff due the undersized pipes and slopes. The new system shall provide much better system than the existing by

using bigger drainage pipes such as 10” or 12"in diameter and connecting them to the storm water system.

Traffic Flow: Reoccurring congestion on I-70 has been observed during the morning and evening peak periods. Locations that were identified during the study include:

- Morning Peak Period
  - Eastbound I-70 between the MacVicar Avenue entrance ramp and the 1st Street exit
  - The 1st Street exit ramp from eastbound I-70 (traffic often queues to mainline I-70)
  - Westbound I-70 between the California Avenue entrance ramp and the Adams Street exit ramp
  - On the 10th Avenue and the 8th Avenue exit ramps from westbound I-70 (the queue on the 8th Avenue exit has been observed to approach mainline I-70)
- Evening Peak Period
  - On northbound Topeka Boulevard for drivers accessing westbound I-70
  - Entering westbound I-70 from the 1st Street ramp.

Safety: Several locations along I-70 experience a significantly higher than average crash rate. These include the areas near the 1st Street ramps, the curve near 3rd Street, and the curve near 10th Avenue.

Access: Currently, the connections between I-70 and Downtown Topeka are primarily on the east side of the Downtown area. No direct connections are provided with Topeka Boulevard or Kansas Avenue, the two major streets that connect North Topeka, the Riverfront Area, and Downtown.

Section 2: Purpose and Need to Consider Transportation Improvements

The I-70 Polk-Quincy Viaduct is a critical component of Interstate Highway 70 through Downtown Topeka. Its historical past, location, safety characteristics, design characteristics, and lack of connections to major north-south city streets, present both transportation and community challenges and opportunities.

Purpose and Need of the Proposed Action

The purpose of the proposed actions to I-70 is to meet current roadway/bridge design criteria, improve safety, increase roadway traffic capacity, balance accessibility, and support economic development in and near the Downtown area.

The I-70 Polk-Quincy Viaduct was originally designed to accommodate approximately 13,200 vehicles per day (vpd). It is now carrying close to 40,000 vpd on four lanes resulting in increased congestion, infrastructure deterioration, increased bridge maintenance, and significant crash experience. Forecasted traffic volumes for this section of I-70 will exceed 80,000 vpd by the year 2040. The existing design lacks direct connections to the two major north-south streets (Topeka Boulevard and Kansas Avenue) that serve Downtown, North Topeka, and the Riverfront area.

Roadway/Bridge Design: While appropriate for the time of its construction, the I-70 Polk-Quincy Viaduct and adjacent roadway sections of I-70 do not meet current highway geometric design criteria. The existing geometric characteristics within the project limits constrain traffic operations and impact safety. These include:

Roadway Issues

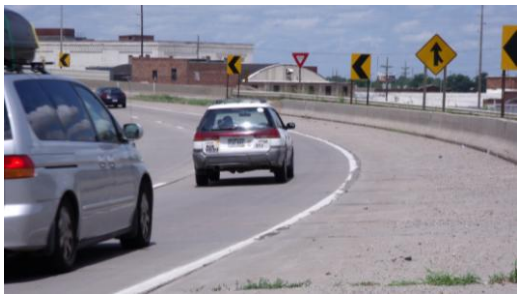
- *Design speed* of the I-70 curve near 3rd Street (40 mph) is less than current minimum Interstate highway criteria (50 mph)
- *Shoulder width* on the viaduct (2 feet) is less than current criteria (10 feet minimum) and creates a potential safety issue when incidents or maintenance activities occur on the bridge and require a lane closure narrowing I-70 to one lane
- *Acceleration/deceleration lanes* limited length create traffic operation and safety issues
- *Interchange ramp spacing* (5 interchanges in 1.6 miles) does not comply with current design criteria (1.0 mile distance between intersecting streets that have ramps)and creates conflicts on mainline I-70 resulting in traffic flow and safety concerns

Bridge Issues

- *Deterioration of bridge elements* due to de-icing treatments and increased traffic volumes (bridge deck is in poor condition)
- *Deterioration of bridge joints* result in ongoing maintenance actions
- *Bridge deck drainage* is a significant maintenance issue
- *Bridge maintenance* is an ongoing issue requiring significant resources
- *Horizontal clearance* issues with adjacent buildings (less than the 15 to 20 feet minimum)

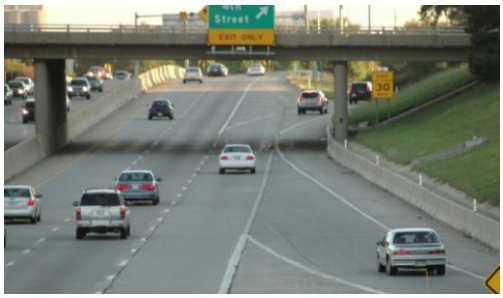
The interaction of design elements within this corridor has a profound effect on capacity, mobility, safety, and incident management. Operational characteristics include a wide spectrum of engineering issues within the I-70 Corridor.

3rd Street Curve: The curve near 3rd Street is the roadway safety need most recognized by the public and stakeholders. The existing curve has a 40 mph design speed based upon the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on the Geometric Design of Highways and Streets* (the "Green Book"). Current design criteria for interstate highways calls for a minimum 50 mph design speed. KDOT's current practice is to design for a 0.06 superelevation using the 0.08 superelevation table in the Green Book. The curve has a posted advisory speed of 45 mph. Warning signs with flashing beacons are posted on both the eastbound and westbound approaches to the curve. The 3rd Street curve has the lowest operating speed of any four-lane section of I-70 in Kansas.



WB I-70 curve near 3rd Street

Interchange Spacing: Operations along I-70 are also affected by the type, location, and spacing of interchanges and ramps. The large number of interchanges in the relatively short project area and the configuration of existing interchanges along the project corridor cause further congestion and operational difficulties. AASHTO design criteria for interstate highways in urban areas call for a spacing of one mile between interchanges (distance between intersecting streets with ramps). Interchange spacing along I-70 in Downtown Topeka does not meet this criterion, having five full or partial interchanges located within approximately 1.6 miles. Half-diamond interchanges are located at 1st Street, 3rd Street, 4th Street, and 10th Avenue. Half diamond interchanges are not normally a preferred design because they do not meet drivers' expectations to be able to exit and enter the interstate highway at the same location. A full diamond interchange is located at 8th Avenue. The high number of interchanges within a relatively short stretch of interstate results in an excessive number of vehicle maneuvers in the flow of traffic. Increased traffic volume in the future will further worsen the level of service (LOS) for the freeway operations.



WB I-70 weaving area: 8th Avenue to 4th Street

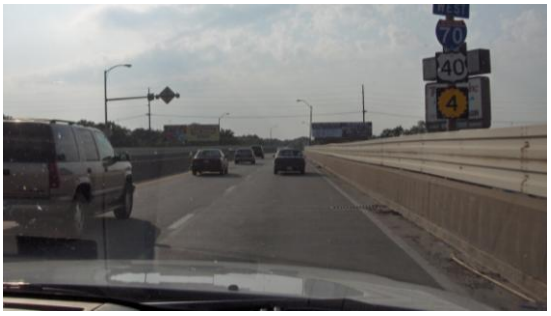
Ramp Design: Ramp entrances and exits to and from I-70 also impact roadway operations. Short acceleration lanes (some 500 to 600 feet long) are less than the current typical design criteria of 1200 feet. This length requires vehicles to enter the freeway at less than normal highway speed. Short deceleration lanes require vehicles to slow down in a highway travel lane before exiting. These added frictions in the traffic stream adversely impact operational capacity and safety.

WB I-70 on-ramp from 3rd Street

Ramp connections to the parallel frontage roads near 4th Street and 8th Avenue result in conflicts due to the proximity of the ramp/frontage road merge with the cross streets. Congestion and traffic back-ups occur on some of the exit ramps due to limited length for vehicle storage and the general layout of the ramps.

WB I-70 off-ramp approaching 8th Avenue

Roadway Shoulders: Cross-sectional elements of a freeway affect the overall safe and efficient operation of traffic. Narrow shoulders not only adversely affect the safety of a freeway but also adversely affect capacity as the minimal lateral distance to roadside features such as a median barrier or bridge rail creates "friction" in the flow of traffic. In addition, the narrow, 2-foot wide shoulders on the Polk-Quincy Viaduct are significantly less than the current minimum criteria of 10 feet. This can have a significant adverse impact on freeway operations as a vehicle disabled or involved in a crash cannot leave the travel lanes and thereby blocks through traffic. Maintenance vehicles or emergency response vehicles must also block a lane anytime they stop on the viaduct. Shoulders also provide vital functions as a recovery area along highway segments, allowing vehicles maneuvering room to leave and return to a travel lane, as well as a storage area for snow removal. In proximity to interchange on-ramps where a vehicle may be unable to merge due to congested mainline conditions, the shoulder can be used to avoid a collision.

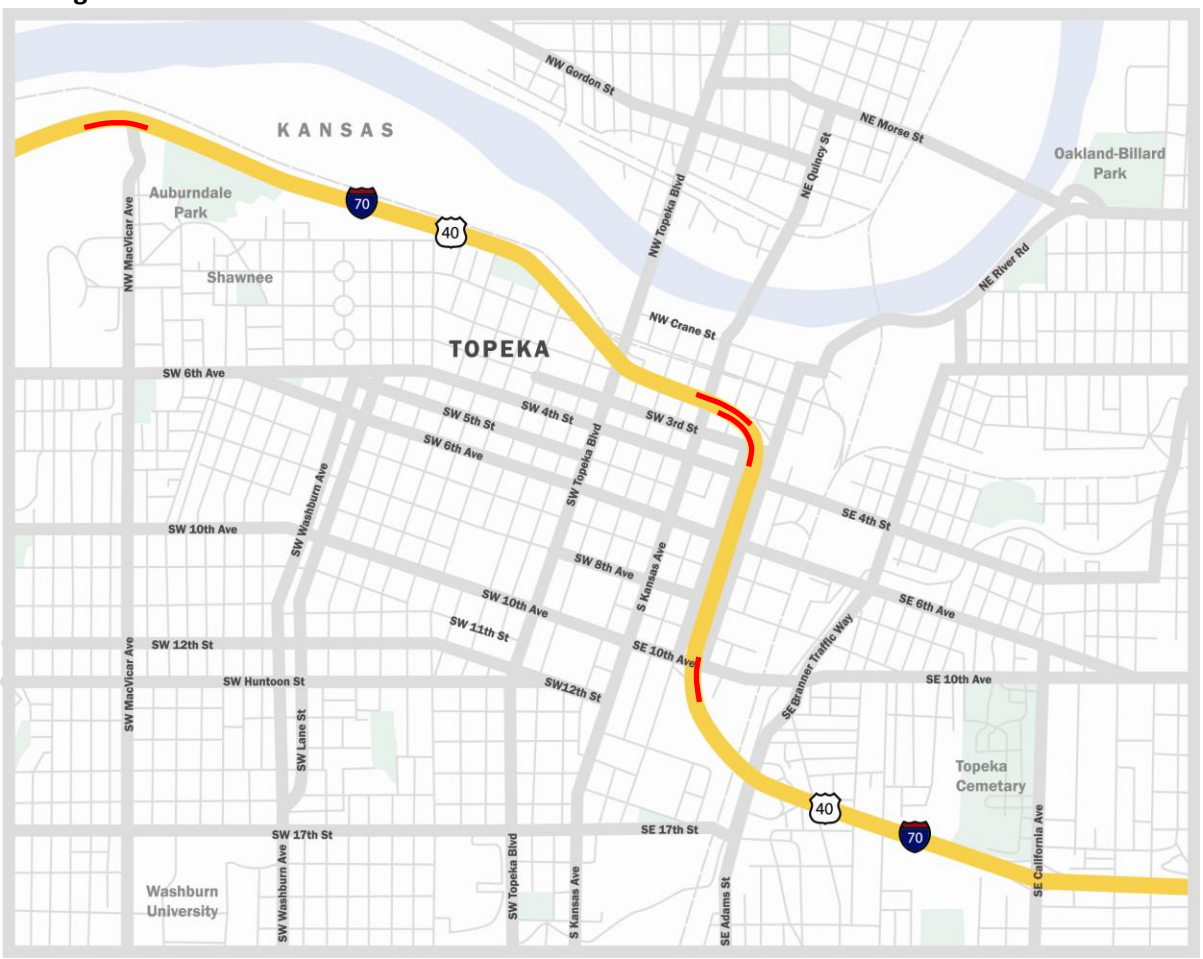


WB I-70 on the Polk-Quincy Viaduct

Safety: Roadway geometric characteristics and constrained traffic operation contribute to the number of crashes that occur along this section of I-70. Crash data, from 2004 through 2008, shows 224 crashes occurring on I-70 between the MacVicar Avenue interchange and the Adams Street/Branner Trafficway interchange. (See Appendix C for the complete safety analysis.)

High crash segments are locations where the frequency of crashes is higher than a calculated critical crash rate for similar roads. In the case of I-70, the calculated critical crash rate is significantly higher than the average statewide crash rate for urban freeways. Shown in Figure 2.1 below, the red shaded sections of I-70 have crash rates equal to or greater than the critical crash rate.

Figure 2.1 Critical Crash Rate Locations for I-70



Three areas where the occurrence of crashes is high are:

Eastbound I-70 near MacVicar Avenue: The majority of crashes in this area occur on the exit ramp near the stop sign. This area was recently reconstructed and this crash pattern may no longer exist.

Eastbound and Westbound I-70 near 3rd Street: The design speed of the 3rd Street curve and the short acceleration lane to enter westbound I-70 from Madison Street/3rd Street may be contributing factors in the crashes occurring in this section of I-70. Sixty-one crashes occurred in the area of the curve. Crash types were primarily collisions with the median barrier or bridge rails, rear-end collisions, or side-swipe passing collisions.

Westbound I-70 near 10th Avenue: The majority of the thirteen crashes that occurred in this area involved a vehicle colliding with the median barrier or a wall. Drivers traveling too fast for conditions were noted in eight of the crashes.

Roadway Capacity and Traffic Flow: Traffic analyses completed for the conceptual alternatives determined that approximately 40,000 vehicles per day currently use the I-70 Polk-Quincy Viaduct and that traffic volumes are projected to increase to approximately 80,000 vehicles per day in the year 2040. A major cause of traffic congestion is the inability of the interstate facility to handle current and future travel demand. If capacity improvements are not made to the I-70 corridor, the existing congestion will only worsen resulting in increased travel time delays, transportation costs, and reduced safety for motorists traveling the corridor. The complete traffic analysis is located in Appendix A.

The capacity, or maximum traffic flow, of a freeway section can be measured by its operating speed, density (number of cars per mile per lane), and flow rate (number of cars per hour per lane). These variables can be quantified and graded on a letter scale of "A" (free-flowing traffic) to "F" (severe congestion with traffic demand exceeding the facility's capacity), called the level-of-service (LOS). Currently the most congested traffic flows on I-70 are on the approaches to Downtown, west from the 1st Street ramps and east from the 10th Avenue ramps. **The levels of service in these areas range from LOS C to D currently and will decline to LOS E to F in the year 2040.**

KDOT practice specifies a LOS "D" as an acceptable minimum LOS for design year (future) traffic conditions for urban freeway reconstruction projects. This provides for reasonable traffic flow in the design year, while keeping construction costs at a practical level.

Table 2.1 shows the current level of service for eastbound I-70. The only area of congestion is during the morning peak period on and near the 1st Street off-ramp.

Table 2.2 shows the current level of service for westbound I-70. Areas of congestion occur during the morning peak period between the California Street on-ramp and the Adams Street off-ramp; also during the evening peak period from the 1st Street entrance ramp to the MacVicar Avenue exit.

Table 2.1 Level of Service for Eastbound I-70 in the Year 2010

Segment			AM Peak		PM Peak	
I-70	From	To	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
EB	MacVicar On-Ramp (Merge)	--	C	23.4	B	15.2
EB	MacVicar Avenue (Merge)	1st Street (Diverge)	C	24.7	B	15.5
EB	1st Street Off-Ramp (Diverge)	--	D	32.7	B	16.2
EB	1st Street (Diverge)	3rd Street (Diverge)	C	18.6	B	13.0
EB	3rd Street Off-Ramp (Diverge)	--	C	21.3	B	13.4
EB	3rd Street (Diverge)	4th Street (Merge)	B	14.5	B	12.1
EB	4th Street (Merge) Weave	8th Avenue (Diverge)	A	8.7	A	9.6
EB	8th Avenue (Diverge)	8th Avenue (Merge)	A	5.3	A	8.8
EB	8th Avenue On-Ramp (Merge)	--	A	9.5	C	23.3
EB	10th Avenue (Merge) Weave	Adams Street (Diverge)	A	5.9	B	15.7
EB	Adams Street (Diverge)	Adams Street (Merge)	A	4.8	B	13.8
EB	Adams Street (Merge) Weave	California Avenue (Diverge)	A	6.8	C	18.3

Table 2.2 Level of Service for Westbound I-70 in the Year 2010

Segment			AM Peak		PM Peak	
I-70	From	To	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
WB	California On-Ramp	--	C	26.2	B	19.9
WB	Adams Off-Ramp	--	D	30.2	C	23.0
WB	Adams Off-Ramp	Adams On-Ramp (Merge)	C	22.7	B	16.0
WB	Adams St. On-Ramp (Weave)	10th Avenue Off-Ramp	D	32.4	C	24.4
WB	8th Avenue Off-Ramp	--	B	13.5	B	12.0
WB	8th Avenue Off-Ramp	8th Avenue On-Ramp	A	7.9	B	11.9
WB	8th Avenue On-Ramp	4th Street Off-Ramp	A	8.2	B	13.8
WB	4th Street Off-Ramp	3rd Street On-Ramp	B	11.3	C	20.1
WB	3rd Street On-Ramp	--	B	11.9	C	25.4
WB	3rd Street On-Ramp	1st Street On-Ramp	B	12.5	C	22.1
WB	1st Street On-Ramp	--	B	14.7	D	29.3
WB	1st Street On-Ramp	MacVicar Avenue Off-Ramp	B	14.7	D	29.2
WB	MacVicar Avenue Off-Ramp	--	B	15.0	D	29.0

Table 2.3 shows the expected level of service for eastbound I-70 in the year 2040. During the morning peak period, the area between the MacVicar Avenue interchange and the 1st Street exit ramp is very congested; the highway is at capacity. During the evening peak period, the area between the 10th Avenue entrance ramp and the Adams Street exit ramp is becoming more congested.

Table 2.3 Level of Service for Eastbound I-70 in the Year 2040 (No Build Condition)

Segment			AM Peak		PM Peak	
I-70	From	To	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
EB	MacVicar On-Ramp (Merge)	--	E	36.4	C	24.1
EB	MacVicar Avenue (Merge)	1st Street (Diverge)	E	40.0	C	23.3
EB	1st Street Off-Ramp (Diverge)	--	E	38.4	C	24.9
EB	1st Street (Diverge)	3rd Street (Diverge)	C	24.5	C	18.9
EB	3rd Street Off-Ramp (Diverge)	--	C	27.6	C	21.8
EB	3rd Street (Diverge)	4th Street (Merge)	B	14.8	B	16.8
EB	4th Street (Merge) Weave	8th Avenue (Diverge)	B	14.5	C	21.5
EB	8th Avenue (Diverge)	8th Avenue (Merge)	A	7.8	B	13.0
EB	8th Avenue On-Ramp (Merge)	--	B	11.8	C	22.9
EB	10th Avenue (Merge) Weave	Adams Street (Diverge)	A	9.8	D	33.2
EB	Adams Street (Diverge)	Adams Street (Merge)	A	8.2	C	24.0
EB	Adams Street (Merge) Weave	California Avenue (Diverge)	A	9.9	D	27.8

Table 2.4 shows the expected level of service for westbound I-70 in the year 2040. During the morning peak period, traffic demand on I-70 exceeds the highway's capacity between the entrance ramp from California Avenue and the Adams Street exit ramp. The segment of I-70 from Adams Street to 10th Avenue is also congested. During the evening peak period, I-70 operates at capacity or LOS E on the Polk-Quincy Viaduct, then traffic demand exceeds capacity between the 1st Street entrance ramp and the MacVicar Avenue exit ramp.

Table 2.4 Level of Service for Westbound I-70 in the Year 2040 (No Build Condition)

Segment			AM Peak		PM Peak	
I-70	From	To	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
WB	California On-Ramp	--	F	Over Capacity	C	27.5
WB	Adams Off-Ramp	--	F	Over Capacity	D	31.7
WB	Adams Off-Ramp	Adams On-Ramp (Merge)	E	42.2	B	17.4
WB	Adams St. On-Ramp (Weave)	10th Avenue Off-Ramp	D	29.8	B	18.5
WB	8th Avenue Off-Ramp	--	C	27.1	C	21.8
WB	8th Avenue Off-Ramp	8th Avenue On-Ramp	B	14.0	B	16.4
WB	8th Avenue On-Ramp	4th Street Off-Ramp	C	22.5	C	22.9
WB	4th Street Off-Ramp	3rd Street On-Ramp	B	15.7	D	30.4
WB	3rd Street On-Ramp	--	C	20.9	E	35.7
WB	3rd Street On-Ramp	1st Street On-Ramp	C	18.4	E	36.1
WB	1st Street On-Ramp	--	C	22.4	F	Over Capacity
WB	1st Street On-Ramp	MacVicar Avenue Off-Ramp	C	23.0	F	Over Capacity
WB	MacVicar Avenue Off-Ramp	--	C	24.8	F	Over Capacity

Accessibility: Connections to I-70 lack balance, with the majority occurring on the east side of the Downtown area and with minimal access on the north side of Downtown. This results in poor access being provided to North Topeka and to the proposed Riverfront redevelopment area.

The I-70 corridor is and will remain a successfully integrated multi-modal corridor for both people and goods. I-70 is a primary route for the movement of freight both locally and throughout Kansas. I-70 serves a significant number of local drivers, who live, work, and shop in and near Downtown Topeka. The Topeka Metropolitan Transit Authority makes significant use of I-70 as do the buses operated by School District 501. Pedestrians and bicyclists cross over or under I-70 at numerous locations.

Community Issues **–** I-70 provides a vital link between Downtown Topeka, the community, the state, and the Midwest. I-70 is a dominant feature of Downtown Topeka. Specific issues relating to the community that were identified by the public and stakeholders are:

Community Issues

- *Minimal access* between I-70 and the north side of Downtown Topeka, the Riverfront area, and North Topeka
- *Visual barrier* between Downtown and the Riverfront area is created by the present configuration of the I-70 Polk-Quincy Viaduct
- *Transit, bicycle, and pedestrian needs* should be considered when designing improvements to I-70
- *Access* to I-70 for emergency services should be considered during design

Urban Design Issues

- *Aesthetics* of proposed improvements should reflect positively on the community
- *Public areas* should be considered as part of future improvements
- *Land use/potential development* should be supported by future improvements
- *Excess right-of-way* should be addressed
- *Transit, bicycle, and pedestrian crossings* over/under future I-70 improvements are important
- *Connection locations* between I-70 and the city street system should be logical

Improvements to I-70 need to provide balanced access to serve the north end of Downtown, the proposed Riverfront redevelopment area, East Topeka, and North Topeka as well as the heart of the Downtown area.

Support Economic Development: I-70 is the primary route to bring local and regional trips to areas in and near Downtown Topeka. However, I-70 currently provides convenient access to only two of four redevelopment areas. Existing ramps provide connections to city streets primarily on the east side of the Downtown area. No direct connections serve the proposed Riverfront redevelopment area or North Topeka.

Downtown: A resurgence of development is beginning to take hold in Downtown Topeka. The rehabilitation of buildings along Kansas Avenue and 8th Avenue, a proposed redesign of Kansas Avenue, and ***potential Entertainment District*** development south of 10th Avenue are breathing new life into the area. This redevelopment activity has prompted the local leaders to take a long-range view of the Downtown transportation network and look for opportunities to improve mobility to better support this growth. I-70 plays a major role in supporting development in the Downtown area.

Riverfront Redevelopment Area: A master plan has been developed for the proposed redevelopment of the area north of I-70 between Topeka Boulevard and Kansas Avenue. The master plan calls for a mixed-use development on both banks of the Kansas River including residential, commerce, and public spaces.

North Topeka: North Topeka is experiencing redevelopment on North Kansas Avenue. A number of new businesses are opening centered on the creation of the North Topeka Arts District. The historic Great Overland Station, a restored UP railroad station, is also located in the area containing a railroad museum and facilities for community events.

Purpose and Need Summary

The purpose of the proposed actions to I-70 is to meet current roadway/bridge design criteria, improve safety, increase roadway traffic capacity, balance accessibility, and support economic development in and near the Downtown area.

Specifically, the project addresses the following needs:

- Design: While appropriate for its time, the geometric features of I-70 do not meet current highway design criteria.
- Safety: The design of the current transportation infrastructure results in safety concerns for motorists entering and exiting I-70, traversing the 3rd Street curve, and crossing the Polk-Quincy Viaduct.
- Roadway Capacity: Designed in the 1950's, segments of the highway experience congestion during peak traffic flow periods.
- Accessibility: There are a number of key destinations in or near the I-70 corridor, but these locations are difficult to reach using the current transportation infrastructure. Current connections between I-70 and city streets are located primarily on the east side of the Downtown area. No direct connections are provided to the two major north-south arterial streets (Topeka Boulevard and Kansas Avenue) that connect North Topeka, the Riverfront Area, and Downtown Topeka.
- Economic Development: Improvements to I-70 and its connections to city streets will support the current development/redevelopment efforts in Downtown Topeka and North Topeka as well as support planned developments in the Entertainment District and the Riverfront Area.

Section 3: Public/Stakeholder Outreach Summary

A significant public and stakeholder outreach effort was a key part of the I-70 Polk-Quincy Viaduct Concept Design Study. The following is a summary of: 1) the study oversight structure; 2) the public and stakeholder outreach efforts; 3) the community issues identified through the outreach; 4) the project goals and evaluation criteria that were developed; and, 5) the revised alternatives, preferred alternative, future design consideration, and resulting public/stakeholder input.

Study Oversight

The study and public/stakeholder outreach was guided by two groups: the Core Team and the Project Advisory Committee.

Core Team: The Core Team members noted in Table 3.1 guided the study process and served as the decision making entity.

Table 3.1 Core Team Members

Name	Organization
Bob Hirt, Project Manager	KDOT Road Design
Jim Brewer	KDOT Road Design
Rod Lacy	KDOT Road Design
Brad Rognlie	KDOT Bridge Design
Kim Qualls	KDOT Public Involvement
Curt Niehaus	KDOT Topeka Metro Office
Thomas Dow	KDOT Planning
Becky Pepper	KDOT Planning
Sara Peters	KDOT Transportation Safety and Technology
David Thurbon	City of Topeka Planning/MTPO
Carlton Scroggins	City of Topeka Planning/MTPO
Shawn Bruns	City of Topeka Engineering
Linda Voss	City of Topeka Traffic Engineering
John Knowles	FHWA
Jim Tobaben	PB Americas, Inc. – Consultant Team

Project Advisory Committee: The project advisory committee (PAC), noted in Table 3.2, was an informed group of stakeholders representing a wide range of community organizations. The PAC was established to provide input and feedback during the concept design study.

The PAC was guided by agreed upon principles, which include:

- Gaining an understanding of long-term transportation requirements
- Creating goals (page 28) and helping to define evaluation criteria (page 29)
- Integrating community needs and values in the deliberations
- Providing input into improvement concepts and selection of concepts to carry forward

Table 3.2 Project Advisory Committee Members

Name	Organization
Karen Hiller, Council Member	City Council Representative, District 1
John Moyer, East Topeka North NIA	Neighborhood Association Representative
Christy Caldwell, Vice President Government Relations	Chamber of Commerce
Mike Hayden, Chairman of the Topeka/Shawnee County Riverfront Authority and Secretary of the Kansas Department of Wildlife and Parks	Riverfront Authority
William Beteta, Executive Director	Heartland Visioning
Susan Mahoney, Executive Director	Downtown Topeka, Inc.
Fred Patton, President of the Board of Directors	North Topeka Business Alliance
John Lauer, Ward Meade NIA	Citizens Advisory Council
Shelly Buhler, Vice Chair, SN County Commission	Chairperson of the MPO
Miriam Krehbiel, President/CEO	United Way of Greater Topeka
Tom Whitaker, Executive Director	Kansas Motor Carriers Association
Lonnie Martin, Member	City Landmark Commission
Chad Lamer, President	Friends of the Kaw
Michelle Hoferer, Commissioner	City Planning Commission

The PAC provided a community perspective throughout the study process. They were involved in establishing the project goals and developing the criteria by which potential improvement alternatives were evaluated. Both the PAC and Core Team were involved in narrowing the potential alternatives from 17 to 3. Both were involved in subsequent revisions to the three alternatives. In addition, the Core Team and PAC have been involved in the discussion regarding whether I-70 should be constructed as a new viaduct or a below-grade facility.

PAC meetings:

- September 29, 2009: Introduction to Study, Study Process, Stakeholder Outreach Results, Discuss Issues, Discuss Goals, Develop Evaluation Criteria
- February 5, 2010: Discuss the Results of "Weighting" the Evaluation Criteria, Discuss Potential Improvement Alternatives and Reduced to 3 Alternatives for Detailed Analysis
- April 26, 2010: Discuss Details of Three Alternatives, Discuss Above-Grade and Below-Grade Options, Urban Design Forms
- July 6, 2010: Discuss Community Input, Discuss Findings for the 3 Alternatives, Discuss Recommendations for Above-Grade Option, Discuss Technical Recommendation for Preferred Alternative
- October 5, 2010: Discuss Revised Alternatives
- December 10, 2010: Discuss Stakeholder Input Regarding the Revised Alternatives

Outreach Efforts

As the technical work on this project proceeded, so did the community engagement.

Summary of Public and Stakeholder Outreach: The following is a list of the outreach efforts for the I-70 Polk-Quincy Viaduct Project. Additional detail is provided for many of these items in the pages that follow.

- 27 stakeholder interviews
- Between 1,400 and 1,500 postcards directly mailed to property and business owners in the study area
- One "storefront" stakeholder day
- Four open house public meetings
- One on-line "virtual" public meeting
- A project specific web site
- Three fact sheets
- Three press releases
- Seven Project Advisory Committee meetings
- Three presentations to the Topeka City Council
- One briefing to the Topeka mayor

- One presentation to the Shawnee County Commission
- Multiple stakeholder meetings

Table 3.3 shows the initial outreach efforts from introducing the study to developing goals and evaluation criteria to identifying and presenting the original three alternatives for public and stakeholder input.

Table 3.3 Timeline of Initial Stakeholder and Public Participation Efforts

Date	Outreach Effort	Purpose
June 15, 2009	Metro Topeka Planning Organization	Introduction to Study
Aug. 2009 to Present	Website	Information on Study
July-Sept. 2009	27 Stakeholder Interviews	Businesses & Organizations
July 22, 2009	City Council Work Session	Introduction to Study
September 29, 2009	Project Advisory Committee Meeting	Introduction to Study, Issues, Goals
October 1, 2009	Stakeholder "Open House"	750 postcard invitations sent
October 13, 2009	Public Meeting #1	Introduction, Issues, Goals
February 5, 2010	Project Advisory Committee Meeting	Discuss Alternatives
February 9, 2010	City Council Work Session	Discuss Alternatives, Next Steps
February 11, 2010	Downtown Planning Team Meeting	Discuss Alternatives, Issues
February 15, 2010	Planning Commission Meeting	Discuss Alternatives
February 17, 2010	Metro Topeka Planning Organization	Discuss Alternatives
February 22, 2010	Riverfront Authority Meeting	Discuss Alternatives
February 25, 2010	Heartland Visioning Meeting	Discuss Alternatives
March 8, 2010	City Parks & Rec. Meeting	Discuss Alternatives, Issues
April 19, 2010	County Commission Meetings	Discuss Alternatives, Issues
April 23, 2010	Meeting with Mayor Bunten	Discuss Alternatives
April 26, 2010	Project Advisory Committee	Discuss Alternatives, Urban Design
April 28, 2010	Public Meeting #2	Present Alternatives
April 28, 2010	Virtual Meetings	Web-based Presentation of Alt's.
May 11, 2010	Chamber of Commerce Meeting	Discuss Alternatives, Above/Below
July 6, 2010	Project Advisory Committee Meeting	Project Status
July 30, 2010	Meeting with Jim Rinner	Project Concepts
August 13, 2010	Presentation – Downtown Optimists	Project Issues, Alternatives
August 13, 2010	Meeting with Jim Ogle	Project Concepts, Media
August 31, 2010	Downtown Topeka, Inc. Meeting	Discuss Alternatives
August 31, 2010	Focus Group Meetings	Discuss Issues, Alternatives
September 8, 2010	Meeting with Council Member Hiller	Discuss Study Status
September 9, 2010	1st Street Neighborhood Associations	Discuss 1st Street Connections
September 10, 2010	Meeting with Jim Ogle	Discuss Prime Time Special

Table 3.4 shows the outreach efforts beginning with the revised alternatives and continuing through the determination of the preferred alternative.

Table 3.4 Timeline of Stakeholder and Public Participation Efforts – Revised Alternatives

Date	Outreach Effort	Purpose
September 28, 2010	Public Information Meeting #3	Discuss Revised Alternatives
October 5, 2010	Project Advisory Committee	Discuss Revised Alternatives
November 2, 2010	Meeting with Mr. Rinner, Ogle, Parrish	Discuss Revised Alternatives
November 15, 2010	1st Street Neighborhood Associations	Discuss Options for 1st Street
November 16, 2010	Chamber of Commerce/DTI Meeting	Discuss Revised Alternatives
November 17, 2010	Metro Topeka Planning Organization	Discuss Revised Alternatives
December 2, 2010	Meeting with Topeka Transit Staff	Discuss Revised Alternatives
December 10, 2010	Project Advisory Committee	Rev. Alternatives Recommendation
December 20, 2010	Metro Topeka Planning Organization	Rev. Alternatives Recommendation
December 20, 2010	Topeka Metropolitan Transit Authority	Discuss Revised Alternatives
January 5, 2011	Riverfront Authority	Discuss Revised Alternatives
January 11, 2011	City Council Work Session	Discuss Revised Alternatives
January 25, 2011	North Topeka Business Alliance	Discuss Revised Alternatives
May 3, 2011	Public Meeting #4	Present Preferred Alternative

Website: An interactive project website http://i70polkquincy.ksdot.org/ was developed to provide information about the study, community issues, and potential changes to I-70 as well as an opportunity to provide comments. The web site included:

- Information regarding corridor transportation needs
- The video presentation made during the virtual meeting and 2nd public meeting
- An opportunity to comment on the three alternatives under consideration.
- Traffic simulations for each of the three alternatives

The web site continued to be updated over the course of the study.

Media Coverage: In addition to the website, staff and the consulting team reached out to community media outlets through press releases. The stakeholder open houses and the public meetings were covered by the local print and electronic news media.

Stakeholder Interviews: Stakeholder interviews were one-on-one or small group discussions with facilitated questions regarding I-70 and how it is used. Twenty-seven stakeholder interviews were conducted with the following organizations.

- Amtrak
- BNSF
- Corps of Engineers
- Downtown Topeka Inc.
- Goodyear
- Great Overland Station
- Greyhound Bus
- Hallmark Cards
- Hills Pet Products
- Kansas Highway Patrol
- Kansas Motor Carriers
- Kansas Department of Wildlife & Parks
- Kaw Valley Bicycle Club
- Let's Help
- North Topeka Business Alliance
- Parrish Hotels
- Riverfront Authority
- Shawnee County Sherriff
- Topeka Capital-Journal
- Topeka Fire Department
- Topeka Independent Business Association
- Topeka Metropolitan Transit Authority
- Topeka Parks Department
- Topeka Police Department
- UPS
- US Foodservices
- USD 501

A summary of the issues identified during these meetings and subsequent public and stakeholder input can be found beginning on page 25.

Storefront Stakeholder Open House: From 11 a.m. to 7 p.m. October 1, 2009, area property owners, business owners, residents, and other stakeholders had a chance to learn about the project as well as provide input. Between 700 and 800 postcards were sent to properties in the study area; about 60 people attended.

The format of the meeting was four separate stations or activities.

- Stakeholder Survey – Attendees were asked to complete the survey that day or take it with them and return it by e-mail, fax or U.S. mail.
- Interactive Map Exercise – This provided an opportunity for stakeholders to put thoughts and ideas directly on a map of the study area.

- Project Displays – Several maps showing different views of the study area were on display. Team members were available to talk with stakeholders.
- Individual/Small-Group Discussions – For those who live, work or own a business in the study area, this was an opportunity to speak more in-depth with a team member about any thoughts or concerns about the project.

Public Open Houses: Four public open house meetings were held during the course of the study.

October 13, 2009

The first open house public meeting was conducted on October 13, 2009. It was publicized on the web site and through a media release. Sixteen interested people attended the event.

The format was generally the same as the stakeholder open house. However, the survey was changed to act as a guiding document for the event, with the questions corresponding to the display boards. Additionally, some of the display boards were updated and attendees had the opportunity to attend one of two presentations about the project. Project team members were available to answer questions and discuss the study.

A press release was issued to let stakeholders know that the information from the open house and survey document was posted on the project website and that there was still opportunity to provide input.

April 28, 2010

A second open house public meeting was conducted on April 28, 2010. This session gave the public and stakeholders an opportunity to review issues regarding the current viaduct, the goals for the project, and the three alternatives selected by the Core Team and Project Advisory Committee for further review. Participants were also able to provide their input regarding the advantages and disadvantages of each of the three alternatives.

Again, nearly 700 postcards were sent to residents and businesses in the study area. It was publicized on the web site and through a media release. Twenty-two people attended. The meeting was covered by a local television station and the Topeka Capital Journal.

September 28, 2010

A public information meeting was held on September 28, 2010 to present the revised alternatives and seek public input regarding those changes. Traffic impacts and proposed changes in access to I-70 were discussed.

May 3, 2011

The final open house public meeting was held on May 3, 2011. The preferred alternative was presented to the public for their information, review, and comment.

Virtual Meeting: To reach out to additional stakeholders, KDOT and the consulting team conducted a virtual meeting on the afternoon of the April 28, 2010 open house. This allowed anyone who wanted to use his or her computer to view the presentation and submit questions and comments. Participants had to register in advance and must have had access to a computer and internet connection. Participants saw the same presentation as if they were at a live public meeting but with the convenience of viewing it on their own computer.

Focus Group Meetings: The ETC Institute conducted three focus groups with residents living in Topeka, Kansas. The purpose of the focus groups was to gather input from residents who have traveled on I-70 near downtown Topeka, including the almost 3400-foot long Polk-Quincy Viaduct. Input from the focus groups helped assess the desirability of transportation improvements that were being considered in the area. The focus groups were conducted on August 31, 2010 with a randomly selected group of residents. A total of 28 residents, 9-10 participants per group, attended the focus groups. The sessions were 90 minutes long and were moderated by a representative from the ETC Institute. The overall results of these group meetings were statistically valid. A report summarizing the results of the focus group meetings is found in Appendix I.

The sections of I-70 that participants felt had the most travel issues were near the ramps for 3rd Street, 4th Street, 8th Avenue, and 10th Avenue. When asked why these areas were a concern, the frequently mentioned reason was because of safety issues associated with merging on/off the highway. Other concerns participants expressed for these sections of highway included the sharpness of the curve near 3rd Street, the narrowness of the shoulders on the viaduct, and the speed of traffic.

The focus group moderator provided a brief overview of the elevated and the below-grade options for I-70 from west of Topeka Boulevard to east of Kansas Avenue. After explaining each option individually, the moderator asked participants which option they favored. Most participants liked the elevated option (82%), 11% disliked the elevated option, and 7% were neutral.

During each session, the moderator provided an overview of each of the three design alternatives being considered for the study area. After explaining each alternative, the moderator asked the participants whether they liked that option and why. Generally, participants thought that all three alternatives were acceptable; however, after explaining the advantages and disadvantages of each option, Alternative #1 was more preferred.

Community Issues

Through the outreach efforts including stakeholder interviews, public meetings, and comments received through the website, a wide variety of issues, concerns, and desired outcomes were brought to the attention of the Core Team and Project Advisory Committee.

Summary of Stakeholder and Public Input: The following is a listing of the issues, concerns, and desired improvements that have been identified by the community:

Safety Issues on I-70

- 3rd Street curve – design speed is too low
- 3rd Street westbound on-ramp – length of acceleration lane is too short
- 3rd Street eastbound off-ramp – traffic control at 3rd Street is unusual in that 3rd Street stops for the ramp causing confusion for unfamiliar drivers
- City emergency personnel no longer use 3rd Street on-ramp to westbound I-70 due to its geometric characteristics and safety concerns
- Westbound I-70, 8th Avenue on-ramp to 4th Street off-ramp – minimal weave distance
- Minimal width shoulders on viaduct – no room to pull out of the travel lanes
- Incidents or crashes on the viaduct or curve often result in secondary crashes as traffic becomes congested and backs up from the initial site
- An incident on the viaduct as simple as a flat tire requires 3 to 4 patrol cars to control traffic
- Officer safety is a concern when working an incident on the viaduct as there is no escape route and no room for error
- Wet weather increases crashes
- Snow when pushed to side of road can become an icing issue as snow melts, runs across roadway, and freezes
- Better communication with drivers needed to warn of incidents
- Concerns for sight distance along I-70
- Too many ramps (confusing drivers)

Access Issues

- Connect I-70 to Topeka Boulevard or Kansas Avenue or both – this access is very important to continued development in Downtown, North Topeka, and the proposed Riverfront area
- Street connections across I-70, either under or over, are very important
- Too many ramps on the east side of downtown
- Need for adequate number of access points to serve the downtown area
- Relocating 3rd and 4th street ramps not a concern to most stakeholders that have been interviewed

- Travelers to/from North Topeka are currently more likely to use the Oakland Expressway or Highway 75 in order to access I-70

Traffic Issues

- BNSF deliveries are primarily from the east on I-70 and use the 4th Street exit ramp, difficulties are experienced in crossing Madison Street to turn right on 4th, some trucks use the 3rd Street exit
- Most BNSF employees use the 8th Avenue interchange
- Closure of the 4th Street exit ramp will put more traffic on Madison from 8th or 10th Streets
- 8th Avenue and 10th Avenue are gateways to downtown
- Ramada Inn customers mainly use the 8th Avenue interchange
- Hallmark Cards – most deliveries come from the east on I-70 and use the exit ramp at 4th Street – loading docks are on the north side of the building, difficulties in crossing left turn lanes in order to go north on Madison Street
- Trucks have a difficult time getting back to eastbound I-70 from Hallmark
- Hallmark has 600 employees, with most coming to work from the north and west – they use the 3rd Street exit ramp
- How would I-70 changes impact parking lots along I-70
- USD 501 (40 school buses a day use I-70 and need better access to Topeka Boulevard and or Kansas Avenue
- Heavy concentration of large trucks and buses north of I-70
- UPS uses 3rd and 4th Street ramps

Transit Issues

- 3 transit routes (2 buses per hour to and from Quincy Street station) use I-70
- Now use 1st Street exit and entrance as it provides a safer route than 3rd Street
- Paratransit service to medical facilities use I-70 with 50-60 passengers per day to the Cotton O'Neil clinic near 29th & Croco and many more trips to Tallgrass, St. Francis, and Stormont medical centers
- More direct connection to and from Topeka Blvd. and Kansas Avenue would benefit bus route structure

Bicycle Issues

- Current city streets under I-70 don't have the width to accommodate bicycles
- A bicycle route that parallels I-70 is a desirable transportation facility
- The Shunga Trail should be connected to the proposed Riverfront Area
- If a "below grade" option for I-70 were to be selected, bicycle and pedestrian crossings are a key issue

- Design of drainage facilities and storm grates are safety issues for bicycles
- Visibility of bicyclists is an important consideration with planning landscaping
- Design of connections to bicycle trails is critical – no right angle turns
- Bicycle trails are proposed using the levees

Social Issues

- Rescue Mission to Let's Help – pedestrian traffic during lunchtime – up to 500 people
- School bus from Rescue Mission to various schools
- Paratransit service from low income areas to medical facilities
- Large bus-dependent and bicycle-dependent population east of Adams Street

US Army Corps of Engineers Issues

- Levee Critical Zone – 500'
- Levee improvements are planned (replace concrete flood wall and reduce seepage under berm)
- I-70 embankment is the levee for a distance east of MacVicar Avenue
- Pump station tied to storm sewers

Aesthetic Issues and Preferences

- Aesthetics of the I-70 improvements are important
- The below grade options was initially preferred by many stakeholders
- View from downtown toward the Riverfront is important
- View of Downtown and Riverfront from I-70 is important
- Need to include green/open space
- View of the river could be important

Business/Economic Development

- I-70 is extremely important to businesses as a route for customers
- Impacts of construction on businesses must be considered
- Ramada Inn – 256 sleeping rooms, 58 apartments, 2 floors office/commercial space, and 33,000 sq. ft. of banquet space
- Potential riverfront development would have a tremendous impact on Topeka
- Watertower area development is a possibility – primarily one owner, therefore a development project could move forward quickly
- Ice Rink will be developed near 8th Avenue and Madison Street
- Most employees for major businesses drive to work, a few use transit or ride bicycles

- 501 School District is planning new facilities on the former State Hospital grounds on MacVicar Avenue that could add 600-1100, possibly up to 1500 people going to and from this location daily

Miscellaneous

- BNSF has track along 1st Street east of Madison that is used for switching operations to serve the mill
- Other sections of I-70 near US-75 and I-470 also experience traffic problems.
- Considerable fuel deliveries along Crane Street
- I-70 is an important route for people visiting Hummer Sports Park
- Build on an offset alignment to minimize traffic disruption during construction.
- Ward Meade and Auburndale Parks near I-70.

Desired Improvements

- Improve the design speed of the 3rd Street curve
- Provide 3 through lanes in each direction on I-70
- Provide shoulders on viaduct
- Provide longer ramp acceleration and deceleration lanes
- Provide connections between I-70 and Topeka Blvd. or Kansas Av.
- Provide better highway lighting

Development of Project Goals and Evaluation Criteria

Prior to developing potential improvement alternatives for I-70, project goals and evaluation criteria were developed to be used in screening a full range of alternatives to determine three that would be carried forward for detailed analysis.

Project Goals: Based upon the input from the public and stakeholders, the Core Team and the Project Advisory Committee developed goals for the highway design and the community connections between I-70 and adjacent land use. The goals are to:

1. Maintain safe, efficient operation and capacity for interstate trips.
2. Maintain safe, efficient operation and capacity for local trips.
3. Meet current geometric design criteria for design speed, shoulder width, ramp lengths, and interchange spacing.
4. Meet current bridge design criteria.

5. Consider facility maintenance issues/costs in the design of new highways, streets, and bridges.
6. Provide logical/reasonable connections to downtown Topeka, North Topeka, and the Riverfront area.
7. Consider the needs for modes of transportation other than automobiles and commercial trucks to cross or access I-70.
8. Consider urban design elements as part of future I-70 corridor design, including aesthetics, potential land use, public areas, and the overall connections between land use, city streets, and I-70.
9. Enhance economic development opportunities in areas near I-70.
10. Stage/phase construction to minimize disruption of traffic flow and to maximize financial feasibility.

Evaluation Criteria: A series of nine criteria was established by the Core Team and the Project Advisory Committee to evaluate alternatives for improving I-70. These criteria address the project goals for the I-70 corridor.

1. *Roadway Design*: addresses the design speed of the 3rd Street curve; concerns about acceleration/deceleration lane lengths; narrow shoulders on viaduct; inadequate spacing between ramps; flexibility for future expansion of I-70 and local streets; and adequate drainage.
2. *Safety*: addresses reducing the number of crashes along I-70, including the high crash areas along I-70 and crossing I-70 on the local street system.
3. *Traffic Mobility and Circulation*: provides for the movement of through traffic on I-70 and for the logical circulation of traffic on the city street system.
4. *Access and Connectivity*: provides access from I-70 to Topeka Boulevard and/or Kansas Avenue as well as logical and reasonable access to I-70 from the local streets; interchanges provide full traffic movements to and from I-70.
5. *Economic Goals*: ensures that future development/redevelopment goals are considered and promotes community connectivity.
6. *Construction and Maintenance*: considers project and maintenance costs; traffic issues during construction; phased construction; and highway maintenance.
7. *Environmental Issues*: minimize impacts on historic properties, the environment, and adjacent properties. Also considers environmental justice.

8. *Aesthetics*: enhances view shed between downtown and the river; recognizes the importance of the roadway and bridge and considers the view from I-70.
9. *Multimodal Considerations*: addresses transit, bicycle and pedestrian needs.

These criteria were utilized to narrow 17 potential improvement scenarios to three that were analyzed in greater detail. The three alternatives were presented to the public for comment. Similar criteria were used to determine a locally preferred alternative.

Revised Alternatives

Public and stakeholder input regarding the original three alternatives included a desire for an additional connection between I-70 and the local street system in downtown. It was determined that 6th Avenue was the recommended location for this additional connection. The three alternatives were revised and additional public and stakeholder outreach was conducted to provide information regarding the revised alternatives and to continue the opportunity for community input.

Public Information Meeting: A public information meeting was held on September 28, 2010 to present the revised alternatives and seek public input regarding those changes. Traffic impacts and proposed changes in access to I-70 were discussed.

Stakeholder Meetings: Stakeholder meetings were conducted with a number of groups and individuals to discuss the revised alternatives. A listing of these meetings is found on page 21. Through these discussions consensus was reached to pursue an elevated alignment (new viaduct) from west of Topeka Boulevard to east of Kansas Avenue. Most of the stakeholder groups preferred Alternative #1 Revised, with the downtown stakeholder groups preferring Alternative #3 Revised. Preferences are noted in Table 3.5.

Table 3.5 Stakeholder Group Preferences for a Preferred Alternative

Group	Above-Grade or Below-Grade	Access Alternative Preference
Core Team	Above-Grade	Alternative #1 (revised)
Project Advisory Committee	Above-Grade	Alternative #1 (revised) (7 for Alt #1, 5 for Alt #3)
Greater Topeka Chamber of Commerce	Above-Grade	Alternative #1 (revised) - Investigate 3rd EB I-70 exit
Downtown Topeka, Inc.	Above-Grade	Alternative #1 (revised) - Investigate 3rd EB I-70 exit
Community Focus Groups	Above-Grade	All Alternatives are Acceptable
Metropolitan Topeka Planning Organization	Above-Grade	Alternative #1 (revised)
Riverfront Authority	Above-Grade	Alternative #1 (revised)
North Topeka Business Alliance	Above-Grade	Alternative #1 (revised)
City Council	Above-Grade	Alternative #1 (revised) - Investigate 3rd EB I-70 exit

Final Public Open House: The final public open house for the Concept Study was conducted on May 3, 2011. This session provided the public and stakeholders the opportunity to view and discuss the Preferred Alternative as well as the City Council's request for a "Future Design Consideration" that would eliminate an eastbound on-ramp and add a third eastbound off-ramp. KDOT has agreed to further investigate this option as the project moves into preliminary design.

Fifty participants attended the meeting and had the opportunity to view a video presentation and talk with staff from KDOT, the City of Topeka, and the consultant team. Verbal comments were mixed with many supporting the Preferred Alternative and many desiring the third eastbound exit shown in the "Future Design Consideration". Sixteen written comments were received supporting the Future Design Consideration.

The information presented at the meeting was posted on the project website the following day for those who were unable to attend the meeting.

The final public open house was advertised in a number of ways. Nearly 700 postcards were sent to residents and businesses in the study area. It was publicized on the web site and through a media release. The meeting was covered by a local television station and the Topeka Capital Journal.

Section 4: Development of Alternatives

Introduction

An iterative process was used to identify and narrow the potential improvement alternatives for I-70 and the Polk-Quincy Viaduct. Project goals were developed by the Core Team of study sponsors and the Project Advisory Committee, which represented community organizations. Initial definitions for a range of alternatives were developed. Seventeen preliminary alternatives were identified based upon the initial definitions. The Core Team and Project Advisory Committee developed a set of evaluation criteria that were used to narrow the potential alternatives to three that were carried forward for more detailed analysis. The three alternatives were presented to the public and stakeholders for comment. Based upon the comments received, each of the alternatives was revised to include access to and from 6th Avenue. The three revised alternatives were further analyzed and a preferred alternative was recommended. In addition, vertical profiles for a new viaduct, a partially below-grade alignment, and a fully below-grade alignment were investigated.

Initial Definitions of Concept Alternatives

- **No Build Alternative** – develop a continued maintenance program for the I-70 Polk-Quincy Viaduct and adjacent segments of I-70. This alternative should include ITS applications to enhance safety at the 3rd Street Curve.
- **Replace "In Kind"** – reconstruct the viaduct on its current alignment with no widening for shoulders and minimal changes to other geometric features. Relocating the 3rd Street ramps to 4th Street would be considered. This alternative should include ITS applications to enhance safety at the 3rd Street Curve.
- **Reconstruct I-70** on its existing alignment including capacity and other roadway geometric improvements. This alternative should include ITS applications to enhance safety at the 3rd Street Curve.
- **Re-align I-70** and include increased capacity for traffic flow, roadway geometric improvements including the 3rd Street curve, and access improvements. Both a new viaduct and below-grade options will be explored for the section between Topeka Boulevard and Kansas Avenue.

Project Goals

Ten initial goals were identified to address the corridor's needs for improving the highway design and the community's connections between I-70 and the adjacent land use.

The initial project goals for the I-70 Polk-Quincy Viaduct are:

1. Maintain safe, efficient operation, and capacity for interstate trips.
2. Maintain safe, efficient operation, and capacity for local trips.

3. Meet current roadway geometric design criteria for design speed, shoulder width, ramp lengths, and interchange spacing.
4. Meet current bridge design criteria.
5. Consider facility maintenance issues/costs in the design of new highways, streets, and bridges.
6. Provide logical/reasonable connections to Downtown Topeka, North Topeka, and the Riverfront area.
7. Consider the needs for modes of transportation other than automobiles and commercial trucks to cross or access I-70
8. Consider urban design elements as part of future I-70 corridor design, including: aesthetics, potential land use, public areas, and the overall connections between land use, city streets, and I-70.
9. Enhance economic development opportunities in areas near I-70.
10. Stage/phase construction to minimize disruption of traffic flow and to maximize financial feasibility.

Preliminary Alternatives

Seventeen preliminary alternatives were developed for consideration:

- **Alternative 1:** Continued maintenance program for the I-70 Polk-Quincy Viaduct and adjacent sections of I-70. Includes ITS applications to enhance safety at the 3rd Street Curve.
- **Alternative 2:** Remove I-70's designation as an interstate highway and convert to an arterial street.
- **Alternative 3:** Replace the existing facility "In Kind" – reconstruct I-70 on its existing alignment with minimal geometric changes.
- **Alternative 4:** Reconstruct I-70 on the existing alignment and widen to six lanes.
- **Alternative 5:** Reconstruct I-70 on the existing alignment, widen to six lanes, and move the 3rd Street ramps to 4th Street to create a full diamond interchange.

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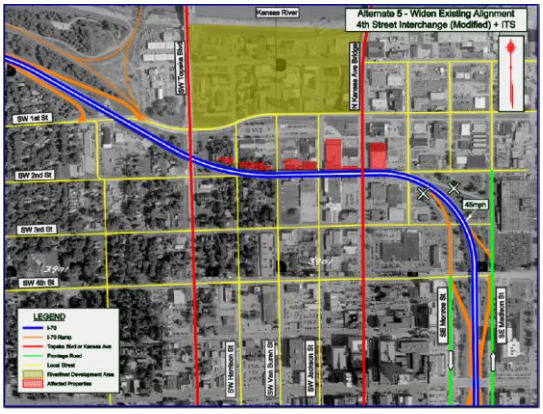
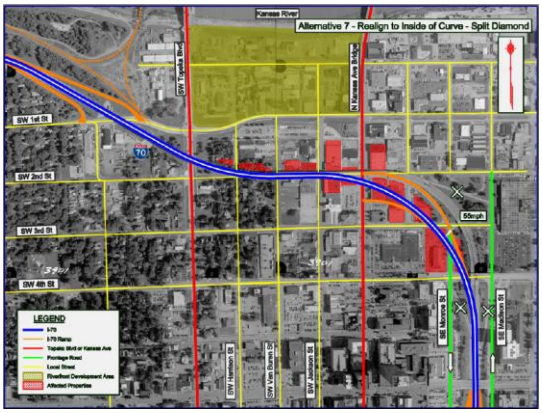
Alternative 4



Alternative 5

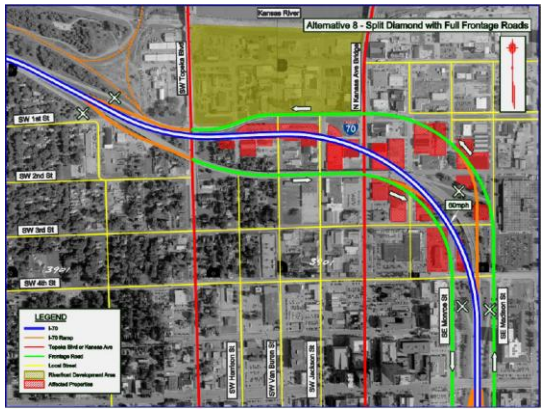
- **Alternative 6:** Realign I-70 to the inside of the 3rd Street curve and move the 3rd Street ramps to 4th Street.
- **Alternative 7:** Realign I-70 to the inside of the 3rd Street curve and construct a split diamond interchange connecting I-70 to 1st Street and Kansas Avenue.

Alternative 6

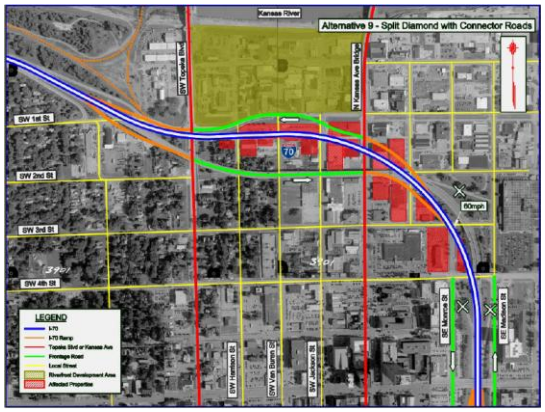


Alternative 7

- **Alternative 8:** Realign I-70 and create a split diamond interchange connecting I-70 to Topeka Boulevard and Kansas Avenue. Connector roads parallel to I-70 are continuous from Topeka Boulevard to 10th Avenue.
- **Alternative 9:** Realign I-70 and create a split diamond interchange connecting I-70 to Topeka Boulevard and Kansas Avenue. Connector roads parallel to I-70 connect the ramp intersections.

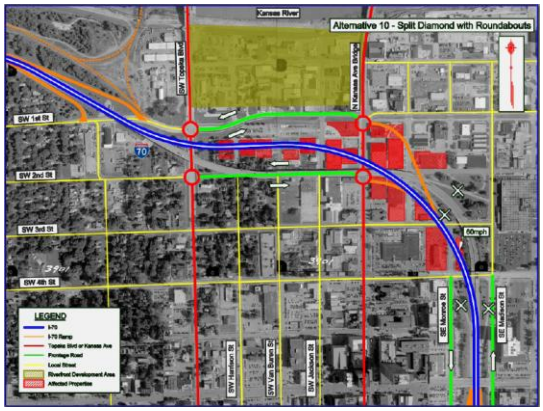


Alternative 8

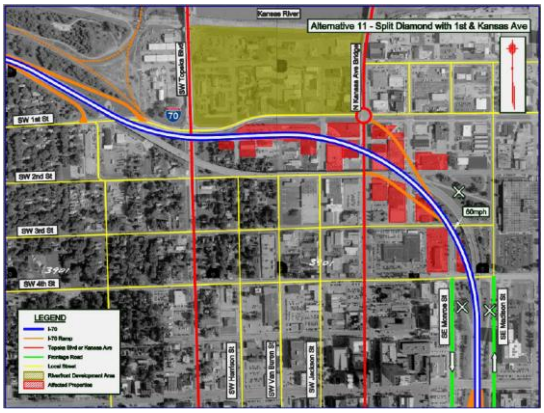


Alternative 9

- **Alternative 10:** Realign I-70 and create a split diamond interchange connecting I-70 to 1st Street and Kansas Avenue. Two-way connector roads are used with roundabouts at the ramp intersections.
- **Alternative 11:** Realign I-70 and create a split diamond interchange connecting 1st Street and Kansas Avenue with a roundabout at 1st and Kansas.

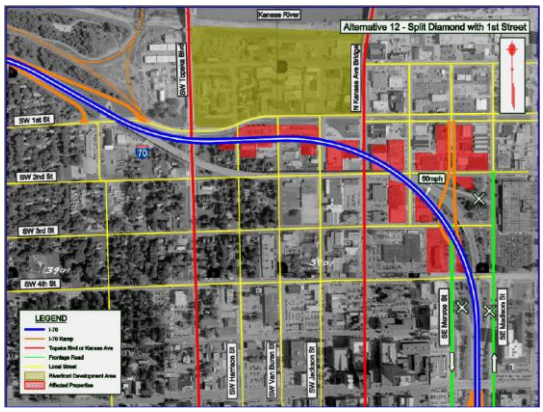


Alternative 10



Alternative 11

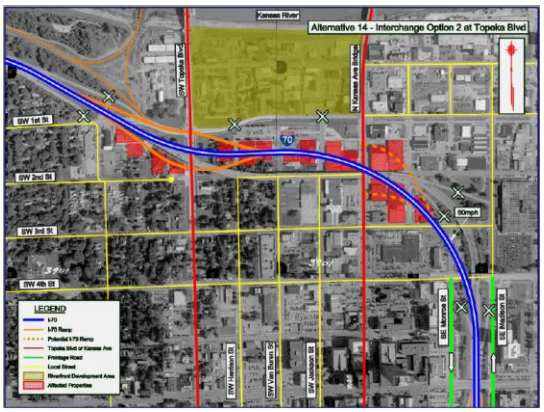
- **Alternative 12:** Realign I-70 and create a split diamond interchange connecting 1st Street west of Topeka Boulevard and 1st Street east of Kansas Avenue.
- **Alternative 13:** Realign I-70 and create a diamond interchange at Topeka Boulevard and possibly a half-diamond interchange at Kansas Avenue.



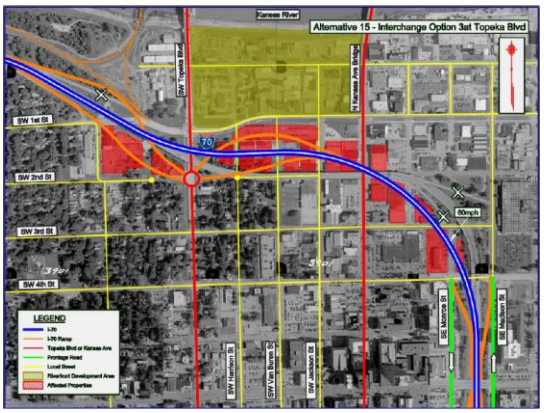
Alternative 12

Alternative 13

- **Alternative 14:** Realign I-70 and create a diamond interchange at Topeka Boulevard with 1st Street closed and, possibly, a half-diamond interchange at Kansas Avenue.
- **Alternative 15:** Realign I-70 and create a diamond interchange at Topeka Boulevard with a ramp intersection at 2nd Street and possibly a half-diamond interchange at Kansas Avenue.

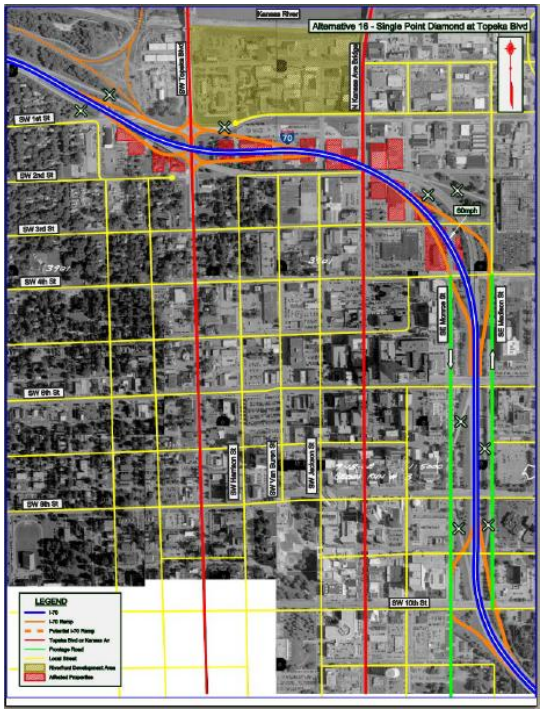


Alternative 14

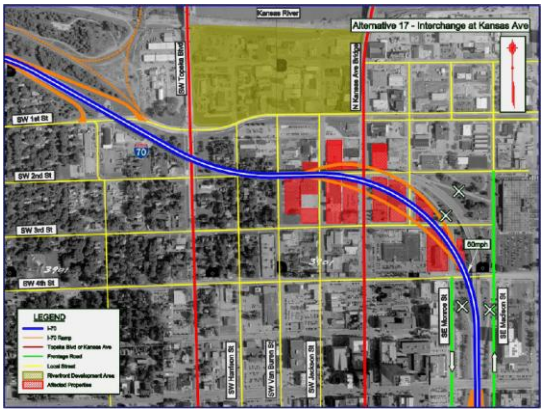


Alternative 15

- **Alternative 16:** Realign I-70 and create a single-point diamond interchange at Topeka Boulevard and with diamond interchanges at 4th Street and 10th Avenue.
- **Alternative 17:** Realign I-70 and create a diamond interchange at Kansas Avenue.



Alternative 16



Alternative 17

Evaluation Criteria

A series of nine criteria was established by the Core Team and the Project Advisory Committee to evaluate alternatives for improving I-70. These criteria address the project goals for the I-70 corridor.

1. **Roadway Design:** addresses the design speed of the 3rd Street curve; concerns about acceleration/deceleration lane lengths; narrow shoulders on viaduct; inadequate spacing between ramps; flexibility for future expansion of I-70 and local streets; and adequate drainage.
2. **Safety:** addresses reducing the number of crashes along I-70, including the high crash areas along I-70 and crossing I-70 on the local street system.
3. **Traffic Mobility and Circulation:** provides for the movement of through traffic on I-70 and for the logical circulation of traffic on the city street system.
4. **Access and Connectivity:** provides access from I-70 to Topeka Boulevard and/or Kansas Avenue as well as logical and reasonable access to I-70 from the local streets; interchanges provide full traffic movements to and from I-70.
5. **Economic Goals:** ensures that future development/redevelopment goals are considered and promotes community connectivity.
6. **Construction and Maintenance:** considers project and maintenance costs; traffic issues during construction; phased construction; and highway maintenance.
7. **Environmental Issues:** minimize impacts on historic properties, the environment and adjacent properties. Also considers environmental justice.
8. **Aesthetics:** enhances view shed between Downtown and the river; recognizes the importance of the roadway and bridge and considers the view from I-70.
9. **Multimodal Considerations:** addresses transit, bicycle, and pedestrian needs.

Initial Screening

These criteria were utilized to narrow 17 potential improvement scenarios to three that were analyzed in greater detail. Table 4.1 describes the initial set of alternatives, comments regarding their strengths and weaknesses, and whether they were recommended for more detailed analysis (shaded in blue).

Table 4.1 Initial Screening of Alternatives

Alternative	Comments	Screening
1. Continued Maintenance + ITS 2. Convert I-70 to City Street 3. Replace I-70 "In Kind" + ITS	• Lowest scores for: Roadway Design, Safety & Multimodal Considerations • Lowest scores for: Access/Connectivity, Support Economic Goals, Aesthetics • Transportation needs are not addressed	Dropped from Consideration
4. Reconstruct on Existing Alignment & Widen to 6 Lanes 5. Reconstruct on Existing Alignment, Widen to 6 Lanes, & Move 3rd Street Ramps to 4th Street	• 40 mph Design Speed for 3rd Street Curve is not improved • Doesn't Address Ramp Spacing • Doesn't Address Access/Connectivity Issues • Scored Low for Safety Improvement	Dropped from Consideration
6. Realign I-70 to Inside 3rd Street Curve, Move 3rd Street Ramps to 4th Street 7. Realign I-70 to Inside 3rd Street Curve, Split Diamond Interchange 1st Street/Kansas Avenue	• Improved Design Speed for 3rd Street Curve • Addresses Some Design Issues • Alternative #7 – Split is too Great • Doesn't Address Access/Connectivity Issues	Dropped from Consideration
8. Realign I-70, Split Diamond Interchange Topeka Boulevard/Kansas Avenue, Connector Roads Topeka Boulevard to 10th Avenue	• 3rd Highest Ranked Alternative • Addresses Design and Safety Issues • Addresses Access/Connectivity Issues	Continue with Detailed Analysis
9. Realign I-70, Split Diamond Interchange Topeka Boulevard/Kansas Avenue, Connector Roads Topeka Boulevard to Kansas Avenue	• Highest Ranked Alternative • Addresses Design and Safety Issues • Addresses Access/Connectivity Issues	Continue with Detailed Analysis
10. Realign I-70, Split Diamond Interchange 1st Street/Kansas Avenue, Two-Way Connector Roads Topeka Boulevard to Kansas Avenue	• Tied for 4th Highest Ranked Alternative • Some Similarities to Alternative #9	Dropped from Consideration
11. Realign I-70, Split Diamond Interchange 1st Street/Kansas Avenue, Two-Way Connector Roads Topeka Boulevard to Kansas Avenue with Roundabouts	• Addresses Design and Safety Issues • Not a True Split Diamond Interchange • Some Similarities to Alternative #9	Dropped from Consideration
12. Realign I-70, Ramp Connections to 1st Street west of Topeka Boulevard and 1st Street east of Kansas Avenue	• Addresses Design and Safety Issues • Not a True Split Diamond Interchange	Dropped from Consideration

Table 4.1 continued

Alternative	Comments	Screening
13. Realign I-70, Diamond Interchange with Roundabouts at Topeka Boulevard and Possible Half-Diamond Interchange at Kansas Avenue	• Tied for 4th Highest Ranked Alternative • Some Similarities to Alternative #16	Dropped from Consideration
14. Realign I-70, Diamond Interchange at Topeka Boulevard (1st Street Closed) and Possible Half-Diamond Interchange at Kansas Avenue	• Addresses Design and Safety Issues • Some Similarities to Alternative #16	Dropped from Consideration
15. Realign I-70, Interchange at Topeka Boulevard with Ramps Intersecting at 2nd Street	• Addresses Design and Safety Issues	Dropped from Consideration
16. Realign I-70, Diamond Interchanges at Topeka Boulevard, 4th Street, and 10th Avenue	• Addresses Design and Safety Issues • Addresses Access/Connectivity Issues • Second Highest Ranked Alternative	Continue with Detailed Analysis
17. Realign I-70, Diamond Interchange at Kansas Avenue	• Addresses Design and Safety Issues • Addresses Access/Connectivity Issues	Dropped from Consideration

Alternatives for Detailed Analysis

Three of the Preliminary Alternatives were selected for a more detailed level of analysis. These Alternatives were redesignated as follows:

- Preliminary Alternative #9 became Alternative #1
- Preliminary Alternative #8 became Alternative #2
- Preliminary Alternative #16 became Alternative #3

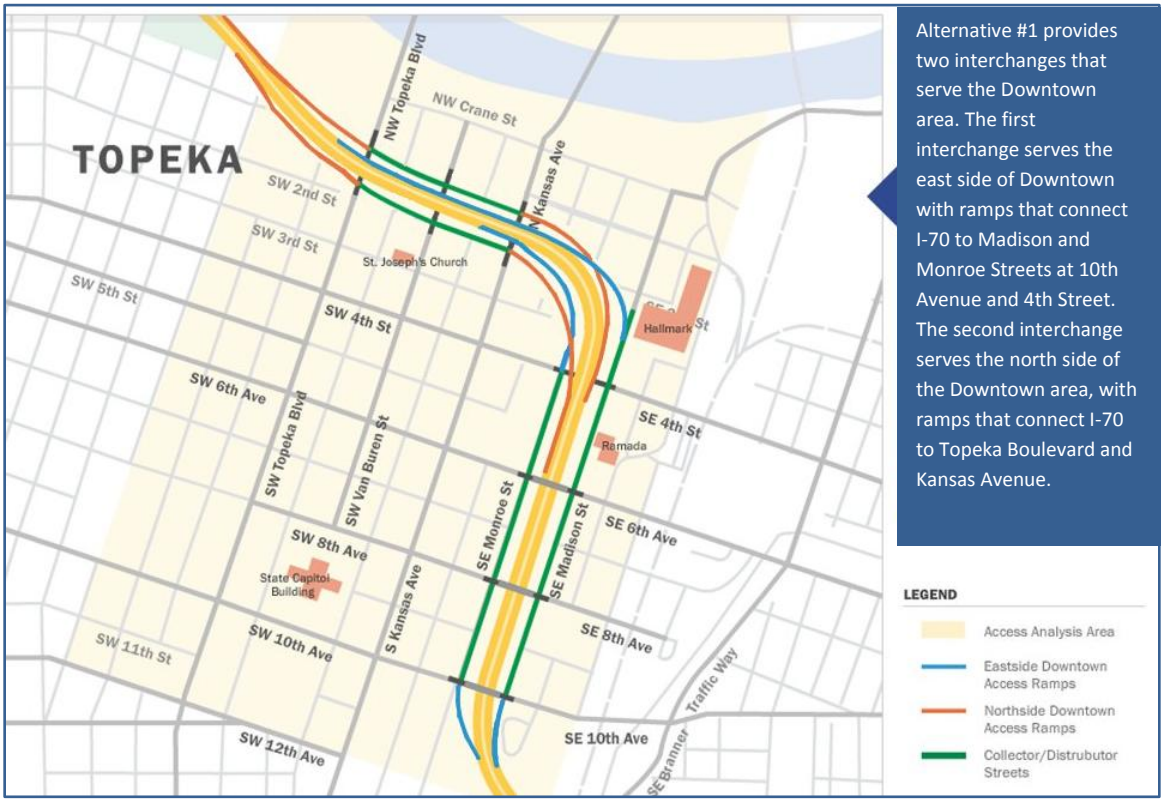
Planning level traffic forecasts were developed for the year 2040. Traffic analyses and VISSIM (traffic simulation) modeling were conducted for the no-build condition AM and PM peak periods as well as the AM and PM peak periods for each of the three alternatives. More information regarding this work can be found in Appendix A.

The potential application of Intelligent Transportation Systems (ITS) devices was reviewed with a primary focus on improving safety at the I-70 curve near 3rd Street. More information can be found in Appendix B.

Concept geometric design layouts were developed for each of the three Alternatives. This work included the development of preliminary horizontal alignment, profiles, and cross sections at critical locations. More information can be found in Appendix E.

Alternative #1 shown in Figure 4.1 provides two interchanges that serve the Downtown area. The first interchange serves the east side of Downtown with ramps that connect I-70 to Madison and Monroe Streets at 10th Avenue and at 4th Street. The second interchange serves the north side of the Downtown area, with ramps that connect I-70 to Topeka Boulevard and Kansas Avenue.

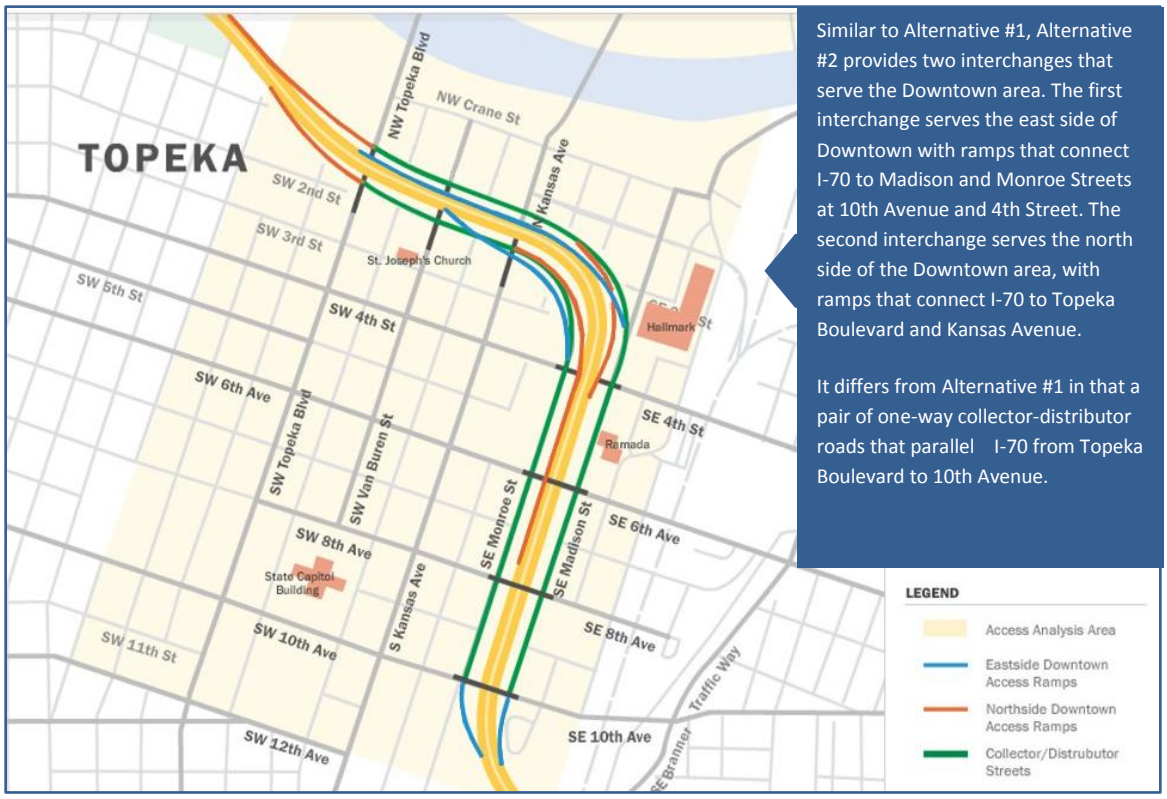
Figure 4.1 Alternative #1 Concept and Impacts



Westbound Exits /Entrances	Exit I-70 at 10th Avenue and Kansas Avenue Enter I-70 from 4th Street and Topeka Boulevard
Eastbound Exits / Entrances	Exit I-70 at Topeka Boulevard and 4th Street Enter I-70 from Kansas Avenue and 10th Avenue
Estimated Construction Cost	$180 million, the lowest of the three original alternatives
Safety	Highway geometric changes improve safety. Changes include: larger 3rd Street Curve, wider shoulders, longer ramp acceleration lanes, better ramp connections with city streets and greater spacing between ramps.
Traffic Flow	Additional lanes are provided where needed on I-70 to reduce congestion. The increased lengths of entrance and exit ramps will smooth traffic flow.
Access	Access is improved for the north end of Downtown, the proposed Riverfront Development and North Topeka. Access is maintained to 4th Street, 6th Avenue, 8th Avenue and 10th Avenue on the east side of Downtown.
Support Development	Supports potential development in the Riverfront area, along Kansas Avenue and the south end of Downtown.
Aesthetics	Aesthetic treatments will be considered along I-70, collector-distributor roads such as Madison and Monroe Streets and below the I-70 bridge.

Alternative #2 shown in Figure 4.2 is similar to Alternative #1, as it provides two interchanges that serve the Downtown area. It differs from Alternative #1 in that a pair of one-way collector-distributor roads parallel I-70 from Topeka Boulevard to 10th Avenue.

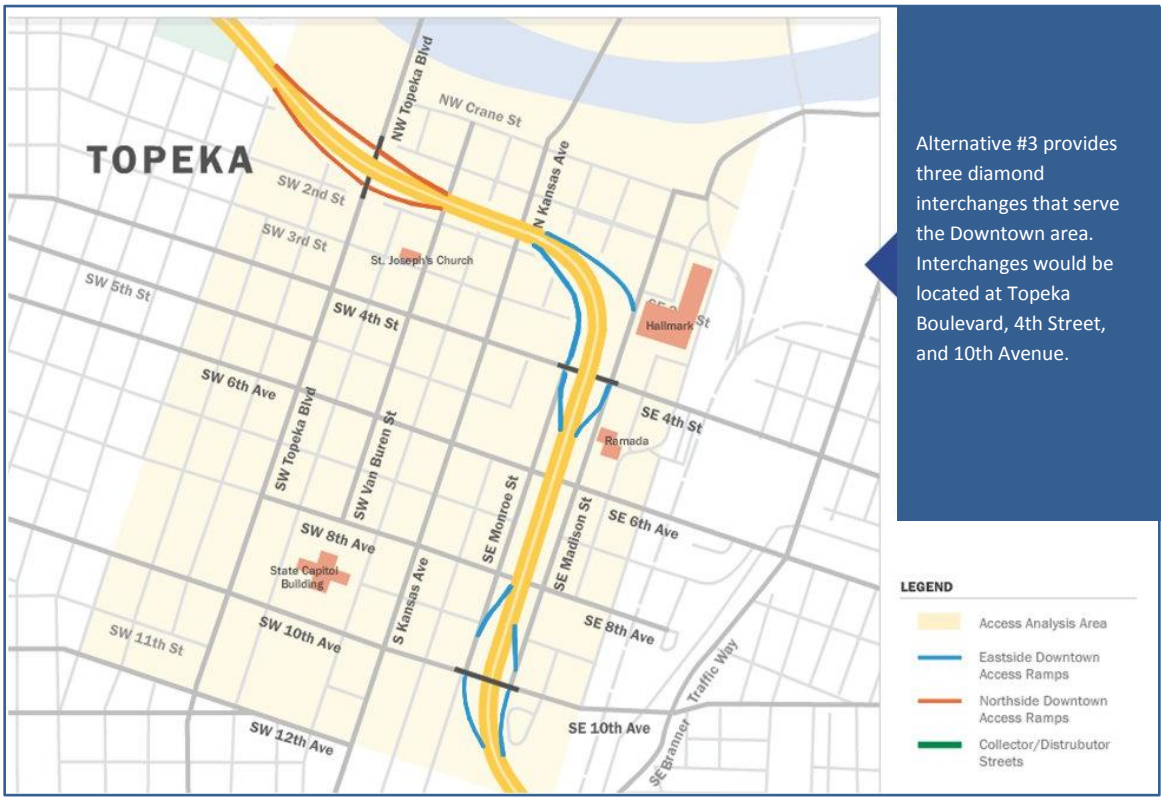
Figure 4.2 Alternative #2 Concept and Impacts



Westbound Exits /Entrances	Exit I-70 at 10th Avenue and Kansas Avenue Enter I-70 from 4th Street and Topeka Boulevard
Eastbound Exits /Entrances	Exit I-70 at Topeka Boulevard and 4th Street Enter I-70 from Kansas Avenue and 10th Avenue
Estimated Construction Cost	$241.5 million, the highest of the three original alternatives
Safety	Highway geometric changes improve safety. Changes include: larger 3rd Street Curve, wider shoulders, longer ramp acceleration lanes, better ramp connections with city streets and greater spacing between ramps.
Traffic Flow	Additional lanes are provided where needed on I-70 to reduce congestion. The increased lengths of entrance and exit ramps will smooth traffic flow. One-way collector-distributor roads parallel I-70 from Topeka Boulevard to 10th Avenue
Access	Access is improved for the north end of Downtown, the proposed Riverfront Development and North Topeka. Access is maintained to 4th St., 6th Ave., 8th Ave. and 10th Ave. on the east side of Downtown.
Support Development	Supports potential development in the Riverfront area, along Kansas Ave. and the south end of Downtown.
Aesthetics	Aesthetic treatments will be considered along I-70, collector-distributor roads such as Madison and Monroe Streets and below the I-70 bridge.

Alternative #3 shown in Figure 4.3 provides three diamond interchanges that serve the Downtown area. Interchanges would be located at Topeka Boulevard, 4th Street and 10th Avenue.

Figure 4.3 Alternative #3 Concept and Impacts



Westbound Exits /Entrances	Exit I-70 at 10th Avenue, 4th Street and Topeka Boulevard Enter I-70 from 10th Avenue, 4th Street, and Topeka Boulevard
Eastbound Exits /Entrances	Exit I-70 at Topeka Boulevard, 4th Street and 10th Avenue Enter I-70 from Topeka Boulevard, 4th Street and 10th Avenue
Estimated Construction Cost	$231.5 million, the middle of the three original alternatives
Safety	Highway geometric changes improve safety. Changes include: larger 3rd Street curve, wider shoulders, longer ramp acceleration lanes, better ramp connections with city streets and greater spacing between ramps.
Traffic Flow	Additional lanes are provided where needed on I-70 to reduce congestion. The increased lengths of entrance and exit ramps will smooth traffic flow. The weaving distance between Topeka Boulevard and 4th St. is less than desirable.
Access	Access is improved to Topeka Boulevard Indirect access is provided for the north end of Downtown, the proposed Riverfront Development and North Topeka. Access is maintained to 4th Street, 6th Avenue, 8th Avenue, and 10th Avenue on the east side of Downtown.
Support Development	Indirect access to the potential development in the Riverfront area and along Kansas Avenue to North Topeka. Access supports potential development the south end of Downtown.
Aesthetics	Aesthetic treatments will be considered along I-70 and below the I-70 bridge.

Public/Stakeholder Input: The three alternatives were presented at a public meeting, various stakeholder group meetings, and to focus groups of randomly selected citizens. While the focus groups found all of the alternatives to be acceptable, stakeholder groups and a number of attendees at the public meeting expressed the desire for an additional connection between I-70 and city streets on the east side of the Downtown area. The most often mentioned location was 6th Avenue. This arterial street crosses the City of Topeka and provides the best connection to I-70 for East Topeka.

Stakeholders also requested that the vertical alignment of a new I-70 between Topeka Boulevard and Kansas Avenue be studied to determine if a new viaduct (above-grade option) or a depressed roadway (below-grade option) would be most appropriate. The master plan for the Riverfront Redevelopment Area recommends a below-grade option.

Both issues are discussed on the following pages, with the discussion of the vertical alignment beginning on page 53.

Revised Alternatives

Each of the three alternatives was revised to include a connection to 6th Avenue.

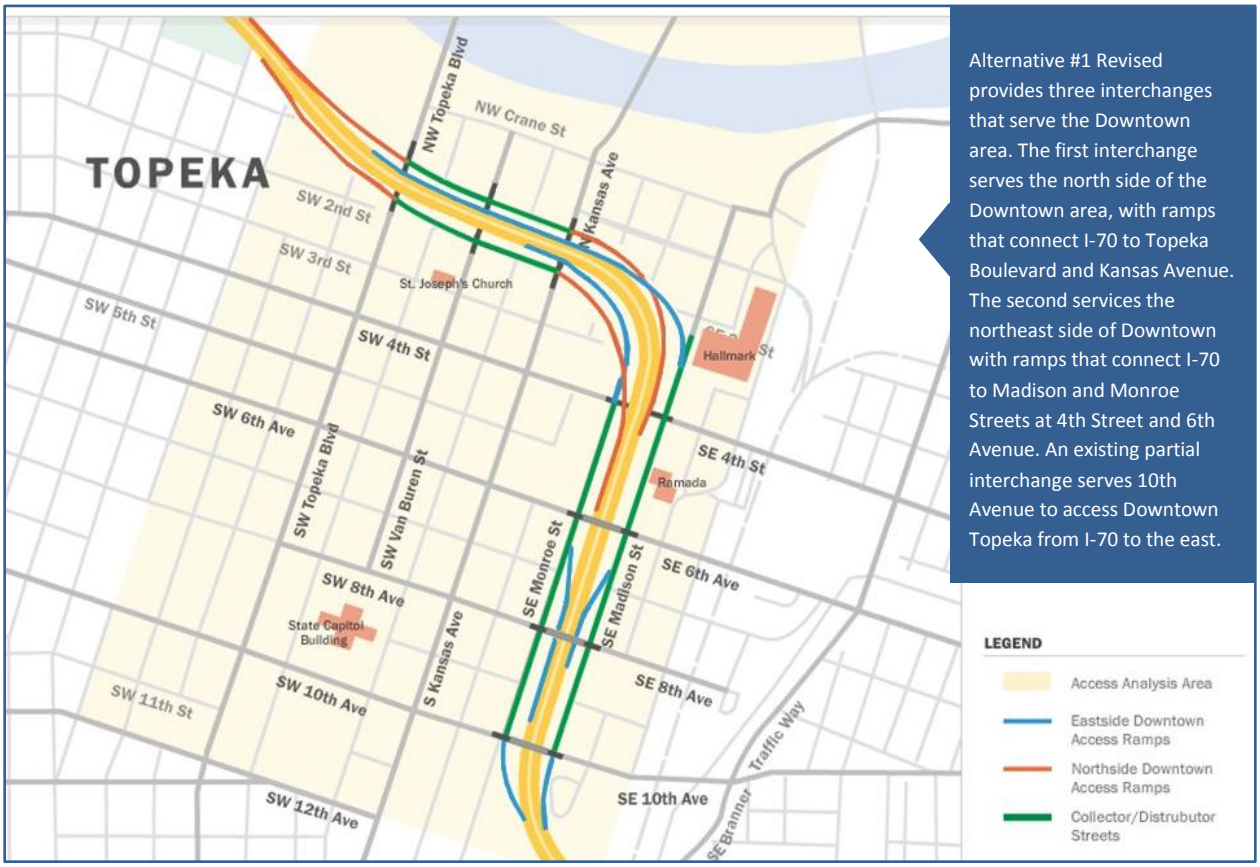
Alternative #1 Revised shown in Figure 4.4, provides three interchanges that serve the Downtown area. The first interchange serves the north side of the Downtown area, with ramps that connect I-70 to Topeka Boulevard and Kansas Avenue. The second services the northeast side of Downtown with ramps that connect I-70 to Madison and Monroe Streets at 4th Street and 6th Avenue. An existing partial interchange serves 10th Avenue to access Downtown Topeka from I-70 to the east.

Alternative #2 Revised shown in Figure 4.5, provides three interchanges that serve the Downtown area. The first interchange serves the north side of the Downtown area, with ramps that connect I-70 to Topeka Boulevard and Kansas Avenue. The second services the northeast side of Downtown with ramps that connect I-70 to Madison and Monroe Streets at 4th Street and 6th Avenue. An existing partial interchange serves 10th Avenue to access Downtown Topeka from I-70 to the east.

Alternative #2 differs from Alternative #1 in that it provides a pair of one-way collector-distributor roads that parallel I-70 from Topeka Boulevard to 10th Avenue.

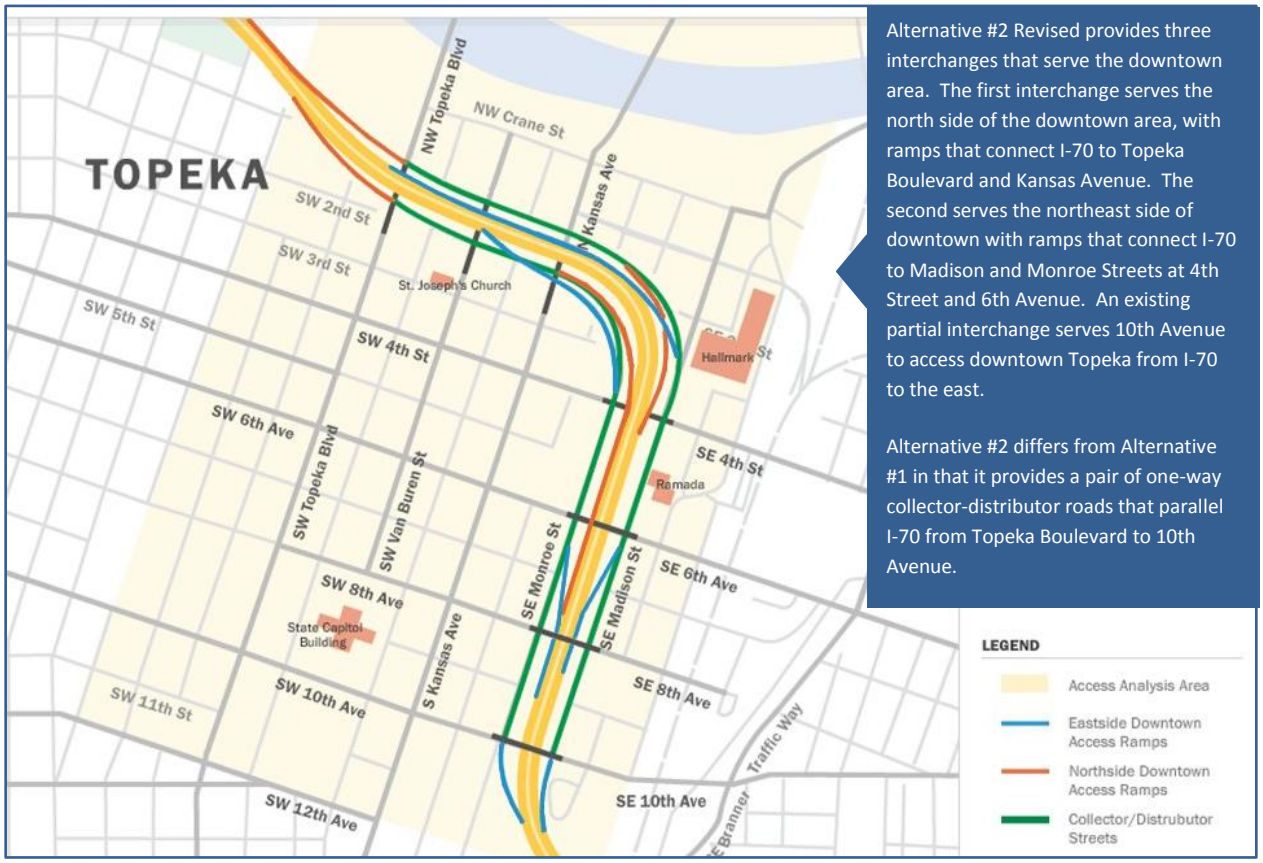
Alternative #3 Revised as shown in Figure 4.6, provides three interchanges that serve the Downtown area. Interchanges would be located at Topeka Boulevard, 6th Avenue and 10th Avenue. The possibility of also providing a pair of ramps at 4th Street serving I-70 to and from the west was analyzed.

Figure 4.4 Alternative #1 Revised Concept and Impacts



Westbound Exits /Entrances	Exit I-70 at 10th Avenue, 6th Avenue and Kansas Avenue. Enter I-70 from 4th Street and Topeka Boulevard.
Eastbound Exits /Entrances	Exit I-70 at Topeka Boulevard and 4th Street. Enter I-70 from Kansas Avenue, 6th Avenue and 10th Avenue.
Estimated Construction Cost	$180 million
Safety	Highway geometric changes improve safety. Changes include: larger 3rd Street curve, wider shoulders, longer ramp acceleration lanes, better ramp connections with city streets and greater spacing between ramps.
Traffic Flow	Additional lanes are provided where needed on I-70 to reduce congestion. The increased lengths of entrance and exit ramps will smooth traffic flow.
Access	Access is improved for the north end of Downtown, the proposed Riverfront Development and North Topeka. Access is maintained to 4th Street, 6th Avenue, 8th Avenue, and 10th Avenue on the east side of Downtown.
Support Development	Supports potential development in the Riverfront area, along Kansas Avenue and the south end of Downtown.
Aesthetics	Aesthetic treatments will be considered along I-70, collector-distributor roads such as Madison and Monroe Streets and below the I-70 bridge.

Figure 4.5 Alternative #2 Revised Concept and Impacts

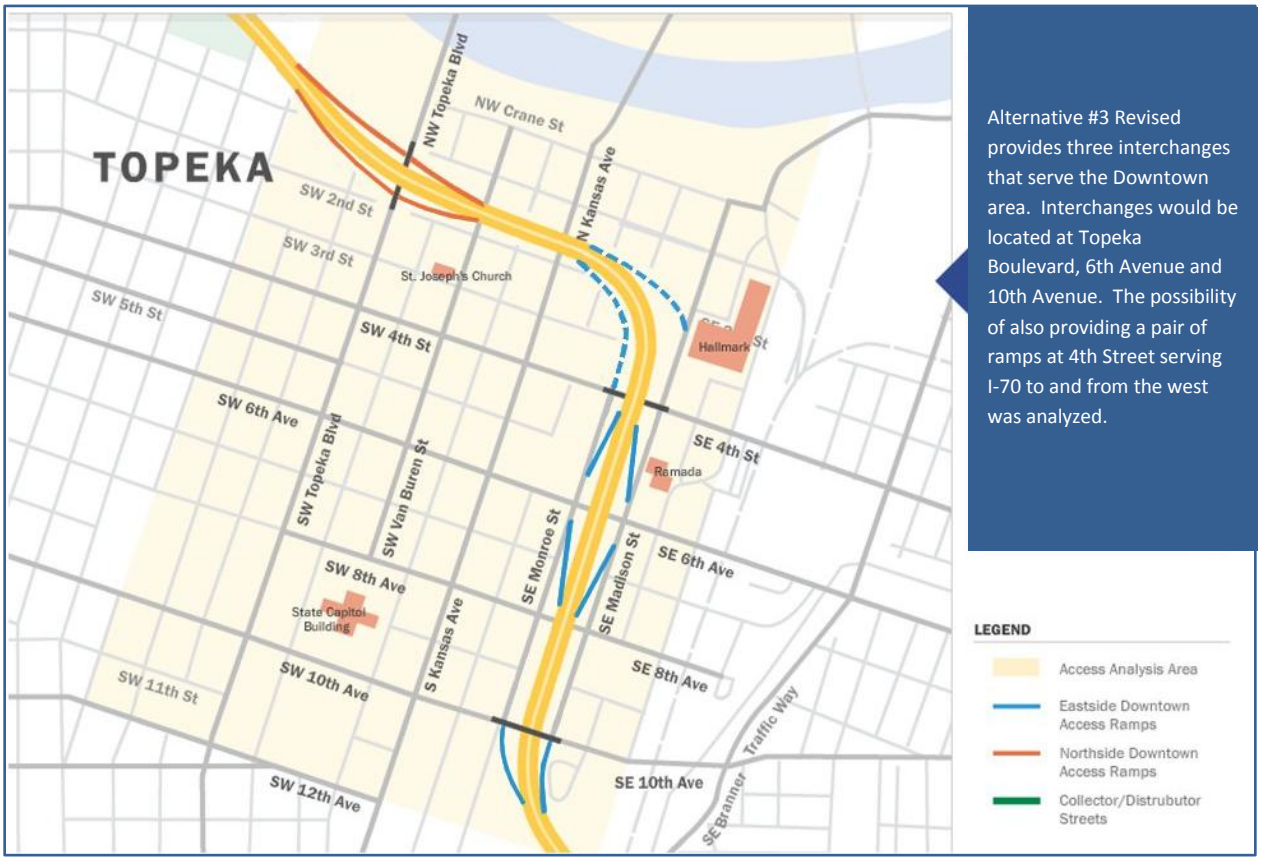


Alternative #2 Revised provides three interchanges that serve the downtown area. The first interchange serves the north side of the downtown area, with ramps that connect I-70 to Topeka Boulevard and Kansas Avenue. The second serves the northeast side of downtown with ramps that connect I-70 to Madison and Monroe Streets at 4th Street and 6th Avenue. An existing partial interchange serves 10th Avenue to access downtown Topeka from I-70 to the east.

Alternative #2 differs from Alternative #1 in that it provides a pair of one-way collector-distributor roads that parallel I-70 from Topeka Boulevard to 10th Avenue.

Westbound Exits /Entrances	Exit I-70 at 10th Avenue, 6th Avenue and Kansas Avenue. Enter I-70 from 4th Street and Topeka Boulevard.
Eastbound Exits /Entrances	Exit I-70 at Topeka Boulevard and 4th Street. Enter I-70 from Kansas Avenue, 6th Avenue and 10th Avenue.
Estimated Construction Cost	$220 million
Safety	Highway geometric changes improve safety. Changes include: larger 3rd Street curve, wider shoulders, longer ramp acceleration lanes, better ramp connections with city streets and greater spacing between ramps.
Traffic Flow	Additional lanes are provided where needed on I-70 to reduce congestion. The increased lengths of entrance and exit ramps will smooth traffic flow. A one-way pair of collector-distributor roads parallel I-70 from Topeka Boulevard to 10th Avenue.
Access	Access is improved for the north end of Downtown, the proposed Riverfront Development and North Topeka. Access is maintained to 4th Street, 6th Avenue, 8th Avenue, and 10th Avenue on the east side of Downtown.
Support Development	Supports potential development in the Riverfront area, along Kansas Avenue and the south end of Downtown.
Aesthetics	Aesthetic treatments will be considered along I-70, collector-distributor roads such as Madison and Monroe Streets and below the I-70 bridge.

Figure 4.6 Alternative #3 Revised Concept and Impacts



Westbound Exits /Entrances	Exit I-70 at 10th Avenue, 6th Avenue, Topeka Boulevard and possibly 4th Street. Enter I-70 from 6th Avenue, Topeka Boulevard, and possibly 4th Street.
Eastbound Exits /Entrances	Exit I-70 at Topeka Boulevard, 6th Avenue, and possibly 4th Street. Enter I-70 from Topeka Boulevard, 6th Avenue, and 10th Avenue.
Estimated Construction Cost	$210 million
Safety	Highway geometric changes improve safety. Changes include: larger 3rd Street curve, wider shoulders, longer ramp acceleration lanes, better ramp connections with city streets and greater spacing between ramps.
Traffic Flow	Additional lanes are provided where needed on I-70 to reduce congestion. The increased lengths of entrance and exit ramps will smooth traffic flow.
Access	Access is improved to Topeka Boulevard Indirect access is provided for the north end of Downtown, the proposed Riverfront Development and North Topeka. Access is maintained to 4th Street, 6th Avenue, 8th Avenue, and 10th Avenue on the east side of Downtown.
Support Development	Indirect access to the potential development in the Riverfront area and along Kansas Avenue to North Topeka. Access supports potential development the south end of Downtown.
Aesthetics	Aesthetic treatments will be considered along I-70 and below the I-70 bridge.

Comparison of Alternatives

The strengths and weaknesses of each of the three alternatives were evaluated for seven categories that relate to the project goals and objectives. These strengths and weaknesses are discussed and shown in the following tables.

Roadway Design: As shown in Table 4.2, all three alternatives would meet current highway design criteria and improve the curve near 3rd Street, provide wider shoulders on the viaduct, increase ramp lengths, increase spacing between ramps, and provide additional lanes where needed. Alternative #1 Revised has the lowest estimated construction cost.

Table 4.2 Strengths and Weaknesses – Roadway Design

Roadway Design	Alternative #1 Revised	Alternative #2 Revised	Alternative #3 Revised
Estimated Cost to Build	**$198 million**	**$201 million**	**$192 million**
Strengths	• Meets current design criteria • 3rd Street curve improved • Wider shoulders • Longer ramps • Greater distance between ramps • Additional lanes where needed • Madison & Monroe Streets improved	• Meets current design criteria • 3rd Street curve improved • Wider shoulders • Longer ramps • Greater distance between ramps • Additional lanes where needed • Madison & Monroe Streets improved • Collector-Distributor roads connect Topeka Boulevard to 10th Avenue	• Meets current design criteria • 3rd Street curve improved • Wider shoulders • Longer ramps • Greater distance between ramps • Additional lanes where needed
Weaknesses	• One slip ramp • Weave distance between Adams and 10th Avenue is less than desirable	• Three slip ramps • Weave distance between Adams and 10th Avenue is less than desirable.	• Weave distance between the Topeka Boulevard and 4th Street ramps is less than the desirable distance for the expected traffic volumes. • Requires an additional lane on westbound I-70 from the 6th Avenue ramp west to MacVicar Avenue • Two slip ramps • Weave distance between Adams and 10th Avenue is less than desirable.

Safety: As shown in Table 4.3, all three alternatives should experience a reduction in the number of crashes as the highway features are reconstructed to meet current design criteria. The highest crash locations are addressed. Alternative #2 Revised and Alternative #3 Revised both have weaving areas where vehicle-to-vehicle conflicts may occur.

Table 4.3 Strengths and Weaknesses – Traveler Safety

Traveler Safety	Alternative #1 Revised	Alternative #2 Revised	Alternative #3 Revised
Strengths	• Updated highway characteristics will reduce number of crashes • High crash locations are addressed	• Updated highway characteristics will reduce number of crashes • High crash locations are addressed	• Updated highway characteristics will reduce number of crashes • High crash locations are addressed
Weaknesses		• Two weaving areas on collector-distributor roads (between ramp connection and intersecting city street) are shorter than desirable and may result in vehicle conflicts.	• Weaving areas on I-70 between Topeka Boulevard and 4th Street ramps is less than desirable and will likely result in conflicts between vehicles entering and exiting I-70. • Weaving conflicts between traffic on the 6th Avenue off-ramp and traffic travelling southbound on Monroe Street

Support Economic Development: As shown in Table 4.4, all three alternatives support potential development and redevelopment in Downtown Topeka. Alternatives #1 Revised and #2 Revised also support development in the Riverfront area through their connections to I-70.

Table 4.4 Strengths and Weaknesses – I-70 Improvements Support Economic Development

Support Economic Development	Alternative #1 Revised	Alternative #2 Revised	Alternative #3 Revised
Strengths	• Supports potential development in the Riverfront area, North Topeka, along Kansas Avenue, and the south end of Downtown.	• Supports potential development in the Riverfront area, North Topeka, along Kansas Avenue, and the south end of Downtown.	• Supports potential development along Kansas Avenue and the south end of Downtown.
Weaknesses			• Indirect access is provided to the proposed Riverfront Development and the north side of the river along Kansas Avenue.

Traffic Mobility and Circulation: As shown in Table 4.5, all three alternatives improve the flow of traffic on mainline I-70 and provide adequate capacity to carry future traffic volumes through at least the year 2040. Some areas of congestion will develop with Alternative #3 Revised due to the ramp connections with city streets and the spacing between some ramps is less than desirable. Madison Street is closed north of 4th Street with Alternative #2 Revised changing the flow of traffic into the industrial area. With all the alternatives, some short sections of city streets will be closed to accommodate the new alignment of I-70.

Table 4.5 Strengths and Weaknesses – Traffic Mobility and Circulation

Traffic Mobility & Circulation	Alternative #1 Revised	Alternative #2 Revised	Alternative #3 Revised
Strengths	• Improved traffic flow for mainline I-70 and for drivers entering and exiting the highway. • Adequate capacity for future traffic on I-70 (year 2040). • Bicycle and pedestrian needs will be considered during design.	• Improved traffic flow for mainline I-70 and for drivers entering and exiting the highway. • Adequate capacity for future traffic on I-70 (year 2040). • Bicycle and pedestrian needs will be considered during design.	• Improved traffic flow for most of mainline I-70 and for most drivers entering and exiting the highway. • Adequate capacity for future traffic on I-70 (year 2040). • Bicycle and pedestrian needs will be considered during design.
Weaknesses	• Some sections of city streets are closed.	• Two weaving areas on collector-distributor and may result in congested traffic flow with future volumes. • Some sections of city streets are closed • Madison closed north of 4th Street – truck traffic exits collector—distributor road to 2nd Street.	• Distances between some on-ramps and off-ramps are less than desirable and may result in spot traffic congestion. • Requires an additional lane from 4th St. west to accommodate ramp traffic at an acceptable level of service. • Congestion occurs as vehicles exiting eastbound I-70 at 6th Avenue weave across Monroe traffic to turn west into Downtown. Potential to queue traffic on the off-ramp. • Some sections of city streets are closed.

Access/Connections between I-70 and City Streets: As shown in Table 4.6, all three alternatives improve access to North Topeka. Alternative #1 Revised and Alternative #2 Revised provide better access to the proposed Riverfront Development with ramps that connect to Topeka Boulevard and Kansas Avenue.

Table 4.6 Strengths and Weaknesses – Access/Connections between I-70 and City Streets

Access / Connections to City Streets	Alternative #1 Revised	Alternative #2 Revised	Alternative #3 Revised
Strengths	• Access is provided to Topeka Boulevard, Van Buren Street, and Kansas Avenue serving the north end of Downtown, the proposed Riverfront Development, and North Topeka. • Access is maintained to 4th Street, 6th Avenue, 8th Avenue, and 10th Avenue on the east side of Downtown.	• Access is provided to Topeka Boulevard, Van Buren Street, and Kansas Avenue serving the north end of Downtown, the proposed Riverfront Development, and North Topeka. • Access is maintained to 4th Street, 6th Avenue, 8th Avenue, and 10th Avenue on the east side of Downtown.	• Access is provided at Topeka Boulevard serving the north side of Downtown and North Topeka • Access is maintained to 4th Street, 6th Avenue, 8th Avenue, and 10th Avenue on the east side of Downtown.
Weaknesses			• Indirect access is provided to businesses north of 1st Street, the proposed Riverfront Development, and the north side of the river along Kansas Avenue.

Aesthetics/Community Desires: As shown in Table 4.7, all three alternatives will consider the aesthetics of new roadways and bridges.

Table 4.7 Strengths and Weaknesses – Aesthetics/Community Desires

Aesthetics / Community Desires	Alternative #1 Revised	Alternative #2 Revised	Alternative #3 Revised
Strengths	• Madison & Monroe Streets landscaped • Viaduct (new bridge) - aesthetics will be considered	• Madison & Monroe Streets landscaped • Viaduct (new bridge) - aesthetics will be considered	• Madison & Monroe Streets landscaped • Viaduct (new bridge) - aesthetics will be considered
Weaknesses			

Traffic during Construction: As shown in Table 4.8, a specific plan for handling traffic during construction will be developed with stakeholder input. Maintaining access to Downtown Topeka is a critical factor that will be considered.

Table 4.8 Strengths and Weaknesses of Handling Traffic During Construction

Traffic During Construction	Alternative #1 Revised	Alternative #2 Revised	Alternative #3 Revised
Strengths	• A plan for traffic flow during construction will be developed with stakeholder input • Offset alignment from Topeka Boulevard to Kansas Avenue will allow existing I-70 to function as it currently does for the major portion of construction • Connector Roads can be used to carry traffic during construction	• A plan for traffic flow during construction will be developed with stakeholder input • Offset alignment from Topeka Boulevard to Kansas Avenue will allow existing I-70 to function as it currently does for the major portion of construction • Connector Roads can be used to carry traffic during construction	• A plan for traffic flow during construction will be developed with stakeholder input • Offset alignment from Topeka Boulevard to Kansas Avenue will allow existing I-70 to function as it currently does for the major portion of construction
Weaknesses	• Some traffic disruption	• Some traffic disruption	• Some traffic disruption

Vertical Alignment between Topeka Boulevard and Kansas Avenue

The second major question raised by some stakeholders was whether the I-70 Polk-Quincy Viaduct should be replaced with a new viaduct or be reconstructed as a below-grade roadway similar to the section of I-70 between 10th Avenue and 6th Avenue. Figure 4.7 shows a visualization of a new viaduct and below-grade options for I-70 between Topeka Boulevard and Kansas Avenue. The master plan for the Riverfront redevelopment area, also depicted in the figure, recommends a below-grade option.

Figure 4.7 Vertical Alignment Options

I-70 New Viaduct Option

I-70 Below-Grade Option

Vertical Alignment Options

The strengths and weaknesses of three different vertical alignment options were studied for the section of I-70 from west of Topeka Boulevard to east of Kansas Avenue. They are:

- **Fully Below-Grade Option** – I-70 would be lowered approximately 25 feet below ground level to allow city streets to remain at current elevations. New bridges over I-70 would be provided at Topeka Boulevard, Van Buren Street, and Kansas Avenue.
- **Partially Below-Grade Option** – I-70 would be lowered approximately 10 feet and city streets would be raised approximately 15 feet to pass over I-70. New bridges over I-70 would be provided at Topeka Boulevard, Van Buren Street, and Kansas Avenue.
- **Above-Grade Option** – a new viaduct would be constructed to carry I-70 traffic over existing city streets. Harrison Street would likely be closed between 1st and 2nd Streets.

Eleven factors were explored to determine the likely impacts of the three vertical alignment options. These are discussed on the following pages.

Roadway Design: As shown in Table 4.9, all of the options will provide a highway that can meet current design criteria. Both the fully below-grade and partially below-grade options require a wider cross-section for I-70 than a new viaduct. A viaduct can be designed to that it can be cost-effectively widened in the future, but either below-grade option will need to be wide enough to provide for any foreseeable number of lanes due to the expense of the retaining walls that will be required. For this reason and others, the estimated construction costs for the below-grade options are significantly higher than for a new viaduct.

Table 4.9 Strengths and Weaknesses – Roadway Design

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Estimated Construction Cost *	$290 million	$250 million	$200 million
Strengths	• Addresses Highway Geometric Issues • Downgrade on-ramps help traffic entering I-70 accelerate. Upgrade off-ramps help traffic exiting I-70 decelerate.	• Addresses Highway Geometric Issues • Downgrade on-ramps help traffic entering I-70 accelerate. Upgrade off-ramps help traffic exiting I-70 decelerate.	• Addresses Highway Geometric Issues • Smoothest vertical profile for I-70 • Greatest sight distance • Can build 4-lane I-70 initially – viaduct could be widened in future when needed
Weaknesses	• Must build initially to accommodate 6-lane I-70 plus ramps/ auxiliary lanes due to extreme expense to widen in future – results in additional initial construction cost • Retaining walls require 30' setback for large trees, sign structures, buildings, etc. • Less desirable highway profile – (ups and downs of travel path)	• Must build initially to accommodate 6-lane I-70 plus ramps/ auxiliary lanes due to extreme expense to widen in future – results in additional initial construction cost • Retaining walls require 30' setback for large trees, sign structures, buildings, etc. • Less desirable highway profile – (ups and downs of travel path)	• Longer on-ramps and off-ramps are necessary due to ramps grades.

*Average of Alternative #1 Revised, Alternative #2 Revised, and Alternative #3 Revised

Safety: As shown in Table 4.10, there are no significant safety differences between the options.

Table 4.10 Strengths and Weaknesses – Safety

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Strengths	• Improved highway design	• Improved highway design	• Improved highway design
Weaknesses	• Risk of falling objects	• Risk of falling objects	• Risk of falling objects

Risk of Flooding: As shown in Table 4.11, there is a significant risk of flooding with either of the below-grade options as I-70 is located in the Kansas River floodplain. As I-70 is a key transportation corridor for the City of Topeka and the State of Kansas, flood conditions would close the highway. The trend in precipitation for the Kansas River basin over the past century shows a 5% to 15% increase with a resulting increase in water flow in the river. The Kansas Department of Wildlife and Parks expects this trend to continue. A number of pump stations would be required to mitigate this risk, with an initial cost of approximately $2 million per installation plus annual operating and maintenance expenses.

Table 4.11 Strengths and Weaknesses – Risk of Flooding

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Strengths	--	--	• No risk • No pumping required
Weaknesses	• Significant risk • Several pump stations required ($2 million per station based upon US-54) plus underground storage and distribution • Kansas River flow increasing	• Significant risk • Several pump stations required ($2 million per station based upon US-54) plus underground storage and distribution • Kansas River flow increasing	--

Ground Water: As shown in Table 4.12, the ground water level impacts both of the below-grade options. With the fully below-grade option, the pavement for I-70 would be approximately 5 feet below the observed water table. While at a higher elevation, the pavement for the partially below-grade option is still lower than the high water table that occurs in wet conditions. Ground water creates uplift forces that impact a roadway's pavement. A drainage system would be required to continuously remove the water from under the pavement. The above-grade option would avoid the issues associated with ground water.

Table 4.12 Strengths and Weaknesses – Ground Water Issues

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Strengths	--	• 10' above typical water table observed in test wells	• No groundwater issues • No pumping required
Weaknesses	• 5' + below water table observed in test wells • Uplift forces from groundwater • Pump stations to handle seepage	• Below a "high water" water table • Uplift forces from groundwater • Pump stations to handle seepage	--

Noise: As shown in Table 4.13, the fully below-grade option provides the lowest noise impact on adjacent properties. The partially below-grade option may provide some benefits for reducing noise, while the above-grade option will have noise levels similar to the current situation.

Table 4.13 Strengths and Weaknesses - Noise

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Strengths	• Lowest impact on adjacent properties	--	--
Weaknesses	--	• Some impact on adjacent properties	• Moderate impact (similar to existing)

Bicycle/Pedestrian Considerations: As shown in Table 4.14, pedestrians often have a greater perception of safety when crossing on a bridge over another roadway rather than when they are crossing under a bridge. The below-grade options would restrict crossing points for pedestrians and bicyclists to three streets: Topeka Boulevard, Van Buren Street, and Kansas Avenue. The above-grade option allows crossings under a new viaduct at almost any point.

Table 4.14 Strengths and Weaknesses – Bicycle/Pedestrian Considerations

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Strengths	• Perception of greater safety when crossings are made on bridge rather than under	• Perception of greater safety when crossings are made on bridge rather than under	• Cross under I-70 at almost any point • Opportunities for bicycle/pedestrian facilities under I-70
Weaknesses	• I-70 crossing points are limited to 3 streets • Opportunities for bicycle/pedestrian facilities are limited	• I-70 crossing points are limited to 3 streets • Opportunities for bicycle/pedestrian facilities are limited	• Pedestrian perceived safety concerns for crossing under bridges

Construction: As shown in Table 4.15, the above-grade option has a number of advantages during construction. This option is less disruptive to the local street system, thereby minimizing the disruption of traffic circulation. The above-grade option can be built more quickly than the below-grade options.

Table 4.15 Strengths and Weaknesses – Construction of Improvements

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Strengths	--	--	• New viaduct can be built over existing streets and traffic • Shortest duration closure of I-70 • Lowest cost • Shortest time to construct • Least risk for Contractor due to unknowns
Weaknesses	• Longer closure of I-70 • Longer time to construct (1 additional construction season) • $24 to $60 million added costs due to groundwater issues • Potential stability issues with foundations of adjacent buildings • Greater risk for Contractor due to unknowns	• Longer closure of I-70 • Longer time to construct (1 additional construction season) • Reconstruct portion of Topeka Blvd & Kansas Av bridges • Loss of direct connection to Topeka Blvd, Van Buren & Kansas Av for some properties • Greater risk for Contractor due to unknowns	--

Utility Impacts: As shown in Table 4.16, the fully below-grade option has major impacts to existing utilities, including storm sewers, sanitary sewers, and combined sewers. These sewers range in size from 12 inches to 96 inches in diameter. These and other utilities would need to lowered 20 to 25 feet below their current elevations so as to pass under I-70. Pump stations would likely be required for the storm and sanitary sewers. The partially below-grade option would have moderate impacts, requiring the lowering of a number of utilities. The above-grade option has minimal impacts.

Table 4.16 Strengths and Weaknesses – Utility Impacts

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Strengths	--	--	• Minimal utility impacts
Weaknesses	• Major utility impacts to storm sewers, sanitary sewers, and combined sewers • Lower utilities 20' + to go under I-70 • Pump stations required • Multi-million dollars to adjust utilities	• Moderate and some major impacts to storm sewers, sanitary sewers, and combined sewers • Lower some utilities to go under I-70	--

Traffic Circulation during Construction: As shown in Table 4.17, the above-grade option results in the least disrupt to local traffic during construction of the I-70 improvements. Both of the below-grade options will require the closure of Topeka Boulevard and Kansas Avenue (not concurrently).

Table 4.17 Strengths and Weaknesses – Traffic Circulation during Construction

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Strengths	--	--	• Least disruptive to local traffic
Weaknesses	• Topeka Boulevard and Kansas Avenue each closed/detoured for 9 to 12 months • Difficult access to properties north of 1st St	• Most disruptive to local traffic • Topeka Boulevard and Kansas Avenue traffic detoured for 1 to 2 years • Topeka Boulevard and Kansas Avenue each closed for 9 to 12 months	--

Maintenance: As shown in Table 4.18, the below-grade options require ongoing operation and maintenance costs for pump stations as well as normal roadway and structure maintenance. An advantage of the above-grade option is that a bridge can be visually inspected, whereas the below-grade options have significant retaining walls which can only be inspected on one side.

Table 4.18 Strengths and Weaknesses - Maintenance

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Strengths	--	--	• Can visually inspect bridge to monitor future issues
Weaknesses	• Ongoing operating and maintenance costs for pump stations ($20,000 per year per pump station based on US-54 experience) • Maintenance costs associated with retaining walls • Snow and ice removal • Cannot visually inspect areas behind retaining walls to identify future maintenance issues	• Ongoing operating and maintenance costs for pump stations ($20,000 per year per pump station based on US-54 experience) • Maintenance costs associated with retaining walls • Snow and ice removal • Cannot visually inspect areas behind retaining walls to identify future maintenance issues	• Maintenance costs associated with viaduct • Snow and ice removal

Aesthetics: As shown in Table 4.19, some stakeholders perceive an advantage for the below-grade options in that the viaduct does not create a visual barrier between Downtown and the Riverfront area. Others believe that the view of Downtown from I-70 is more important and that the above-grade option provides this view.

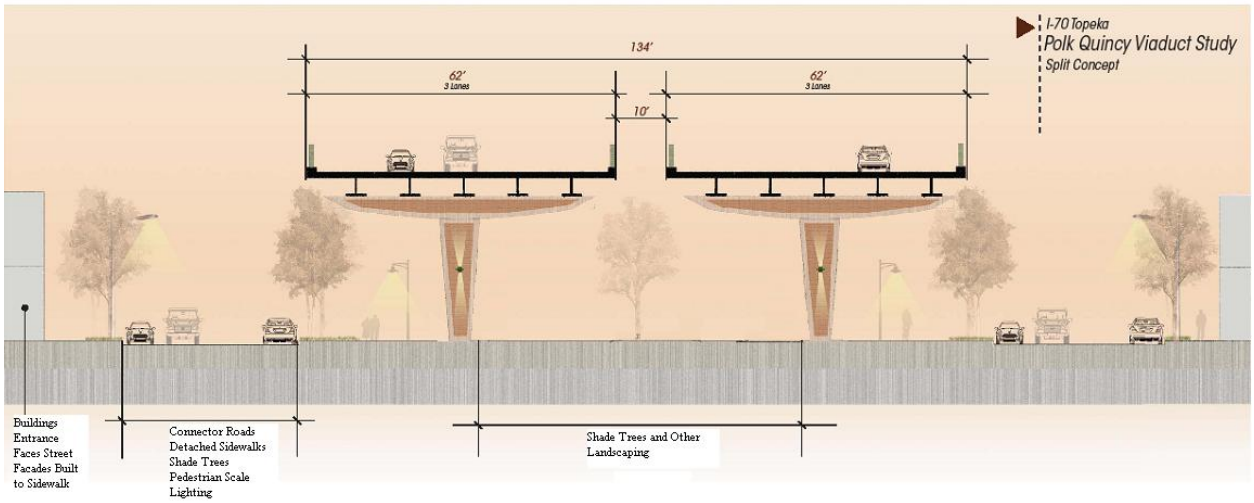
Table 4.19 Strengths and Weaknesses - Aesthetics

	Fully Below-Grade (25' below ground level)	Partially Below-Grade (10' below ground level)	Above-Grade (New viaduct)
Strengths	• I-70 is not a visual barrier between Downtown and Riverfront • Aesthetic treatments will be considered	• I-70 is not a visual barrier between Downtown and Riverfront • Aesthetic treatments will be considered	• View of Downtown and Riverfront from I-70 • Opportunity to use space under viaduct • Aesthetic treatments will be considered • Favored by 93% of focus groups
Weaknesses	• Limited view of city from I-70 • Physical barrier between Downtown and Riverfront	• Limited view of city from I-70 • Partial view of vehicles on I-70 from Downtown • Physical barrier between Downtown and Riverfront	• Viaduct may be perceived as a visual barrier

Conclusion

From a technical standpoint, the above-grade (new viaduct) option provides the most advantages at a significantly lower cost. Three focus groups of randomly selected citizens from Topeka were asked their option regarding the vertical alignment options. Ninety-three percent of the focus group participants preferred the above-grade option shown in Figure 4.8.

Figure 4.8 Above-Grade (New Viaduct) Option



Preferred Alternative

The strengths and weaknesses of the three alternatives were compiled and presented to the public and stakeholders. As shown in Table 4.20, the overall concept of Alternative #1 Revised is the preferred alternative for the improvements to I-70 near Downtown Topeka.

Table 4.20 Preferences of Stakeholders

Group	Above-Grade or Below-Grade	Access Alternative Preference
Core Team	Above-Grade	Alternative #1 (revised)
Project Advisory Committee	Above-Grade	Alternative #1 (revised) (7 for Alt #1, 5 for Alt #3)
Greater Topeka Chamber of Commerce	Above-Grade	Alternative #1 (revised) - Investigate 3rd EB I-70 exit
Downtown Topeka, Inc.	Above-Grade	Alternative #1 (revised) - Investigate 3rd EB I-70 exit
Community Focus Groups	Above-Grade	All Alternatives are Acceptable
Metropolitan Topeka Planning Organization	Above-Grade	Alternative #1 (revised)
Riverfront Authority	Above-Grade	Alternative #1 (revised)
North Topeka Business Alliance	Above-Grade	Alternative #1 (revised)
City Council	Above-Grade	Alternative #1 (revised) - Investigate 3rd EB I-70 exit

The preferred alternative shown in Figure 4.9 creates an access system with two "split diamond" interchanges, one serving the north side of the Downtown area and one serving the east side. Six lanes will be provided where needed to accommodate future (year 2040) traffic volumes.

On the **north side**, the existing 1st Street ramps are relocated so that they connect directly with Topeka Boulevard. These ramps serve traffic traveling to and from the west on I-70. A complementary set of ramps connect to Kansas Avenue and serve traffic traveling to and from the east on I-70. These ramps are joined by a pair of one-way connector roads to form a system that will provide access to Downtown from the north, the proposed Riverfront redevelopment area, and North Topeka.

A similar system of ramps and connector roads will serve the **east side** of the Downtown area. The existing 3rd Street ramps will be relocated to 4th Street and will serve traffic traveling to and from the west on I-70. The existing 10th Avenue ramps will remain and be widened, and new 6th Avenue ramps will be constructed, serving traffic traveling to and from the east on I-70. The 4th Street, 6th

Avenue, and 10th Avenue ramps will be connected by the one-way, connector road pair of Madison and Monroe Streets. Other ramps between 10th Avenue and 4th Street will be removed.

The preferred alternative provides good overall traffic flow for the forecasted year 2040 traffic volumes. The "level of service (LOS)" on mainline I-70 is primarily in the LOS B to LOS C range. Two sections will experience LOS D (acceptable) during the morning peak period and two during the evening peak period. During the morning peak period, LOS D occurs on eastbound I-70 between MacVicar Avenue and Topeka Boulevard and on westbound I-70 between Adams Street and 10th Avenue. During the evening peak period, LOS D occurs on eastbound I-70 between the 6th Avenue and 10th Avenue ramps and on westbound I-70 between Topeka Boulevard and MacVicar Avenue.

Figure 4.9 Preferred Alternative

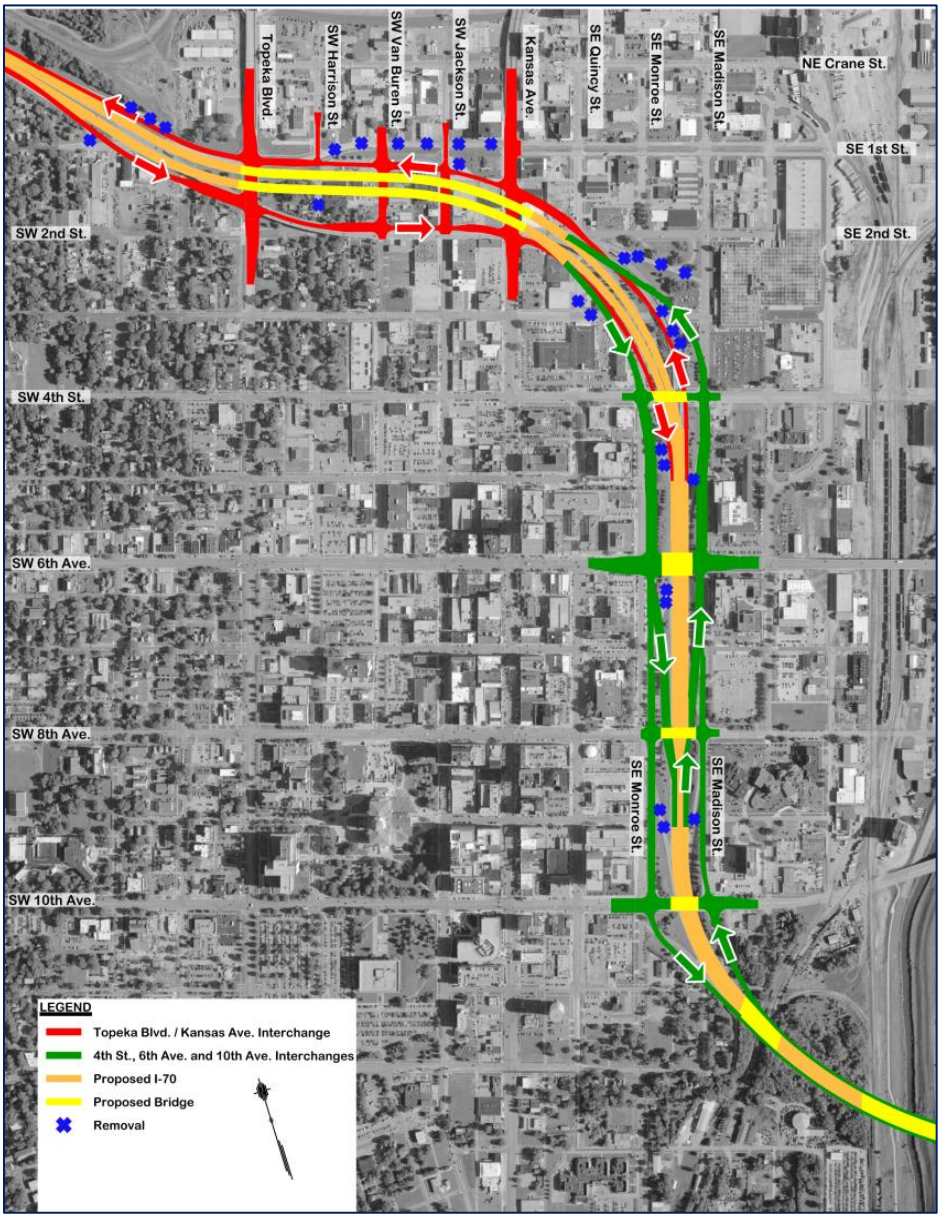
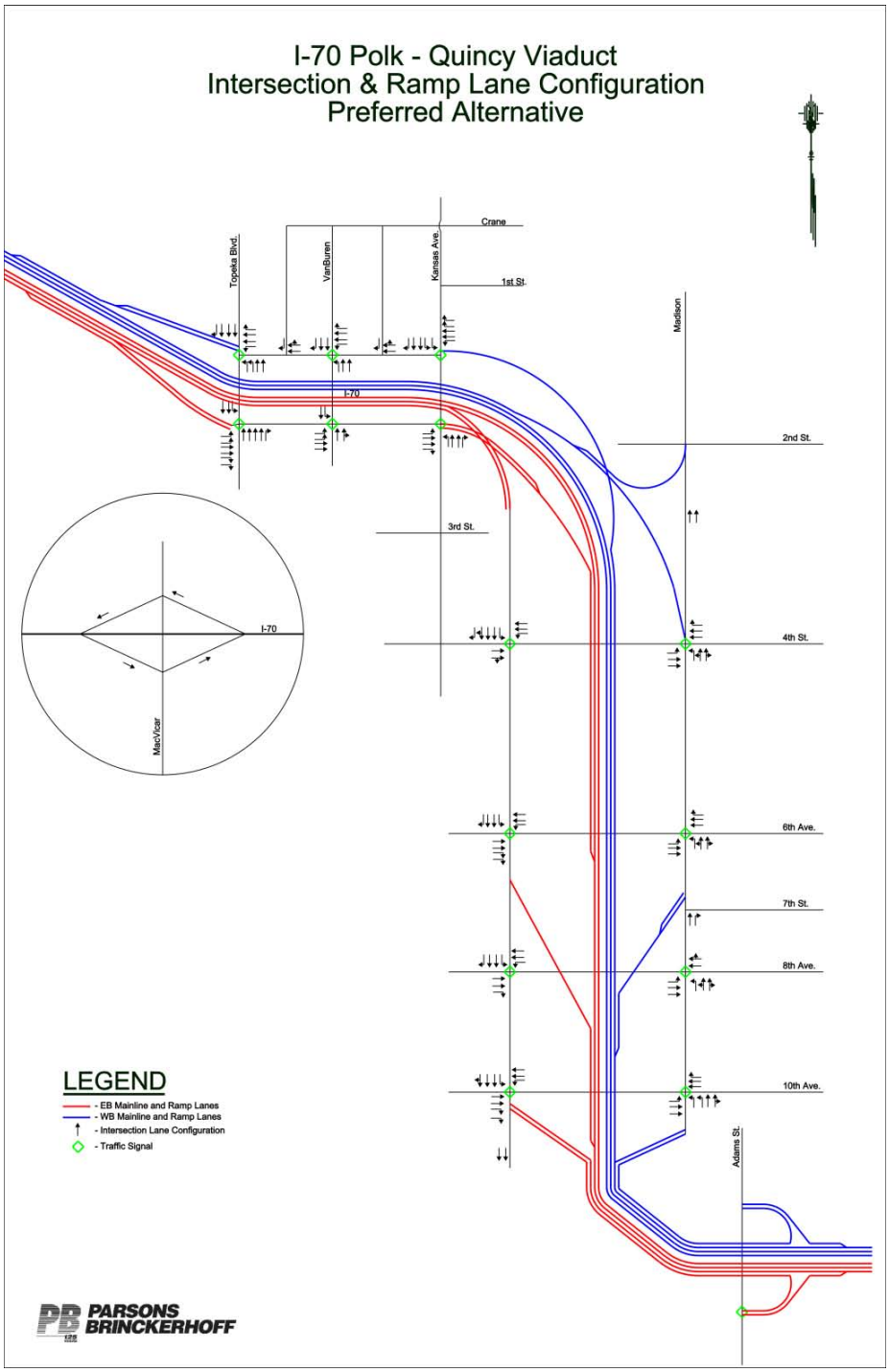


Figure 4.10 is a schematic of the lane arrangement with each red line indicating an eastbound lane on I-70 and its ramps, while each blue line represents a westbound lane or ramp. The green diamonds show intersections having traffic signals.

Figure 4.10 I-70 Lane and Ramp Configuration

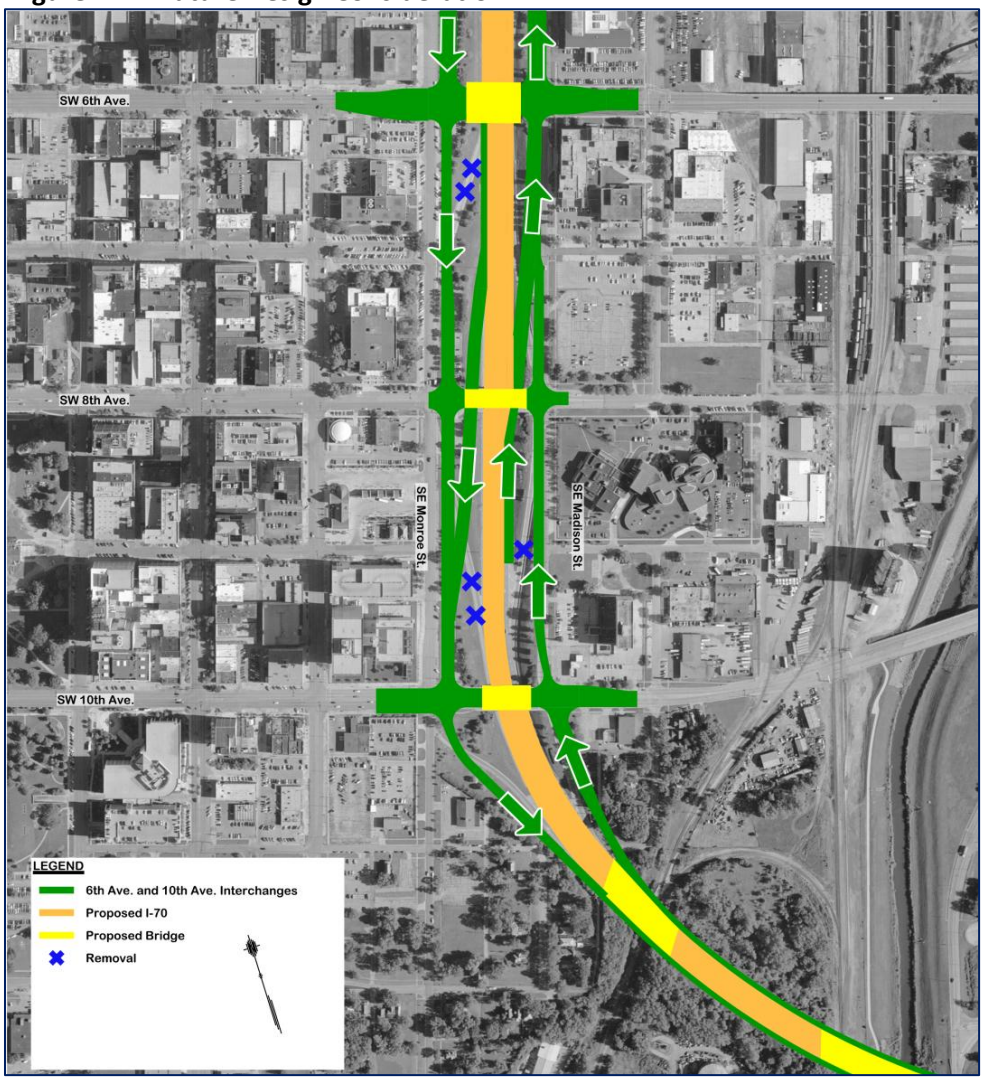


Future Design Consideration

The City Council, supported by the Greater Topeka Chamber of Commerce and Downtown Topeka, Inc., has requested that a "Future Design Consideration" be investigated as the project moves into preliminary design. The Preferred Alternative (Alternative #1 Revised), shown in Figured 4.10, has three westbound exits from I-70 and two westbound entrances; there are two eastbound exits and three eastbound entrances. The **Future Design Consideration**, shown in Figure 4.11, would explore a third eastbound exit from I-70 by eliminating the eastbound entrance from 6th Avenue and adding an eastbound exit for 10th Avenue.

KDOT has agreed to analyze this modification of the preferred alternative during the next phase of the project.

Figure 4.11 Future Design Consideration



Summary

Seventeen initial concepts and three revised alternatives were studied and reviewed by various stakeholder groups and the general public. Alternative #1 Revised was selected as the Preferred Alternative to carry forward into preliminary design. At that time, a Future Design Consideration requested by the City Council will be reviewed. A Break-in-Access report will then be prepared.

The Preferred Alternative provides three exits from westbound I-70 located at 10th Avenue, 6th Avenue, and Kansas Avenue, as well as two exit from eastbound I-70 located at Topeka Boulevard and 4th Street. Entrances to westbound I-70 will be provided at 4th Street and Topeka Boulevard. Entrances to eastbound I-70 will be provided at Kansas Avenue, 6th Avenue, and 10th Avenue.

During preliminary design a Future Design Consideration will investigate eliminating the eastbound entrance ramp from 6th Avenue and providing an eastbound exit at 10th Avenue.

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Section 5: Socioeconomic and Environmental Considerations

The purpose of the environmental screening includes: 1) identifying potential significant adverse social, economic, or environmental impacts for each alternative, 2) determining whether mitigation measures are possible to reduce or to avoid any identified impacts, and 3) determining whether all environmental regulations and requirements can be satisfied during subsequent environmental studies.

Development of alternatives at this stage consists of conceptual design layouts or "footprints". Actual right-of-way requirements have not been established.

Based upon this environmental screening, none of the three alternatives would result in significant adverse social, economic, or environmental impact. No "fatal flaws" in terms of environmental impact were identified for any of the alternatives. Table 5.1 shows a comparison of the environmental screening for each alternative and the no build scenario.

Table 5.1 Comparison of Alternatives for Environmental Screening

	No Build	Alternative #1 Revised	Alternative #2 Revised	Alternative #3 Revised
Right-of-Way Required	None	45 properties may be impacted	45 properties may be impacted	45 properties may be impacted
Displacement of Residences	None	9	9	9
Parks	None	Adjacent to three parks. No significant impacts	Adjacent to three parks. No significant impacts	Adjacent to three parks. No significant impacts
Historic Properties	None	None	None	None
Economic Development	None	Potential positive impact	Potential positive impact	Some potential positive impact
Floodplain	None	Project is within the floodplain, but protected by a levee system. Widening of westbound I-70 near MacVicar Avenue may have a minor impact on the levee (levee would be widened).		
Other Land Use Impacts	None	None	None	None
Communities of Concern	Low income area	Low income area	Low income area	Low income area

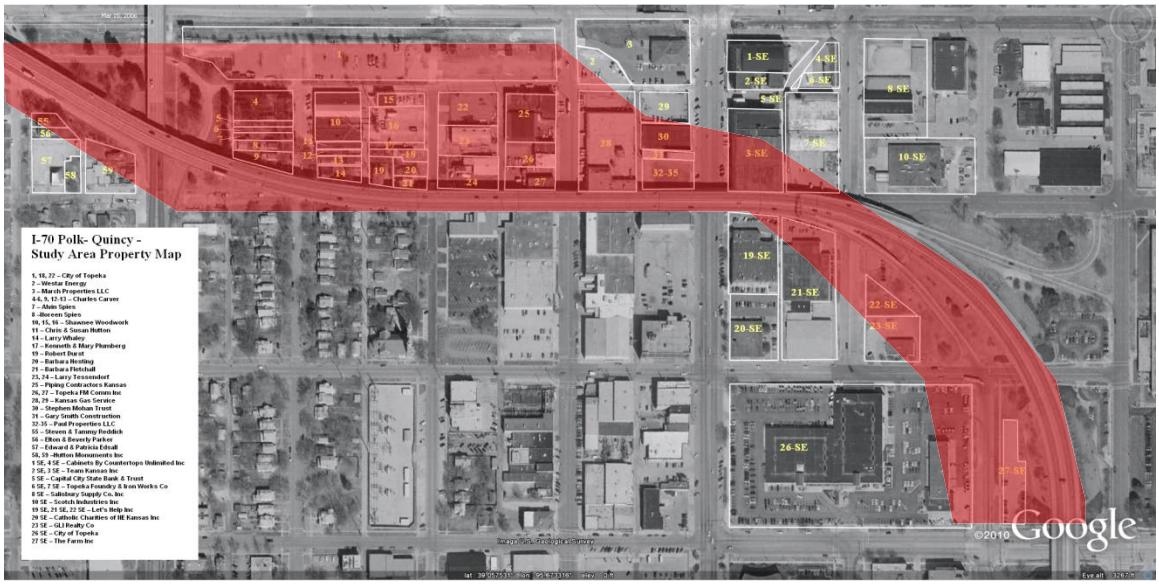
Table 5.1 (continued) Comparison of Alternatives for Environmental Screening

	No Build	Alternative #1 Revised	Alternative #2 Revised	Alternative #3 Revised
Visual and Aesthetics	None	Potential to improve the aesthetics of I-70	Potential to improve the aesthetics of I-70	Potential to improve the aesthetics of I-70
Pedestrian Patterns	None	None	None	None
Transit Patterns	None	Improved connections to I-70	Improved connections to I-70	Less direct access to transit center from I-70
Construction Impacts	None	Maintenance of traffic plan will be developed for the preferred alternative.		
Mitigation	None	None	None	None

Right-of-Way

Forty-five properties shown in the shaded area of Figure 5.1 may be impacted by the relocation of I-70 depending upon the final design. Nine of those properties are residences. Right-of-way limits will be determined during preliminary design, the next phase of the project.

Figure 5.1 Potential Right-of-Way Impacts



Source: Shawnee County Property Data

Parks

Figure 5.2 shows the parks located along the I-70 corridor. Improvements to I-70 would have no significant impacts upon these parks.

- **Auburndale Park**, located south of I-70 at 2400 SW Perry, is primarily "green space". East of the waterway that feeds into the Kansas River is an area that provides drainage retention during periods when the elevation of the river is significantly above normal.

  I-70 would not require widening along the park area. If widening were required it would have no impact of the function of the park.

- **Ward-Meade Park** is located at 124 NW Fillmore Street on the south side of I-70. This park is the site of Old Prairie Town, a six-acre park with an 1800's town square of vintage buildings and a small botanical garden.

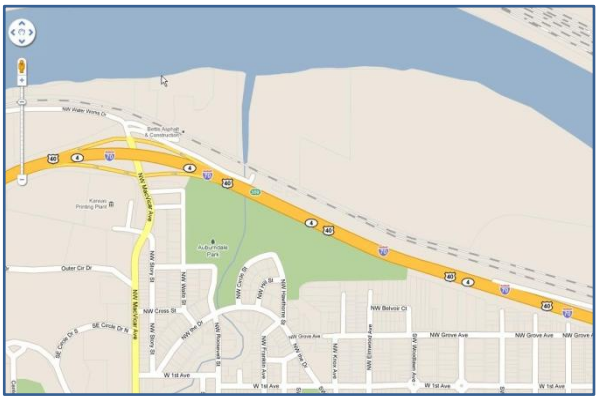
  Retaining walls may be required along I-70 to avoid encroaching on the park area.

- **W. Giles Park** is located on the south side of I-70 at the intersection of 1st Street and SW Taylor Street. The park provides playground and picnic facilities.

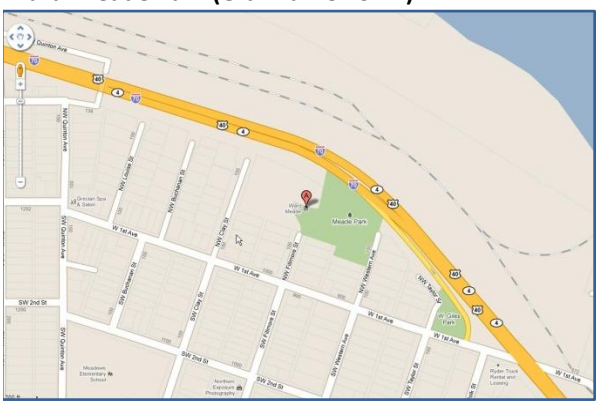
  The proposed eastbound I-70 off-ramp to Topeka Boulevard would pass along the northeast side of the park in the same manner as the current 1st Street ramp. No right-of-way will be required.

Figure 5.2 Parks along I-70

Auburndale Park



Ward-Meade Park (Old Prairie Town)



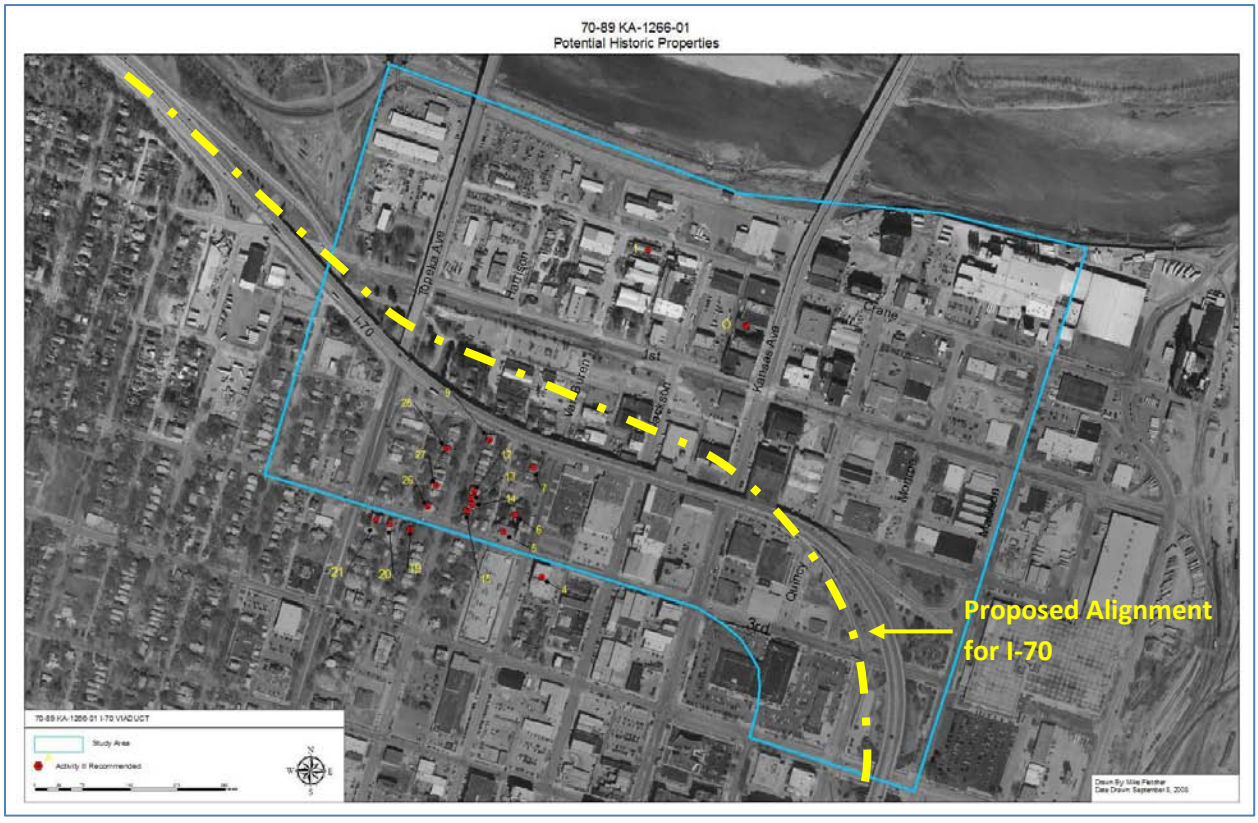
W. Giles Park

Source: Google Maps

Historic Buildings

A review of the potential historic properties does not indicate any conflicts with the proposed relocation of I-70. Figure 5.3 shows the locations of potential historic properties in the area that are recommended for Activity II analysis. These properties are located north of 1st Street and south of 2nd Street. The proposed alignment for I-70 is between 1st Street and 2nd Street.

Figure 5.3 Potential Historic Buildings

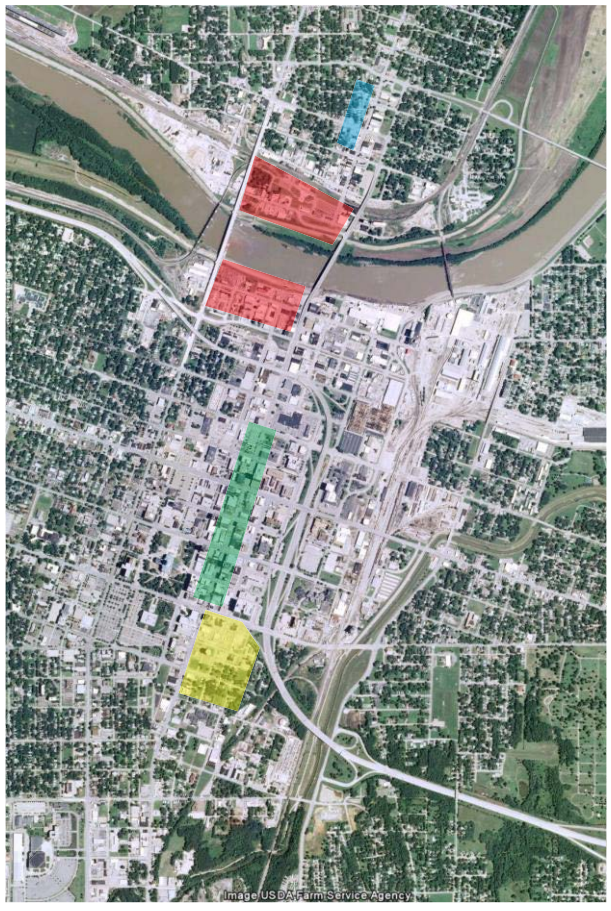


Economic Development

I-70 serves four areas of potential development shown in Figure 5.4. The first is the proposed Riverfront Development area which lies on the north side of I-70 between Topeka Boulevard and Kansas Avenue. A master plan has been developed for the Riverfront area which includes both the north and south sides of the Kansas River, see Figure 5.5. The second is a proposed entertainment district that is located on the west side of I-70 and south of 10th Avenue. The third area is Downtown itself which is undergoing redevelopment, with much of the activity focused on Kansas Avenue. The fourth is the North Topeka Arts District located on North Kansas Avenue.

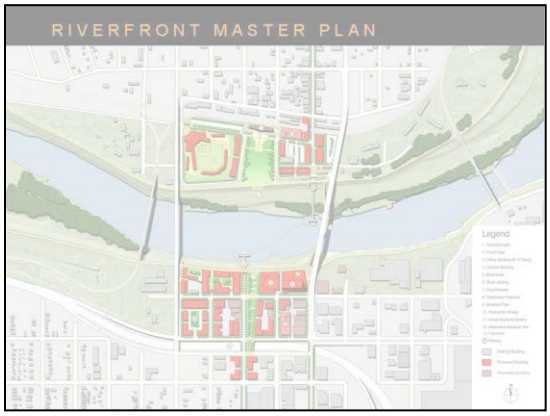
The alternatives for improvement to I-70 have been developed to support these areas of potential economic development.

Figure 5.4 Economic Development Areas



Source: Google Earth for aerial photography

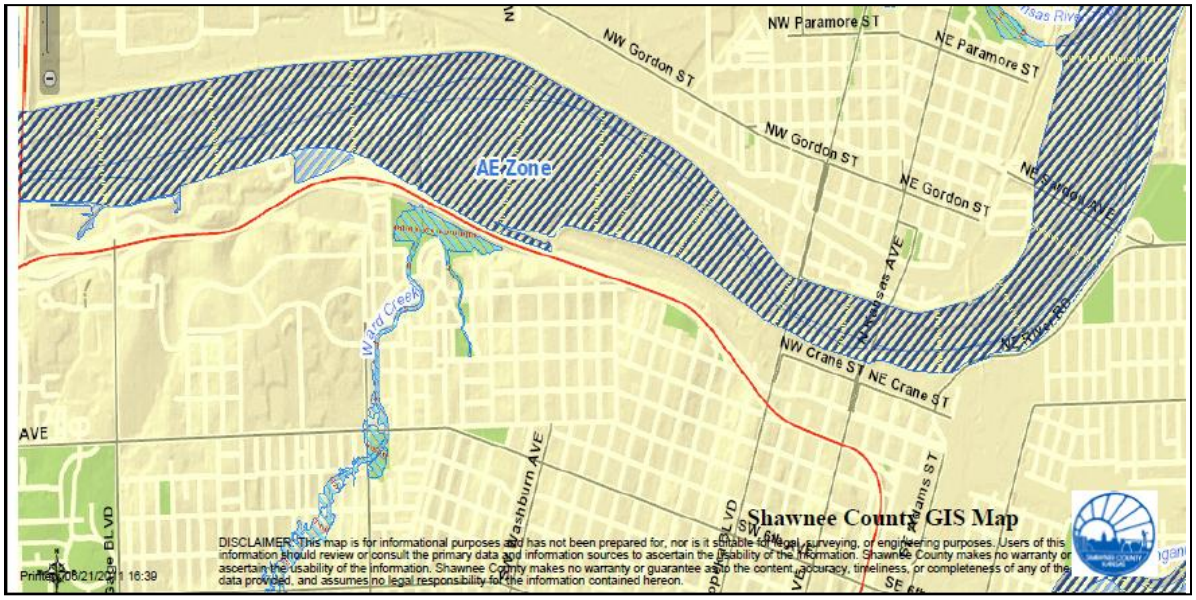
Figure 5.5 Riverfront Master Plan



Floodplain

The Kansas River passes just to the north of I-70. The floodplain in this area is shown in Figure 5.6. The study area is protected by a levee system. The embankment for I-70 is the levee from the MacVicar Avenue interchange east for approximately one-half mile. As the improvement concept moves forward into design, coordination with the Corps of Engineers will be required.

Figure 5.6 Floodplain Map



Communities of Concern

Federal Environmental Justice guidance is to ensure that communities of concern, defined by minority populations and low-income populations, are included in the transportation planning process, and to ensure that they may benefit equally from the transportation system without shouldering a disproportionate share of its burdens.

There are three **fundamental environmental justice principles**:

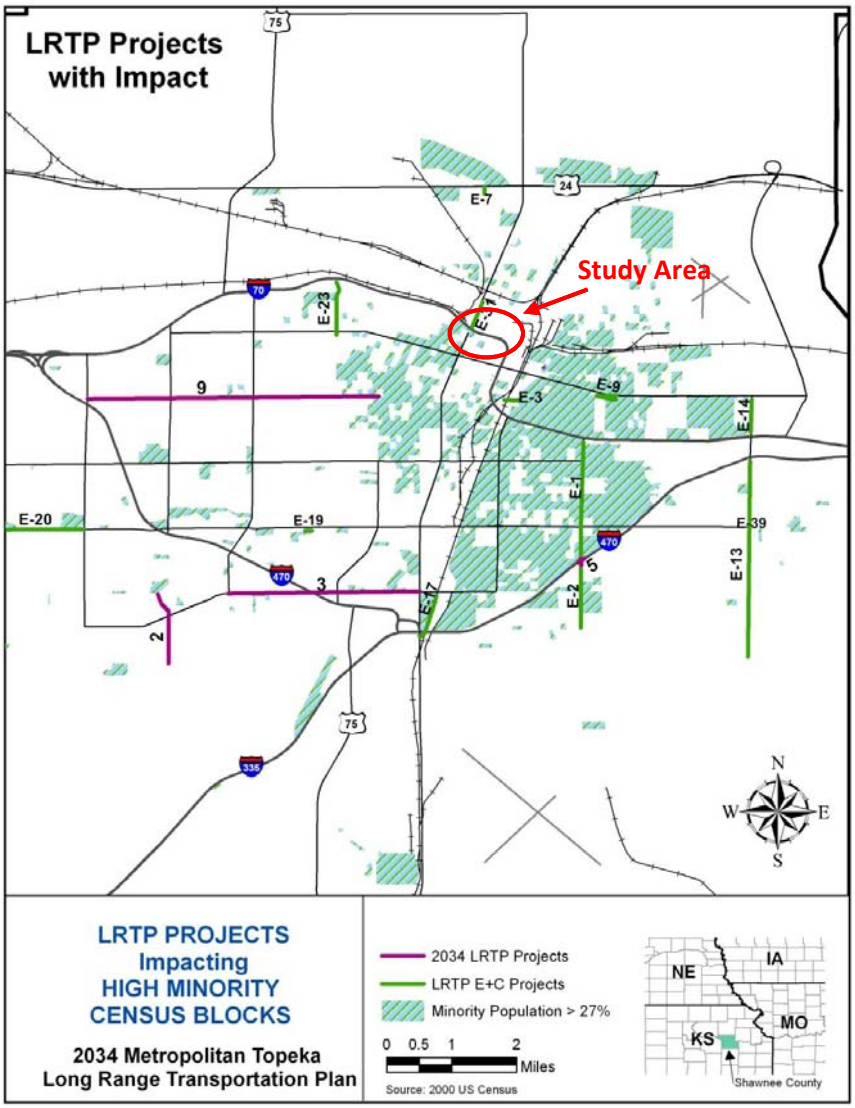
- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The Metropolitan Topeka Planning Organization's (MTPO) 2034 Long Range Transportation Plan (LRTP) has identified communities of concern (e.g. environmental justice populations).

Minority Population

According to the 2000 US Census, 18 percent of the MTPO region's residents are considered to be minorities. For purposes of environmental justice analysis, the blocks where the share of minority population is at least one and one-half times greater than that of the overall MTPO area were considered to be communities of concern. Those individual blocks are shown in Figure 5.7. The proposed realignment of I-70 in this area will not impact a community of concern.

Figure 5.7 High Minority Census Blocks

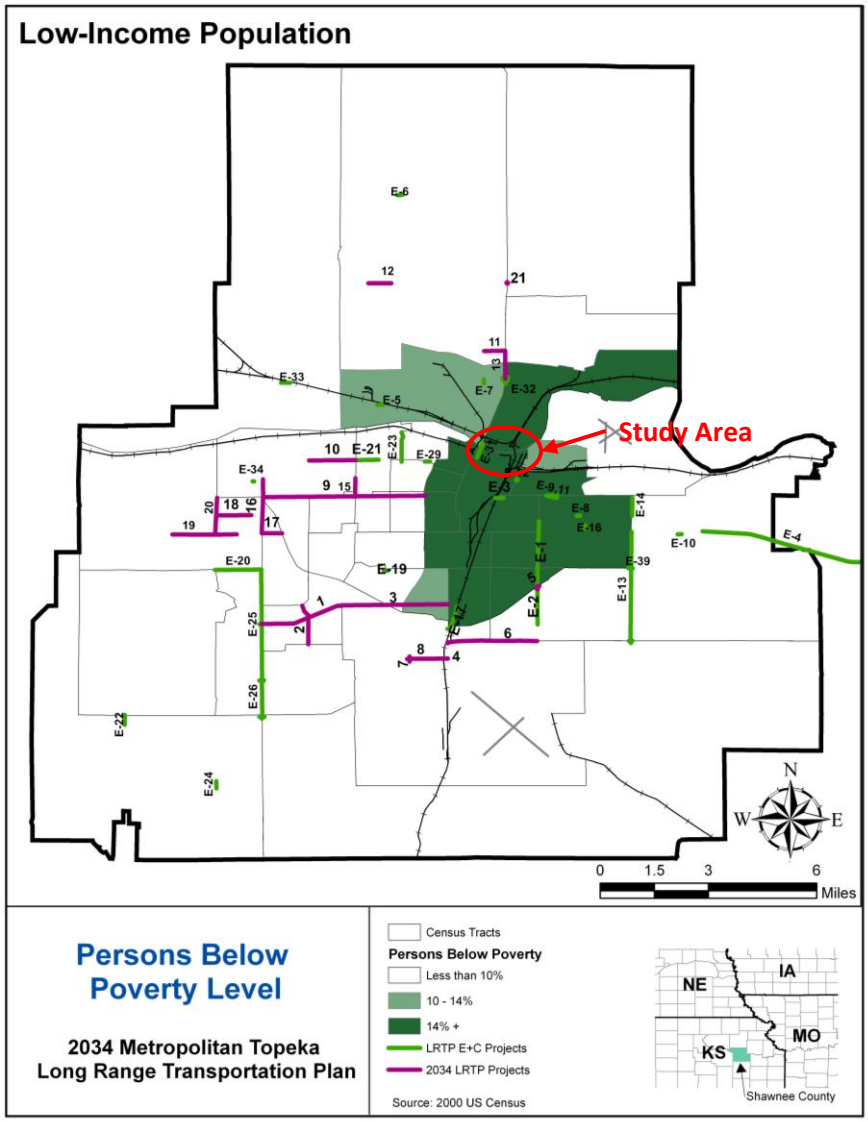


Source: 2034 Metropolitan Topeka Long Range Transportation Plan

Low Income Population

In the 2000 US Census, nearly 10 percent of the population of the MTPO planning area reported incomes below the federal poverty level (referred to as "low income" in this analysis). For purposes of environmental justice analysis, the blocks where the share of low income population is one and one-half times greater than that of the overall MTPO area were considered to be communities of concern. Those areas are shown in dark green in Figure 5.8. The proposed realignment of I-70 for all three alternatives will be within a low income area. The area is primarily commercial with a few residences. To provide the safety and traffic operation benefits that are goals of the study, this impact is unavoidable.

Figure 5.8 Low Income Populations



Source: 2034 Metropolitan Topeka Long Range Transportation Plan

Bikeway Master Plan

The current Regional Trails Plan has two bicycle trails, shown in Figure 5.9, that cross I-70 near Downtown Topeka. The existing Shuga Trail, shown by a pink line, crosses under I-70 between Adams Street and 10th Avenue. It then continues north to its current ending point at 10th Avenue. Future plans call for the Shunga Trail to be extended north and east. A proposed trail, shown by a dotted blue line, will be located a couple of blocks east of the "north-south" segment of I-70. This trail would extend north to the Kansas River levee and then turn west and extend along the levee. A new Bikeways Master Plan is being developed and will need to be reviewed during preliminary design.

Figure 5.9 Bicycle Trails

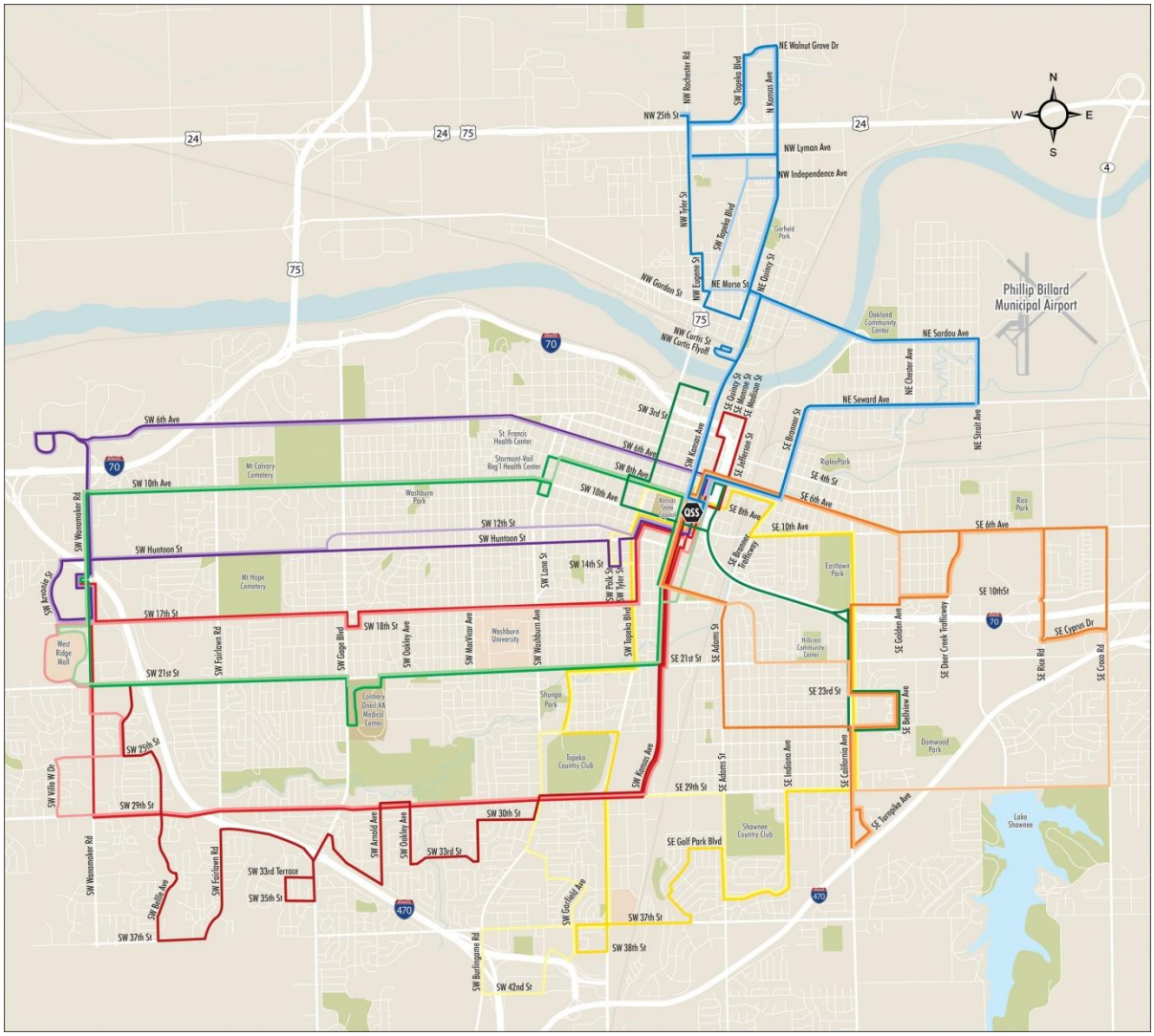
Source: Shawnee County Trails Map

Transit and School Buses

Both the Topeka Metropolitan Transit Authority (TMTA) and Unified School District (U.S.D.) 501 operate buses on I-70. Based upon responses from their stakeholder interviews, safe access to I-70 is an important issue to both. At the time of the interview, TMTA had three routes using I-70, each with two buses per hour as well as the companion paratransit service. Paratransit service provides 50 to 60 rides per day on I-70 going to the Cotton-O'Neil medical clinic near 29th Street and Croco

Road. Likewise, many paratransit trips use I-70 to go to the Tallgrass medical facility near 10th Avenue and Wanamaker Road. TMTA makes use of the 1st Street entrance-ramp instead of the 3rd Street ramp when going west on I-70 due to safety concerns. Numerous bus routes are shown in Figure 5.10 that cross I-70 on 6th Avenue, 8th Avenue, 10th Avenue, Topeka Boulevard, and Kansas Avenue.

Figure 5.10 TMTA Bus Routes



Source: Topeka Metropolitan Transit Authority

U.S.D. 501 operates 40 buses a day on I-70. In addition, the District's Hummer Sports Park is located near I-70 and MacVicar Avenue. The District has purchased the former State Hospital grounds, also located in this area. As this site develops, it is expected to draw 600 to 1100 people per day.

Environmental Documentation

The Kansas Department of Transportation and Federal Highway Administration reviewed the impacts of the proposed I-70 improvements on historic properties, parks, and communities of concern, as well as comments from the public and other stakeholders. They concluded that a "documented categorical exclusion" was the appropriate environmental document for the project as it moves forward into the design phase.