

NOTICE !

The Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) are considering use of the Design-Build process, rather than the Design-Bid-Build process, to yield transportation solutions for the needs identified and studied in this Environmental Impact Statement (EIS). The Design-Build process allows design of the facility and construction to take place simultaneously by a contractor chosen to design and build the project, in this case, for a specified cost. The solutions proposed in this EIS are intended to represent a “worst-case” yet reasonable scenario for likely impacts of the project, offering a footprint within which any number of reasonable options might be proposed.

The alternatives offered in the EIS do not limit the proposals the Design-Build contractor can suggest. For example, the specific layout of the I-29 ramps for Paseo Boulevard might retain a left-hand exit, as is current, rather than the right-hand exit shown in the EIS. The interchange layouts for the Front Street and the Route 210 interchanges might differ from the layouts examined in this EIS. However, the footprint used within the EIS for environmental analysis is expected to accommodate the alternatives that the Design-Build contractor proposes. Reasonable proposals from the contractor will be examined to assure we have considered their impacts and also to confirm their ability to meet the purpose and need of the project in a safe and effective manner. Public involvement about the chosen alternative(s) and its specific details is expected as the Design-Build process progresses.

We will continually monitor and assess the proposed Design-Build alternative to make sure it does not introduce significant impacts that aren't covered in the approved NEPA document.



CHAPTER IV

Environmental Consequences

This chapter describes the potential environmental consequences of the reasonable alternatives defined in Chapter II - Alternatives. The reasonable alternatives include those alternatives that were carried forward following the initial improvement concept screening and interchange analysis and engineering refinements. The baseline conditions enabling the evaluation of the potential social, economic and environmental impacts were established and defined in Chapter III – Affected Environment.

The proposed action is a reconstruction and includes an increase in mainline capacity for a portion of the study corridor. This chapter assesses the impacts of the alternatives, as summarized below. The alternatives are described in detail in Chapter II. In this chapter, impacts of the alternatives are described within three subcorridors, defined in Chapter II: North Subcorridor; River Crossing Subcorridor; and CBD North Loop Subcorridor. Through the evaluation described in this chapter, a Preferred Alternative for the entire I-29/35 Study Corridor was identified. The Preferred Alternative for the study corridor is a combination of the Preferred Alternatives for each of the subcorridors.

The impacts analysis in this chapter is based on the use of a maximum footprint to assess environmental impacts. This provides the ability to accommodate other designs within the footprint that would have either equal or less impacts than what is indicated. The mainline and interchange types for each alternative as described in Chapter II were assumed in order to complete the impact analysis. The build alternatives include footprint to enable widening the I-29/35 mainline to six through lanes with sufficient right-of-way to enable widening to eight through lanes if warranted in the future. MoDOT will continue to look at ways to refine the footprint of the project during the design phase in order to impact the fewest resources.

The reasonable alternatives analyzed are summarized below:

North Subcorridor (M-210/Armour Road to 14th Avenue)

- ***No-Build Alternative*** – This alternative includes only minor short-term activities that would be completed throughout the life of the project, including pavement overlays, routine maintenance and bridge repair.
- ***Build Alternative (Preferred)*** – The build alternative includes widening the I-29/35 mainline to six through lanes with sufficient right-of-way to enable future widening to eight through lanes and improving the interchange at M-210/Armour Road and the half interchange at 16th Avenue.

River Crossing Subcorridor (14th Avenue to Dora Street)

- ***No-Build Alternative*** – Under this alternative, the I-29/35 Corridor would remain in its present configuration and location and a new bridge over the Missouri River would not be constructed. This alternative includes only minor short-term activities that would be completed throughout the life of the project, including pavement overlays, routine

maintenance and bridge repair. The bridge repair would include the corridor roadway bridges, as well as a major rehabilitation plan that would extend the life of the existing I-29/35 Paseo Bridge over the Missouri River. It would include two pavement mill and overlays to maintain the driving surface of the interstate.

- **Build Alternatives** – Within this subcorridor, the build alternative includes widening the I-29/35 mainline initially to six through lanes with sufficient right-of-way to enable future widening to eight through lanes and improving or replacing the I-29/35 Paseo Bridge, as well as several corridor interchange improvement options. The build alternative combinations within this subcorridor include:
 - **Alternative A (Alternative A or B is Preferred)** – Alternative A consists of rehabilitating the existing I-29/35 Paseo Bridge and converting it to a one-way bridge for southbound traffic. A new companion bridge would be constructed immediately adjacent to and downstream from the existing bridge. The existing Paseo Bridge would need rehabilitation work because the 2005 project was only meant to extend the bridge's service for 10 to 15 years. At that time it was determined that another major maintenance project would be needed to reconstruct the structural steel floor system to accommodate one direction of traffic, if the existing bridge is to remain in use, and to construct a new slab.

This build alternative includes widening the I-29/35 mainline and assumes constructing braided ramps at Bedford Avenue and Levee Road and an improved interchange at Front Street.

- **Alternative B (Alternative A or B is Preferred)** – This alternative includes the construction of two new twin bridge structures, with one bridge carrying southbound traffic and one bridge carrying northbound traffic or the construction of one larger structure within the same footprint. This build alternative includes widening the I-29/35 mainline and assumes constructing braided ramps at Bedford Avenue and Levee Road and an improved interchange at Front Street. Two different interchange types at Front Street have been illustrated, which are labeled as B-1 and B-2. These two interchange types are used to determine the impacts for Alternative B.
- **Alternative C** – This alternative includes the construction of one new bridge carrying both northbound and southbound traffic located downstream of the existing Paseo Bridge. This build alternative also includes widening the I-29/35 mainline and assumes constructing braided ramps at Bedford Avenue and Levee Road and an improved interchange at Front Street.

CBD North Loop Subcorridor (Dora Street to Broadway Boulevard)

- **No-Build Alternative** – This alternative includes only minor short-term activities that would be completed throughout the life of the project, including pavement overlays, routine maintenance and bridge repair.
- **Build Alternatives** – Within this subcorridor, the build alternatives include improvements to the north leg of the Central Business District (CBD) Loop, as well as several corridor interchange improvement options. There are two build alternative combinations within this subcorridor.
 - **Alternative A** – This build alternative includes widening the I-29/35 mainline from Dora Street to the northeast corner of the CBD Loop. From there to just west of Broadway Boulevard, the mainline's current six-lane section would be maintained

with minor ramp and lane modifications to improve operations and safety. The US 24/Independence Avenue, M-9 and Main Street interchanges would remain in their current configurations. The existing Paseo Boulevard left-hand entrance and exit would be converted to a right-hand entrance and exit. The Broadway Boulevard interchange could potentially be converted to a Single Point Urban Interchange (SPUI) and the I-29/35 mainline ramps to and from the north would be removed.

- *Alternative B (Preferred)* – This build alternative includes widening the I-29/35 mainline from Dora Street to the northeast corner of the CBD Loop. The mainline from the northeast corner of the CBD Loop to just west of Broadway Boulevard maintains the current six-lane mainline section, but includes ramp and lane modifications to improve operations and safety. The existing Paseo Boulevard left-hand entrance and exit are converted to a right-hand entrance and exit.

Within this alternative, access from the US 24/Independence Avenue westbound loop ramp to I-35 southbound/I-70 westbound is relocated as US 24/Independence Avenue is converted to a continuous frontage road from the northeast corner of the CBD Loop to the Broadway Boulevard interchange. Direct access from Sixth Street to I-29/35 northbound is added. The M-9 directional interchange would be converted to an at-grade interchange. Operations and impacts were assessed assuming that in this alternative the Broadway Boulevard interchange would be converted to a Single Point Urban Interchange (SPUI).

Alternatives Plates showing the proposed improvements for each reasonable alternative are included in Appendix C. The evaluation factors that were used to differentiate the alternatives for each subcorridor are summarized in Exhibits IV-1, IV-2 and IV-3.

A. Land Use Impacts

Evaluation of land use impacts involves the determination of impacts to existing land use patterns and consistency with local comprehensive development plans.

1. IMPACTS ON EXISTING LAND USE

a. The No-Build Alternative

The No-Build Alternative would not impact existing land use patterns. Development projects that are proposed, planned or underway would likely continue in their present form, and changes to existing land uses would occur according to each city's comprehensive plans as deemed necessary and appropriate by local authorities.

b. The Build Alternatives

All of the build alternatives would have the same general impacts to existing land use patterns.

Since all of the build alternatives involve widening of the existing roadway, rather than a new alignment, the majority of improvements would occur within existing right-of-way or with partial acquisitions of property. The majority of partial impacts would occur to commercial, industrial, and vacant/open space land use, while a few partial property impacts would occur to multi-family residential and single family residential units.

Although land use impacts in the form of total property acquisitions are few, some would occur to businesses in the industrial area of North Kansas City, south of 16th Avenue. Some would also occur in the industrial area south of the Front Street interchange in Kansas City, some of which are vacant buildings. Although land use impacts (total and partial acquisitions of land)

would be necessary in some areas, the overall land use patterns adjacent to the corridor would not be disrupted as a result of the project. (Total and partial acquisitions of residences and businesses are discussed further in Section C – Right-of-Way Acquisition Impacts.)

2. CONSISTENCY WITH COMPREHENSIVE DEVELOPMENT PLANS

As discussed in Chapter III, the city of Kansas City's master plan called Forging Our Comprehensive Urban Strategy (FOCUS) was developed to guide the future of the city for the next 25 years. The FOCUS plan contains components that provide land use planning guidelines and strategies which form the basis for development of area or neighborhood land use plans that are more detailed regarding future land use recommendations. In addition, the city of North Kansas City adopted the 2002-03 Master Plan Revision, which provides goals and strategies for specific planning areas within the City.

Although some partial and total property acquisitions would be necessary, continued development and redevelopment of specific areas adjacent to the I-29/35 corridor, as outlined in each city's comprehensive plans and area plans, would not be hindered and could proceed under any of the build alternatives. Those areas were discussed in the land use section of Chapter III and include the following:

- the north side of downtown Kansas City
- the south side of the River Market Area
- the Columbus Park neighborhood
- the Paseo/Independence intersection realignment
- the Port Authority mixed-use development site south of Berkley Riverfront Park
- the future commercial development at the southeast quadrant of the Armour Road (M-210) interchange
- the light industrial/warehouse development on the vacant land northeast of the 16th Avenue interchange

Representatives of the cities of Kansas City and North Kansas City were invited to a scoping meeting at the beginning of the EIS process, and to a series of stakeholder meetings, public meetings and project coordination meetings. Through this coordination with the cities, areas designated for future development or redevelopment were taken into consideration as the alternatives were being developed in order to accommodate future land uses and traffic patterns. MoDOT will continue to coordinate with each city throughout the EIS process.

B. Social Impacts

The analysis of social impacts involves the assessment of a variety of factors which act collectively to create or reinforce a sense of community or place. Community is typically formed through associations between residents and key elements such as neighborhoods, places of commerce, schools, and public facilities. The degree to which alternatives would influence or impact these patterns of social interaction and community is detailed in the following text.

1. NEIGHBORHOOD AND COMMUNITY COHESION

This potential impact measure considers likely changes in neighborhood or community cohesion for various social groups as a result of the proposed action. It also includes considerations of proposed impacts to social groups as a result of the proposed action. It includes considerations of proposed impacts to school districts, recreation areas, churches and businesses. The construction of the original freeway within the study corridor altered community cohesion, including the disruption of neighborhoods and businesses. The build alternatives, which modify

the existing freeway system, do impact some properties located adjacent to the study corridor, however the proposed action would not result in new severances or further disruptions to existing neighborhoods.

a. North Subcorridor

The existing neighborhoods in the North Subcorridor along I-29/35 are primarily low-density, single-family neighborhoods with some multi-family residential along the periphery. This residential area is located in the north-west quadrant of the I-29/M-210 Interchange. There are no residential neighborhoods in the other quadrants; they are commercial and industrial areas. Most of the commercial and industrial properties in the southeast quadrant of the I-29/M-210 Interchange have been acquired as a part of a commercial redevelopment project.

No-Build Alternative

The No-Build Alternative would not have direct property impacts on existing neighborhoods and community cohesion. The No-Build Alternative would not impact existing schools, churches or businesses. The No-Build Alternative would result in increased traffic delays. The increase in travel times would lead to a reduction in accessibility to residences, business sites and community facilities.

Build Alternative (Preferred)

The build alternative would have no impact on community cohesion for the residential neighborhoods in the vicinity of the project. The neighborhoods would remain intact, and would continue to be connected to nearby commercial areas via the existing city street and sidewalk system.

b. River Crossing Subcorridor

No-Build

The No-Build Alternative would not have direct property impacts on existing neighborhoods and community cohesion. There are no residential neighborhoods in this area. The No-Build Alternative would not impact existing schools, churches or businesses. The No-Build Alternative would result in increased traffic delays. The increase in travel times would lead to a reduction in accessibility to residences, business sites and community facilities.

Build Alternatives A, B (Alternative A or B is Preferred) and C

The proposed alignment of the build alternatives would not have an impact on neighborhood or community cohesion in this subcorridor. There are no residential neighborhoods located in this subcorridor. The Port Authority property located to the west of I-29/35 at Front Street may be developed in the future. MoDOT will coordinate with the Port Authority during the design process regarding access to potential future arterials.

c. CBD North Loop Subcorridor

No-Build

The No-Build Alternative would not have direct property impacts on existing neighborhoods and community cohesion. The No-Build Alternative would not impact existing schools, churches or businesses.

Build Alternatives

The proposed alignment of the build alternatives would not have a major impact on neighborhood or community cohesion in this subcorridor. There would be no severances of

existing neighborhoods resulting from the build alternatives. There are no total residential property acquisitions as part of build alternatives.

Build Alternative A – This alternative would have virtually no effect on community cohesion and continuity, as the improvements would focus on the freeway mainline and would leave existing adjacent roadways as they are now.

Build Alternative B (Preferred) – Alternative B includes elements that would increase the community linkages and historical ties by extending Independence Avenue through the M-9 interchange, lowering the grade of the M-9 interchange and providing for a future opportunity to reduce the physical barrier between Columbus Park and the River Market areas. This would ultimately lead to a restoration of the continuity of this area, which was altered by previous highway construction projects. It is anticipated that this would be a beneficial aspect of the project with regard to community cohesion and continuity.

2. TRAVEL PATTERNS AND ACCESSIBILITY

The analysis of travel patterns and accessibility impacts involves assessing changes to these factors related to the No-Build and build alternatives. There are currently nine interchange access points to I-29/35, beginning just north of Missouri Route 210 in Clay County and continuing south on I-29/35/US 71 to the north side of the CBD Loop, designated as I-35/70 and US 24/40.

a. North Subcorridor

No-Build Alternative

The No-Build Alternative would not have any new opportunities for changes in travel patterns or accessibility.

Build Alternative (Preferred)

This alternative would not change the location of access to and from I-29/35, and as such, there would not be a change in travel patterns. This alternative would improve the traffic capacity at the interchanges. Improvement to the M-210 interchange and the 16th Avenue interchange would enhance the level of access and safety at each interchange. The access management elements of the build alternatives could impact access to adjacent properties on M-210 near I-29/35. The 16th Avenue Build Alternative would provide better heavy truck traffic movement.

b. River Crossing Subcorridor

No-Build Alternative

The No-Build Alternative would not have any new opportunities for changes in travel patterns or accessibility.

Build Alternatives A, B (Alternative A or B is Preferred) and C

The build alternatives incorporate improvements to ramps at Bedford Avenue/Levee Road that would improve safety and access for the merging and diverging traffic on I-29/35. The interchange types evaluated at Front Street would not change access. The interchange type included with River Crossing Alternatives B-2 and C would allow Front Street to have a more direct connection under I-29/35 improving accessibility across the freeway.

c. CBD North Loop Subcorridor

No-Build Alternative

The No-Build Alternative would not result in changes in travel patterns or accessibility.

Build Alternatives A and B (Preferred)

Access to-and-from the Kansas City, Missouri CBD would be improved as a result of the increase in vehicle capacity. The build alternatives show a modification to access from the Paseo Boulevard where entrance and exit ramps would now occur on the right side of the freeway. This modification would improve travel movements between Independence Avenue and Front Street.

For Alternative A along the north side of the CBD Loop, the only modification of existing access would occur at Broadway. The Broadway interchange would have additional capacity. In order to minimize weaving conflicts, a number of exit and entrance ramps would be removed, however, the current level of access would be maintained or enhanced.

Alternative B results in access modifications resulting from addressing existing geometric deficiencies. Access ramps would be relocated in some cases. A continuous frontage road would be provided both north and south of I-70/35 with improved connections to and from I-29/35.

Alternative B also includes modifications at M-9. M-9 would be modified with an at-grade interchange replacing the tight cloverleaf configuration. Additional access would be created between M-9 and the River Market and Columbus Park neighborhoods by lowering the M-9 interchange and extending Independence Avenue across M-9.

The Broadway interchange would be modified to provide additional capacity. In order to minimize weaving conflicts, a number of exit and entrance ramps would be removed, however, the current level of access would be maintained or enhanced. The westbound entrance ramp to I-70 from Independence Avenue would be removed, with access replaced by frontage road access.

3. PUBLIC PARKS AND RECREATION AREAS

As discussed in Chapter III, publicly-owned parks and recreation facilities (including public pedestrian/bicycle off-street trails) have special status under the provisions of Section 4(f) of the U.S. Department of Transportation Act of 1966. Some Section 4(f) eligible properties may also be subject to Section 6(f) of the Land and Water Conservation Fund Act, or the grants program UPARR 1010 as discussed in Chapter III. During the early stages of this project, Section 4(f) eligible parks and recreation facilities were mapped and identified as prime candidates for avoidance. Avoidance is preferred unless such avoidance would have other, more extraordinary socio-economic, environmental or engineering consequences.

Impacts to public parks and recreation facilities for each alternative are discussed below. If the Preferred Alternative encroaches on a Section 4(f) eligible property, a Section 4(f) evaluation must be conducted that tests all proposed alternatives. This evaluation must lead to a finding that there is no feasible and prudent alternative to the taking of that park or recreation area, and that all possible planning to minimize harm to the resource has been undertaken.

Impacts can also be in the form of “constructive use” due to proximal impacts. Constructive use occurs when the transportation project does not require land from a 4(f) resource, but the proximity impacts (indirect impacts due to noise, aesthetics, access, land use changes, and impacts to ecological features) are so severe that they cause substantial impairment to the protected activities, features, or attributes that qualify a resource for 4(f) protection [23CFR 771.135.(p)(iii)]. In both cases, the FHWA determines the applicability of Section 4(f).

a. North Subcorridor***No-Build Alternative***

The No-Build Alternative would have no impacts to River Forest Park, a section 6(f) and 4(f) property and the only public park in this subcorridor.

Build Alternative (Preferred)

The build alternative would have no direct acquisition impacts to River Forest Park, and there would be no constructive use impacts, as there are no recreational facilities in the park and the highway currently exists adjacent to the park.

b. River Crossing Subcorridor***No-Build Alternative***

The No-Build Alternative would have no impacts to public parks or recreation facilities in this subcorridor.

Build Alternatives A, B (Alternative A or B is Preferred) and C

The build alternatives would have no direct impacts or constructive use impacts to public parks or recreation facilities in this subcorridor as discussed below.

Berkley Riverfront Park – There would be no direct impacts to Berkley Riverfront Park by direct conversion of land, and since there is already an existing interchange near the park, and highway improvements would not substantially impair the utility of the park, there would be no constructive use impacts to the park.

Riverfront Heritage Trail – The Missouri River bridge(s) in each alternative would cross over the Riverfront Heritage Trail (bicycle/pedestrian path) located at the south side of the river at the levee. There would be no direct conversion of land, as the trail would be spanned and no piers would be placed on the trail. The trail is already spanned by the existing Paseo Bridge and, therefore, the new bridge(s) would not have a constructive use impact on the trail. However, there would be temporary impacts in the form of temporary closure of the trail during new bridge construction. As discussed in Chapter III, Section A.2.d., the FHWA has determined that the Trail is not a Section 4(f) eligible resource because its primary purpose is for transportation. It should be noted that the Riverfront Heritage Trail remained open during the recent Paseo Bridge Rehabilitation Project.

c. CBD North Loop Subcorridor***No-Build Alternative***

The No-Build Alternative would have no impacts to the public parks and recreation facilities in this subcorridor. However, there could be impacts to a public park, from a city project that would tie into I-29/35 (independent of the I-29/35 project), even in a no-build scenario.

Belvidere Playground – There is no impact to Belvidere Playground from the No-Build Alternative of the I-29/35 project. The proposed connection would intersect the existing grade of the ramp south of the City of Kansas City's proposed Paseo Boulevard realignment project. However, it should be noted that there could be impacts to the Belvidere Playground park area as the result of a city boulevard improvement project which is independent of and not reliant on the I-29/35 project (see documentation concerning amendment to the Kansas City Major Street Plan, Case No. 175-S-15 in Appendix H). The City of Kansas City is planning to realign the Paseo Boulevard which would include a wide median between the north and southbound lanes

at Independence Avenue (see Alternatives Plates A-05 and B-05 in Appendix C). The southbound lanes would be shifted farther to the west, thereby requiring a realignment of the southbound portion of the Paseo Boulevard (north of Independence Avenue) that would tie into the existing Paseo off-ramp of I-29/35 at the north corner of the park. The City's planned realignment would result in encroachment on the Belvidere Playground property.

Build Alternatives A and B (Preferred)

Both Build Alternatives A and B would have neither direct impacts by conversion of land, nor constructive use impacts to any of the public parks and recreation facilities in this subcorridor. Measures to avoid impacts to the parks and recreation facilities are discussed below.

Kessler Park and Belvidere Playground – Both of the Build Alternatives A and B have been aligned to avoid direct impacts to these parks and by utilizing retaining walls to keep roadway improvements within existing right-of-way. Since the roadway currently exists adjacent to these parks and the upgraded roadway facility would not substantially impair the utility of the parks, there would be no constructive use impacts.

At the north corner of Belvidere Playground, the Paseo Boulevard north and southbound on/off-ramps would tie into the existing Paseo north and southbound lanes within the existing right-of-way in either alternative. The city's plans to realign the Paseo Boulevard would be able to tie into the on/off ramps at the north corner of Belvidere Playground, however the city's realignment would impact Belvidere Playground as discussed above for the No-Build Alternative.

Margaret Kemp Park, Columbus Square Park and West Terrace Park / Case Park – The improvements within Alternatives A and B would occur within existing right-of-way at these parks. Therefore there would be no direct impacts by land conversion, and since the roadway currently exists adjacent to these parks and the upgraded roadway facility would not substantially impair the utility of the parks, there would be no constructive use impacts.

The Riverfront Heritage Trail – In this subcorridor the trail is a signed on-street route and is also marked on the existing sidewalk, which is immediately adjacent to the street. The trail follows 4th Street under the existing Broadway Avenue bridge and follows Wyandotte Street on the bridge over I-29/35, however, there would be no direct impacts to the trail by conversion of land. At Wyandotte Avenue, neither of the alternatives would disrupt the existing bridge over I-29/35. The bridge would therefore remain and the existing route would continue to function. The Riverfront Heritage Trail remained open during the 2005 Paseo Bridge rehabilitation project, however, it is anticipated that there would be temporary closures of the trail during the construction activities associated with the I-29/35 Paseo Bridge construction project.

4. OTHER PUBLIC/SEMI-PUBLIC LANDS AND FACILITIES

As discussed in Chapter III, public and semi-public lands and facilities within the study corridor, other than Section 4(f) eligible public parks and recreation facilities (discussed previously), include publicly owned open or undeveloped space, scenic byways, boulevards/parkways, schools, places of worship (churches/synagogues), community centers, museums, municipal/governmental facilities, and public safety/emergency service facilities. A complete listing of public and semi-public lands and facilities is provided in Chapter III.

All of the scenic byways, boulevards and parkways would retain the same traffic patterns that currently exist. The Spirit of Kansas City Regional Scenic Byway would continue to travel along Lydia Avenue and Levee Road (along Berkley Riverfront Park) at the Front Street interchange.

Admiral Boulevard and Grand Avenue (boulevard) would continue to cross over I-29/35 at the same locations, and the Paseo Boulevard (parkway) ramps would continue to be connected to I-29/35.

All public/semi-public impacts discussed below would be in the form of partial impacts to open or undeveloped space. No impacts would occur to schools, places of worship, community centers, museums, municipal/governmental facilities, or public safety/emergency service facilities. Impacts to public/semi-public lands and facilities are summarized in Table IV-1 (page IV-19).

a. North Subcorridor

No-Build Alternative

The No-Build Alternative would have no total or partial acquisition impacts on other public or semi-public lands and facilities.

Build Alternative (Preferred)

The build alternative would have no total acquisitions of public/semi-public lands or facilities. However, partial impacts would occur and are as follows:

- Partial acquisition of two parcels (one on each side of I-29/35) of the North Kansas City Levee District, occurring at the North Hillside Drainage Ditch (for culvert extensions), just north of the Armour Road interchange.

b. River Crossing Subcorridor

No-Build Alternative

The No-Build Alternative would have no total or partial acquisition impacts on other public or semi-public lands and facilities.

Build Alternatives

Alternatives A and B-1 (Alternative A or B is Preferred) – Alternatives A and B-1 would have no total acquisitions of other public or semi-public lands and facilities. The seven partial impacts to property would be the same for both of these alternatives and would be as follows:

- Macon Street (in the city of North Kansas City) would be removed between Bedford Avenue and Levee Road.
- The North Kansas City Levee District, on the north side of the Missouri River at the levee – the new bridge(s) would span over the levee, and piers would be placed on Levee District property, on the north side of the levee. In addition, a small piece of this property would be acquired where the southbound off-ramp intersects with Levee Road.
- Property of the United States of America (Army Corps of Engineers) occurring at the wooded area between the north levee and the Missouri River – the new bridge(s) would span over this area, however piers would be placed within the property.
- The Kansas City Levee District, on the south side of the Missouri River at the levee – the new bridge(s) would span over the levee, and piers would be placed on the south side of the levee.
- Partial acquisition of a small portion of the east edge of city-owned open space inside the northwest loop of the existing Front Street interchange.

- Partial acquisition of the north edge of both city owned open space inside the southwest loop of the Front Street interchange. The parcel is owned by the city of Kansas City and currently being leased by the Kansas City Rugby Football Club through the Port Authority.
- Partial acquisition of the northeast corner of the land that the Port Authority is planning to develop as a mixed-use urban village, south of Berkley Riverfront Park.

Alternatives B-2 (Alternative A or B is Preferred) and C – Alternatives B-2 and C would have no total acquisitions, but would have six partial acquisition impacts. Most of these partial impacts would be similar to those of Alternatives A and B-1 described above, but with variations noted:

- Macon Street (in the city of North Kansas City) would be removed between Bedford Avenue and Levee Road.
- The North Kansas City Levee District, on the north side of the Missouri River.
- The Kansas City Levee District, on the south side of the Missouri River.
- Property of the United States of America (Army Corps of Engineers) at the wooded area between the north levee and the Missouri River.
- City-owned open space inside the northwest loop of the existing Front Street interchange. Variation – proposed right-of-way extends into the loop more than that of Alternatives A and B-1.
- Partial acquisition of the east edge of the southwest loop of the Front Street interchange. Variation – impacts less property.

c. CBD North Loop Subcorridor

No-Build Alternative

The No-Build Alternative would have no total or partial acquisition impacts on other public or semi-public lands and facilities.

Build Alternatives

Alternatives A and B (Preferred) – Alternatives A and B would have no total or partial acquisitions of other public or semi-public lands and facilities in this subcorridor.

5. SAFETY ISSUES

In this section, traffic safety issues are discussed in relation to crash rates, and public safety is discussed in relation to potential disruptions to police, fire and emergency service delivery.

a. Highway and Traffic Safety

Improved traffic safety was identified as part of the purpose and need for the proposed action and was discussed in Chapter II, which includes tables with existing and projected crash rate numbers. The build alternatives follow FHWA and American Association of State Highway and Transportation Officials (AASHTO) design criteria for an urban freeway.

North Subcorridor

No-Build Alternative – The current crash rates for I-29/35 are greater than the statewide average. The No-Build Alternative would result in a continuation of the existing rate of crashes

on I-29/35. Because this alternative would keep the facility as is, no substantial improvements to safety and the design standards would occur to reduce the crash rates. The total number of crashes would increase over time because the rate at which the crashes occur remains the same as existing, but the amount of traffic using the facility would increase.

Build Alternative (Preferred) – The Build Alternative would incorporate improved design features to promote the free and safe flow of traffic leading to a reduction in crash rates that, at a minimum, would match current statewide average crash rates for urban interstates.

River Crossing Subcorridor

No-Build Alternative – The No-Build Alternative would result in a continuation of the existing rate of crashes on I-29/35, and the total number of crashes would increase over time as discussed previously for the North Subcorridor.

Build Alternative A (Alternative A or B is Preferred) – Since this alternative uses the existing Paseo Bridge in place, the existing crash rate in that section was used, because no substantial improvements to safety and the design standards would occur to reduce the crash rates. Because the rate at which the crashes occur would remain the same as existing, but the amount of traffic using the facility would increase, the total amount of crashes would increase over time for this alternative.

Build Alternatives B (Alternative A or B is Preferred) and C – In Build Alternatives B-1, B-2 and C, new bridges would be constructed over the Missouri River, therefore updated safety and design standards would improve safety and decrease crash rates in these alternatives.

CBD North Loop Subcorridor

No-Build Alternative – The No-Build Alternative would result in a continuation of the existing rate of crashes on I-29/35, and the total number of crashes would increase over time as discussed previously for the other two subcorridors.

Build Alternatives A and B (Preferred) – In Build Alternatives A and B, improved design features would be incorporated to promote the free and safe flow of traffic leading to a reduction in crash rates that, at a minimum, would match current statewide average crash rates for urban interstates.

b. Overall Public Safety

As discussed in Chapter III, Fire Station No. 25 (located in the CBD North Loop Subcorridor), northwest of the Independence Avenue/Route 9 interchange in Kansas City, is the only public safety facility located within the study corridor. Other police, fire and ambulance facilities that serve the area are located outside of the study corridor and are not directly affected by any of the alternatives.

The No-Build Alternative

With the No-Build Alternative, in all of the subcorridors, no public safety facilities would be impacted, however, response times could be expected to increase as traffic congestion increases.

The Build Alternatives

None of the build alternatives in any of the subcorridors would have direct impacts to public safety facilities. Build Alternatives A and B in the CBD North Loop Subcorridor would have no

direct impact on access, parking or the building on the Fire Station No. 25 property, and travel patterns from the fire station to the River Market area, the Columbus Park Neighborhood and the north CBD area would generally remain the same. In the long term, the build alternatives can be expected to improve local and regional area circulation. The roadway improvements would enhance the overall public safety by addressing congestion and improving response times for emergency vehicles and police personnel as a result of providing a smoother flowing facility.

Construction related activities may temporarily disrupt routes and travel patterns in the short term for police, fire and ambulance services responding to calls. However, communication with the cities and their emergency services during construction would be imperative in order to facilitate the planning of temporary alternate routes for emergency vehicles.

6. ENVIRONMENTAL JUSTICE AND TITLE VI CONSIDERATIONS

a. Introduction

On February 11, 1994, President Clinton issued Executive Order on Environmental Justice 12898. This Executive Order requires all federal agencies to address the impact of their programs with respect to environmental justice. The Executive Order states that, to the extent practicable and permitted by law, neither minority nor low-income populations may receive disproportionately high or adverse impacts as a result of a proposed project. It also requires that those representatives of any low-income or minority population that could be affected by the project be given the opportunity to be included in the impact assessment and public involvement process.

Federal Agencies have developed guidelines and policy guidance to assist in the evaluation of Federal Actions for conformance with the spirit and the intent of E.O. 12898. FHWA has issued technical guidance and developed policy papers on the implementation of the National Environmental Policy Act (NEPA) and its associated regulations as well as various Executive Orders. In April 1997, the U.S. Department of Transportation issued the DOT Order on Environmental Justice to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 5680.1) to summarize and expand on the requirements of E.O. 12898. In December 1998, the FHWA issued FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 6640.23) that requires the FHWA to implement the principles of the DOT Order 5610.2 and E.O. 12898 by incorporating environmental justice principles in all FHWA programs, policies and activities.

The Missouri Department of Transportation (MoDOT) has adhered to these orders in the preparation of this Environmental Impact Statement (EIS). This EIS does review the proposed action and its alternatives in light of E.O. 12898, DOT Order 5680.1 and DOT Order 6640.23.

MoDOT is also committed to the provisions of the Americans with Disabilities Act of 1990 (ADA) and the provisions of Title VI of the Civil Rights Act of 1964. This is to ensure that no person shall, on the grounds of race, color, national origin, age, sex or disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.

To briefly summarize the intent of E.O. 12898, the proposed action is to be reviewed for effects on minority populations and/or low-income populations. This review is accomplished through development of demographic baseline conditions, use of field observations, public involvement, contacts with community representatives and by examining the potential disproportionate impacts of the build alternatives. Efforts have been made to minimize property impacts through

the use of design techniques that require less space so that there are no full residential displacements. The baseline demographic analysis was discussed in Chapter III, Section A.

The following terms have the following meanings:

- *Disproportionately high impact* means an adverse effect that is predominately borne by a minority and/or low-income population; or would be suffered by the minority and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-minority and/or non low-income population.
- *Low-Income* means a household income at or below the Department of Health and Human Services poverty guidelines of \$19,350 for a family of four (2005).
- *Minority* means a person who is:
 - 1) *Black* (having origins in any of the black racial groups of Africa);
 - 2) *Hispanic* (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);
 - 3) *Asian American* (having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or
 - 4) *American Indian and Alaskan Native* (having origin in any of the original people of North America and who maintain cultural identification through tribal affiliation or community recognition).

b. Information Gathering

Demographic

The racial composition, ethnicity, and income levels vary in the study corridor. Year 2000 Census Block Data was utilized to better understand the general socio-economic situation of the area's residents and to provide base information that can be used to further understand and identify potential impacts to low-income and minority populations.

The Census data is available for a number of geographic and political boundaries. These include states, counties, cities, and a number of census-based boundaries, such as census tracts and blocks. Block data is available for the I-29/35 Study Corridor and was employed to illustrate the anticipated impacts regard to race, ethnicity and income considerations. The potential impact area included a band parallel to I-29/35 that extended the length of the project. In Exhibit III-4, the composition of minority population in the area is illustrated and defined by those blocks with between 51 and 75 percent minority population and those with between 76 and 100 percent of the Census Block's residents being a minority. Those percentages are also used to highlight Census Block's where over half of the population is Hispanic, of any race.

While the racial composition of block groups provides an illustration of minority concentration, each and every neighborhood was addressed in the public involvement process and in the project development process.

The 2000 Census Data for the I-29/35 Study Corridor shows that the minority population is approximately 45 percent of the total population. As shown in Exhibit III-4, most of the blocks within the study corridor where at least 51 percent of the individuals living there are minority are located south of the Missouri River in the Pendleton Heights, Paseo West, and Columbus Park neighborhoods and the Central Business District.

Census data for 2000 was used to provide base information that can be used to further understand and identify impacts to low-income populations. Those areas, where more than 25 percent of the populations are below the poverty level, are located in the CBD North Loop Subcorridor. The 2000 Census of Population provided income, auto ownership, housing value and educational attainment information by Census Tract. There is also a transient population that uses this area. There is no data available on this population but MoDOT is aware of its existence.

General English proficiency concerns were reviewed using the 2000 census information. The census variable – language spoken at home was used to identify if there were any English proficiency concerns related to environmental justice. There are two tracts that fall with the project study corridor where over 25 percent of the residents speak English less than very well. These tracts are 000300 and 001000, which include the Columbus Park and Pendleton Heights neighborhoods.

Public Involvement

E.O. 12898 also addresses the importance of providing affected population the opportunity to be informed of the proposed action and its alternatives. It is likewise important to provide the affected population the opportunity to provide comments throughout the public involvement process.

Some of the key issues heard from representatives of the neighborhoods along the corridor included the importance of pedestrian accommodations, limiting property impacts, and maintaining the character of the neighborhood. MoDOT has had discussions with the neighborhoods on these issues. For example, residents of Guinotte Manor expressed concerns about the maintenance of bus routes if access to Troost Avenue is removed. In response MoDOT has looked not only at an alternative that only modifies existing and maintains the current ramp and access from Independence Avenue but also at an option that would provide new access to Troost while still providing a way to exit the interstate at this location.

The maintenance of neighborhood character was incorporated into the build alternatives. Input received from the I-29/35 Stakeholders and through community leaders indicated a desire to preserve the existing neighborhood character. An example of this includes concern from the Columbus Park Neighborhood about an increase in the amount of drive-through traffic, particularly heavy trucks within this neighborhood because of a new ramp that would allow traffic to exit the interstate at this location. One of the options that is being looked at is a modification of the existing which would maintain access as it currently exists. The other option would include a new ramp allowing traffic to exit I-29/35 south to get to Independence Avenue. This option does move the alignment of Independence Avenue closer to the interstate and further from the neighborhood itself while also increasing the green space in this area slightly.

One public open house meeting has been held in conjunction with the project on September 28, 2004. The meetings were advertised by a number of methods, including sending press releases to numerous newspapers including the *Kansas City Star*, the *Northland Journal*, the *Northeast News*, the *Dispatch Tribune* and the *Sun-News*. Television coverage prior to the meetings was provided by major stations in the Kansas City area and on a number of radio shows. MoDOT has an effective outreach program to involve potentially affected interests in the decision making process and keep them informed of the status of the project, as documented in Chapter VIII, Comments and Coordination.

Public input opportunities were provided to residents living in the study corridor neighborhoods at the stakeholder meetings held in September 2004 and January and February of 2005.

Concerns expressed related primarily to access, air and noise issues. Impacts to neighborhood and community cohesion and travel patterns and accessibility are discussed in Chapter IV, Section B. Air quality impacts are discussed in Chapter IV, Section G. and noise impacts are described in Chapter IV, Section H.

One of the newspapers that was used as a resource to advertise the public meetings and increase awareness of opportunities to comment to minority individuals or those with limited English proficiency in the Kansas city area, was *Dos Mundos*. MoDOT also hired a Spanish-speaking interpreter to attend the public meeting. There has also been coordination specifically with the Columbus Park neighborhood which has a large Vietnamese population. Future public outreach efforts would be made through a variety of publications to increase awareness of the project and encourage comments from minority communities. For more information on public involvement efforts see Chapter VIII, Comments and Coordination.

c. Environmental Justice and Title VI Impacts

The demographic data, field investigations, community contacts, media and public involvement program provided information on special populations within each subcorridor. The assessment of impacts is described for each of the subcorridors.

North Subcorridor

There are residential populations at the far north end of the North Subcorridor. Based on locally gathered information there are some low and moderate income individuals and families who live in the multi-family housing in The Avenues neighborhood at the M-210/Armour Road interchange. However the improvements at this location would remain within the existing right-of-way.

Based on the block data gathered from the Year 2000 Census there are no blocks within the study corridor in this Subcorridor where more than 51 percent of the population is minority.

There are no residential acquisitions within the North Subcorridor. Highway access to these areas would remain the same so there would be no adverse impact related to access. Improvements would be made to promote the free and safe flow of traffic in the area.

No adverse impact to transit systems is expected in the North Subcorridor because existing transit access would remain the same under the No-Build and build alternatives. The existing transit routes maintained by others would be accommodated as they are today.

River Crossing Subcorridor

There are no documented residential populations in this subcorridor. There is a transient population that utilizes the street network, bridges and parks in this area but the build alternatives are not anticipated to have an effect on this group.

CBD North Loop Subcorridor

There are several residential neighborhoods within the CBD North Loop Subcorridor. The households within this subcorridor have more diverse characteristics than in the North Subcorridor. The demographic baseline information shows minority or low-income population concentrations within the study corridor.

Census data shows that there are several areas within the study corridor where minorities make up over half of the population. These include several blocks in the Pendleton Heights neighborhood along Paseo Boulevard and including the public housing developments of Riverview Gardens and Chouteau Court. There are also several blocks within the Paseo West

neighborhood where the minority population is greater than half, some of these blocks having a high percentage of Hispanic residents. Columbus Park to the north of the Loop has a number of blocks where the minority population is more than 51 percent. There is one block where Hispanic individuals make up more than 76 percent of the population. From field observation and coordination with the neighborhood it was found that there is also a large Vietnamese population. There are also a few blocks within the Central Business District where minorities make up the majority of the residents living there.

As part of the stakeholder meetings that have taken place, the neighborhoods have been involved in discussions to help identify opportunities for further communication with any special populations. Opportunities for project input were provided in numerous ways. The concerns that have been heard from the residents include those related to increased traffic on residential streets, maintaining access to transit services and noise and air quality impacts.

The alternatives in the CBD North Loop Subcorridor do not result in full residential property acquisitions. The build alternatives result in small modifications in access to and from the North Loop. Other access modifications involve consolidation of ramp access to improve operations and safety of I-35/70. Access modifications may result in increased travel of two to four blocks in some cases.

The access in this subcorridor has been changed to promote the free and safe flow of traffic. While some access points are being removed, others are being added. The changes would provide more of a separation between local and through traffic. Local traffic would need to rely more heavily on the frontage road system but would still be able to get to the same destinations. The access to the neighborhoods in this subcorridor would remain and the changes would not isolate residents or sever the existing neighborhoods from the rest of the area.

Transit and pedestrian access is also important to area residents. Of the Census tracts located in the subcorridor the percentage of occupied housing units where no vehicle is available ranges from approximately 12 to 63 percent. Tract 001400 contains the highest percentage of occupied housing units where no vehicle is available at about 63 percent. Tracts 001300 and 001000 have the next highest percentage at approximately 45 percent and 40 percent respectively. In response to concerns from residents of Guinotte Manor about maintaining the transit route at Troost Avenue, MoDOT found ways to keep this service with both alternatives. Transit and pedestrian access is being maintained and no portion of the population is being isolated or losing their ability to get to their destination as a result of this project.

There are concerns from residents about the removal of two buildings on Lydia Avenue, which runs parallel to I-29/35. Some individuals feel that these provide a barrier between the Guinotte Manor residences and the interstate. Noise and air quality impacts have been studied as part of this EIS.

d. ADA Issues

There has not been any indication of a definable segment of the population who is disabled or otherwise is in need of specialized services. Don Bosco operates a Senior Center at its location on Campbell Street in the Columbus Park neighborhood but this is a daytime operation and there are no individuals in residence there. Access to the center via pedestrian and transit routes would not be changed and vehicular access would be improved. As part of Alternative B in this Subcorridor, US 24/Independence Avenue would be moved further south and away from the Center's current location. Green space would be added where the street network was previously located.

e. Summary

During the course of the I-29/35 Corridor Study, there has been a concerted effort made to minimize residential displacements so that no residential properties are being taken in full and to minimize other impacts to the adjacent communities and neighborhoods. Public involvement and demographic analysis contributed to identifying and avoiding disproportionate impacts. Vehicular access to neighborhoods has been preserved and an effort made to maintain those routes which are used by public transit. These components of the project support enhanced neighborhood character and have been developed through a collaborative process between MoDOT, I-29/35 stakeholders, neighborhood representatives and community leaders. Based upon these efforts, disproportionately high impacts to minority or low-income residents in the I-29/35 Corridor are not expected.

C. Right-of-Way Acquisition Impacts

Among the various impacts of the construction of a highway or other major transportation improvement project, the acquisition of real property, including residences and businesses, is the action which engenders the most discussion among those directly affected. In an effort to make the property acquisition process as equitable as possible, regulations including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601) and the Missouri Department of Transportation's relocation program and relocation advisory assistance program which satisfies the requirements of Title VI of the Civil Rights Act of 1964, have been developed to ensure adequate consideration and compensation for the persons whose property is required for the project.

The right-of-way acquisition impacts include land that is acquired for highway construction and operation purposes. Right-of-way impacts include both total acquisition (i.e. the entire tract, parcel or lot is acquired for right-of-way) and partial acquisition (i.e. only a portion of the tract, parcel or lot is acquired for right-of-way). With a partial acquisition, a habitable residence or viable commercial business would remain and the primary structure is not acquired. Table IV-1 shows total as well as partial acquisitions by land use category of single-family residential, multi-family residential, business/commercial, public park/recreation facility, and public/semi-public (other than public parks and recreation facilities) for each of the build alternatives. The public park/recreation facility impacts and the other public/semi-public facility impacts were discussed in sections B.3.a and B.3.b of this chapter. In this section, relocation impacts were evaluated in more detail within the categories of residential and business/commercial displacements. The right-of-way impacts are also illustrated on the Alternatives Plates in Appendix C.

1. RESIDENTIAL ACQUISITION IMPACTS

Residential Impacts discussed below indicate the number of full and partial acquisitions. These acquisitions are based on conceptual engineering completed as part of this DEIS. The number of impacts could be reduced or increased as design details are developed.

a. North Subcorridor

No-Build Alternative

The No-Build Alternative would not require additional right-of-way, and therefore there would be no residential acquisitions.

**Table IV-1
Right-of-Way Impacts**

Subcorridor & Alternatives	Total Acquisitions					Partial Acquisitions				
	Single-Family	Multi-Family	Business	Public Park/ Rec.	Public/ Semi-Public**	Single-Family	Multi-Family	Business	Public Park/ Rec.	Public/ Semi-Public**
North Subcorridor										
Build Alt. *	0	0	1	0	0	0	1	6	0	2
River Crossing Subcorridor										
Build Alt. A*	0	0	0	0	0	0	0	20	0	7
Build Alt. B-1*	0	0	0	0	0	0	0	20	0	7
Build Alt. B-2*	0	0	0	0	0	0	0	20	0	6
Build Alt. C	0	0	0	0	0	0	0	20	0	6
CBD North Loop Subcorridor										
Build Alt. A	0	0	1	0	0	3	0	4	0	0
Build Alt. B*	0	0	1	0	0	4	0	4	0	0

Source: MoDOT District 4 and HNTB Corporation, 2005.

* Indicates Preferred Alternative. In the River Crossing Subcorridor, Alternative A or B is Preferred.

** Other than public parks and recreation facilities

Note: In addition to the costs of total acquisitions, the right-of-way cost estimates include the costs of right-of-way project overhead, easements, and the costs of partial acquisitions.

Build Alternative (Preferred)

There would be no total or partial acquisitions of single-family residences in this subcorridor.

There would be no total acquisitions of multi-family residences in this subcorridor. However, there would be one multi-family partial impact. This would occur at the Spanish Eight apartment complex at the northwest quadrant of the Armour Road interchange. Although property would not be acquired, it would be necessary to remove the entry drive that allows access into the middle of the complex. The entry off of Ozark Street would still remain.

b. River Crossing Subcorridor

No-Build Alternative

There would be no residential impacts from the No-Build Alternative.

Build Alternatives A, B (Alternative A or B is Preferred) and C

There are no residential areas in this subcorridor and therefore there would be no residential impacts by the build alternatives.

c. CBD North Loop Subcorridor

No-Build Alternative

The No-Build Alternative would not require additional right-of-way, and therefore there would be no residential acquisitions.

Build Alternatives A and B (Preferred)

There would be no total acquisitions of single-family residences by either of the build alternatives in this subcorridor. However, there would be two partial impacts, all of which would occur at the east side of the Columbus Park Neighborhood (west side of I-29/35): The first two partial acquisitions would occur and would be the same for both alternatives:

- One single-family residential property impacted along the rear property line, including an out-building (small shed).
- Two vacant residential properties impacted along the rear property lines, one of those with an acquired out-building (small shed).
- One vacant residential property impacted on the side property line located at 6th Street and Charlotte.

2. RELOCATION POLICIES

The Missouri Department of Transportation offers a relocation assistance program to individuals, families, business owners, farm operators, and non-profit organizations that are partially or totally displaced by a state highway project. This program conforms to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601). Relocation assistance under this program will be made available to all relocated persons without discrimination.

The Uniform Act, as well as Missouri state laws, requires that just compensation be paid to the owner of private property taken for public use. The appraisal of fair market value is the basis of determining just compensation to be offered the owner for the property to be acquired. An Appraisal is defined in the Uniform Act as a written statement independently and impartially prepared by a qualified appraiser setting forth an opinion of defined value of an adequately described property as of a specific date, supported by the presentation and analysis of relevant market information.

It is the policy of FHWA and MoDOT that no person be requested to move from their dwelling until at least one comparable replacement dwelling has been made available to that person. A comparable, replacement dwelling is safe, decent, sanitary and functionally similar to the present dwelling and within the financial means of the displaced person. The replacement housing must also be open to persons regardless of race, color, religion or national origin.

A representative of MoDOT will assist each displaced person in securing comparable replacement housing and be sensitive to the special needs of any special group of residents. The relocation coordination office would maintain liaison activities with other agencies rendering services useful to persons who must relocate. The occupants of residences are entitled to receive reasonable and necessary moving costs and related expenses in relocating their personal property.

Displacement and relocation of residences and businesses are often necessary parts of undertaking a transportation improvement when sufficient right-of-way has not been provided to accommodate future needs. In an effort to make the property acquisition process as equitable as possible, the FHWA has established standards to ensure adequate consideration and compensation.

The program is designed to make actual payments available to offset some of the expenses experienced by those who are displaced. The program also provides advisory assistance to owners and tenants who are displaced.

The Missouri Department of Transportation's relocation program is designed to provide uniform and equitable treatment for those persons who are displaced from their residences, businesses, or farms. The relocation advisory assistance program satisfies the requirements of Title VI of the Civil Rights Act of 1964. The program provides advisory assistance to:

- 1) Owners and tenants who are displaced;
- 2) Persons occupying real property adjacent to that being acquired who are caused substantial economic injury by the acquisition;
- 3) Persons who, as a result of the project, move personal property from real property not being acquired for the project; and
- 4) Persons who move into property after acquisition and are aware that they would have to move due to the project.

Relocation assistance payments are designed to compensate displaced persons for costs that have been imposed on them by a MoDOT project. Any displaced owner-occupant or tenant of a dwelling who qualifies as a displaced person is entitled to payment of his or her actual moving and related expenses, as MoDOT determines to be reasonable and necessary. A displaced owner-occupant who has occupied a displacement dwelling for at least 180 days is also eligible to receive up to \$22,500 for a replacement housing payment. This includes the amount by which the cost of a replacement dwelling exceeds the acquisition cost of the displacement dwelling, increased interest costs and incidental costs. A displaced owner-occupant that has occupied a displacement dwelling for at least 90 days, but less than 180 days, and a tenant that has occupied a displacement dwelling for at least 90 days is entitled to a payment not to exceed \$5,250 for either a rental or down payment assistance.

The Uniform Act requires that comparable, decent, safe, and sanitary replacement housing within a person's financial means be made available before that person may be displaced. Should this project include persons who cannot readily be moved using the regular relocation program benefits and/or procedures, i.e., when there is a unique housing need or when the cost of available comparable housing would result in payments in excess of statutory payment limits (\$22,500 or \$5,250), the MoDOT's relocation policy commits to utilizing housing of last resort. Housing of last resort involves the use of payments of statutory maximums or the use of other unusual methods of providing comparable housing.

Any displaced business, farm operation, or nonprofit organization which qualifies as a displaced person is entitled to payment of their actual moving and related expenses, as MoDOT determines to be reasonable and necessary. In addition, a business, farm or nonprofit organization may be eligible to receive a payment, not to exceed \$10,000, for expenses incurred in reestablishing their business, farm operation, or nonprofit organization at a replacement site.

A displaced business may be eligible to choose to receive a fixed payment in lieu of the payments for actual moving and related expenses, and actual reasonable reestablishment expenses. The payment amount for this entitlement alternative is based on the average net earnings of the business. This fixed payment amount cannot be less than \$1,000 or more than \$20,000.

Relocation resources are available to all residents and business relocated without discrimination. A general information notice in the form of a brochure entitled "Relocation and Assistance and Payments Program" will be provided to persons who may be displaced. This relocation brochure provides general information about the MoDOT's relocation program. A copy of the MoDOT Relocation Assistance Program brochure is available at the MoDOT District Offices.

3. AVAILABILITY OF HOUSING

There would be no total acquisitions of single-family residences or multi-family residences in any of the build alternatives, therefore no residents would be displaced and in need of replacement housing.

4. COMMERCIAL/BUSINESS DISPLACEMENTS

There would be total impacts to commercial property as well as partial impacts to commercial property and privately owned, non-residential property in the three subcorridors. The total acquisitions would result in displacement of structures, and the partial acquisitions would generally impact parking lots, access points or open/yard areas.

a. North Subcorridor

No-Build Alternative

The No-Build Alternative would not require additional right-of-way, and therefore there would be no commercial/business acquisitions.

Build Alternative (Preferred) – Total Acquisitions

There would be one total acquisition of a business in this subcorridor as follows:

- Cherokee Distribution Services, Inc., at the southeast quadrant of the 16th Avenue interchange, on the east side of I-29/35, where the property and two buildings would be acquired for right-of-way. The buildings are presently vacant and for lease.

Build Alternative (Preferred) – Partial Acquisitions

There would be six businesses and privately owned, non-residential property that would be impacted by partial acquisitions as follows:

- *Arby's* along the north side of Armour Road, at the northeast corner of the interchange quadrant – Three parking spaces would be removed at the south end of the property and access from Armour Road would be closed and replaced with a cul-de-sac on Taney Street. The drive-through would continue to function.
- *Captain D's* along the north side of Armour Road, east of Taney Street – Partial acquisition of property, including 12 parking spaces. Full access from Armour Road at Taney Street would be replaced with a cul-de-sac on Taney Street. Patrons could still access the area from Armour Road just east of this location.
- *O.U.P., Inc.* along the south side of Armour Road at the southwest corner of the interchange quadrant – No property would be acquired; however, access would be changed. There would no longer be egress at the east driveway due to its proximity to the on-ramp access. The traffic light would be removed at Ozark Street and the only access to and from the property would be at the west driveway (right-in and right-out).
- Vacant non-residential property on the west side of the I-29/35 southbound on-ramp, owned by American Lodging – Partial acquisition of the side yard area adjacent to the highway, and acquisition of one out-building.
- *Cook Composites & Polymers Company*, south of 16th Avenue on the west side of I-29/35 – Partial acquisition of open land.

- *J. E. Dunn Construction Company*, south of 16th Avenue on the east side of I-29/35 – Partial acquisition of the northwest corner of property used as a storage area for construction equipment and materials, and impact to the entry drive which would require relocation.

b. River Crossing Subcorridor

No-Build Alternative

The No-Build Alternative would not require additional right-of-way, and therefore there would be no commercial/business acquisitions.

Build Alternatives A and B-1 (Alternative A or B is Preferred)

Alternatives A and B-1 (Alternative A or B is Preferred) – Total Acquisitions – There would be no total business acquisitions by either of these alternatives in this subcorridor. One building would be acquired within the Kansas City Industrial Contractors, Inc. complex. It is one building of seven on the property and is therefore considered a partial impact of the business establishment (see further discussion below).

Alternatives A and B-1 (Alternative A or B is Preferred) – Partial Acquisitions – There would be 20 businesses (one having a building impact) and privately owned, non-residential property that would be impacted by partial acquisitions. The impacts would be the same for both alternatives, as follows:

- *Northtown Devco*, c/o NT Realty, at 14th Avenue on the east side of I-29/35 – Partial acquisition of open land on a vacant parcel.
- *Northtown Devco*, c/o NT Realty, south of 14th Avenue adjacent to the west side of I-29/35 – Partial acquisition of a small linear parcel that appears to be used as storage by the adjoining property, which is Houseman Ready Mix.
- *Burlington Northern Railroad*, south of 14th Avenue – The railroad property and tracks run under the I-29/35 bridge. The only partial impact would occur where there are new piers. The new bridge would be occupied within an aerial easement over the property.
- *Norfolk and Southern Railroad*, north of Bedford Avenue – The railroad property and tracks run under the I-29/35 bridge. The only partial impact would occur where there are new piers, and there would be an out-building that would require relocation on the property. The new bridge would be occupied within an aerial easement over the property.
- *Burlington Northern Railroad*, adjacent to the north side of Bedford Avenue – There is a narrow band of railroad property and tracks that run under the I-29/35 bridge. The only partial impact would occur where there are new piers. The new bridge would be occupied within an aerial easement over the property.
- Four businesses on a parcel located on the west side of I-29/35, south of Bedford Avenue – Partial acquisition of the north corner of the property (where the entry drive is located), the east edge of the paved drive along the east side of the property, and a small tip of the south corner of the property. The entry drive would have to be relocated, thereby resulting in removal of some of the storage area at the north end of the property. No marked parking stalls would be impacted, as these are at the building side of the drive, however, some parking occurs on the east side of the drive although it is not striped for parking. The width of the drive that would remain would be a minimum of 24

feet. There are four businesses on this property that would be indirectly affected by the driveway impacts:

- *Gladstone Winnelson Co.* (kitchen and bath supplier) – entry drive and storage area impacts
 - *Custom-Bilt Metals* – drive impacts
 - *Pioneer Container Corp.* – drive impacts
 - *EnviroBate Global, Inc.* – yard impacts at south corner
- Four businesses on a parcel of property located on the east side of I-29/35, south of Bedford Avenue – Partial acquisition of the far west edge of the property. Some parking would be impacted and Macon Street would be removed resulting in removal of three access points off of Macon Street. Access would then be from Bedford Avenue only. The four affected businesses, and corresponding parking impacts, are described below. Although there would be 22 spaces lost by right-of-way acquisition, 22 spaces could be replaced by adding parking stalls perpendicular to the proposed right-of-way on the west edge of the property after construction.
 - *Prologis Distribution Center* – loss of seven parking spaces (out of 22)
 - *S & K Cabinetry* – loss of four parking spaces (out of 14)
 - *Central Tyco Fire Products* – loss of two parking spaces (out of six)
 - *Future Foam* – loss of nine parking spaces (out of 18)
 - *Wagner Industries, Inc.*, located on the east side of I-29/35 between Bedford Avenue and Levee Road – Partial acquisition of the west edge of the property would result in the loss of some open/yard area in the southwest corner, some of the west edge of a paved truck maneuvering area south of the building, three access points off of Macon Street (this street would be removed), relocation of the entry/identification sign, and 59 of the 177 car parking spaces on the west edge of the property and at the southwest corner of the building would be affected. In addition, to allow circulation and access to the parking lot on the west side of the building, the entry/identification sign would need to be relocated.
 - *Isle of Capri Casino*, located on the east side of I-29/35, at the Front Street interchange – Partial acquisition of the surface parking area between Front Street and I-29/35 would result in the loss of 152 car parking spaces, two bus spaces and ten truck spaces. This is approximately 12 percent of the surface lot car spaces, 20 percent of the bus spaces and 43 percent of the truck spaces available in the surface parking lots. There are an additional 522 parking spaces in the parking garage at this time.
 - *Kansas City Power & Light Co.*, located adjacent to the east side of the Isle of Capri Casino – Partial acquisition of a small piece of open/yard area of the southwest corner of the property.
 - *Kansas City Southern Railway Co.*, located just south of the Front Street interchange – The railroad property and tracks run under the I-29/35 bridge. There is one parcel, but it is separated under I-29/35 by a privately owned parcel (see next parcel impact discussed below). The only partial impact would occur where there are new piers. The new bridge would be occupied within an aerial easement over the property.
 - *Reed Oven Company* owns a parcel located on each side of I-29/35, between the two sets of Kansas City Southern railroad tracks – Partial acquisition would occur to a vacant open/yard area of the property.

- *Kansas City Industrial Contractors (KCI), Inc.* is a large construction related complex on each side of Guinotte Avenue and on each side of I-29/35 – The property contains seven warehouse buildings, open storage areas, a parking lot and a piece of vacant land. Two of the warehouses are vacant. Impacts would include the removal of one large warehouse building adjacent to the west side of I-29/35, on the south side of Guinotte Avenue, and partial acquisition of the east half of vacant land on the west side of I-29/35.
- *Union Pacific Railroad*, located north of Dora Street – The railroad property and tracks run under the I-29/35 bridge and includes two parcels on each side of the highway that contain a private drive that is open to company vehicles only. The only partial impact would occur where there are new piers on the property. The new bridge would be occupied within an aerial easement over the property.

Build Alternative B-2 (Alternative A or B is Preferred)

Alternative B-2 (Alternative A or B is Preferred) – Total Acquisitions – There would be no total business acquisitions by this alternative in this subcorridor.

Alternative B-2 (Alternative A or B is Preferred) – Partial Acquisitions – Alternative B-2 would have partial acquisition impacts to the same 20 businesses and privately owned, non-residential properties as those described for Alternatives A and B-1 above. Although the same parcels would be impacted, the impacts within some of those parcels would vary from those of Alternatives A and B-1 as follows:

- *Isle of Capri Casino* – Partial acquisition of the parking lot area would result in a loss of 210 surface car parking spaces, four bus spaces and 24 truck spaces. This would amount to a loss of 17 percent of the car surface parking spaces, 40 percent of the bus spaces and all of the truck parking spaces available in the surface parking lots. There is an additional 522 car parking spaces in the parking garage at this time.
- *Kansas City Southern* railroad property would have impacts from two more bridges (for on/off ramps) over the tracks.
- *KCI, Inc.* – Two buildings (of the seven within the complex) would be removed. One building would be the same warehouse that would be impacted in Alternatives A and B-1, and the other building is vacant and located on the north side of Guinotte Avenue, on the east side of I-29/35.
- *Reed Oven Company* – Partial acquisition of property would include more area than that impacted in Alternatives A and B-1.

Build Alternative C

Alternative C – Total Acquisitions – There would be no total business acquisitions by this alternative in this subcorridor.

Alternative C – Partial Acquisitions – Alternative C would have partial acquisition impacts to the same 20 businesses and privately owned, non-residential properties as those described for Alternative B-2 above. Although the same parcels would be impacted, the impacts within two of those parcels would vary from those of Alternative B-2 as follows:

- *Wagner Industries* – Partial acquisition impacts at the west edge of the property would result in a loss of 77 of the 177 car parking spaces and a dead-end parking lot on the west side of the building. In addition, there would be slightly more impacts to the truck

maneuvering area southwest of the building, and slightly more impacts to the open/yard area in the southwest corner of the property.

- *Isle of Capri Casino* – Partial acquisition of the surface parking lot area would result in a loss of 449 car parking spaces, ten bus spaces and 24 truck spaces. This amounts to a loss of 36 percent of the surface car parking spaces, all the bus and truck parking spaces. There are an additional 522 parking spaces for cars in the parking garage at this time.

c. CBD North Loop Subcorridor

No-Build Alternative

The No-Build Alternative would not require additional right-of-way, and therefore there would be no business acquisitions.

Build Alternatives A and B (Preferred)

Alternatives A and B (Preferred) – Total Acquisitions – There would be one business impacted by total acquisition, and would be the same for both alternatives, as follows:

- Vacant business/light industrial building, located at the northeast corner of Lydia Avenue and 5th Street, on the west side of I-29/35 – The property contains a building and an open/yard area. Previously known as Davis Electric Warehouse.

Alternatives A and B (Preferred) – Partial Acquisitions – There would also be 4 businesses and privately owned, non-residential property that would be impacted by partial acquisitions, which would be the same for both alternatives, as follows:

- *Chunco Foods*, located on the south side of Dora Street/E 2nd Street, on the west side of I-29/35 – Partial acquisition of a paved area used for truck maneuvering on the east edge of the property. The property also contains a warehouse building, a small parking area, and an open/yard area.
- Vacant non-residential parcel (zoned M-1: Light Industrial) located south of Dora Street on the west side of I-29/35 – Partial acquisition of the east half of a small vacant parcel owned by United Missouri Bank.
- Vacant non-residential parcel (zoned M-1: Light Industrial) located half way between 5th Street and Dora Street on the west side of I-29/35 – Partial acquisition of the east 2/3 of a small parcel containing a billboard. The owner is listed as Comptroller Department (United Missouri Bank).
- *AID Industries*, located half way between 5th Street and Dora Street on the west side of I-29/35 – Partial acquisition of the east edge of an open/yard area of this property containing a two-story brick building and what appears to be a salvage business.

5. AVAILABILITY OF COMMERCIAL PROPERTY

There is a wide availability of commercial property within one mile of the displaced buildings. The displaced commercial properties are warehouse/light industrial spaces ranging in size from approximately 1,800 square feet through 42,000 square feet in size. The structures have been there for many years and are variable in condition from poor to average.

There is a significant development of new warehousing space in the area of 19th Avenue and Ripley Street. The planned construction is to start in 2005. The site lists 6 buildings for a total of 351,808 square feet. The building sizes range from 26,880 square feet to 86,400 square feet. This site has easy access to I-29/35.

Additionally there is vacant commercial property in the area. One listing had 24 properties ranging from 3,330 to 66,000 square feet. While the availability of such property is variable there is nothing to indicate, at this time, that this trend would discontinue. These properties all have easy access to I-29 and M-9.

D. Economic Impacts

Highways are essentially “tools” used in transporting goods and people from one place to another. Investments in highways contribute to economic development in that they lower transportation and logistics costs. Such changes may be realized in numerous ways, including improved safety, decreased fuel and other vehicle operating costs, and improved ability to travel to the corridor.

Benefits from the transportation improvements would accrue to persons or businesses whose vehicles use the improvements. In addition, lower transportation costs can be passed on to consumers as lower prices for consumer goods, to workers as higher wages or to business owners as higher profits. In this way, persons may thus benefit from transportation investments without actually traveling on the highway.

It is important to keep in mind that for any of these benefits to occur, the new investments must either enable significant reductions in transportation costs or cause revised perceptions of the area. If the savings in transportation cost is too small for each trip, the investments would not produce significant additional benefits. An investment must be based on reasonable estimates of traffic volumes they would serve, the cost savings travelers would experience and a realistic assessment of the perceptions of the region.

1. ECONOMIC IMPACTS

The continued increase in economic activity in the Kansas City Metro region is evidenced by long-term trends in population growth and increased employment. Such growth would place ever-increasing demands on the existing transportation system. The build alternatives would have a positive impact on the economic activity in the area. For example, the percentage of regional households within 30 minutes of downtown Kansas City would increase with the build alternative to 36 percent, compared with 32 percent for the No-Build.

a. Employment

There are a number of major employment centers located along I-29/35 that would benefit from improved accessibility from the proposed action. The Bedford Avenue interchange area provides truck traffic with access to the nearby industrial area. Improving access to this area would help retain and improve this area’s economic viability. The central business district (CBD) is located adjacent to I-35/70. Improvements in access to employment located within the CBD would be important to maintaining or increasing economic viability in this area. Likewise, the overall improvements of I-29/35 would help support the economic vitality of other employment locations within the project corridor. The project would also improve the suitability of sites for business expansion and contribute to increased employment from the attraction of new businesses.

b. Local Sales Tax Collections

There are a number of factors that contribute to sale tax revenues. However, by improving access to commercial areas located in the corridor, the proposed action would be a positive factor that may contribute to increased sales tax collections within the corridor and for the Kansas City Metro region.

c. User Costs and Benefits

Economic Impacts can be direct or indirect and can be short-term or long-term in scope. Direct economic impacts decrease or increase the cost of doing business or non-work activities of the general public. Indirect economic impacts include improving access to a business or property, which resulting in an increase in value. Examples of short-term impacts are the construction jobs created while the road is being built. Long-term benefits include increase employment resulting from businesses deciding to expand or relocate to an area because of improved access.

System Performance Effects

System performance effects are primarily experienced by the users of the system. These system users receive direct long-term economic impacts. The three traditional system performance effects are: 1) change in travel time; 2) vehicle operating costs; and 3) level of safety. These system performance measures can be quantified by comparing system performance with and without the proposed improvement. The regional travel demand model and traffic simulation model used to estimate future traffic volumes are used as a basis for estimating the changes in system performance. The model results presented are for the combinations of subcorridor alternatives. The information for the build alternatives shown in the table reflect the ultimate eight-lane configuration. A comparison of six and eight-lane build alternatives is provided in Chapter II. A six-lane alternative provides approximately 40 percent of the travel time savings, but would help reduce vehicle miles of travel resulting in vehicle operating cost savings as compared to the eight lane alternative. The system performance measure produced by the travel demand model is summarized in Table IV-2.

North Subcorridor – The one build alternative contributes to travel time savings but also increases in regional miles traveled.

River Crossing Subcorridor – Differences in hours and miles of travel are small.

CBD North Loop Subcorridor – Alternative B, which includes the box diamond, would increase the hours of travel by 1000 per day, but would reduce miles traveled by 1000 miles.

Change in Travel Time

Construction of the build alternative would reduce travel time and increase the predictability of travel time. Both of these benefits are reductions in opportunity costs for transportation system users. A business or individual can use the time savings for more productive activities. With available data, an estimate of the reduction in average travel time can be produced, but an estimate of the benefit from reducing the travel time variability cannot.

The direct economic benefit resulting from the reduction in average travel time is estimated using the travel demand model's estimate of vehicle-hours-of-travel (VHT) with and without the Build Alternatives. The methodology used to estimate the monetary value of travel times savings is provided in the *Guidebook for Assessing the Social and Economic Effects of Transportation*

*Projects*¹. The VHT from the No-Build Alternative is subtracted from the build alternative VHT to determine the reduction in VHT resulting from the build alternative. The estimated reduction in VHT is then subdivided into passenger vehicle and heavy truck portions based on the truck percentage. The resulting VHT subtotals are then multiplied by an hourly rate that reflects the value of time for the vehicle type and purpose. Truck VHT is valued at \$27.46 per hour; passenger vehicle VHT is valued at \$11.94 per hour in year 2005 dollars. Trucks are considered to represent an average of ten percent of the traffic stream in the urban region.

**Table IV-2
Year 2030 Annual Forecasted System Performance Measures
in Kansas City Region with No-Build and Build Alternatives**

Alternative	Daily Vehicle-hours of Travel (VHT)	Change in VHT from No-Build	Daily Vehicle-miles of Travel (VMT)	Change in VMT from No-Build
Region with No-Build	2,435,200	0	58,589,800	0
North Build River Crossing A CBD Loop A	2,429,700	- 5,500	58,604,500	14,700
North Build River Crossing A CBD Loop B*	2,430,700	- 4,500	58,603,500	13,700
North Build River Crossing B-1 CBD Loop A	2,429,700	- 5,500	58,604,500	14,700
North Build River Crossing B-1 CBD Loop B*	2,430,700	- 4,500	58,603,500	13,700
North Build River Crossing B-2 CBD Loop A	2,429,800	- 5,400	58,606,000	16,200
North Build River Crossing B-2 CBD Loop B*	2,430,800	- 4,400	58,605,000	15,200
North Build River Crossing C CBD Loop A	2,429,800	- 5,400	58,606,000	16,200
North Build River Crossing C CBD Loop B	2,430,800	- 4,400	58,605,000	15,200

Source: HNTB Corporation, 2005.

* Indicates Preferred Alternative. In the River Crossing Subcorridor, Alternative A or B is Preferred.

The resulting direct economic impact resulting from the reduction in travel time under the build alternatives is approximately \$1,252 million to \$1,310 million for a 20-year period in year 2005 dollars. The differences are relatively small between alternatives, with the only difference relating to the travel time savings with the existing loop ramps at M-9 as compared to the box diamond at M-9. Table IV-3 summarizes the results.

¹ Forkenbrook, David and Glen Weisbrod, *Guidebook for Assessing the Social and Economic Effects of Transportation Projects*. National Cooperative Highway Research Program Report 456. Transportation Research Board, Washington, DC 2001.

**Table IV-3
Change in Travel Time (2010-2030)**

Alternative	Change in Vehicle Hours of Travel (Daily VHT)		20-Year Travel Time Savings (millions of 2005 dollars)
	Year 2010	Year 2030	
Region with No-Build	0	0	\$ 0.0
North Build River Crossing A CBD Loop A	- 19,400	- 5,500	\$ 1,309.7
North Build River Crossing A CBD Loop B*	- 19,200	- 4,500	\$ 1,256.4
North Build River Crossing B-1 CBD Loop A	- 19,400	- 5,500	\$ 1,309.7
North Build River Crossing B-1 CBD Loop B*	- 19,200	- 4,500	\$ 1,256.4
North Build River Crossing B-2 CBD Loop A	- 19,400	- 5,400	\$ 1,305.1
North Build River Crossing B-2 CBD Loop B*	- 19,200	- 4,400	\$ 1,251.8
North Build River Crossing C CBD Loop A	- 19,400	- 5,400	\$ 1,305.1
North Build River Crossing C CBD Loop B	- 19,200	- 4,400	\$ 1,251.8

Source: HNTB Corporation, 2005.

* Indicates Preferred Alternative. In the River Crossing Subcorridor, Alternative A or B is Preferred.

Change in Vehicle Operating Costs

The build alternative increases capacity on I-29/35 from the CBD Loop to Armour Road increasing the amount of traffic and system measured traveled distance. To use the new higher speed facility, drivers travel farther to access the roadway, increasing vehicle miles traveled. The build alternative results in an increase in vehicle miles of travel (VMT), which translates into increased vehicle operating costs.

Vehicle miles of travel are not the only variables that can affect vehicle operating costs. Vehicle operating costs are the expenses incurred by drivers to operate their vehicle. Expenses include fuel consumption, tire wear, maintenance and repair, oil consumption, depreciation, license and insurance. The majority of these expenses vary based on the number of miles driven. The exceptions are license and insurance costs and a portion of depreciation. The magnitude of the mileage-based expenses varies based on miles traveled, road geometry, road surface type and condition, grades, environmental factors and operating speed variability.

All of the variables effecting vehicle operating costs cannot be quantified in this analysis, but the increased cost to motorists of the added vehicle miles of travel is estimated. The resulting estimate would tend to overestimate the impact because vehicle operating conditions are not being factored into the analysis. A more free flow of traffic on the build alternative at relatively constant speeds would result in generally lower vehicle operating costs than operating costs in

traffic along the No-Build Alternative characterized by lower speeds. Because of improved accessibility increased travel more vehicle miles of travel would lead to higher vehicle operating costs.

To estimate the impact on vehicle operating costs resulting from a change in vehicle miles of travel, the change in vehicle miles of travel was determined for the build alternative by subtracting the No-Build Alternative results from the build alternative results for 2010 and 2030. This change in total vehicle miles of travel was then disaggregated into heavy trucks and other vehicles using truck percentages of ten percent for the years 2010 to 2030. A value of \$0.72 for trucks and \$0.36 for other vehicles was used as the vehicle operating cost per mile in 2005 dollars.

The resulting costs between 2010 and 2030 were then interpolated to develop annual costs for the 20-year analysis period beginning in 2010. The annual costs were then discounted to 2005 dollars using a discount rate of three percent. Table IV-4 summarizes the results. The 20-year increase in vehicle operating cost with the build alternative is approximately \$170 million to \$175 million in 2005 dollars. The differences are relatively small between alternatives, with the only difference contrasting directly with travel time savings. With vehicle operating costs, the more direct travel provided by the box diamond in North CBD Loop Alternative B results in travel time savings as compared to North CBD Loop Alternative A.

**Table IV-4
Change in Operating Cost (2010-2030)**

Alternative	Increase in Travel Distance (Daily VMT)		20-Year Savings (millions of 2005 dollars)
	Year 2010	Year 2030	
Region with No-Build	0	0	\$ 0.0
North Build River Crossing A CBD Loop A	96,500	14,700	- \$ 172.0
North Build River Crossing A CBD Loop B*	96,300	13,700	- \$ 170.2
North Build River Crossing B-1 CBD Loop A	96,500	14,700	- \$ 172.0
North Build River Crossing B-1 CBD Loop B*	96,300	13,700	- \$ 170.2
North Build River Crossing B-2 CBD Loop A	96,800	16,200	- \$ 174.5
North Build River Crossing B-2 CBD Loop B*	96,600	15,200	- \$ 172.8
North Build River Crossing C CBD Loop A	96,800	16,200	- \$ 174.5
North Build River Crossing C CBD Loop B	96,600	15,200	- \$ 172.8

Source: HNTB Corporation, 2005.

* Indicates Preferred Alternative. In the River Crossing Subcorridor, Alternative A or B is Preferred.

Change in Crash Costs²

Construction of a build alternative would increase safety. Despite the higher speeds on a freeway, the reduction in merge conflicts and improved design standards would result in fewer crashes. The statewide average crash rate on an urban freeway is 126.57 crashes per hundred million vehicle miles (1998-2008). The actual crash rate on I-29/35 was much higher than the statewide average. The actual crash rates by mainline section are presented in Chapter I, Purpose and Need.

To quantify some of the economic impact of crash reduction, the monetary savings to through traffic were estimated for a 20-year period beginning in 2010. The annual number of crashes expected to occur regionally under the No-Build Alternative was compared with the build alternative. Plus, safety differences within the build alternatives regarding reuse of the existing Paseo Bridge were considered.

Using forecasted Average Daily Traffic (ADT) numbers and the appropriate crash rates, the reduction in through traffic crashes was estimated for the year 2030 for each alternative. To estimate the savings over the 20-year period, the reduction in crashes for each year were interpolated between the years 2010 and 2030. The resulting number of crashes avoided in the years 2010 to 2030 was multiplied by an average crash cost calculated by MoDOT based on crash trends and crash cost data provided by MoDOT (see Chapter II.J.5. for additional information). The estimated monetary value of the crashes avoided was then discounted to year 2005 dollars using a discount rate of three percent.

The savings resulting from crashes avoided by through traffic using a safer roadway is estimated at \$298 million to \$338 million over 20 years in 2005 dollars. The primary difference in the calculations occurs in the River Crossing Subcorridor. Here, the safety benefits associated with new bridges are compared with use of the existing Paseo Bridge in Alternative A. Table IV-5 summarizes the resulting savings in crashes avoided by through traffic for each alternative along with the estimated number of crashes avoided in years 2010 and 2030.

Comparison of Construction Costs to User Cost Benefits

Benefit-to-cost ratios were calculated to evaluate the financial efficiency of the build alternatives. The benefit-to-cost ratio represents the amount of monetary benefit gained per dollar of construction. Higher benefit-to-cost ratios indicate higher financial benefits per dollar spent while lower ratios represent smaller returns on expenditures. First, the build alternative user cost benefits are added up from travel times, operating costs and crash calculations. Then, the relative user cost benefit was calculated by subtracting out the baseline or total user cost of the No-Build Alternative. Last, the relative user cost benefit is divided by its individual construction cost (high end) to calculate a benefit-to-cost ratio.

Table IV-6 depicts the benefit-to-cost ratios for the build alternatives. Benefit-to-cost ratios ranged from 4.8 to 6.0, where Build Alternative I and III (North Build, River Crossing A, CBD Loop A and North Build, River Crossing B1 CBD Loop A) had the highest ratios. The table also shows that build alternatives with CBD Loop A outperformed build alternatives with CBD Loop B if the River Crossing alternative is held constant.

² Accident statistics and safety data summarized or presented in this Section are protected under federal law. See Appendix A.

**Table IV-5
Crash Cost Reduction (2010-2030)**

Alternative	Change in Number of Crashes		20-Year Crash Cost Savings (millions of 2005 dollars)
	Year 2010	Year 2030	
Region with No-Build	0	0	\$ 0.00
North Build River Crossing A CBD Loop A	- 142	- 715	\$ 297.5
North Build River Crossing A CBD Loop B*	- 142	- 715	\$ 297.5
North Build River Crossing B-1 CBD Loop A	- 147	- 738	\$ 337.8
North Build River Crossing B-1 CBD Loop B*	- 147	- 738	\$ 337.8
North Build River Crossing B-2 CBD Loop A	- 147	- 738	\$ 337.8
North Build River Crossing B-2 CBD Loop B*	- 147	- 738	\$ 337.8
North Build River Crossing C CBD Loop A	- 147	- 738	\$ 337.8
North Build River Crossing C CBD Loop B	- 147	- 738	\$ 337.8

Source: HNTB Corporation, 2005.

* Indicates Preferred Alternative. In the River Crossing Subcorridor, Alternative A or B is Preferred.

**Table IV-6
Benefit-to-Cost Ratio (2010-2030)**

Alternative	20-Year Total User Cost (millions of 2005 dollars)	20-Year Relative User Cost Benefit (< > No-Build) (millions of 2005 dollars)	Benefit-to-Cost Ratio
Region with No-Build	\$ 409,290.8	\$ 0.0	0.0
North Build River Crossing A CBD Loop A	\$ 407,855.6	\$ 1,435.3	6.0
North Build River Crossing A CBD Loop B*	\$ 407,907.0	\$ 1,383.8	5.0
North Build River Crossing B-1 CBD Loop A	\$ 407,815.3	\$ 1,475.5	5.9
North Build River Crossing B-1 CBD Loop B*	\$ 407,866.8	\$ 1,424.0	5.1
North Build River Crossing B-2 CBD Loop A	\$ 407,822.5	\$ 1,468.3	5.7
North Build River Crossing B-2 CBD Loop B	\$ 407,874.0	\$ 1,416.8	4.9
North Build River Crossing C CBD Loop A	\$ 407,822.5	\$ 1,468.3	5.6
North Build River Crossing C CBD Loop B	\$ 407,874.0	\$ 1,416.8	4.8

Source: HNTB Corporation, 2005.

* Indicates Preferred Alternative. In the River Crossing Subcorridor, Alternative A or B is Preferred.

2. ECONOMIC DEVELOPMENT BENEFITS

Economic development results in higher wages, new jobs, more job choices, increased activity choices, increased economic stability through economic diversification and improved public amenities. Economic development includes business startup, expansion, attraction and retention. An efficient transportation system is a key ingredient for economic development. The cost of moving people and good directly affects the cost of doing business.

Construction of any of the build alternatives would improve the efficiency of the transportation system for the Central Business District, Kansas City and North Kansas City. Regional accessibility for local businesses would be enhanced by improved efficiency and travel times on the I-29/35 corridor. Businesses located directly along the corridor would have improved accessibility, an important factor to the profitability of businesses.

3. SHORT-TERM ECONOMIC IMPACTS

The two primary short-term economic impacts that can result from a roadway construction project are business disruption caused by temporary traffic control and an increase in construction employment. Efforts would be made to maintain traffic during construction and to reduce the length of the construction period to the extent possible.

Any of the build alternatives would increase jobs in construction and related sectors of the economy while the roadway is under construction. The infusion of construction related spending would have local and regional impacts as services and products are purchased to build the roadway. The wages paid to construction workers would be partially spent in local businesses. To provide some perspective on the number of induced jobs generated for each construction job, FHWA estimated that for every on-site construction job 4.3 indirect jobs were created, based on national data.³

E. Joint Development

Among the potential benefits of a transportation investment are opportunities to jointly enhance and/or preserve social, economic, environmental, cultural or visual values of an area. The National Environmental Policy Act of 1969 (NEPA) declared that it is the “continuous responsibility” of the Federal Government to “use all practical means” to “assure for all Americans, a safe, healthful, productive and aesthetically and culturally pleasing surrounding.” It is from this policy that the authority is granted to transportation agencies to utilize traditional improvement projects as means to provide for non-transportation benefits. The following joint development uses are encouraged: bicycle and pedestrian facilities, acquisition of scenic easements, historic sites, beautification, historic preservation and archaeological planning and research.

The I-29/35 Corridor is home to numerous commercial and industrial centers within the Kansas City region. The I-29/35 project would have a positive impact on the future development of these commercial and industrial centers. Efficient and safe highway travel to these centers would be critical for current and future developments.

³ The Federal Highway Administration estimated that a \$1 billion investment in the Federal-aid highway program supports approximately 42,100 full-time equivalent jobs. Of this total 7,900 are on-site construction jobs, 19,700 are supply industry jobs and 14,500 are induced jobs supported in the local economy. (Summary: *Economic Impacts of Federal-Aid Highway Investment*, U.S. Department of Transportation Web Site [www.fhwa.dot.gov/policy/empl.html].)

1. NORTH SUBCORRIDOR

There are no proposed or existing developments in the North Subcorridor in which the I-29/35 project would directly assist with future development or enhancement. However, the City of North Kansas City has been acquiring several land parcels on the east side of the M-210 interchange and is seeking to develop new retail and mixed-use redevelopment in the future. The build alternatives are anticipated to provide for improved regional access and safety. Additional access considerations relative to the M-210 corridor relate the important balance of providing for the safe and efficient movement of people with the needs for individual property access. Access management in the M-210 interchange area would be further coordinated during the project design process.

2. RIVER CROSSING SUBCORRIDOR

There is a potential development in the River Crossing Subcorridor in which the I-29/35 project would assist with future development or enhancement. There is an opportunity to coordinate with the Port Authority on the future development of property west of the Front Street interchange. Continued coordination between MoDOT and the Port Authority may be needed as development proposals for the site are prepared.

3. CBD NORTH LOOP SUBCORRIDOR

There are opportunities in the CBD North Loop Subcorridor to work with the local agencies and neighborhoods regarding certain types of corridor enhancements or urban design elements that could be integrated into the proposed action. Use of integrated urban design enhancements would help to better connect the CBD to the River Market and Columbus Park areas.

Opportunities exist with some of the alternatives identified in this study for joint development between the City and MoDOT for condensing the roadway “footprint” and creating additional infill development along the corridor. This type of joint development would potentially integrate the transportation system with that of economic development activities to support the overall health and vitality of the area.

Other opportunities include coordinating future modifications of M-9, including provision of bicycle and pedestrian accommodation over the Missouri River and linking this crossing to existing bicycle and pedestrian facilities in the area.

As final design proceeds for improvements to the corridor, MoDOT will continue to work with the City and stakeholders to develop an appropriate context sensitive urban design approach for integrating enhancements along the corridor.

F. Pedestrian and Bicyclist Considerations

1. GENERAL

A discussion of existing pedestrian and bicycle facilities and existing plans is provided in Chapter III, section 2.d. The discussion refers to a number of pedestrian and bicycle plans that have been developed at the local and regional level, some of which travel through the I-29/35 Study Corridor. The Mid-America Regional Council (MARC) developed a regional bike plan and the “MetroGreen Regional Greenway Initiative.” The MetroGreen plan discusses the development of a regional pedestrian/bicycle system that includes major on-street routes and off-street trails in the seven-county area. In addition, “Bike KC” is the City of Kansas City’s Bicycle Transportation Initiative and was based on the MARC regional bike plan. It is a planned and phased network of 600 miles of on-street bicycle routes (located on existing and future city streets) that primarily serves a transportation purpose.

Pedestrian and bicycle considerations are also important factors in the city of Kansas City's comprehensive plan (called FOCUS – Forging Our Comprehensive Urban Strategy). The city also developed the “Kansas City Walkability Plan” in March of 2003 as a policy guide for providing adequate pedestrian options throughout the City to provide a “walkable community.” Two major geographic areas discussed in the Plan within the study corridor are the Missouri Riverfront and the Kansas City Downtown area. The River Market area and the north edge of the Downtown area are becoming more mixed-use, pedestrian oriented neighborhoods. The Walkability Plan noted that I-29/35 acts as a barrier between the two areas, and although there are a few bridges, the high vehicular speeds at the numerous on/off ramps make pedestrian travel at these crossings difficult.

The Walkability Plan's recommendation is to give priority to improving the pedestrian connections between the Missouri Riverfront area and Downtown via Wyandotte, Main Street and Grand Avenue. In addition, the Plan recommends “that the City work cooperatively with MoDOT to encourage a more pedestrian friendly MoDOT infrastructure where studies indicate pedestrian activity,” and that pedestrian mobility improvements should be an integral part of all transportation improvements.

In December 2005, the River Crossing Task Force was formed by MARC to develop a policy to address pedestrian/bicycle accommodations over major river crossings. The policy is currently in the draft stages and MoDOT has provided written comments to the Task Force. MoDOT will continue coordination with MARC on pedestrian/bicycle issues and the policy adopted by the River Crossing Task Force.

2. MISSOURI RIVER CROSSING ISSUES

a. Review of Existing Plans

Existing bicycle and pedestrian routes currently exist or are planned along each side of the Missouri River. The Riverfront Heritage Trail exists along the levee on the south side of the river and a future trail is proposed to follow the levee on the north side of the river. The current plans of MARC and those of Kansas City's Bicycle Transportation Initiative indicate route crossings of the Missouri River at the Heart of America Bridge (HOA) and at the Chouteau Bridge which is located east of the study corridor. There are currently some accommodations for bicycle and pedestrian movement at these two locations, however, the level of accommodation does not meet AASHTO standards for bike lanes and there is no physical separation for bicyclists and pedestrians.

b. Recommendation of the Northland Downtown MIS

The Northland Downtown Major Investment Study (MIS), completed in 2002, included an examination of highway, transit, bicycle and pedestrian modes of travel. It included a recommendation to provide for a bicycle and pedestrian crossing that would be located on the existing HOA Bridge. However, it was considered a short-term solution as a new pedestrian/bicycle crossing was recommended in combination with a new fixed guideway (light rail or bus rapid transit) bridge crossing that would be located immediately east of the Heart of America Bridge. The light rail transit (LRT) system is not likely to be implemented in the near future so other strategies to provide a similar quality of bicycle and pedestrian movement across the Missouri River would need to be revisited.

c. Coordination With User Groups

In meetings with the MARC Bicycle/Pedestrian Advisory Committee, bicycle and pedestrian supporters indicated that they view a new bridge crossing at the Paseo as a new opportunity to improve bicycle and pedestrian movements. Providing a bicycle and pedestrian crossing within

this corridor, however, is not desirable as it could lead to conflicts with high-speed interstate travel. Although bicycles are allowed on most streets and highways, they are not encouraged on the mainline of I-29/35 since it is unsafe for relatively slow moving bicycles to be on a fully access-controlled interstate facility with a minimum speed of 40 miles per hour. A separate or connected structure would need to be provided if pedestrian/bicycle travel were to be provided in the I-29/35 corridor. In addition, the location of I-29/35 is less connected with the regional pedestrian and bicycle travel network and destination areas than the other bridge crossings.

d. Pedestrian/Bicycle Access Study on HOA Bridge

The Missouri Department of Transportation evaluated the Paseo Bridge, the Broadway Bridge and the Heart of America (HOA) Bridge to determine if any of these bridges could accommodate a retrofit to include pedestrian/bicycle traffic. It was determined that the only feasible river crossing for pedestrian/bicycle traffic would be at the HOA Bridge, which is in the vicinity of the River Market area and the Central Business District, and is designated as a planned bike route in MARC's regional bike plan.

A report that developed some engineering concepts related to re-configuring the traffic lanes on the HOA Bridge to better accommodate non-motorized travel was completed for MoDOT in 2001. The purpose of the report, titled "Heart of America Bridge Bike Lanes, M-9 Highway, Conceptual Report," was to evaluate alternative lane configurations which would provide bicycle/pedestrian access across the bridge. The length of roadway studied in the report included the area from the 3rd Street ramps on the south side of the river (in Kansas City) to the 10th Avenue intersection on the north side of the river (in North Kansas City). MARC's regional bike plan designates 10th Avenue as a planned bike route and M-9 (north of 10th) as a proposed bike route. Two options were studied in the report:

- In **Option 1**, a 10-foot wide, two-way, shared pedestrian/bicycle path would use the outside shoulder of only the northbound lanes of the bridge and would be separated from vehicular traffic by a 2-foot wide concrete barrier. The two northbound traffic lanes would remain 12 feet wide with the same existing inside shoulder width (3'-9"). The three existing southbound traffic lanes (12 feet wide) and shoulders (one foot inside, 2'-9" outside) would not be affected. It was determined that it would also be necessary to add approximately 300 linear feet of new pavement for the path at the approach to 10th Avenue because the existing "right turn only" lane at this location is of insufficient width to accommodate the bike path.
- In **Option 2**, the outside shoulders of both the northbound and southbound lanes would be used for a one-way bicycle facility, and only the northbound shoulder would also include a two-way pedestrian facility. The northbound shoulder would include a 5-foot bike-only lane for northbound bike traffic only, and a 5-foot two-way pedestrian-only lane on the outside. The southbound shoulder would be a 5-foot wide lane for bicycles only and would be one-way only (southbound). The bicycle lanes would be separated from traffic by a solid white line rather than a barrier because the bicycle traffic would be flowing in the same direction as vehicular traffic.

In this option, a 5-foot wide, one-way, bike-only lane on the southbound outside shoulder was considered because of a very narrow existing shoulder width. The bridge was originally designed as a 4-lane facility (two lanes in each direction). However, several years after construction, the southbound lanes were re-stripped to provide three southbound travel lanes instead of two. This resulted in reducing the inside shoulder width of the southbound facility to one foot and the outside shoulder width to 2'-9". Therefore, a 5-foot, one-way, bike-only lane on the southbound outside shoulder would

require 11-foot wide vehicular lanes instead of 12-foot lanes, and the inside shoulder width would be 1'-9". The report indicated that if one southbound vehicular lane is eliminated to accommodate a wider shared pedestrian/bicycle lane (as in Option 1), the estimated peak hour Level of Service B would drop to C.

In Option 2 it was also recommended that approximately 850 feet of the southbound facility approaching the bridge be widened by five feet, beginning at the 10th Avenue intersection. This would most likely require additional right-of-way or permanent easement, and possibly the construction of a retaining wall on the west side of the roadway.

Option 1 was estimated to cost approximately \$500,000, two-thirds of which would be for the concrete safety barrier separating vehicular traffic from bicycle traffic. Option 2 was estimated to cost approximately \$215,000, but did not include a concrete safety barrier. Utilities and right-of-way costs were not included in either of these estimates. The pros and cons that were discussed in the report for each option are listed below.

Option 1 Pros:

- Physical separation by a concrete safety barrier.
- Minimum impact on vehicular lanes. Two 12-foot wide travel lanes would be retained (northbound) and southbound lanes would not be affected.
- Conflicts with motor vehicles would be limited to the northbound ramp at 3rd Street and the east side of the 10th Avenue intersection.
- Pedestrian traffic would be discouraged from using the southbound lanes to cross the river.

Option 1 Cons:

- Cost would be higher (\$500,000) because of concrete barrier.
- Bicyclists using southbound M-9 from north of 10th Avenue would be required to cross over at 10th Avenue to access the path located on the northbound side. Consequently they may continue to use the southbound M-9 lanes over the river, even though there would not be a designated bike lane on that side.
- Maintenance may require manual labor – maintenance vehicles may have difficulty accessing the 10-foot path.
- Installation of the concrete barrier may reduce the effectiveness of drainage and snow removal.

Option 2 Pros:

- Cost would be less (\$215,000) because there are no concrete safety barriers – bike traffic would flow in the same direction as vehicular traffic.
- Using both sides of the bridge is more compatible with the long term plan of using M-9 as a bike route. Southbound bicyclists, north of 10th Avenue, would be able to continue

on southbound M-9 instead of having to cross over to the northbound side at 10th Avenue (as in Option 1).

- Maintenance can be done in the same manner and at the same time as general bridge surface maintenance – no concrete barrier.

Option 2 Cons:

- Pedestrian/bicycle traffic would not be physically separated from vehicular traffic.
- An existing bus stop (west side of M-9) would require relocation or removal.
- Right-of-way or easement acquisition (west side of M-9, south of 10th Avenue) may be costly.
- Bicyclists using the planned 10th Avenue bike route would be required to cross M-9 to access the southbound bike lane on M-9.
- Recreational bicyclists or those of average experience may be less likely to use bike lanes with no physical separation.
- Pedestrians may inadvertently use the southbound lane to cross the bridge even though there would be no designated lane for pedestrians to use.

In both options, the existing storm drainage inlets in the pedestrian/bicycle lanes would need to be retrofitted to accommodate bicycle traffic. In addition, safety rails (a minimum of 4.5 feet high) would need to be added wherever necessary to improve safety of bicycle and pedestrian travel.

Implementation of Option 1 along M-9, from the 3rd Street ramps to 10th Avenue, appears to be the most feasible and appropriate option for the local authorities to consider. This option could be implemented following the proposed widening of the I-29/35 facility. Although Option 1 would cost more because of the concrete barrier installation, it would result in a much safer pedestrian/bicycle facility, would address the needs of the broadest range of users, create the least number of conflict points with vehicular traffic, and would involve the least amount of right-of-way acquisition. In addition, at the open space in the southeast quadrant of the 10th Avenue intersection, there could be opportunities to provide pedestrian/bicycle oriented amenities, such as a rest stop or a park and ride facility.

AASHTO guidelines recommend that a two-way shared use path should be a minimum of 10 feet wide with a two-foot shoulder on each side of the path unless special circumstances result in reduced clearance. Under these circumstances, since space is limited on the HOA Bridge and the two-foot shoulders cannot be included in Option 1; cautionary signs should be posted to warn users of the conditions.

The access to 3rd Street at the south portion of the HOA Bridge can provide a link to the Riverfront Heritage Trail via Grand Avenue or Main Street. However, the HOA Bike Lanes Conceptual Report did not discuss a link to the future trail that would be on the levee at the north side of the river. The HOA Bridge structure terminates immediately on the north side of the levee and the roadway is then on fill. There is also undeveloped land on each side of the roadway, and a future connection to the levee could be possible at this location.

3. PEDESTRIAN/BICYCLIST CONSIDERATIONS

Although there are no sidewalks connected to the travel lanes of the I-29/35 facility, there are sidewalks on most of the side streets that cross over or under the facility, with the exception of 16th Avenue and Bedford Avenue in North Kansas City, and Dora Street and M-9 in Kansas City. Affected pedestrian/bicycle facilities, including sidewalks, bike routes and trails are discussed below for each subcorridor.

a. No-Build Alternative

In the No-Build Alternative, no additional pedestrian or bicycle facilities are specified. However, future improvements that may occur at interchanges, intersections or bridge crossings where there are existing, planned or proposed pedestrian/bicycle facilities, would include replacement of existing sidewalks and would include adequate clearances to accommodate pedestrians and bicyclists where necessary and appropriate. These pedestrian/bicycle accommodations would comply with ADA standards.

b. Build Alternatives

North Subcorridor

At the Armour Road interchange, sidewalks currently exist on the north side of Armour Road and continue through the interchange, but there is no sidewalk on the south side of Armour through the interchange and eastward. In the build alternative, existing sidewalks would be replaced through the interchange to provide pedestrian connections along Armour Road. At 16th Avenue and Bedford Avenue, there are currently no sidewalks in this industrial area. The MARC regional bike plan designates Armour Road and 16th Avenue as future on-street bike routes. Therefore, the new bridges over Armour Road and 16th Avenue would be designed with adequate horizontal clearance to allow for future bike routes and sidewalks.

River Crossing Subcorridor

In all of the build alternatives in this subcorridor, I-29/35 crosses over the Riverfront Heritage Trail at the south bank of the Missouri River. The new Paseo Bridge that would cross over the river would adequately span the trail and would also span the levee on the north side of the river, thereby allowing adequate clearance for the future (proposed) pedestrian/bicycle trail at that location.

CBD North Loop Subcorridor

In this subcorridor, sidewalks exist on all of the streets that cross over or travel under I-29/35, with the exception of Dora Street and M-9 which has a paved shoulder on the northbound side rather than a sidewalk. In "Kansas City's Bicycle Transportation Initiative," planned and proposed on-street bike routes include Independence Avenue (from east of Paseo Boulevard to Charlotte Street), Troost Avenue (at the intersection with Independence) Charlotte Street (traveling under I-29/35/70), 5th Street (traveling under M-9), and Grand Avenue (crossing over I-29/35/70). In addition, the Riverfront Heritage Trail travels along 4th Street (under Broadway) and along Wyandotte Street (over I-29/35/70).

Alternative A – In this alternative, the only street with sidewalks that would be affected would be Broadway. The Broadway Bridge over I-29/35/70 currently has sidewalks which would be replaced.

Alternative B (Preferred) – In this alternative, the streets that would be affected include Independence Avenue (adjacent to the mainline), Charlotte Street (under the mainline), M-9 Highway (new bridge over the mainline and over 5th), 5th Street (under M-9), Main Street (new

bride over the mainline), Broadway (new bridge over the mainline), and 6th Street (adjacent to the mainline). Existing sidewalks would be replaced, and new bridges would have improved sidewalks and would be designed to allow adequate clearance for planned bike routes such as those along Charlotte Street and 5th Street under M-9. In addition, the realigned Independence Avenue between Troost and Charlotte Street would be designed to accommodate the planned bike route in this location.

MoDOT will coordinate closely with the cities of Kansas City and North Kansas City in providing adequate pedestrian and bicycle access across bridges appropriate for pedestrian/bicycle access, and in providing adequate bridging over pedestrian/bicycle routes or paths that travel under I-29/35. All new pedestrian and bicycle facilities would be constructed to current design and ADA standards.

G. Air Quality Impacts

The I-29/35 EIS, Transportation Improvement Program (TIP) # 590054 is included in the FY 2004-2007 TIP endorsed by MARC, the Metropolitan Planning Organization (MPO) for the region in which the project is located. Projects in the TIP are considered to be consistent with the 2030 regional transportation plan endorsed by MARC.

In January 2003, the FHWA and the Federal Transit Administration (FTA) determined that the 2030 regional transportation plan conforms with the State Implementation Plan (SIP) and the transportation-related requirements of the 1990 Clean Air Act Amendments. On January 6, 2004, the FHWA and the FTA determined that the TIP also conforms with the SIP and the Clean Air Act Amendments. These findings were in accordance with 40 CFR Part 93, "Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 USC or the Federal Transit Act."

The project's design concept and scope are consistent with the project information used for the TIP conformity analysis. According to MARC, the I-29/35 project is part of an existing conformity plan and would not be affected by the implementation policy for the new 8-hour Ozone standard.

H. Noise Impacts

1. NOISE ABATEMENT CRITERIA

The FHWA's Noise Abatement Criteria (NAC) and MoDOT's FHWA approved interpretation of the NAC, as detailed in MoDOT's Traffic Noise Policy⁴, were used in the analysis of the acoustic impact of the proposed project. The analysis was conducted according to the guidelines as presented in the Federal Code of Regulation, Title 23 Part 772, which provides procedures whereby the acoustic impact of the proposed action can be assessed and the needs for abatement measures determined. The FHWA and MoDOT's NAC for various land uses are presented in Table IV-7.

The noise level descriptor used is the equivalent sound level, $L_{eq}(h)$, defined as the steady state sound level in a one hour period which contains the same sound energy as the actual time-varying sound.

⁴ Traffic Noise Policy, Missouri Department of Transportation, MoDOT Preliminary Studies Group, Environmental Section, September 1997.

Noise mitigation measures for traffic noise impacts would be considered when the predicted noise levels approach or exceed those values shown for the appropriate activity category of the FHWA Noise Abatement Criteria, Table 1, or when the predicted traffic noise levels substantially exceed the existing noise levels.

**Table IV-7
Noise Abatement Criteria
Hourly A-Weighted Sound Level – Decibels (dBA)**

Activity Category	$L_{eq}(h)$ (1 Hr)	Description of Activity Category / Land Uses
A	57 dBA (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the lands are to continue to serve their intended purpose.
B	67 dBA (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	72 dBA (Exterior)	Developed lands, properties or activities not included in Categories A or B above.
D	---	Undeveloped lands.
E	52 dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

Source: Code of Federal Regulations, Title 23 Part 772, Revised October 1997 and MoDOT Traffic Noise Policy, September 1997.

MoDOT has defined the NAC approach or exceed criteria for Activity Category “B” as being equal to or greater than 66 dBA $L_{eq}(h)$ for noise sensitive receptors such as residences, churches, schools, libraries, hospitals, nursing homes, apartment buildings, condominiums, etc. The criteria for Activity Category “C” is 71 dBA $L_{eq}(h)$ or greater. MoDOT has defined an increase of 15 decibels or more over the existing noise as being substantial. Title 23 CFR, Section 772.11(a) states, “In determining and abating traffic noise impacts, primary consideration is to be given to exterior areas. Abatement would usually be necessary only where frequent human use occurs and lower noise level would be of benefit.”

2. TRAFFIC NOISE MODELING

The FHWA Traffic Noise Model, (TNM[®] 2.5)⁵ was used to model existing 2003 and design year 2030 L_{eq} noise levels. The design year noise levels were compared to the existing noise levels and to the NAC, Table 1. The design year noise levels were also used in the noise mitigation analysis to analyze the feasibility of abatement measures for locations projected to experience a noise impact. Inputs such as volume, speed, and truck percentages were modeled to reflect the traffic characteristics “which yield the worst hourly traffic noise impact on a regular basis for the design year...”⁶. The following parameters were used in this model to calculate an hourly $L_{eq}(h)$ at a specific receiver location:

- Distance between roadway and receiver;
- Relative elevations between roadway and receiver;
- Hourly traffic volumes for light-duty (two axles, four tires), medium-duty (two axles, six tires), and heavy-duty (three or more axles) vehicles;

⁵ Michael C. Lau, Cynthia S. Y. Lee, Gregg G. Judith L. Rochat, Eric R. Boeker, and Gregg C. Fleming. FHWA Traffic Noise Model® Users Guide (Version 2.5 Addendum). Federal Highway Administration, April 2004.

⁶ 23 CFR, Section 772.17(b).

- Vehicle speed;
- Roadway grade; and
- Topographic features, including retaining walls and berms.

One hundred twenty two representative receiver locations, labeled N1 through N105 (Noise Modeling Sites) and FS-1 through FS-9 (Field/Noise Measurement Sites), were selected to illustrate the noise impacts at residences, the ReStart Homeless Shelter, the Don Bosco Senior Center, and commercial properties adjacent to the proposed project. Noise modeling sites and noise measurement sites are shown on Exhibit IV-4.

Future 2030 design hour traffic data were used to model the design year $L_{eq}(h)$ noise levels. These noise levels were compared to the existing noise levels to determine if MoDOT's 15 decibel increase criteria would be exceeded and to the NAC noise levels in Table 1. Exceeding either criterion is, by definition, an impact. Therefore, mitigation measures must be reviewed to determine if they are both feasible and reasonable. Design year $L_{eq}(h)$ noise levels along the I-29/35 corridor ranged from 58 to 77 dBA $L_{eq}(h)$. The results of the peak hour traffic noise modeling are presented in Tables IV-8, IV-9 and IV-10.

a. North Subcorridor

Based upon the build alternatives, future design hour noise levels would exceed the NAC at 11 of the 26 representative receptors in the North Subcorridor, Table IV-8. These 11 receptors represent 28 living units in the North Subcorridor. Future $L_{eq}(h)$ noise levels at these receptors would range from 66 to 77 dBA. The change in noise levels at these locations range from a decrease of one decibel to an increase of four dB.

Table IV-8
Design Hour Noise Levels, dBA $L_{eq}(h)$
North Subcorridor

Receiver I.D. ⁽¹⁾	Land Use ⁽²⁾	# of Units	NAC Category	Noise Level, dBA $L_{eq}(h)$			2030 dB Increase over Existing	Impact ⁽³⁾
				NAC Level	Existing (2003)	2030 Build without Noise Abatement		
N37	Com	1	C	72	67	68	1	N
N39	Com	1	C	72	66	64	-2	N
N40	Hotel	15	E	52	46	47	1	N
N41	Res	1	B	67	69	73	4	Y
FS-9	Res	1	B	67	70	74	4	Y
N42	Res	3	B	67	74	77	3	Y
N46	Apts.	1	B	67	72	75	3	Y
N47	Apts.	7	B	67	73	74	1	Y
N48	Apts.	2	B	67	70	70	0	Y
N49	Apts.	5	B	67	66	66	0	Y
N50	Apts.	6	B	67	65	64	-1	N
N50a	Apts.	8	B	67	65	65	0	N
N51	Apts.	5	B	67	65	66	1	Y
N51a	Apts.	5	B	67	65	65	0	N
N52	Apts.	4	B	67	64	64	0	N
N53	Res	1	B	67	64	64	0	N
N54	Res	1	B	67	68	69	1	Y
FS-8	Res	1	B	67	68	69	1	Y
N55	Apts.	1	B	67	69	68	-1	Y

Table IV-8 (continued)
Design Hour Noise Levels, dBA L_{eq}(h)
North Subcorridor

Receiver I.D. ⁽¹⁾	Land Use ⁽²⁾	# of Units	NAC Category	Noise Level, dBA L _{eq} (h)			2030 dB Increase over Existing	Impact ⁽³⁾
				NAC Level	Existing (2003)	2030 Build without Noise Abatement		
N56	Com	1	C	72	65	67	2	N
N57	Motel	30	E	52	46	46	0	N
N58		10	E	52	48	47	-1	N
N59	Com	2	C	72	68	68	0	N
N60	Com	2	C	72	66	67	1	N
N61	Com	5	C	72	64	65	1	N
N62	Com	3	C	72	65	65	0	N

(1) N = Noise Modeling Site, FS = Noise Measurement Site

(2) Res. – Residence, Com. – Commercial

(3) Y = Impact, N = No Impact

b. River Crossing Subcorridor

Based upon the build alternatives, future design hour noise levels in the River Crossing Subcorridor would range from 59 to 68 dBA L_{eq}(h). All of these noise levels are below the NAC for Activity Category C. The modeled noise levels are summarized in Table IV-9.

Table IV-9
Design Hour Noise Levels, dBA L_{eq}(h)
River Crossing Subcorridor

Rcvr. I.D. ⁽¹⁾	Land Use ⁽²⁾	# of Units ⁽³⁾	NAC Category	Noise Level, dBA L _{eq} (h)					2030 dB Increase over Existing			Impact ⁽⁴⁾		
				NAC Level	Existing (2003)	2030 Build without Noise Abatement			2030 dB Increase over Existing			Impact ⁽⁴⁾		
						Alternatives			Alternatives			Alternatives		
						A	B	C	A	B	C	A	B	C
N33	Casino	1	C	72	58	61	61	61	3	3	3	N	N	N
N34	Com	1	C	72	66	68	68	68	2	2	2	N	N	N
N35	Com	1	C	72	65	66	66	66	1	1	1	N	N	N
N36	Com	1	C	72	61	63	63	63	2	2	2	N	N	N
N64	Com	1	C	72	62	63	63	63	1	1	1	N	N	N
N65	Com	1	C	72	68	66	66	66	-2	-2	-2	N	N	N
N66	Zoned Com	U	C	72	66	66	--	--	0	--	--	N	N	N
N67	Zoned Com	U	C	72	61	62	62	62	1	1	1	N	N	N
N69	Zoned Com	U	C	72	62	64	64	64	2	2	2	N	N	N
N70	Zoned Com	U	C	72	60	61	61	61	1	1	1	N	N	N
N71	Zoned Com	U	C	72	57	59	59	59	2	2	2	N	N	N
N72	Com	2	C	72	63	65	65	65	2	2	2	N	N	N

(1) N = Noise Modeling Site, FS = Noise Measurement Site

(2) Res. – Residence, Com. – Commercial

(3) U=Presently Undeveloped

(4) Y = Impact, N = No Impact

c. CBD North Loop Subcorridor

In the CBD North Loop Subcorridor, future design hour noise levels would exceed the NAC at 31 of the 76 representative receptors for Alternative A, and would exceed the NAC at 36 of the 76 representative receptors for Alternative B, Table IV-10. Design hour exterior $L_{eq}(h)$ noise levels would range 66 to 75 dBA for the 78 living units that would be exposed to noise levels above the NAC. The interior noise level at the ReStart Homeless Shelter would range from 46 to 48 dBA $L_{eq}(h)$.

**Table IV-10
Design Hour Noise Levels, dBA $L_{eq}(h)$
CBD North Loop Subcorridor**

Receiver I.D. ⁽¹⁾	Land Use ⁽²⁾	# of Units	NAC Category	Noise Level, dBA $L_{eq}(h)$				2030 dB Increase over Existing		Impact ⁽³⁾	
				NAC Level	Existing (2003)	2030 Build without Noise Abatement		Alt. A	Alt. B	Alt. A	Alt. B
						Alt. A	Alt. B				
N1	Com.	1	C	72	65	67	68	2	3	N	N
N2	Res.	2	B	67	63	64	65	1	2	N	N
N3	Com.	1	C	72	64	65	66	1	2	N	N
N4	Res.	2	B	67	63	64	65	1	2	N	N
N5	Com.	1	C	72	69	71	72	2	3	Y	Y
N6	Com.	1	C	72	65	67	67	2	2	N	N
N7	Com.	1	C	72	71	71	74	0	3	Y	Y
N8	Com.	1	C	72	68	69	72	1	4	N	Y
N9	Com.	1	C	72	68	69	71	1	3	N	Y
N10	Com.	1	C	72	66	67	69	1	3	N	N
N11	Com.	2	C	72	69	70	71	1	2	N	Y
N12	Res.	1	B	67	64	65	65	1	1	N	N
N13	Res.	1	B	67	69	70	71	1	2	Y	Y
N14	Com.	1	C	72	70	71	70	1	0	Y	N
N15	Com.	1	C	72	67	69	69	2	2	N	N
N16	Homeless Shelter	2	E	52	49	50	50	1	1	N	N
N17		4	E	52	46	47	46	1	0	N	N
N18	Com.	4	C	72	67	67	69	0	2	N	N
N19	Res.	1	B	67	58	58	61	0	3	N	N
N20	Res.	7	B	67	61	62	63	1	2	N	N
N21	Res.	2	B	67	64	65	66	1	2	N	Y
N22	Apts.	2	B	67	71	75	75	4	4	Y	Y
N23	Apts.	3	B	67	72	75	75	3	3	Y	Y
N24	Apts.	4	B	67	70	72	72	2	2	Y	Y
FS-6	Apts.	1	B	67	66	73	73	7	7	Y	Y
N25	Apts.	4	B	67	64	67	67	3	3	Y	Y
FS-7	Apts.	1	B	67	62	63	63	1	1	N	N
N26	Apts.	6	B	67	57	59	59	2	2	N	N
N27	Apts.	12	B	67	58	59	59	1	1	N	N
N28	Apts.	8	B	67	54	55	55	1	1	N	N
N29	Apts.	8	B	67	53	53	53	0	0	N	N
N30	Res.	1	B	67	57	58	58	1	1	N	N
N31	Res.	1	B	67	56	57	57	1	1	N	N
N73	Res.	1	B	67	70	73	73	3	3	Y	Y
N74	Res.	16	B	67	63	66	66	3	3	Y	Y
FS-5	Res.	8	B	67	66	66	66	0	0	Y	Y
N76	Res.	1	B	67	67	68	68	1	1	Y	Y

Table IV-10 (continued)
Design Hour Noise Levels, dBA L_{eq}(h)
CBD North Loop Subcorridor

Receiver I.D. ⁽¹⁾	Land Use ⁽²⁾	# of Units	NAC Category	Noise Level, dBA L _{eq} (h)				2030 dB Increase over Existing		Impact ⁽³⁾	
				NAC Level	Existing (2003)	2030 Build without Noise Abatement		Alt. A	Alt. B	Alt. A	Alt. B
						Alt. A	Alt. B				
N77	Res.	1	B	67	67	68	68	1	1	Y	Y
N78	Res.	2	B	67	69	70	70	1	1	Y	Y
N79	Res.	3	B	67	71	74	74	3	3	Y	Y
N80	Res.	2	B	67	70	73	73	3	3	Y	Y
N81	Res.	1	B	67	62	64	64	2	2	N	N
FS-4	Res.	1	B	67	63	68	68	5	5	Y	Y
N82	Res.	1	B	67	73	75	75	2	2	Y	Y
N83	Res.	6	B	67	65	68	68	3	3	Y	Y
N84	Res.	2	B	67	57	59	59	2	2	N	N
N84a	Res.	2	B	67	61	63	61	2	0	N	N
N85	Res.	1	B	67	64	68	68	4	4	Y	Y
N86	Res.	1	B	67	68	68	67	0	-1	Y	Y
N86a	Res.	1	B	67	60	62	61	2	1	N	N
N87	Res.	1	B	67	67	68	67	1	0	Y	Y
N88	Apts.	4	B	67	61	62	62	1	1	N	N
FS-3	Sen. Ctr.	0	B	67	67	67	66	0	-1	Y	Y
N89	Sen. Ctr.	1	B	67	67	68	66	1	-1	Y	Y
N89a	Res.	1	B	67	59	60	60	1	1	N	N
N89b	Res.	1	B	67	56	57	56	1	0	N	N
N90	Park	1	B	67	64	64	64	0	0	N	N
N90a	Res.	1	B	67	58	60	57	2	-1	N	N
FS-2	Res.	1	B	67	65	66	62	1	-3	Y	N
N91	Res.	1	B	67	65	66	62	1	-3	Y	N
N91a	Res.	2	B	67	62	64	59	2	-3	N	N
N92	Condos	1	B	67	60	61	60	1	0	N	N
N93	Com.	1	C	72	64	65	65	1	1	N	N
N94	Condos	2	B	67	60	61	62	1	2	N	N
N95	Com.	3	C	72	67	68	71	1	4	N	Y
N96	Condos	1	B	67	61	61	64	0	3	N	N
N97	Condos	1	B	67	62	63	65	1	3	N	N
N98	Condos	1	B	67	71	72	72	1	1	Y	Y
FS-1	Com.	1	C	72	69	70	72	1	3	N	Y
N99	Condos	2	B	67	65	66	68	1	3	Y	Y
N100	Res.	1	B	67	67	68	69	1	2	Y	Y
N101	Com.	1	C	72	69	70	70	1	1	N	N
N102	Condos	1	B	67	68	69	70	1	2	Y	Y
N103	Com.	3	C	72	69	70	71	1	2	N	Y
N104	Com.	2	C	72	57	60	60	3	3	N	N
N105	Com.	1	C	72	67	70	71	3	4	N	Y

(1) N = Noise Modeling Site, FS = Noise Measurement Site

(2) Res. – Residence, Com. – Commercial

(3) Y = Impact, N = No Impact

3. ABATEMENT MEASURES

Various methods were reviewed to potentially mitigate the noise impact of the proposed improvements. Among these were reduction of speed limits, restriction of truck traffic to specific times of the day, a total prohibition of trucks, alteration of horizontal and vertical alignments, property acquisition for construction of noise barriers or berms, acquisition of property to create buffer zones to prevent development that could be adversely impacted, noise insulation of public use or nonprofit institutional structures, the use of berms, and the use of noise walls.

Restriction or prohibition of trucks is adverse to the project purpose. Reduction of speed limits, although acoustically beneficial, is seldom practical unless the design speed of the proposed roadway is also reduced. Design criteria and recommended termini for the proposed project prevent substantial horizontal and vertical alignment shifts that would produce significant changes in the projected acoustical environment. The desire to minimize right-of-way takings prohibits the acquisition of buffer zones or the construction of earth berms. Noise insulation is not necessary since no public use or nonprofit institutional structures were identified as being affected by the project. Therefore, only the construction of noise barriers was considered for noise mitigation.

When the criterion is exceeded or a substantial increase occurs, noise abatement procedures are to be reviewed to determine if they are feasible and reasonable.

Feasibility deals with the engineering considerations of noise abatement, for example, topography, access, drainage, safety, maintenance, and if other noise sources are present. MoDOT requires at least a five dBA insertion loss for first-row receivers for noise abatement to be considered feasible.

Reasonability of proposed noise abatement mitigation measures is more subjective than evaluation of feasibility. It implies use of common sense and good judgment and is based on a number of factors. These factors include, but are not limited to:

- Noise wall must provide noise reduction of at least 5 dBA for all primary receptors. Primary receptors are those which are closest to the highway.
- Noise wall must provide attenuation for more than one receptor.
- Noise wall must be 18' (5.5m) or less in height above normal grade.
- Noise wall must not interfere with normal access to the property.
- Noise wall must not pose a traffic safety hazard.
- Noise wall must not exceed a cost of \$30,000 per benefited receptor. A benefited receptor is defined as a receptor, which receives a noise reduction of 5 dBA or more.
- The majority of the affected residents (primary and benefited receptors) must concur that a noise wall is desired.

In areas where noise impacts would occur, noise abatement (i.e. barriers) would have to be constructed between the road and the receiver to effectively abate the noise being produced by the traffic. Noise abatement was analyzed at six locations within the project limits, two in the North Subcorridor and four in the CBD North Loop Subcorridor. The noise barrier locations of only those that were determined to be both feasible and reasonable are shown on Exhibit IV-4.

a. North Subcorridor

The residential development east of I-29/35 and north of Armour Road (M-210) would require a 549-foot long noise barrier that would range in height from 15 to 18 feet. Noise Barrier 1 would provide a 2 – 7 decibel reduction for four residences. The estimated cost for this barrier is \$168,358, based on \$18.00 per square foot, resulting in a cost of \$42,090 per unit. This barrier meets MoDOT's criteria for feasibility, but not the criteria for reasonableness.

The residential development west of I-29/35 and north of Armour Road (M-210), which includes a few residences north of Armour Road and two apartment complexes (The French Quarter Apartments and The Sunny Hills Apartments and Townhomes) would require a noise barrier 9 – 18 feet high and 3,050 feet long. This barrier (Barrier 2) would be comprised of two sections (2a & 2b) and would provide a noise reduction of 5 – 7 decibels for 30 living units. The estimate cost of this barrier is \$709,655. The cost per residence is \$23,655. Barrier 2 is both feasible and reasonable (see Exhibit IV-4 for location).

The information on these two noise barriers is summarized in Table IV-11.

Table IV-11
Acoustical Mitigation – Noise Barrier Analysis
North Subcorridor

Barrier No.	Range of Future Leq Noise Levels, (dBA)		Noise Reduction (dB)	Barrier Characteristics			Number of Units Attenuated	Cost/ Benefited Receptor
	w/o Barrier	With Barrier		Length ft	Height ft	Cost*		
1	73 – 77	70 – 71	2 – 7	549	15 – 18	\$168,358	4	\$42,090
2	65 – 75	59 – 70	5 – 7	3,050	9 – 18	\$709,655	30	\$23,655

*Based on \$18.00 per square foot.

b. River Crossing Subcorridor

Noise levels adjacent to the River Crossing Subcorridor would not approach or exceed the NAC (see Table IV-9), therefore, noise mitigation was not analyzed within this section of the project.

c. CBD North Loop Subcorridor

A noise barrier 843 feet long, ranging in height from 6 – 12 feet was analyzed for the Chouteau Courts public housing apartment complex located east of I-29/35 and north of Independence Avenue. Noise Barrier 3 would provide a noise reduction of 5 – 10 decibels for ten residences at a cost of \$14,051 per residence. This barrier meets MoDOT's definition for feasible and reasonable noise mitigation (see Exhibit IV-4 for location).

Noise Barrier 4 would need to be 18 feet high and 2,719 feet long to provide noise mitigation for 24 residences located between Pacific Street and Dora Street west of I-29/35, along the east side of the Guinotte Manor public housing area and the east side of the Columbus Park single-family residential neighborhood. This barrier would provide a noise level reduction ranging from five to nine decibels. The estimated cost of this barrier would be \$654,579 resulting in a cost per residence of \$27,274. Both noise reduction and the cost per residence would meet MoDOT's criteria for feasible and reasonable noise mitigation (see Exhibit IV-4 for location).

There are two residences north of Independence Avenue between Campbell Street and Harrison Street in the Columbus Park Neighborhood. Noise Barriers 5 and 6, for Alternatives A and B respectively, were analyzed for this area. The Alternative A noise barrier, Barrier 5, would need to

be 1,983 feet long and 18 feet tall and it would only provide a two (2) decibel reduction in the design year $L_{eq}(h)$ noise level. Noise Barrier 6 would be shorter at 1,768 but would still only provide a noise reduction of two (2) to three (3) decibels. Therefore, neither Barrier 5 nor Barrier 6 is feasible.

The information on these four noise barriers is summarized in Table IV-12.

**Table IV-12
Acoustical Mitigation – Noise Barrier Analysis
CBD North Loop Subcorridor**

Barrier No.	Range of Future Leq Noise Levels, (dBA)		Noise Reduction (dB)	Barrier Characteristics			Number of Units Attenuated	Cost/ Benefited Receptor
	w/o Barrier	With Barrier		Length ft	Height ft	Cost*		
3	72 – 75	65 – 69	5 – 10	843	6 – 12	\$140,506	10	\$14,051
4	66 – 75	61 – 67	5 – 9	2,719	9 – 18	\$654,579	24	\$27,274
5 Alt. A	68	66	2	1,983	18	\$642,576	2	\$321,288
6 Alt. B	67	64 – 65	2 – 3	1,768	18	\$572,910	2	\$286,455

*Based on \$18.00 per square foot.

There are other individual residences along the I-29/35 corridor that would experience a noise impact. However, as can be seen from the analysis for Noise Barriers 5 and 6, the density of these residences make it impossible to design a noise wall which can provide a five dBA reduction for more than one receptor without exceeding the \$30,000 per benefited receptor criteria as stated in MoDOT’s Noise Policy.

Based on the study completed for the I-29/35 corridor, Noise Barrier 2, Table IV-11, in the North Subcorridor and Noise Barriers 3 and 4, Table IV-12, in the CBD North Loop Subcorridor meet MoDOT’s feasibility definition along with the engineering and economical aspects of MoDOT’s reasonableness criteria. Public informational meetings, both formal and informal, will be conducted during the project development stage to solicit comments, opinions and concerns from local officials and the public.

Should the majority of affected residents at the separate locations impacted concur that noise abatement is desired adjacent to the I-29/35 corridor then the department will consider noise abatement which meets the feasible and reasonable criteria. If substantial changes in horizontal or vertical alignment occur during the remaining stages of design and construction, noise abatement measures will be reviewed. A final Noise Report will be prepared if needed during final design and following all receipt of public comments.

I. Water Resources Impacts

Modification to aquatic resources within the Build Alternatives includes culvert extensions at stream crossings, temporary access and piers at the Missouri River, filled wetlands at 16th Avenue, and a filled non-jurisdictional pond at 16th Avenue. As discussed in Chapter III.B.3, data was gathered from USGS quadrangle maps, the U.S. Fish and Wildlife Service’s (USFWS) National Wetlands Inventory (NWI) maps, aerial photography, field observations from public right-of-way, and detailed on-site field investigations. The water resources located in the study corridor are shown on Exhibit III-6, on the Alternatives Plates in Appendix C, and on plan view maps in Appendix I.

1. STREAM IMPACTS

The stream crossings include the Missouri River (perennial), the North Hillside Drainage Ditch (an intermittent tributary of the Missouri River) and an unnamed tributary that flows into the North Hillside Drainage Ditch (all shown as blue lines on the USGS maps). Stream impacts occur when fill material (concrete, embankment, etc.) displaces the natural substrate of a stream within the ordinary high water mark (OHWM), or when the stream channel is otherwise disturbed by construction activities outside of the fill area. The existing culverts of the two intermittent streams would be extended to accommodate additional roadway width. At culverted stream crossings, the “length” refers to the linear impact to the part of the stream that is outside of the existing culvert. Stream impacts are summarized in Table IV-12 and are indicated by “length” in linear feet and surface area in acres. The Missouri River is currently crossed by the Paseo Bridge and would continue to be bridged in order to minimize impacts.

Since the project involves improvement of an existing roadway, all of the stream crossings have previously been culverted, relocated, or bridged. As a result, stream impacts are minimal. The impacts to streams within the I-29/35 Study Corridor are as follows:

a. North Subcorridor

No-Build Alternative

The No-Build Alternative would have no impact on streams.

Build Alternative (Preferred)

The build alternative would have impacts on two intermittent streams in this subcorridor. Up to 130 feet (0.03 surface acres within the OHWM) of the intermittent unnamed tributary to North Hillside Drainage Ditch, would be impacted through construction of the project: up to 15 feet would be impacted through culvert extensions on the west side of I-29/35; 15 feet of culvert extension on the downstream end (east side of I-29/35); and up to 100 feet of channel cut off and filled east of I-29/35. A new channel from the downstream culvert extension would be cut to tie into the existing stream channel within existing MoDOT right of way. Up to 139 feet of the intermittent North Hillside Drainage Ditch, will be impacted through culvert extensions, up stream and down stream (0.03 surface acres within the OHWM). The unnamed drainage ditch located north of 16th Avenue would be outside of the construction limits and would not be impacted by the roadway improvements

b. River Crossing Subcorridor

No-Build Alternative

The No-Build Alternative would have no impact on streams.

Build Alternatives

The three build alternatives would each involve crossing the Missouri River with bridge structures (from levee to levee), thereby having no substantial linear impacts to the river. The linear impact is shown as “0” for each alternative in Table IV-12. The only surface area impacts would occur from the placement of piers within the OHWM of the river. During construction, temporary access impacts would also occur, as well as temporary impacts during potential bridge demolition. No causeways would be built across the river during bridge construction and none of the Build Alternatives would include approach fills impacting the river.

Alternative A (Alternative A or B is Preferred) – In Alternative A, the existing bridge would remain in place for southbound traffic and a new companion bridge would be built on the east

side of the existing bridge for northbound traffic. The piers for the companion bridge would displace approximately 0.06 acres of surface area within the OHWM of the river.

Alternative B (Alternative A or B is Preferred) – In Alternatives B-1 and B-2, the existing bridge would be removed and new twin bridges would be built, one east of the existing bridge (for northbound traffic) and one in the same location as the existing bridge (for southbound traffic) or one larger structure would be constructed within the same footprint. The piers for the twin bridges or the single bridge would displace approximately 0.12 acres of surface area within the OHWM of the river.

Alternative C – In Alternative C, one new large single bridge would be built on the east side of the existing bridge, and upon its completion, the existing bridge would be removed. The piers for the new single bridge would displace approximately 0.12 acres of surface area within the OHWM of the river.

c. CBD North Loop Subcorridor

There are no streams within this subcorridor; therefore there would be no stream impacts by any of the alternatives.

2. WETLAND IMPACTS

The analysis of impacts to wetlands is based on the types and extent of “vegetated” wetlands and was assessed for the area within the Build Alternatives. The only vegetated wetland shown on the National Wetlands Inventory (NWI) maps within the study corridor was a potential “forested” (PFO1A) wetland area located on the north side of the Missouri River. Field investigations have been performed within the Initial Area of Investigation shown on Exhibit III-6, including the streams to determine if vegetated wetlands are present. No wetlands were observed above the OHWM of the two streams north of Armour Road, and a Preliminary Jurisdictional Wetland Determination, according to the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual, was performed at the NWI site along the Missouri River. It was determined that this area did not meet all of the parameters to be considered a jurisdictional wetland. However, the USACE will make the final jurisdictional determination prior to the Final EIS.

There are three vegetated wetlands, all of which are located in the North Subcorridor. The Build Alternative in this subcorridor would impact two of these wetlands. A total of up to 0.04 acre of the 0.27-acre emergent wetland located north of 16th Avenue along the unnamed drainage ditch would be directly impacted by embankment fill, however, its source of hydrology would not be altered. The forested wetland along the unnamed drainage ditch would not be either directly or indirectly impacted, as it is located outside of the proposed construction limits and its source of hydrology would not be altered. The second impacted wetland is the fringe wetland located along the outside of the pond located within the 16th Avenue loop ramp. A total of up to 0.04 acre of the fringe wetland would be filled with the removal of the pond, of which 0.02 acre is emergent wetland and 0.02 acre is forested wetland.

3. PONDS

The No-Build Alternative in all of the subcorridors would have no impacts to ponds. The only impact to ponds would occur in the North Subcorridor by the Build Alternative, where a 0.56-acre detention pond in the 16th Avenue loop ramp would be impacted by fill material. This pond has no outlet, but receives run off from the east side of the highway, inflow from a pipe that collects surface run off from the west side of the highway, inflow from a pipe flowing into the pond from the southeast, and overland flow collected by a drain inlet in a low area located

between the east side of the pond and the loop ramp. There is no stream channel flowing in or out of this pond, and although it is within the historic 100-year floodplain, it is cut off from the Missouri River by the river's levee and is above the water level of the river as determined by an on-site survey. Therefore, there is no hydrologic connection to the Missouri River and as such, can be considered isolated and non-jurisdictional. The USACE will make the final determination upon their review of the field evaluation data prior to the Final EIS. Although this detention pond would be drained and the area re-graded during construction, there would be a new detention area constructed in the same approximate area. The detention pond located south of 19th Avenue is outside of the Build Alternative right-of-way and would not be impacted. Pond impacts are summarized in Table IV-13 and are indicated by surface area in acres.

**Table IV-13
Water Resources Impacts**

Subcorridor & Alternatives	Streams		Wetlands (by type)			Ponds
	Length (L.F.)	Surface Area (Ac.)	Emergent (Ac.)	Scrub-Shrub (Ac.)	Forested (Ac.)	Surface Area (Ac.)
North Subcorridor						
No-Build Alt.	0	0	0	0	0	0
Build Alt. *	269	0.06	0.06	0	0.02	0.56**
River Crossing Subcorridor						
No-Build Alt.	0	0	0	0	0	0
Build Alt. A*	0	0.06	0	0	0	0
Build Alt. B-1*	0	0.12	0	0	0	0
Build Alt. B-2*	0	0.12	0	0	0	0
Build Alt. C	0	0.12	0	0	0	0
CBD North Loop Subcorridor						
No-Build Alt.	0	0	0	0	0	0
Build Alt. A	0	0	0	0	0	0
Build Alt. B*	0	0	0	0	0	0

Source: HNTB Corporation, 2005.

* Indicates Preferred Alternative. In the River Crossing Subcorridor, Alternative A or B is Preferred.

**Pond impacts relate to a non-jurisdictional pond.

4. COMPENSATORY MITIGATION

Construction activities requiring discharges into jurisdictional "Waters of the U.S.," which include streams, wetlands and other special aquatic sites, will require a Department of the Army Permit under Section 404 of the Clean Water Act (permits are discussed in more detail in Section L. of this chapter). Streams are regulated below the limits of the ordinary high water mark (OHWM). Impacts to the Missouri River would be minimized by bridging the river. Impacts to intermittent streams would be minimized by utilizing existing right-of-way for widening.

During the permitting process, MoDOT will coordinate with the USACE, the EPA and the Missouri Department of Natural Resources to develop appropriate mitigation strategies, which would include consideration of bridge construction techniques and design of any mitigation (whether on-site or off-site) the USACE deems necessary as compensation for project impacts to Waters of the U.S.

Where appropriate, possible mitigation strategies for stream impacts could include utilizing grade control structures, stabilizing disturbed banks with a combination of live vegetation and riprap or erosion control mats (bioengineering techniques), incorporating native seeding and plantings along the buffer zones adjacent to stream banks, or providing stream mitigation at other locations.

J. Water Quality Impacts

1. SURFACE WATER QUALITY IMPACTS

As discussed in Chapter III, the study corridor is located within the Lower Missouri-Crooked watershed (Hydrologic Unit #10300101), and the Missouri River is the only water resource on the 303(d) list of impaired waters, although the reaches of the river that were on the list do not fall within the study corridor. In this type of urban environment the major water quality concerns would include channelization or other alteration of natural stream channels, construction site erosion, and residential and commercial use of pesticides and fertilizers. All surface runoff in the study corridor eventually flows into the Missouri River.

The Missouri Department of Natural Resources (MDNR) was contacted via a letter requesting information concerning environmental considerations within the study corridor. However, a response letter from MDNR was not received. The MDNR was also invited to the scoping meeting. They were unable to attend, but an informational packet of materials pertinent to the project was sent to MDNR and they indicated that they would defer their comments until after the Draft EIS is circulated.

a. No-Build Alternative

The No-Build Alternative would have no additional impacts to water quality, other than the on-going operation and maintenance related pollutants that currently contribute to water quality impacts.

b. Build Alternatives

Direct water quality impacts include highway or bridge runoff, construction-related impacts, and operation and maintenance related impacts.

Construction related impacts are primarily due to the erosion of cleared areas, operation of heavy earth-moving equipment, and storage of construction materials and supplies, and could include pollutants such as petroleum products, sedimentation, and nutrients leaching from seeded and mulched bare areas. Temporary impacts to water resources in and adjacent to the I-29 corridor can be prevented or minimized by following the management practices outlined by the MDC including the State Channel Modification Guidelines when modifying channels or relocating streams. The Missouri River would be bridged and all other stream crossings would utilize culvert extensions that maintain the low-flow characteristics of the streams. In addition, the project would comply with specific conditions of Section 401 Water Quality Certification, which become conditions of the Section 404 permit. This includes, for example, the following methods to minimize impacts: graded areas should be seeded and mulched as soon as possible using native planting and seeding recommendations; disturbance to the stream banks and riparian zones should also be minimized; work should be minimized between March 1 and June 15; and all standard erosion protection devices such as ditch checks and silt fences shall be installed at the outset of construction and maintained throughout the period.

The National Pollutant Discharge Elimination System (NPDES) permit, administered by MDNR, requires that slopes and ditches be properly designed to prohibit or reduce erosion. MoDOT operates under the provisions of the Missouri State Operating Permit MO-R 100007 (or subsequent operating permit), which is a general permit issued for road construction statewide. In addition, to protect the environment from sedimentation and construction pollutants during the building phase, the control of water pollution is to be accomplished by the use of MoDOT's Pollution Prevention Plan. Control measures include the use of temporary berms, ditch checks, slope drains, sediment basins, straw bales, silt fences, seeding and mulching. Temporary and

permanent runoff drainage (retention or detention) basins would also be designed and installed to lessen water quality impacts by trapping sediment and other contaminants, while reducing erosive storm surges.

In addition, the MDNR recommends that native (preferably woody) vegetation be planted along the portions of the roadway that remain undeveloped to mitigate for the increased runoff from impermeable road surfaces. MDNR also recommends that native vegetation be incorporated into stream bank stabilization areas to protect water quality through shading and runoff interception. MoDOT will consider using native vegetation in disturbed areas as appropriate. The MDNR Solid Waste Management Program suggests that compost or wood chips be used whenever possible during construction. MoDOT will use these construction practices to the extent possible during construction.

Potential operation and maintenance related impacts to water quality could include pollutants such as petroleum products, coolants, rubber debris, metals, and de-icing minerals/chemicals. There is also the possibility of collisions on any roadway, regardless of operating characteristics and traffic volumes. Collisions can contribute to pollutants, as chemicals spilled could run off or be flushed into drainage channels.

2. GROUNDWATER QUALITY IMPACTS

There are no public drinking wells or sole-source aquifers within the study corridor; therefore no effects to those types of groundwater supplies are anticipated. Vegetated slopes and swales, and detention systems in appropriate locations can provide treatment of potentially polluted runoff from the roadway, thereby avoiding or minimizing impacts to groundwater quality.

K. Floodplain Impacts

As part of the National Flood Insurance Program (NFIP), many communities and counties have had Flood Insurance Studies (FIS) performed to identify flood hazards for floodplain management and flood insurance purposes. The administration of the NFIP, performed by the Federal Emergency Management Agency (FEMA), entails detailed studies of flood-prone streams and rivers for the determination of flood boundaries and flood hazards. The level of detail for the studies varies depending on the severity of the flooding hazards and other factors.

At the beginning of the Draft EIS process, a letter was sent to the State of Missouri Emergency Management Agency (SEMA) requesting comments concerning the project and inviting the agency to a scoping meeting. The letter explained the purpose and extent of the project and was supplemented with a map showing the location of the study corridor. In reply to this correspondence, SEMA stated that any development associated with the project located within a Special Flood Hazard Area (SFHA), requires a floodplain development permit from SEMA for the proposed project (see letter dated January 7, 2004 in Appendix G). The Special Flood Hazard Areas are the areas delineated on an NFIP map as being subject to inundation by the base (100-year) flood. The letter also stated that if a proposed development is within a regulated floodway, SEMA requires a certificate of "no-rise" and a statement as to the effects of possible flooding before the development can be granted a permit. A licensed engineer must perform the hydraulic analysis to current FEMA mapping standards.

Exhibit III-6 and the Alternatives Plates in Appendix C show the extent of the base 100-year floodplain and the regulatory floodway boundaries throughout the study corridor.

1. FLOODPLAIN ENCROACHMENT

The encroachments of the 100-year floodplain and the regulatory floodway would be the result of widening or re-aligning the highway, and are described below and summarized in Table IV-14. The linear feet of floodplain crossed are also included, however, these are existing crossings and no new crossings would occur.

**Table IV-14
100-Year Floodplain and Regulatory Floodway Encroachments**

Subcorridors & Alternatives	100-Year Floodplain Crossing (linear feet)	100-Year Floodplain (acres)	Regulatory Floodway (acres)
North Subcorridor			
Build Alternative*	1780	1.39	0
River Crossing Subcorridor			
Alternative A*	120	0.20	0.18 (piers)
Alternative B-1*	120	0.20	0.18 (piers)
Alternative B-2*	370	0.49	0.18 (piers)
Alternative C	370	0.49	0.18 (piers)
CBD North Loop Subcorridor			
Alternative A	0	0	0
Alternative B*	0	0	0

Source: HNTB Corporation, 2005.

* Indicates Preferred Alternative. In the River Crossing Subcorridor, Alternative A or B is Preferred.

Three subcorridors for this project include the North Subcorridor, the River Crossing Subcorridor, and the CBD North Loop Subcorridor. The flooding source for the River Crossing and CBD North Loop Subcorridor is the Missouri River. The North Subcorridor includes the North Hillside Drainage Ditch and an unnamed tributary of the ditch. The No-Build Alternative in each of the subcorridors would have no impacts to the 100-year floodplain or the regulatory floodway.

a. North Subcorridor

Build Alternative (Preferred)

FEMA maps show two flooding sources that I-29/35 crosses along this subcorridor: the North Hillside Drainage Ditch and an unnamed tributary of the North Hillside Drainage Ditch. The North Hillside Drainage Ditch flows in a southeasterly direction through a box culvert that conveys runoff under I-29/35. The 100-year floodplain crosses Armour Road right-of-way for about 490 feet in length and inundates I-29/35 right-of-way for about 700 feet in length. The unnamed tributary to the North Hillside Drainage Ditch flows in a southeasterly direction through a culvert that conveys runoff under I-29/35. The 100-year floodplain of this tributary inundates I-29/35 right-of-way for about 590 feet in length. Impacts on the floodplains occur through widening of the existing roadway and the subsequent extension of the drainage structures.

b. River Crossing Subcorridor

There are two flooding sources that the build alternative crosses along this subcorridor; one is the Missouri River, and the other is an isolated Zone AH (defined by FEMA as an area of 100-year shallow flooding where depths are between one and three feet) along Front Street.

The Missouri River flows in a northeasterly direction at the I-29/35 crossing. The Missouri River floodplain is crossed by I-29/35 at the Paseo Bridge. This crossing traverses approximately

1,500 feet over the 100-year floodplain and the matching regulatory floodway, which must continue to be bridged with the build alternatives without additional impacts. Due to navigational requirements, the 100-year floodplain is well under the elevation of the bridge.

The Corps of Engineers' North Kansas City Levee Unit flood control project is located along the north edge of the floodplain and floodway, and the East Bottoms Levee Unit flood control project is along the south edge. Designed and constructed by the Corps of Engineers, and owned and maintained by the Cities of North Kansas City and Kansas City, these levee units provide protection from a 500-year Missouri River flood. There are very highly valued business properties and infrastructure protected by these units, and the Corps of Engineers is presently conducting a Feasibility Study assessing whether the height of the system should be increased. Because of these adjacent flood protection systems, the build alternatives would be designed to result in no permanent hydraulic impacts to the 500-year Missouri River flood.

The I-29/35 Paseo Bridge is a suspension-type bridge with a 616-foot main span, centered on the northern portion of the river channel. The north pier for the main span is located just behind the north channel bank and the south pier for the main span is located in the deepest portion of the channel, approximately three hundred feet from the south bank. The south pier for the southern main approach span is located at the south bank of the river, and the north pier for the northern main approach span is located in a wooded floodplain overbank area. Due to the 500-year river flood being confined between two levees and to the height of the superstructure above the river, the only hydraulic impacts of the structure are the four major piers mentioned above, and two smaller piers located near the levees. Because of the structure type, the existing Paseo Bridge piers are skewed about 10 degrees, compared to the direction of flow in the river and floodplain.

The build alternatives for the River Crossing Subcorridor are as follows:

- **Alternative A (Alternative A or B is Preferred)**– A new companion bridge would be constructed on the east side of the existing bridge (the existing Paseo Bridge would remain in place).
- **Alternative B (Alternative A or B is Preferred)** – The existing Paseo Bridge would be removed and new twin bridges or one larger structure would be constructed. If twin bridges were constructed the new southbound bridge would be in the same location as the existing bridge. Alternative B-1 includes a modification of the existing Front Street interchange, and B-2 includes a new SPUI at Front Street.
- **Alternative C** – the existing Paseo Bridge would be removed and a new large single bridge would be constructed on the east side of the existing bridge location.

Bridge “type” options under consideration for the river crossing include:

- Construction of a bridge parallel to and downstream of the existing Paseo Bridge. The new bridge could be a tied arch with two spans, cable stayed, truss, or suspension type. The pier locations matching those of existing bridge (Alternative A).
- Construction of a deck girder, tied arch or cable stayed bridge parallel to the existing (Alternatives B-1, B-2 and C).
- Construction of one new bridge in the general vicinity of the existing Paseo Bridge (Alternatives B-1, B-2).

The second set of options (for Alternatives B-1, B-2 and C) require pier locations that do not match the existing bridge. The deck girder and cable stayed bridge alternatives both include a 450-foot main span adjacent to the south bank of the river, between 270-foot approach spans with a series of smaller spans on the north side of the floodplain. A tied arch bridge also includes a 450-foot main span on the south side of the river channel, with shorter approach spans than the deck girder and cable stayed bridge alternative. The piers for the deck girder bridge alternative would be aligned with the river flow direction, while the piers for the cable stayed and tied arch bridge alternatives would need to be normal to the roadway, at approximately a ten degree skew to the river flow direction.

In Alternatives B-1, B-2 and C, the deck girder, tied arch and cable stayed bridges all would have more piers in the river channel, as well as more overbank piers, than the existing bridge. However, the shorter spans would allow use of narrower piers than the current bridge, so the overall flow area obstructed by the piers is expected to be equivalent to that of the existing structure. If this total pier width area is not increased, then it is likely that a new bridge would pass the 100 and 500-year floods with no increase in backwater, without the need for any hydraulic mitigation measures.

However, in Alternatives B-1, B-2 and C, construction of a new bridge would result in an interim period where both the existing and proposed bridges would be in place. The exception would be in the case of a single bridge for Alternatives B-1 and B-2. During the interim period, it is likely that the combination of the existing and new bridges would increase upstream backwater, because of the hydraulic impacts of additional piers that do not match the locations of the existing piers. The longer the interim period, the greater the risk that a severe event could occur with both bridges in place; There is a 4% chance that a 100-year event would occur within four years, and a 0.8% chance that a 500-year event would occur over that same period. These chances increase to 18% and 4%, respectively, over a 20-year period. Depending upon the magnitude of increase resulting from occurrence of a 500-year event with two non-matching bridges in place, FEMA, the Corps of Engineers, North Kansas City and Kansas City may insist that the potential backwater increases be mitigated by some form of improvement of flood conveyance. The most feasible form of conveyance supplementation would be to excavate additional flow area in the northern floodplain overbank area, to compensate for the hydraulic impacts of additional piers. Such an excavation could be up to 500 feet wide and several feet deep under the bridges, with transitions to existing ground hundreds of feet long both upstream and downstream.

In Alternative A, construction of a new bridge with pier locations matching the existing structure also may result in additional hydraulic losses, depending on the separation distance between the structures. If the new bridge is located very close to the existing, and the new piers are aligned with the existing ones, then very little or no additional hydraulic loss would be expected. Moved farther apart, to where the existing and new structure each has its own distinct impact on flood flows, then additional conveyance may be required, similar to that described above.

Alternatives A and B-1 would encroach on 0.18 acres of floodplain and regulatory floodway of the Missouri River as a result of new bridge piers, including a total length of 90 linear feet with all of the new piers. In addition, Alternatives A and B-1 would encroach on 0.02 acres of existing Zone AH floodplain along Front Street for a length of 30 linear feet. However, the proposed improvements would be designed to not increase 100-year flood impacts.

Alternatives B-2 and C would encroach on 0.18 acres of floodplain and regulatory floodway of the Missouri River as a result of new bridge piers, including a total length of 90 linear feet with all of the new piers. In addition, Alternatives B-2 and C would encroach on 0.31 acres of

existing Zone AH floodplain along Front Street for a length 280 linear feet. However, the proposed improvements would be designed to not increase 100-year flood impacts.

c. CBD North Loop Subcorridor

The only floodplain along this subcorridor is located at the far west end, however it would not be impacted by either the No-Build Alternative or Alternatives A (Preferred) and B.

2. FLOODING RISKS

The proposed roadway modifications and bridge elevations are set well above 100-year frequency flood elevations, based on studies prepared by FEMA. The modifications would be designed to in no way redirect or increase the flow. The proposed Paseo Bridge (s) in the build alternatives would remain well above the 500-year frequency flood elevations, based on Coast Guard navigation regulations. About 400 feet west of I-29/35, FEMA maps indicate that the 100-year floodplain encroaches on Armour Road. The proposed road improvements within this area would be designed to not increase flood elevations, and to maintain the existing conditions.

Two other areas have been identified where local flooding occurs adjacent to the highway. Water ponds due to detention taking place in the center of the eastbound loop ramp to 16th Avenue. As-built drawings for I-29/35 indicate that storm water runoff from the highway and areas east of the loop are detained within this area. This area is not identified as within the floodplain on the FEMA maps.

Wagner Industries indicated that flooding occurs on and north of their property. Preliminary investigations based on North Kansas City data identified contributing drainage areas of 14 acres and 28 acres. Neither of these drainage areas is contiguous with the FEMA mapped floodplain areas. Therefore the flooding is local in nature. The build alternatives of the highway project would be designed to not increase runoff to these existing ponding areas.

The build alternatives would result in an increase of up to approximately 22 acres of impervious pavement, which is approximately 1 percent of the total local drainage areas. Overall, an increase in runoff peaks and volumes of about 2 percent would be expected for those drainage areas. Because much of these areas either drain to or lie within the floodplain areas behind the levee systems, even minor increases in runoff volume may have impacts, especially when Missouri River flood levels preclude gravity flow drainage. In those instances, runoff either ponds or must be pumped to the river. To prevent adverse impacts, runoff resulting from increased impervious pavement areas would need to be addressed in the roadway design process. Solutions may include separate drainage systems for areas higher than the maximum river flood, storage (surface and/or underground), and/or supplemental pump capacity for existing pump stations.

3. IMPACTS ON NATURAL AND BENEFICIAL FLOODPLAIN VALUES

The footprint of the roadway fill placed in the floodplain is minor when compared to the total floodplain area. Thus, impacts on natural and beneficial floodplain values are minimal. However, if overbank excavation is necessary to offset hydraulic losses resulting during an interim period with two bridges with non-matching pier locations, there would be a temporary impact to natural values while vegetation is re-established within the excavated areas.

4. SUPPORT OF PROBABLE INCOMPATIBLE FLOODPLAIN DEVELOPMENT

The project corridor is presently an urban/suburban environment and consequently there is little undeveloped land for floodplain development. It is unlikely that incompatible development would be encouraged by the construction of this project.

5. MEASURES TO MINIMIZE FLOODPLAIN IMPACTS AND MEASURES TO RESTORE AND PRESERVE THE NATURAL AND BENEFICIAL FLOODPLAIN VALUES

The project construction would incorporate those features necessary to meet NFIP standards, FEMA, SEMA. Work within the Missouri River floodplain, between levee units, would further fall under the jurisdiction of the Corps of Engineers and the local Federal levee sponsors. All practical measures to minimize impacts to the floodplain would be incorporated into the project design.

L. Permits

Permits applicable to the highway build alternatives may be categorized into two groups: regulatory permits and construction permits. Regulatory permits assist government agencies in the administration and implementation of federal, state or local statutes or initiatives. These permit programs are processed through planning and design phases of proposed actions. Construction permits serve as regulators of construction activities to protect the adjacent environs. State or local government agencies typically operate roadway construction permit programs.

1. REGULATORY PERMITS

a. Section 401 of the Clean Water Act (U.S. Coast Guard)

The U.S. Coast requires a Water Quality Certificate from MDNR, which states that the project complies with the provisions of Section 401 of the Clean Water Act. The Water Quality Certificate is necessary because a bridge permit is required on the project. This certificate is separate from the Section 404 permit required by the Corps of Engineers.

b. Section 404 of the Clean Water Act (U.S. Army Corps of Engineers)

Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into “Waters of the U.S.” unless exempted or authorized by the USACE. Section 404 is the primary Federal statute that implements federal regulatory policies concerning the protection of wetlands as specified in various orders and regulations. The USACE, Kansas City District, has an agreement with the Missouri Department Natural Resources to process requests for Section 401 water quality certifications jointly with the Section 404 permit application.

Based on map review, windshield surveys, and field investigations, it was determined that “Waters of the U.S.” are present in the study corridor. “Waters of the U.S.” include streams, ponds (if connected to “Waters of the U.S.”), wetlands, and other special aquatic sites. The streams crossed by the build alternatives are classified as “Waters of the U.S.” Any dredge or fill activities in these streams would require a Section 404 permit from the USACE.

Under certain specific circumstances, a project may qualify for authorization by a Section 404 Nationwide Permit (e.g. NWP 14 for Linear Transportation Crossings, NWP 15 for US Coast Guard Approved Bridges). A Nationwide Permit is a form of general permit which authorizes a category of minor activities throughout the nation and allows those activities to occur with little, if any, delays or paperwork. For projects with more extensive impacts, an Individual Permit may be applicable, which involves a public notice and agency review. At the time of permit application, the USACE will determine which type of permit is appropriate for the project.

In regard to the Paseo Bridge crossing over the Missouri River, the USACE also regulates structures and work in navigable waterways through Section 10 of the Rivers and Harbors Act of 1899. A Section 10 permit may be required.

c. Bridge Permit (U.S. Coast Guard)

The U.S. Coast Guard regulates bridges over navigable waterways through Section 9 of the Rivers and Harbors Act of 1899. A Section 9 permit will be required for the construction of any new bridge. Coast Guard approval will be required for cofferdam construction, steel erection and demolition. The Coast Guard was contacted to determine the applicable horizontal and vertical clearances for the new bridge.

d. Floodplain Permits

Portions of some of the build alternatives of this project occur in areas that are designated by FEMA as Special Flood Hazard Areas (SFHA). The State of Missouri is a participant in the National Flood Insurance Program (NFIP), and any development associated with this project that occurs within a SFHA must meet the requirements of the State of Missouri Executive Order 98-03. This requires obtaining a floodplain development permit from SEMA prior to construction or development. In addition, portions of some of the build alternatives occur within a regulatory floodway, and as such, a “No-Rise” certificate and statements as to the effects of possible flooding are required. MoDOT is responsible for providing a no-rise certificate to SEMA prior to its issuance of the Floodplain Development Permit for the project. A hydraulic study would be required that would show that there are no effects on the floodway elevations.

2. CONSTRUCTION PERMITS

MoDOT, in coordination with MDNR, has developed a Temporary Erosion and Sedimentation Control Program to protect the adjacent environment from sedimentation and construction material pollutants discharged from construction activities. These procedures and specifications will be utilized for the highway construction, and MoDOT is committed to assuring the best management practices by the highway contractor. This agreement satisfies the requirement for a National Pollutant Discharge Elimination System (NPDES) permit, Section 402 of the federal Clean Water Act and the Missouri Clean Water Act. The NPDES permit, administered by MDNR, requires that slopes and ditches are properly designed to prohibit or reduce erosion. MoDOT operates under the provisions of the Missouri State Operating Permit MO-R 100007 (or subsequent operating permit), which is a general permit issued for road construction statewide.

Other construction related permits could include temporary batch-plant permits issued by MDNR. Mitigation plans will be done to comply with the specific permit requirements. Additional construction permits may be required from local governments.

M. Natural Terrestrial Communities

1. NATURAL COMMUNITIES

As discussed in Chapter III, a search of MDC’s Natural Heritage Database was conducted, but it was found that no significant, high-quality natural communities occur in the study corridor.

2. FOREST COMMUNITIES

The forested communities in the study corridor include small remnants of upland oak-hickory forest, and the riparian forest areas located in the floodplain of the Missouri River and along the smaller stream corridors. These wooded areas protect water resources from runoff, stabilize stream banks, inhibit soil erosion, and provide aesthetic value, wildlife habitat, and plant and animal diversity.

The No-Build Alternative would have no direct impact on the forested communities within the study corridor.

Direct impacts to forested communities by the build alternatives would occur where it is necessary to remove woodland vegetation for roadway and bridge construction. Since the build alternatives involve the widening of an existing roadway, the majority of forest impacts would be at the edges of woodlands rather than fragmentation of contiguous habitats. Table IV-15 summarizes the acreages of upland and riparian forest that would be removed by each alternative within each subcorridor.

**Table IV-15
Forest Community Impacts**

Subcorridor & Alternatives	Upland Forest (Acres)	Riparian Forest (Acres)
North Subcorridor		
No-Build Alternative	0	0
Build Alternative *	0.04	0.04
River Crossing Subcorridor		
No-Build Alternative	0	0
Build Alternative A*	0	0.60
Build Alternative B-1*	0	0.60
Build Alternative B-2*	0	0.60
Build Alternative C	0	1.25
CBD North Loop Subcorridor		
No-Build Alternative	0	0
Build Alternative A	0	0
Build Alternative B*	0	0

Source: HNTB Corporation, 2005

* Indicates Preferred Alternative. In the River Crossing Subcorridor, Alternative A or B is Preferred.

Secondary impacts of forest removal are discussed under the “Wildlife Impacts” Section (N) of this chapter. During the planning process, alignment adjustments were made and retaining walls were included in the design in order to minimize right-of-way acquisition, thereby avoiding or minimizing impacts to some of the wooded areas adjacent to the roadway.

To address forest impacts, tree plantings would occur along the corridor wherever practicable but would not be planted in the clear zones or any area where they would become a hazard. Trees removed as part of the construction project would be replaced according to the MoDOT tree replacement program. The program requires planting two trees for every tree of 15 centimeters (six inches) in Diameter Breast Height or larger that is lost to construction. Tree species would be selected to complement and enhance the habitat and appearance of the affected areas.

N. Wildlife Impacts

1. GENERAL

Right-of-way acquisition in transportation improvement projects can directly impact aquatic and terrestrial habitat through habitat modification and fragmentation, thereby resulting in a reduction in habitat size.

The study corridor is located in a highly urbanized/developed area, and the natural habitat that previously occurred has been disturbed. The most notable wildlife habitat considerations in this urban corridor are forested areas and riparian corridors associated with the Missouri River and its tributaries at the north end of the study corridor. Much of the forest in the area has been fragmented and cleared for development, and most of the remaining areas are very small.

As indicated in Table IV-15 of the previous Section M on Forest Communities, impacts are relatively minimal, since this project consists of widening and interchange improvements of an already existing highway.

Streams, wetlands, and ponds (although there are relatively few in the study corridor) also provide habitat values and are considered in the analysis. Not only do they serve as habitats for some amphibious species, but they also provide drinking water for terrestrial wildlife. As discussed in Section I of this chapter, impacts to the natural water resources in the study corridor would be minimal.

Only those species with a high tolerance of humans and development are those that survive and remain in this urban environment. The wildlife species currently present have adapted to living near humans in a developed environment and would attempt to relocate in response to the habitat impacts of any of the alternative highway improvements. However, some impacts could occur because smaller, less mobile species may have difficulty moving to other areas with suitable habitat. Other species that are relatively mobile may also be impacted because suitable habitat in an urban area is scarce, and the wildlife population is likely at or near carrying capacity. As a result, wildlife may have difficulty withstanding the loss of their limited habitat. In addition, the wildlife species within this urban corridor would continue to be subject to vehicle-induced mortality as they disperse to other areas at the outset of construction. There could also be a slight increase in wildlife mortality after construction, because of a wider roadway. Therefore, some impacts to wildlife could occur, although they would most likely be minimal because of the narrow limits of construction.

2. THREATENED AND ENDANGERED SPECIES

As discussed in Chapter III, the federally endangered pallid sturgeon, the federally threatened/state endangered bald eagle and the state endangered peregrine falcon have the potential of occurring in or near the study corridor. The No-Build Alternative would have no direct impacts to these species. However, the build alternatives could have impacts to these species as discussed below.

a. Pallid Sturgeon (*Scaphirhynchus albus*) (*Endangered on both the federal and state level*)

The endangered pallid sturgeon occurs in the Missouri River and suitable overwintering habitat for the species exists in the form of deep holes such as scour holes behind bridge piers and downstream from wing dike or L-dike tips where scouring takes place. A more detailed discussion of the pallid sturgeon's habitat and characteristics is included in Chapter III.

Fishery sampling programs conducted by the USFWS have also indicated that the pallid sturgeon is often found along with the shovelnose sturgeon (*Scaphirhynchus platorhynchus*), which is not endangered, indicating some overlap in habitat requirements. The U.S. Geological Survey Columbia Environmental Research Center is conducting studies on shovelnose and pallid sturgeon on the Missouri River. Data from May 2005 (Dr. Robert Jacobson, Research Hydrologist, USGS-CERC) showed that six shovelnose sturgeon were located via acoustic telemetry within 11 miles upstream and downstream of the Paseo Bridge (closest location, three miles downstream). Recent capture data for pallid sturgeons in February and March 2006 were for sampling stations monitored by the Missouri Department of Conservation. These recent

captures were approximately 20, 30, and 40 river miles downstream of the project area at Paseo Bridge.

As discussed in Chapter III, hydrographic surveys (dated 1994 and 1999-2000), aerial photography (flown March 2002) and field observations (October 2004) indicate that there are two L-dikes and one wing dike located within the study corridor (within 1000 feet of the Paseo Bridge) on the north side of the river, one bridge pier located within the main channel, and one bridge pier located on the north edge of the river at the L-dike below the bridge. Scour holes currently exist at the tips of these dikes, however the tip of the L-dike that is located under the existing Paseo Bridge is about 350 feet from the bridge. In addition, it is most likely that scour holes occur at the downstream side of the piers. These scour holes at the piers could be impacted, however, the scour holes at the dikes are outside the impact zone of the bridge alternatives.

To avoid or minimize impacts to the pallid sturgeon, seasonal construction restrictions at the bridge could be employed if deemed necessary. For example, disturbance to the complex habitat behind (downstream of) the dikes that would alter the flow or conditions behind these dikes could be avoided during the overwintering period, thereby avoiding or minimizing impacts to the pallid sturgeon. Future design and coordination of bridge pier construction and possible removal will be discussed with the USFWS and the MDC during the design phase to consider seasonal patterns of habitat use and avoid potential habitat areas. MoDOT and FHWA will conduct any necessary Section 7 Endangered Species Act consultation prior to construction. MoDOT conducted a hydrographic survey of the Missouri River at the Paseo Bridge location in March 2006 to determine the existence of potential habitat within a 250 foot area that included the existing Paseo Bridge and the area within the proposed right-of-way on the east side of the bridge. FHWA and MoDOT are participating in informal consultation with the USFWS regarding the pallid sturgeon. A meeting between the agencies took place on March 24, 2006, where the USFWS was presented with the results of the latest hydrographic survey and the May 2005 USGS-CERC detailed habitat data for the pallid and shovelnose sturgeons

b. Bald Eagle (*Haliaeetus leucocephalus*)

(Threatened on the federal level, Endangered on the state level)

As discussed in Chapter III, potential bald eagle habitat occurs at the wooded area on the north shore of the Missouri River. Although this wooded riparian corridor provides potential bald eagle nesting or roosting habitat, there are currently no known or recorded locations of bald eagle nests or roosting areas within or near the study corridor, therefore none of the alternatives would have an impact on the bald eagle. Nesting activity is most often initiated between January 1st and March 1st, and the most critical time for incubation and rearing of young is between March 1st and May 15th. A visual assessment of the riparian area would be conducted just prior to clearing operations to determine if bald eagle nests exist. Although no nesting occurs at this time, should nesting eagles be found within a mile of the Preferred Alternative prior to construction, MoDOT and FHWA will conduct any necessary Section 7 Endangered Species Act consultation. Appropriate action would be taken to minimize impacts to the nest site, which could include limiting construction activity near the nest from January 1 to May 15.

c. Peregrine Falcon (*Falco peregrinus*)

(Endangered on the state level)

The Missouri Department of Conservation's Natural Heritage Database indicated that a peregrine falcon nest site exists on a tall building in the downtown Kansas City area, just south of (outside of) the study corridor. This building would not be impacted by any of the alternatives, nor would any other tall buildings.

d. Species of Conservation Concern

According to the MDC's Natural Heritage Database, the silver chub (*Macrhybopsis storeriana*) and the sturgeon chub (*Macrhybopsis gelida*) are ranked S3 (rare or uncommon) in the state and have been observed in the Missouri River. The silver chub has been observed in the river east of the study corridor and the sturgeon chub has been observed in the river northwest of the study corridor. During bridge construction, the area of disturbance within the river would be limited to pier construction and is therefore expected to be minimal and would not result in substantial water quality degradation or major alteration of the river habitat. Individual chub species that may be in the vicinity would either be unaffected or may temporarily avoid the construction area. Therefore, no major impacts to these species of conservation concern are anticipated.

O. Cultural Resources

1. CULTURAL RESOURCES

The potential impacts of the alternatives are discussed below for the historic and archeological resources identified during the cultural resources investigations and analysis presented in Chapter III. The properties, districts and bridges noted are either on or eligible for the NRHP. On February 24, 2005, the SHPO concurred that properties, districts and bridges listed below in Tables IV-16 [except for LJA9, Kessler Park], IV-17 and IV-18 [except for A4649, Broadway Bridge] were eligible for inclusion on the NRHP (see Appendix G for SHPO correspondence). The SHPO added one bridge to the originally submitted list of properties, districts and bridges. The added bridge was the Broadway Bridge, Bridge A4649/JAB24. LJA9, Kessler Park, was submitted to the SHPO on May 26, 2005 by MoDOT and on June 20, 2005, the SHPO concurred that Kessler Park was eligible for the NRHP and the project would have no adverse effect on Kessler Park. The previously recorded NRHP properties and districts are listed in Table IV-19. These tables include the Effect Recommendation.

Table IV-16
NRHP Eligible Properties within the I-29/35 APE

No.	Address	Type	Construction Date	Style	Criterion	Effect Recommendation
JA4	1426 Guinotte (Plate A-06)	Commercial	c. 1900s	Commercial	C	No Adverse Effect
LJA9	Kessler Park (Plates A-07 & 08)	Landscape	1895-1939	City Beautiful Movement & Works Progress Administration	C	No Effect
JA73	569-571 Campbell (Plate A-09)	Residential	1883-1884	Italianate	C	No Effect
JA86	520-526 Holmes (Plate A-10)	Apartment	1913	Colonnade Apartment/ Square Brick Column Porch	C	No Effect
JA89	611-613 Forest (Plate A-09)	Apartment	1890s	Italianate	C	No Effect
JA98A	1015 E. 8 th St. (Plate A-09)	Commercial	1908	Two-Part Commercial	C	No Effect
JA107A	703 E. 10 th St. (Plate A-09)	Apartment	1925-1930	Mission	C	No Effect
JA157	340 W. 5 th St. (Plate A-11)	Commercial	c. 1920	Two-Part Commercial	C	No Effect

**Table IV-17
NRHP Eligible District within the I-29/35 APE**

No.	Address	Type	District Name	Date	Style	Criterion	Effect Recommendation
JA129	404-406 Admiral (Plate A-10)	Commercial	Admiral Blvd. Commercial District	1917	Two-Part Commercial Block	C	No Effect
JA130	400 Admiral (Plate A-10)	Commercial	Admiral Blvd. Commercial District	1913	Commercial	C	No Effect
JA131	411-417 E. 6th St. (Plate A-10)	Commercial	Admiral Blvd. Commercial District	c.1910	Two-Part Commercial Block	C	No Effect

**Table IV-18
NRHP Eligible Bridges within the I-29/35 APE**

Bridge Number	Location	Current Name	Date	Style	Criterion	Effect Recommendation
JAB27	South of Broadway Bridge (not shown on Plates)	Pencoyd Bridge	1892	Pin-Connected Pratt Through Truss	C	No Effect
L734R1	Paseo Blvd. Over MO River (Plates A-05, 06 and 07)	The Paseo Bridge	1952-1954	Self-Anchored Suspension Bridge	C	Adverse Effect
A4649	Broadway Bridge over MO River (not shown on plates)	The Broadway Bridge	1955	Through Arch	C	No Effect

**Table IV-19
Previously Recorded NRHP Buildings and Districts within the I-29/35 APE**

Name	Location	Construction Date	Property Type	Effect Recommendation
Kansas City Masonic Temple/JA101	903 Harrison (Plate A-09)	1909-1911	NRHP Building	No Effect
Kelley-Reppert Motor Company/JA126	416-429 Admiral (Plate A-10)	1920	NRHP Building	No Effect
Buick Automobile Co. Bldg. /JA134	216-220 Admiral (Plate A-10)	1907	NRHP Building	No Effect
Western Union Telegraph Building/JA140	100-114 E. 7 th (Plate A-10)	1920	NRHP Building	No Effect
Old Town Historic District	Old Town Historic District (Plates A-10 & A-11)	Mid 1800s to present	NRHP District	No Effect
Wholesale District	Wholesale District (Plates A-11 & A-12)	1874-1931	NRHP District	No Effect

With the exception of the replacement of Paseo Bridge with a new bridge, none of the proposed alternative alignments for the I-29/35 EIS Improvement Project would acquire any property associated with any building, structure, object, site or district on or eligible for the NRHP.

Should any of these resources be impacted, they will be handled based on the stipulations in the Memorandum of Agreement (MOA). The draft MOA can be found in Appendix F.

a. North Subcorridor

No-Build Alternative

The No-Build Alternative would have no impact on the properties, districts and bridges noted as on or eligible for the NRHP.

Build Alternative (Preferred)

The Build Alternative would have no impact on these resources since no properties, districts or bridges were noted as being on or eligible for the NRHP.

b. River Crossing Subcorridor

No-Build Alternative

The No-Build Alternative would have no direct impact on the properties, districts and bridges noted as being on or eligible for the NRHP.

Build Alternatives

Alternative A (Alternative A or B is Preferred) – Alternative A would have no direct impact on the one bridge eligible for the NRHP, the Paseo Bridge (L734R1). This alternative has a companion bridge that would be constructed downstream of the existing Paseo Bridge.

The companion bridge type has not been selected at this time. The type of bridge selected would have a viewshed effect depending on the type of the bridge. There is presently no downstream parallel bridge so the new bridge would alter the views of the bridge and from the bridge. The bridge types under consideration are described in Chapter II. The suspension bridge would have the least adverse visual effect and the cable stayed the most as it is the most visually different among the bridges which have an extensive array of superstructure elements. The tied arch bridge type would have a moderate visual effect due to the elliptical structural elements. The plate girder, having a minimal amount of superstructure, would have the least visual effect when viewed, as the Paseo Bridge towers and cables would be dominant structural elements.

As noted previously in Section C.4.b, the KCI, Inc. building (property JA-3A) would be removed. This industrial building is adjacent to NRHP eligible property JA-4 Mid American Storage, the former Smith and Sons Manufacturing Company. This would not be an adverse effect to the viewshed of property JA-4. Both buildings are located in an industrial area and the building removed is one and one half stories tall. The NRHP eligible property is six stories tall

Alternatives B (Alternative A or B is Preferred) – These alternatives would have a direct impact on the NRHP eligible Paseo Bridge (L734R1) since it could replace the existing Paseo Bridge with one of a pair of new structures or one larger bridge structure. The type of the replacement bridge has not been selected at this time. The replacement bridge could be located downstream and would be constructed first and once open for traffic operations, the existing Paseo Bridge could be demolished and a new replacement bridge constructed or the Paseo Bridge could remain in place if adaptive reuse for the Bridge was developed.

As described in Alternative A above, the viewshed of the NRHP Property JA-4, the Mid-America Storage, would not be adversely effected by removal of the KCI, Inc. building as a part of this alternative.

Alternative C – This alternative would include the construction of a single new bridge, constructed downstream of the existing Paseo Bridge. The single bridge could be built in stages. The Paseo Bridge would be removed upon completion of the new bridge.

The Paseo Bridge would not need to be removed in order for the new bridge to function properly, however it would no longer be connected to any roadways and the issue of navigation with various bridge piers would need to be considered. Maintenance of a suspension bridge would continue to be an issue and without private funding, it would be difficult for MoDOT to justify the expense of continuous maintenance for the Paseo Bridge.

As described above, the viewshed of the NRHP Property, JA-4, the Mid-America Storage, would not be adversely affected by removal of the KCI Inc. building as a part of this alternative.

c. CBD North Loop Subcorridor

No-Build Alternative

The No-Build Alternative would have no impact on any property, district or bridge that is on or eligible for the NRHP.

Build Alternatives A and B (Preferred)

Both alternatives would be constructed within existing right-of-ways, both state and city. There would not be any direct impact on any property, district or bridge on eligible for the NRHP. The two buildings which are being acquired are not adjacent to any NRHP eligible property, district or bridge. There is no anticipated alteration in their associated viewshed. The two buildings which are being acquired are small modern warehouse type buildings, Chunco Foods (MJA11-B) and the now vacant Davis Electric warehouse (MJA14) adjacent to I-29/35. Their removal would not alter the viewshed of any property, district or bridge on or eligible for the NRHP.

The site of the Town of Kansas Graveyard (Property MJA-122), which may be recommended eligible for the NRHP for Data Recovery upon completion of initial future investigations, is partially located in the existing right-of-way of the M-9 and I-35/70 interchange. It has not been verified that any of the graves were relocated after the cemetery was closed, therefore, multiple graves could still be present. Should the existing grades be altered during construction, the possibility exists that unmoved graves could be discovered. If this alternative is chosen, the cemetery should be tested by an archaeologist prior to construction. Property VJA117 could be affected by Alternative B (Preferred). The property is an Archeological Area of Interest that would need future Phase I testing, following design and prior to construction, to determine if a site is present and should Phase II investigation proceed to determine site significance. The site is on the corner of 6th and Charlotte. Further investigations will be conducted in accordance with the stipulations set forth in the Memorandum of Agreement found in Appendix F.

2. MITIGATION MEASURES

The Paseo Bridge, being eligible for the NRHP, would be subject to the provisions of a Programmatic Section 4(f) of the Surface Transportation Act of 1966.

The Programmatic Section 4(f) for Historic Bridges and Form are included in Appendix E of this DEIS. This Programmatic Section 4(f) eliminates the need for a standard Section 4(f) Evaluation Document.

A draft MOA and Information to Accompany the MOA (ITA) for the Paseo Bridge and other properties in or eligible for inclusion in the National Register have been prepared and have been

included in Appendix F of this DEIS document, which would include the mitigation measures of documentation, archival photography and (in regard to the Paseo Bridge) advertisement for reuse by others.

P. Hazardous Waste Sites

Existing hazardous waste sites, as discussed in Chapter III, occur within the study corridor and some would be affected by the proposed improvements. Releases into the environment may be worker exposures. Types of potential negative impacts may include, but are not limited to those impacts listed as follows:

- Dust from disturbing contaminated soils during earth moving activities, with potential exposure to workers and nearby residents.
- Unearthing disposal sites and spreading hazardous materials.
- Displacement of contaminated soils by borrowing or excavating and placing material in the embankment or undocumented area.
- Creation of conduits for migration of potential contaminants (i.e. underground utilities).

All known and unknown hazardous waste impacts encountered during roadway improvements would be handled per federal, state, and local laws and regulations. Sites can be addressed by avoidance, minimization, and/or mitigation. Standard procedures described in the MoDOT Project Development Manual would be followed beginning in preliminary design regarding inspection for asbestos containing materials (ACM) and lead based paint (LBP) in buildings that would be demolished, and hazardous waste surveys. However, the likelihood of these impacts occurring is low due to preventative measures taken before and during construction. Avoidance of known sites would occur to the extent possible. Known impacts would be remediated prior to, or as part of the construction of the roadway improvements. If an unknown site is encountered during construction, MoDOT and the MDNR must be contacted and appropriate laws and EPA regulations would be followed to eliminate or minimize any adverse environmental consequences.

1. HAZARDOUS WASTE SITE IMPACTS

The observed and documented hazardous waste sites listed in Chapter III were rated as having either a high, moderate or low potential for contamination. Three high potential sites were designated in Chapter III (Site #14 – American Railcar Industries, Site #20 – Cook Paint & Varnish, and Site #40 – KC Limited Partnership, formerly Habco). Sites #14 and #40 have been totally avoided. Although Site #20 would be avoided, it is part of an industrial complex comprised of other individual parcels, in which a portion of open land would be acquired (see further discussion under North Subcorridor Build Alternative).

The potential impacts of the alternatives and the proposed mitigation plans are discussed below for the potential hazardous and solid waste sites identified during the hazardous material screening. In addition, the text includes some discussion concerning the buildings that would be demolished in the alternatives in regard to the potential for contamination impacts.

a. North Subcorridor

No-Build Alternative

The No-Build Alternative would have no impact on the potential hazardous waste sites identified during the hazardous material screening. Any current release of hazardous materials or waste would likely continue.

Build Alternative (Preferred)

The build alternative would have no impacts to high or moderate potential hazardous waste sites identified during the hazardous material screening. Two metal buildings on the Cherokee Distribution Services property (in the industrial area south of 16th Avenue, east side of I-29/35) would be demolished; however, this site was not included in any of the hazardous waste databases discussed in Chapter III. Through field reconnaissance, it was determined that the site poses a low potential for contamination, and no further investigations are recommended other than the MoDOT standard of environmental/asbestos inspection for demolition plans.

Although Site #20 (Cook Paint & Varnish) would be avoided, it is part of an industrial complex (between 16th and 14th Avenues, west of I-29/35) comprised of other individual parcels, in which a small portion of open grassed land on Site #19 (Cook Composites and Polymers) rated as having a low potential for contamination would be acquired. There are no structures on the parcel that is being partially acquired.

b. River Crossing Subcorridor**No-Build Alternative**

The No-Build Alternative would have no impact on the potential hazardous waste sites identified during the hazardous material screening. Any current release of hazardous materials or waste would likely continue.

Build Alternatives

Alternatives A and B-1 (Alternative A or B is Preferred) – Alternatives A and B-1 would have impacts to one moderate potential hazardous waste site identified during the hazardous material screening.

- *Site #4 – KCI, Inc.* (formerly Excelsior Steel Furnace), is located south of Guinotte Street on the west side of I-29/35, and is rated as having a moderate potential for contamination. The building on this property would be acquired and investigation and cleanup of these sites may be necessary prior to construction. (This building is part of the KCI industrial complex that contains a total of seven buildings, six of which would remain on the complex.)

Alternatives B-2 (Alternative A or B is Preferred) and C – Alternatives B-2 and C would have impacts on two moderate potential hazardous waste sites identified during the hazardous material screening.

- *Site #4 – KCI, Inc.* – (same as discussed above)
- *Site #6 – KCI, Inc.* is located on the east side of I-29/35, south of Guinotte Street. This site is rated as having a moderate potential for contamination. Both of the buildings on these properties would be demolished and investigation and cleanup of these sites may be necessary prior to construction. (This building is part of the KCI, Inc. industrial complex that contains a total of seven buildings, five of which would remain on the complex.)

c. CBD North Loop Subcorridor**No-Build Alternative**

The No-Build Alternative would have no impact on the potential hazardous waste sites identified during the hazardous material screening. Any current release of hazardous materials or waste would likely continue.

Build Alternatives

Alternatives A and B (Preferred) – Alternatives A and B would have no impacts to high or moderate potential hazardous waste sites identified during the hazardous material screening. One vacant building, formerly Davis Electric (located in the industrial area south of Dora Street, west side of I-29/35), would be acquired, however, this site was not included in any of the hazardous waste databases discussed in Chapter III. Through field reconnaissance, it was determined that the site poses a low potential for contamination, and no further investigations are recommended other than the MoDOT standard of environmental/asbestos inspection for demolition plans.

2. MITIGATION MEASURES

The preferred method of mitigation for the potential hazardous waste sites is avoidance. However, if due to other factors, a site cannot be avoided and is impacted by the project, site inspections and characterization would be performed as part of the design or construction process; in addition to the full Phase I investigation previously discussed for the KCI, Inc. buildings.

A positive impact of the build alternatives would be remediation or clean up of the waste sites located within the limits of the Preferred Alternative, where acquisition of property occurs. Remediation of solid and hazardous waste sites, and related contamination, most likely would be conducted in the preconstruction phase of the project.

Q. Visual Impacts

Visual quality impacts are determined by the degree of change in the visual environment as related to viewer response.

1. VIEWS OF AND FROM THE ROAD

There are two distinct categories of viewers, or viewer response, to be considered: (1) viewers who are users of the project facility and who have views of the surrounding environment (i.e. views from the road); and (2) the "visual receptors", or people who can observe the roadway from an adjacent vantage point (i.e. views of the road). The most "sensitive" visual receptors are those individuals in residential areas who would have the potential for undesirable views of the road. (Views of the road are usually not undesirable to commercial and industrial receptors.) In addition, roadway encroachments have the potential to negatively affect the visual quality of the surrounding environment if a high degree of change occurs to a high quality environment. Although the notable visual resources along the corridor possess the high visual quality that provides scenic viewing opportunities for users of the roadway (views from the road), those resources are also potentially sensitive to the visual impacts resulting from encroachment of the roadway.

a. North Subcorridor

No-Build Alternative

Views Of the Road and Visual Quality – The No-Build Alternative in this subcorridor would not physically alter the existing visual quality of the environment through which the I-29/35 corridor travels. Since there would be no major changes in width or horizontal and vertical alignment, the existing visual environment and views of the road would essentially remain the same as current conditions.

Views From the Road – The views *from* the road would remain unchanged except in those areas that would be developed or redeveloped in the future. In this subcorridor, most of the

current views *from* the road include industrial buildings, deteriorating buildings, numerous billboards, poor pavement conditions and high traffic volumes. The only notable high quality views *from* the road occur at the River Forest Park area.

Build Alternative (Preferred)

Views Of the Road and Visual Quality – In the North Subcorridor the existing visual environment is of low quality in the industrial and commercial areas, high to moderate quality in the residential areas, and high quality at the River Forest Park area. The build alternative would have an overall low visual impact on this environment. The visual “change” would be minimal since the improvements would be widening of an already existing roadway facility and reconfiguration of existing interchanges. The reconfiguration of the interchange at Armour Road would result in the southbound off-ramp being realigned farther away from the Avenues residential area (located near the northwest quadrant of the interchange), thereby positively altering the residents’ view *of* the road.

Views From the Road – The views *from* the road would, for the most part, be similar to those of the No-Build Alternative, including those areas that would be developed or redeveloped in the future. In this subcorridor, most of the current views *from* the road would include industrial buildings, deteriorating buildings and numerous billboards. The only notable high quality views *from* the road would occur at the River Forest Park area.

b. River Crossing Subcorridor

No-Build Alternative

Views Of the Road and Visual Quality – The No-Build Alternative in this subcorridor would not physically alter the existing visual quality of the environment through which the I-29/35 corridor travels. Since there would be no major changes in width or horizontal and vertical alignment, the existing visual environment and views *of* the road would essentially remain the same as current conditions. The users of Berkley Riverfront Park and the River Front Heritage Trail currently have an excellent view of the historic Paseo Bridge, which has been enhanced with aesthetic lighting treatments such as illuminated pylons and cables, and which underwent rehabilitation in 2005.

Views From the Road – The views *from* the road would remain unchanged except in those areas that would be developed or redeveloped in the future. In this subcorridor, most of the current views *from* the road include industrial buildings, deteriorating buildings, numerous billboards, poor pavement conditions and high traffic volumes. The only notable high quality views *from* the road occur at the Missouri River area where motorists are afforded excellent views of the river and its riparian environment. In addition, from the southbound lanes, when travelers reach the Paseo Bridge, they are afforded views of Berkley Riverfront Park and the downtown Kansas City skyline in the background, in addition to the aesthetic lighting treatments on the bridge itself.

Build Alternatives

Alternative A (Alternative A or B is Preferred) – Views Of the Road and Visual Quality – In the River Crossing Subcorridor the existing environment is of low visual quality in the industrial areas and high quality at the Missouri River area. Alternative A would have an overall low visual impact on this environment. The visual “change” would be minimal throughout most of this subcorridor since the improvements would be widening of an already existing roadway facility and reconfiguration of existing interchanges. The views *of* the road would not be substantially different than those to which viewers have been accustomed, and there are no existing residential areas (sensitive visual receptors) in this subcorridor.

A noticeable change, however, would occur at the Missouri River where a new companion bridge for northbound traffic would be constructed on the east side of the existing, historically eligible Paseo Bridge, which would remain in place for southbound traffic. The viewers of the new bridge would be the users of the Isle of Capri Casino, the motorists on I-29/35, the users of the Riverfront Heritage Trail and, to a certain extent, the users of Berkley Riverfront Park (the view of the new bridge from the park would be partially blocked by the existing bridge). One design option for the new companion bridge would be a suspension type of bridge that would be similar in appearance to the existing suspension bridge in order to provide visual harmony with the historic structure. A second option for the new companion bridge would be to construct a tied arch type of bridge which would be somewhat dissimilar in appearance and size as compared to the existing bridge, but which would complement the vertical cables of the existing bridge. A third option for the new companion bridge would be to construct a cable-stayed type of bridge, which would be somewhat similar in appearance to the existing suspension bridge, in that it would also utilize pylons and cables, but the angled cables of this type of bridge would oppose the vertical cables of the existing bridge. Although some of the bridge options may be considered dissimilar in appearance to the existing bridge, this could also be viewed as a demonstration of progress in bridge design, thereby emphasizing the differences in bridge type and allowing the historic aspect of the existing bridge to stand apart from a new bridge with a more contemporary design.

Alternative A (Alternative A or B is Preferred) – Views From the Road – The views *from* the road would remain relatively unchanged except in those areas that would be developed or redeveloped in the future, and at the new bridge. In this subcorridor, most of the views *from* the road would still include industrial buildings, deteriorating buildings, and numerous billboards. The only notable high quality views *from* the road occur at the Missouri River area where motorists are afforded excellent views of the river and its riparian environment. In addition, from the southbound lanes, when travelers reach the Paseo Bridge, they are afforded views of Berkley Riverfront Park and the downtown Kansas City skyline in the background, in addition to the aesthetic lighting treatments on the bridge itself. A view of the new companion bridge would also be included in views *from* the road by motorists traveling in either direction, and the same visual aspects of the bridges as discussed above under “views of the road” would come into play.

Alternatives B (Alternative A or B is Preferred) – Views Of the Road and Visual Quality – Alternatives B-1 and B-2 would have an overall low visual impact on the existing environment, and the views *of* the road would be the same as those described for Alternative A, with the exception of the bridges over the Missouri River. In Alternatives B-1 and B-2, the existing suspension bridge would be removed and new twin bridges or one larger structure would be constructed. Possible design options for the new bridges include deck girder, tied arch or cable-stayed. With a deck girder design, the bridges would have a lesser visual impact on the river area environment than other bridge types (including the existing bridge) because of its simpler profile. A tied arch design would be a visual change from the existing suspension bridge type, but would still be an aesthetically pleasing element in the environment. A cable-stayed design would be somewhat similar (utilizing pylons and cables) to the existing suspension bridge type that it would replace and would therefore result in a minimal impact to the environment. Since there is already an existing bridge across the river, an additional bridge of any of the three types would result in relatively minimal visual change to this environment. There are no existing residential areas (sensitive visual receptors) near the river crossing that would be affected by views of an additional bridge, and the users of the Riverfront Heritage Trail that would travel under the bridges are already accustomed to a bridge structure.

In Alternative B-1 the interchange at Front Street would be a modified version of the existing interchange. In Alternative B-2 the interchange at Front Street would be a SPUI design. Although the plan views of the two interchanges are different, the ground-level views of the road from Berkley Riverfront Park would be relatively similar. In Alternative B-2, the existing portion of Front Street adjacent to the Riverfront Heritage Trail would be removed, thereby removing this view of the road from trail users. The two interchange options would have a low visual impact on the existing environment, since there is already an interchange at this location and no existing residential areas.

Alternatives B (Alternative A or B is Preferred) – Views From the Road – In Alternatives B-1 and B-2, the views from the road would remain relatively unchanged except in those areas that would be developed or redeveloped in the future. For these two alternatives in this subcorridor, the views from the road would be the same as those described above for Alternative A. A view of the new twin bridges or the new single bridge would also be included in views from the road by motorists traveling in either direction. Aesthetic lighting of these bridge alternatives should be integrated into the design of these new structures in order to replace the community's recent investment in beautifying the existing Paseo Bridge.

Alternative C – Views Of the Road and Visual Quality – Alternative C would have an overall low visual impact on the existing environment, and the views of the road would be the same as those described for Alternative A, with the exception of the bridge over the Missouri River. In Alternative C, the existing suspension bridge would be removed and a larger single bridge would be constructed on the east side of the existing bridge. The design options for the new bridge would likely be similar as those for Alternatives B-1 and B-2 (to include deck girder, tied arch or cable-stayed) and, therefore, the views of the road would be similar to those discussed above for Alternatives B-1 and B-2. In addition, the interchange at Front Street would be a SPUI design and the visual impacts and views of the road in this area, as well as the approach for integrating urban design enhancements would be the same as those described for Alternative B-2 above.

Alternative C – Views From the Road – In Alternative C, the views from the road would remain relatively unchanged except in those areas that would be developed or redeveloped in the future. For this alternative in this subcorridor, the views from the road would be the same as those described above for the other alternatives.

c. CBD North Loop Subcorridor

No-Build Alternative

Views Of the Road and Visual Quality – The No-Build Alternative in this subcorridor would not physically alter the existing visual quality of the environment through which the I-29/35 corridor travels. Since there would be no major changes in width or horizontal and vertical alignment, the existing visual environment and views of the road would essentially remain the same as current conditions. On the north side of the downtown area, the mainline of the roadway is recessed and therefore less visible to viewers at ground level. Although the recessed mainline of the roadway is visible to viewers in multi-story residential buildings at the edges of the downtown area and the river market area, views of city traffic are not unacceptable to those who choose to reside in this type of urban environment.

Views From the Road – The views from the road would remain relatively unchanged except in those areas that would be developed or redeveloped in the future. In this subcorridor, most of the notable views from the road include the wooded bluffs of Kessler Park, the historic River Market area and the historic downtown Kansas City area (in the west half of the CBD Loop).

Motorists are provided short-duration views of the River Market and downtown areas from the mainline because it is recessed, but they have longer duration views from the frontage roads located above the mainline. In addition, some views toward the river, the municipal airport, the West Bottoms and downtown Kansas City, Kansas are provided to motorists at the northwest corner of the CBD Loop.

Build Alternatives

Alternative A – Views Of the Road and Visual Quality – In the CBD North Loop Subcorridor the existing environment is of low to moderate visual quality in the area between the Paseo Boulevard and Troost Avenue, and of moderate to high visual quality in the Kessler Park area, the Columbus Neighborhood area and the downtown area. Alternative A would have an overall low visual impact on this environment. The visual “change” would be minimal throughout most of this subcorridor since the improvements would be widening of an already existing roadway facility and reconfiguration of existing interchanges. The residential areas of Guinotte Manor, Chouteau Court/Paseo West Neighborhood, and the Columbus Park Neighborhood contain sensitive visual receptors that would have undesirable views of the road similar to existing conditions. However, the views of the road would not be substantially different than those to which these viewers have been accustomed, since improvements would be widening of the existing roadway. On the north side of the downtown area, the mainline of the roadway would still be recessed and therefore less visible to viewers at street level. Although the recessed mainline of the roadway would be visible to viewers in multi-story residential buildings at the edges of the downtown area and the river market area, views of city traffic are not unacceptable to those who choose to reside in this type of urban environment.

Alternative A – Views From the Road – The views from the road would remain relatively unchanged except in those areas that would be developed or redeveloped in the future. In this subcorridor, most of the notable views from the road would include the wooded bluffs of Kessler Park, the historic brick buildings of the “Old Town Historic District” in the River Market area, the historic buildings of the “Wholesale Historic District” in the west half of the downtown Kansas City area, and the mix of early and modern government and office buildings in the east half of the downtown area. On the north side of the downtown area, motorists are provided short-duration views from the mainline because it is recessed, but they have longer duration views from the frontage roads located above the mainline. In addition, some views toward the river, the municipal airport, the West Bottoms and downtown Kansas City, Kansas are provided to motorists at the northwest corner of the CBD Loop.

Alternative B (Preferred) – Views Of the Road and Visual Quality – Alternative B would have an overall low visual impact on the existing environment, and the visual impacts and views of the road would be the same as those described for Alternative A, with the exception of two locations near the Columbus Park Neighborhood. In the first location, at the southeast side of the neighborhood, the loop ramp adjacent to Troost Avenue would be removed providing more space between the residences and the roadway. In the second location, at the southwest corner of the neighborhood, the loop ramps would be removed at the M-9 interchange and replaced with a box diamond interchange, although Cherry Street would remain adjacent to the residences. In these two locations, the removal or realignment of ramps/streets could result in more distance and visual separation between the residential areas and roadways.

Alternative B (Preferred) – Views From the Road – In Alternative B, the views from the road would remain relatively unchanged except in those areas that would be developed or redeveloped in the future. For this alternative, the views from the road would be the same as those described above for Alternative A.

2. AESTHETIC CONSIDERATIONS / VISUAL ENHANCEMENTS

As roadway design plans are developed, urban design features could be integrated into the overall aesthetics of corridor in the Downtown Kansas City area. Urban design elements and landscaping can also help to maintain the property values of the neighborhoods adjacent to the roadway. In the Downtown area, the bridges over I-29/35 could be enhanced with integrated treatments that may include decorative wall and bridge features and finishes, pedestrian railings, aesthetic lighting, paving and other potential elements and amenities that complement and visually blend these improvements into their surroundings. In the Downtown and River Market areas, an option that could be considered involves the 5th and 6th Street frontage roads, whereby they are realigned closer to the main lines in order to provide more space between the road and the adjacent existing development. Urban design elements, landscaping, or new infill development could be incorporated in the additional space to enhance the character and aesthetics of the urban environment, and make it more pedestrian oriented.

In urban areas, and in areas where the roadway is visible to residences, landscaping with evergreen trees and shrubs can help to screen and soften the views of the road in addition to providing enhanced views *from* the road.

In the detailed design phase for the Preferred Alternative, it would be determined whether or not abatement is desired by the residential neighborhoods. If sound abatement is incorporated in these areas, the residents' views of the road would be eliminated, but walls would be highly visible to the residents. Walls would also be part of the drivers' view from the roadway. Therefore, if sound abatement is incorporated in these areas, landscaping and aesthetically pleasing surface treatments would be considered in order to soften or reduce the visual impact of the walls.

MoDOT can incorporate aesthetics and urban design elements into the final design of the corridor, provided other funding sources are identified to pay for and maintain such enhancements, in an integrated fashion to ensure the roadway and bridge improvements would visually complement the character of the study corridor.

R. Energy

Energy considerations to be taken into account when evaluating the various alternatives include the energy consumed during normal operation and maintenance. Direct and indirect energy impacts should also be considered. Direct impacts include the energy consumed by vehicles using the facility. Indirect impacts include construction energy and such items as the effects of any changes in automobile usage due to the construction of the facility.

Energy consumed during construction includes energy consumed for earthwork and construction activities, as well as energy consumed off-site for the production of materials and equipment. Energy consumed during construction also includes energy expenditures caused by vehicle delay due to construction activities, such as lane closures.

1. CHANGE IN FUEL CONSUMPTION

The amount of fuel consumed by vehicles in the region is a function of the total VMT, the average speed the vehicles are traveling and the ratio of automobiles, gasoline trucks and diesel trucks. As discussed above in the economics impacts section, construction of a build alternative increases the capacity of the study area, thus increasing the daily and annual amount of VMT in the region. Additionally, the projected increase in regional average speed per vehicle does not contribute to better fuel efficiency per vehicle. While fuel efficiency is at its

worst at low congested speeds and does improve at faster speeds, after speeds reach 40mph fuel efficiency starts to decline again. For instance, a facility that had an average speed of 40mph that has been improved to 55mph will result overall in lower fuel efficiency. As a result, the build alternatives increase the fuel consumption and energy expenditures as compared to the No-Build Alternative.

Table IV-20 summarizes the results.

**Table IV-20
Fuel Consumption (2030)**

Alternative	Change in Daily Fuel Consumed (gallons)
No-Build	0
Build 6-Lane	12,254
Build 8-Lane	13,021

2. NO-BUILD ALTERNATIVE

The No-Build Alternative, due to its very definition, requires no construction on I-29/35, and thus would have no increased energy impacts.

However, over time, energy use would increase due to basic rehabilitation and increased travel times along the corridor due to congestion.

3. BUILD ALTERNATIVES

For all build strategies, measures would be taken to reduce energy consumption, including the limiting the idling of construction equipment and employee vehicles, encouraging carpools or vanpools among construction workers and locating staging areas as close as possible to work sites.

For any build concept, traffic delays are anticipated during the reconstruction of I-29/35. Reductions in lane widths and shifts in traffic would reduce traffic speeds and cause delays during peak travel times. Delays to traffic on cross roads are also anticipated due to reconstruction of interchanges. It is expected that these various delays for traffic traveling through a construction zone would result in a temporary increased use of energy, in this case gasoline and diesel fuel. However, long term, the improvements made on I-29/35 would result in decreased travel time. This would reduce the use of gasoline and diesel fuel required for travel on the highway.

S. Construction Impacts

Potential construction impacts are described in this section. While construction impacts would be more fully known when more detailed design plans have been completed, MoDOT shall work with the public to address concerns during the final design of projects within the I-29/35 Corridor and would provide further coordination with impacted parties and individuals.

MoDOT has developed a series of Standard Specifications for Highway Construction. These specifications include, but are not limited to, air, noise, and water pollution control measures to minimize construction impacts. The Standard Specifications for Highway Construction also include traffic control and safety measures. MoDOT would implement these standards on the

I-29/35 bridge and roadway improvements in the corridor for construction activity. Pollution control measures, both temporary and permanent, would be enacted under the project construction specifications. During construction of the project, construction methods and operations would be conducted in accordance with MDNR and MoDOT regulations, particularly concerning batch plant operations and clearing and grubbing functions.

1. WASTE DISPOSAL

Specifications and procedures for the disposal of wastes resulting from construction activity would be developed with consideration given to the MDNR Solid Waste Management Program. This program emphasizes the need to develop uses and markets for recycled and recyclable materials in construction activities. These materials include, but are not limited to, waste tires, rubberized asphalt, ground glass subgrade, structural steel, plastic lumber, and paints that utilize recycled glass. Furthermore, any potential hazards in the right-of-way would be identified and handled in accordance with all applicable regulations. In addition, the construction specifications would include requirements to prohibit the contractor from disposing of any pollutants, such as fuels, lubricants, raw sewage, or other harmful substances, inappropriately.

Impacts would be mitigated by adherence to construction permit and contract conditions. Materials resulting from clearing and grubbing, demolition, or other operations (except materials to be retained) would be removed from the project, or otherwise properly disposed of by the contractor. There would not be excess fill for the project that would need to be disposed. It is anticipated that excess fill material, or borrow, will be needed for construction of the project at certain locations, the most significant of which is the area directly north of the existing I-29/35 Paseo Bridge. The contractor would be responsible for determining the source and disposition of borrow for the project as well as any environmental requirements.

2. WATER QUALITY

Construction impacts on water resources include both direct and indirect impacts. Water quality impacts during construction activities could include increased sediment load with resulting increased turbidity levels in the river. The sediment increase could be due to runoff from cleared areas within the construction limits, earthmoving and construction activities in the river. Disturbance of the river channel during river foundation construction could cause short-term increases in turbidity. Spillage of fuels, lubricants and other toxic materials during construction can impact the water quality of the river. Spillage of spoils from drilled shaft or footing excavation in the river can impact the water quality. Turbid water and suspended solids may be discharged from pumps used in de-watering activities during roadway, bridge and culvert construction directly to the waters of Missouri. This would be a temporary impact during construction. 'Best management practices' will be used to minimize the turbidity of the waters of Missouri caused during construction. The implementation of standard sedimentation and erosion control measures and the careful handling of foundation spoils and toxic materials can reduce the potential for these construction impacts.

Storm water runoff is addressed by MoDOT's Sediment and Erosion Control Program and would be used to address this concern during construction. MDNR has noted that nutrients leached from project areas that have been hydro seeded and mulched can result in increased phosphorous levels in streams and adjacent water bodies, such as creeks and reservoirs. The Missouri Department of Conservation (MDC) has stated that the following best management practices should reduce impacts to the aquatic environment to a minimal level:

- Grade and seed disturbed areas as soon as possible and in compliance with the MDC seeding and planting recommendations;

- Minimize disturbances to the stream banks and riparian zones; and
- Avoid work in stream channels from the beginning of March to mid June as much as possible and practicable; and undertake all necessary precautions to prevent petroleum products from entering streams.

These best management practices, as outlined by the MDC, also include conformance to the State Channel Modification Guidelines when altering channels or relocating streams. Measures would be taken to ensure that proper flow conditions are maintained in the creeks and tributaries during construction. In addition, restoration work would include cleanup, shaping, replacement of topsoil, and establishment of vegetative cover on all disturbed bare areas, as appropriate, and in accordance with the project's landscaping plan.

3. AIR

Construction activity would cause temporary air quality impacts. These short-term effects would include the following:

- Increased emissions from heavy diesel construction vehicles and equipment. Emissions from construction vehicles and equipment would be controlled in accordance with emission standards prescribed under state and federal regulations.
- Increased emissions from vehicles as a result of decreased speeds through work zones. Efforts would be made to minimize these impacts by maintaining smooth traffic flow during construction periods. Further discussion of this subject can be found in this section under Section 7.c., Maintenance of Traffic.
- Increase in dust resulting from grading operations and exposed soils. Dust generated by construction activities would be minimized by the implementation of dust control measures, such as water sprinkling and applications of calcium chloride to control dust and other airborne particulates.

Contractors would be required to comply with Missouri's statutory regulations regarding air pollution control, which are designed to minimize air quality impacts by reducing air pollutants during construction. Air quality impacts would be mitigated by adherence to construction permit and contract conditions, which include prohibitions against burning of construction debris, and control measures to limit pollution if tree trunks and limbs are permitted to be burned on site.

4. NOISE

Noise from heavy construction equipment and haul trucks would result in unavoidable short-term impacts. Residents adjacent to the roadway would be most impacted by construction noise. In an effort to minimize the effects during construction, contractors may be required to equip and maintain muffling equipment for trucks and other machinery in order to minimize noise emissions. Operations with high temporary noise levels such as pile driving may need to have abatement restrictions placed upon it such as work-hour controls and maintenance of muffler systems.

MoDOT has worked with affected groups throughout the NEPA process and will continue to do so during the detailed design phase.

5. VIBRATION

Due to the proximity of the alignment to residential areas south of the Paseo Bridge to the northeast corner of the CBD Loop and along the north leg of the CBD Loop, a carefully planned

and executed drilling and blasting program would be prepared, during the design development phase, which would place limits or controls on drilling and blasting activities. The requirements of this program will be governed by local, state, and federal regulations. MoDOT has worked with affected groups throughout the NEPA process and will continue to do so during the detailed design phase.

6. BRIDGE IMPACTS

The existing I-29/35 Paseo Bridge could be removed by the proposed action depending on the alternative that is chosen. If the existing bridge were to be removed, it would likely be dropped into the Missouri River in sections and the sections would be removed by heavy construction equipment located on the bank or on barges in the river. During the time the bridge would be in the river, there would be some temporary disturbance to aquatic species. These are anticipated to be minor as the bridge superstructure and substructure occupy a small amount of the total volume of the water in the river channel. The existing river piers shall be removed down to elevation 698.0, mean sea level versus three feet below the river channel bottom. Effects to dikes would be minor and the current bridge is high enough that vegetation beneath the bridge is not effected by the bridge and is able to develop. The superstructure would most likely be removed by explosive devices strategically placed on the structure. Coast Guard approval will be required prior to demolition and will determine adequate removal conditions.

As part of the 2005 rehabilitation of the I-29/35 Paseo Bridge, the extent of the existing bridge's lead based paint was reduced and those areas were repainted with non-lead based paint. Lead paint remains on the bridge in the area under the deck. It is recommended that best management practices be used when removing the bridge to minimize particles entering the air, water or ground due to paint during demolition.

Construction activities for the new bridge would likely be spread over several construction seasons. The number of construction seasons required would depend on the bridge type chosen. However, typically the first season(s) would include pier construction and the subsequent season(s) superstructure construction.

River bridge construction activities would likely be performed primarily from barges. Specific activities include drilling and concreting drilled shaft foundations, cofferdam construction of footings, and pier construction. Additionally, erection of superstructure steel members would be accomplished from barge-mounted cranes. Causeways and shooflies would not likely be used during construction because the water velocity and river traffic of the Missouri River does not make them suitable for this project.

Prior to construction activities taking place, threatened and endangered species of wildlife surveys may be necessary to determine if special considerations are appropriate to minimize adverse impacts. These may include seasonal restrictions on land clearing and tree removal or demolition and construction activities in the river. The Pallid Sturgeon has no recorded instances of spawning activity in the vicinity of the bridge location. However, the potential overwintering habitat, such as deep scour holes and behind the bridge piers at wing dam tips, for the Pallid Sturgeon may be impacted by the construction of bridge piers. Seasonal construction restrictions were proposed for the Route 19 Bridge replacement project at Hermann, Missouri. Seasonal construction restrictions could be employed in this location, if deemed necessary.

Migratory birds may nest in vegetation affected by the proposed construction near the vicinity of the bridge. In addition, migratory birds may also nest on bridge structures. The primary season for most migratory bird nesting activity in Missouri is between the dates of April 1 to July 15.

However, some migratory birds are known to nest outside of the primary nesting season period. To the extent practicable, MoDOT will schedule vegetation clearing and bridge demolition activities outside of the primary nesting season dates to avoid or minimize adverse impact to nesting migratory birds.

At this time, bridge type studies and type selection has not been determined. Construction methods and impacts for the bridge can vary depending on the bridge type selected. For instance, a tied arch bridge could be constructed on falsework on a barge and floated into place.

7. TRAFFIC IMPACTS

During the construction of the preferred build alternative, the existing I-29/35 roadway and bridge corridor would stay in operation; however, the traffic capacity on I-29/35 and traffic access between I-29/35 and the local roadway system would be impacted. During construction, I-29/35's mainline capacity, to some degree, may be reduced or possibly closed for periods of time. However, with a single bridge for the River Crossing Subcorridor Alternative B, the bridge would be closed and demolished prior to construction of the new bridge resulting in impacts to the local roadway system.

a. Construction Sequencing

The construction sequencing and maintenance of traffic strategy for constructing the I-29/35 roadway and bridge corridor improvements would be designed ideally using these guidelines:

- Efforts would be made to maintain traffic service on I-29/35 during the construction period. There may be some situations that would allow only one lane to be open each way or possibly I-29/35 could be closed for a period of time in order to reduce the total construction time.
- Efforts will be made to maintain traffic on the existing or new Missouri River bridge while new bridge(s) are constructed. Traffic on the existing I-29/35 Paseo Bridge may be maintained while a new bridge is being constructed. Once the new bridge was completed, traffic may then be shifted onto the new bridge. Then, the existing I-29/35 Paseo Bridge would be replaced. However, traffic will not be maintained if a single bridge is selected for River Crossing Subcorridor Alternative B.
- To some degree, efforts would be made to maintain traffic service across I-29/35 along major arterial roadways during any given construction period. The major arterials in the study corridor are: M-210/Armour Road, 16th Avenue, Bedford Avenue/Levee Road, Front Street, Paseo Boulevard, US 24/Independence Avenue, M-9 and Broadway Boulevard.

Local access to individual parcels in the area adjacent to the construction would be maintained to the greatest extent possible through the use of newly constructed pavement, temporary connections, temporary widening of existing and/or new pavement and the use of nearby alternative routes.

All of the build alternatives are of the scale that they could be constructed in separate phases. The project may be implemented as part of a design-build process that could potentially reduce the amount of time typically needed to construct the project. The design-build process could also provide additional flexibility to the design and construction schedule of the project. The timing for the project as currently anticipated, including the portion of the study corridor from M-210 to the northeast corner of the CBD Loop, is to begin construction in 2007 and finish

construction in 2011. Project phases could overlap and a number of phases could be underway at the same time. Project phasing might be as follows although that is subject to the final design and construction methods used:

1. Construct a new bridge structure downstream of the existing Paseo Bridge. Or close and demolish the existing Paseo Bridge and construct a new bridge structure.
2. Construct roadway corridor bridges in stages to accommodate widening of the roadway corridor.
3. Widen the I-29/35 mainline to six through lanes from M-210/Armour Road to the northeast corner of the CBD Loop.
4. Construct new corridor interchange in stages to correspond with widening work.
5. Construct Northeast Corner of Loop to East Leg of Loop/US 24/Independence Avenue in order to accommodate I-29/35 mainline widening.
6. Phase II rehabilitation or removal of existing I-29/35 Paseo Bridge/Construction of new southbound bridge, depending on alternative chosen.
7. Construct Broadway Boulevard Interchange.
8. M-9 Interchange improvements.
9. In the long term the I-29/35 mainline may be widened from M-210/Armour Road to the northeast corner of the CBD Loop from the improved six-lane to eight lanes, when traffic warrants and if funding is available.

b. Duration of Construction

Construction impacts would also be affected by the duration of construction. If construction occurs over a shorter period of time, the impacts would be more intense but briefer than if construction occurs over a longer period of time. The construction schedule is not known at this time due to decisions related to a decision on the bridge type and design-build. Funding levels are a constraint to how fast construction can occur.

The project could physically be constructed over two or three construction seasons if multiple phases of the project are able to be let at the same time. The construction timeframe for the project is based on the delivery and contracting approach for the project, and the Missouri River bridge would be the controlling factor in the construction schedule.

c. Maintenance of Traffic

The impacts of interchange reconstruction on the urban arterial system include a temporary loss of access to, from and across I-29/35. As the study corridor is located in an urban area, there are many alternative routes for traffic to use while access is reduced or restricted at interchanges during construction. The travel delay experienced by motorists would vary depending on the level of construction that is occurring at the time, and the time of day that the travel occurs. A lane closure in the peak direction of peak hour travel would result in shifts of traffic to alternative routes and in additional delays to motorists remaining on I-29/35. Delays may also occur in the non-peak directions and during non-peak hours, but the length of the delays would lessen with the lower traffic volumes that are present during these periods.

Traffic impacts during construction would be minimized by the availability of alternative regional travel routes. From a regional perspective, there are several alternate facilities serving

north-south corridors: US 169, M-9, I-635, I-435 and M-291. A large part of the commuting trips originating north of the Missouri River would be expected to use alternate roadway routes and Missouri River bridges such as US 169, M-9, Chouteau Trafficway and I-435 during construction. In fact, in January 2003, the Paseo Bridge was closed for several weeks, as emergency maintenance was required. In spring 2005, the bridge was closed again for approximately four months, as a result of Phase I of a major rehabilitation project. During both of these closures a detailed traffic plan was prepared and used to direct vehicles to other roadways such as M-9, Armour Road, Broadway and Chouteau and to Missouri River bridges in the metropolitan area. If sections of I-29/35 were to be closed as part of construction of the Preferred Alternative, a similar traffic plan would likely be used. The traffic impacts would likely be similar to those experienced during the 2005 major rehabilitation project. Those impacts included high volumes on other Missouri River crossings, and on the streets mentioned above. While volumes were higher on other routes, those routes were able to handle the traffic.

Very few public comments were received during the closure of the Paseo bridge because the public was given a great deal of information in advance of the closure. Public involvement was critical during the closure for the rehabilitation work and much of it started more than a year prior to the closure and continued through the completion of the project. This gave the public time to adjust their routes accordingly. Public involvement will be equally important for any closures of the I-29/35 Study Corridor during prior to, and during, construction of this project.

There are some possible differences between the closure for the 2005 major rehabilitation project and the options available for this project. The rehabilitation project included only the bridge and it is possible that other sections of the I-29/35 corridor could be closed at times during construction. The length of time for the rehabilitation project involved a closure of approximately four months. For this project, longer closures are a possibility which could amount to results which were not experienced during the rehabilitation project.

Traffic impacts to motorists that remain on I-29/35 during construction would be minimized through the use of intelligent transportation system (ITS) measures. These measures would include permanent and portable message signs, and would be used on a regional basis to direct traffic away from the I-29/35 corridor especially when I-29/35 mainline lane capacity would be reduced. Intelligent transportation systems such as MoDOT's Kansas City Scout system, temporary changeable message signs and motorist assist programs, would help keep commuters informed on alternative route choices, commute time and delays, and clear crashes quickly to promote the safe and free flow of traffic on I-29/35 during construction.

Efforts would be made to maintain traffic service across I-29/35 along major arterial roadways during any given construction period. The major arterials in the study corridor are: M-210/Armour Road, 16th Avenue, Bedford Avenue/Levee Road, Front Street, Paseo Boulevard, US 24/Independence Avenue, M-9 and Broadway Boulevard. MoDOT will coordinate with local governments to provide information about construction activity and to assist in traffic management.

During subsequent design phases, a detailed traffic maintenance plan will be developed for each individual project. These plans will be coordinated with local jurisdictions. The media, MoDOT web site, ITS and other methods would be used to provide coordinated information to motorists regarding the availability of alternative travel routes.

d. Alternative Transportation

The traffic impacts of construction would be minimized by increased coordination and promotion of alternative transportation modes. MoDOT will coordinate with the Kansas City Area

Transportation Authority (KCATA) to encourage the use of public transportation, increase vehicle occupancy and decrease the mode share of the private vehicle in the corridor. A bus rapid transit (BRT) route would be available via the M-9/Heart of America bridge. MoDOT will partner with the regional public transportation system to provide information to travelers that an alternate mode choice is available during roadway construction. One option being considered is to subsidize transit fares during peak commute times.

T. Navigational Impacts

1. CLEARANCES

The existing Paseo Missouri River Bridge would have to be modified to increase vehicular traffic capacity. Alignment alternatives were studied within the River Crossing Subcorridor for the EIS, Alternative A, B and C. All of the alignments would shift the bridge centerline to the east or downstream of the existing Paseo Bridge. The alignment alternatives are a function of what would be done with the existing Paseo Bridge. Each of the alignment alternatives would have a different impact to navigation. While the bridge type selection is not a part of this EIS, the bridge type of the new bridge can also have an impact on navigation. Presently, the navigation channel is located off of the south bank. If the existing bridge remains and another bridge is added, the piers of the new bridge must match the location of the piers of the existing bridge. The first pier on the existing bridge is located 308 feet off of the south bank. If the existing bridge is replaced the new bridge piers must be located approximately 450 feet off of the south bank of the Missouri river. All new bridges must provide a minimum vertical clearance of fifty-two feet above the 2% flowline. The clearances listed above have been approved by the Coast Guard.

River Crossing Subcorridor Alternative A would add a companion bridge downstream to the existing bridge and complete an in-depth rehabilitation to the existing bridge to extend the design life from 10-15 years (2005 rehabilitation) to 50 years. The existing bridge and piers are skewed about ten degrees to the direction of flow of the Missouri River. The new bridge would match the span configuration and pier orientation of the existing bridge.

River Crossing Subcorridor Alternative B would replace the existing Paseo Bridge with two new bridges or single larger structure. If two new bridges were constructed, the first bridge would be built downstream from the existing bridge. The location of the new bridge would allow approximate 50 feet between this bridge and a twin bridge. The traffic would be shifted to the new bridge after it is completed and the existing bridge would be removed. The new twin bridge would match the alignment of the existing bridge. With a single larger bridge, the new bridge would be built within the same project footprint as with two new bridges.

River Crossing Subcorridor Alternative C would replace the existing Paseo Bridge with one new bridge. The new bridge would be built with approximately 50 feet between the new and existing bridges. The existing bridge could be removed after the new bridge is constructed.

For all alignment alternatives bridge construction and demolition could result in temporary impacts to navigation on the Missouri River by constricting the vertical and horizontal clearance. The cable-stayed, suspension, tied arch or truss bridge types may require temporary falsework in the river during construction that could restrict the movement of river traffic. If Alternative B or C is selected and a steel deck girder bridge type is chosen, temporary falsework in the river would not be required during construction thus not impacting navigation. For all alignment alternatives erection of the bridge superstructure could limit river traffic for brief periods as cranes operate over the navigation channel. For all alignment alternatives demolition and removal of the existing bridge could restrict river traffic until the channel is cleared. Construction

activities that impact river navigation would be coordinated with the U.S. Coast Guard well in advance of the work.

Alternative A provides less horizontal clearance to the navigation channel compared to Alternatives B and C. The navigation channel is located off of the south bank. The piers for Alternative A are located 308 feet off of the south bank while the piers for alignment alternatives B and C are located approximately 450 feet off of the south bank. Portions of the I-29/35 Study Corridor could be closed during construction and this could include the Paseo Bridge in order to allow for the removal of the current structure. For all alignment alternatives river recreation and barge traffic may be impacted for some time during construction. However, after construction is completed, the bridge would not impact recreational or commercial navigation.

2. WATERBORNE COMMERCE

Information and data for assessment of waterborne commerce were taken from a report published by the U.S. Army Corps of Engineers (USACE) Institute for Water Resources, Part 2, published in 2003. The Missouri River is recorded from its mouth at the Mississippi River upstream to Fort Benton, Montana, a distance of 2,073 miles. The Paseo Bridge crossing (at mile 364.7) is located in Reach 1 (Kansas City to the Mouth).

The USACE 2003 study divides the river into two navigable reaches: Reach 1 – from the mouth at the Mississippi River to Kansas City (which includes the Port of Kansas City) and Reach 2 – from Kansas City to Omaha. There is significant difference in the amount of materials which are moved along the two reaches. Freight traffic in Reach 1 was at its peak at 9,295 thousand short tons in 2001, with a low of 6,594 thousand short tons in 1995. The distribution of total tonnage shipped by year and reach on the Missouri River is shown in Table IV-21.

Table IV-21
Omaha, Nebraska to Mouth of Missouri River
Total Freight Traffic in Thousands of Short Tons

Year	Reach 1*	Reach 2**
1994	7,940	1,424
1995	6,594	970
1996	7,740	1,210
1997	7,781	1,376
1998	7,919	2,292
1999	8,853	1,665
2000	8,340	1,801
2001	9,295	1,411
2002	7,901	1,553
2003	7,769	1,195

* Reach 1 --- Kansas City to Mouth --- R.M. 374.8 to R.M. 0.0
(includes Port of Kansas City)

** Reach 2 --- Omaha to Kansas City --- R.M. 627.0 to R.M. 374.8

Source: *Waterborne Commerce of the United States*, Calendar Year 2003 – Part 2,
Corps of Engineers,

Trips are defined as vessel movements. A trip is logged between every point of departure and every point of arrival for self propelled vessels, and a trip for loaded barges is from the loading point to the unloading point. As shown in Table IV-22, river traffic in Reach 1 is over five times the traffic in Reach 2.

Table IV-22
2003 Vessel Trips
Missouri River – Omaha, Nebraska to the Mouth

Location	Upstream				Downstream			
	Self Propelled Vessels*	Non-Self Propelled Vessels		Total	Self Propelled Vessels*	Non-Self Propelled Vessels		Total
	Tow or Tug	Dry Cargo	Tanker		Tow or Tug	Dry Cargo	Tanker	
Reach 1	13,135	13,332	92	26,559	13,130	13,066	80	26,276
Reach 2	2,308	2,335	10	4,653	2,308	2,334	8	4,650

* There were no Self Propelled, Passenger & Dry Cargo or Tanker Vessels in Reach 1 or Reach 2.

The Missouri River is an important freight traffic route, although the volume of traffic has seen a decline and will likely continue to do so. This decline is due to liability issues, low water and fewer small operators than in the past. It is possible to have an interim condition during construction of this project where the current Paseo Bridge remains in place while a new structure is being built and the bridge pier locations may not match. However, the location of the navigation channel on the south bank ensures that a minimum distance will be maintained for navigational purposes even in this type of interim condition. The construction of a new bridge at this location will not impact navigational safety and efficiency.

U. Secondary and Cumulative Impacts

The Council on Environmental Quality defines cumulative impacts as: *The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7).* Direct effects are caused by the project and occur at the same time and place. Indirect (secondary) effects are caused by the specific project and are later in time or further removed. The focus of cumulative effect analysis is on resource sustainability in an expanded geographic and time boundary.

The proposed action is the replacement of bridges, interchanges and pavement that have reached the end of their economic life and may have operational or safety deficiencies. The project does not introduce a new transportation facility or corridor into the region. There is much research and empirical evidence to support the theory that economic development would follow significant improvements in transportation and access. However, the build alternatives for this project would basically replace an existing infrastructure and would not provide any substantial new access. The existing economic and social opportunities would remain or would be enhanced.

The I-29/35 Paseo Bridge Project Area has been developed within a built environment where urban land uses, including residential, commercial and industrial areas have existed since the late 1800s. Over time, there has been continuous development and redevelopment of these sites. These redevelopment activities have cleared properties of the structures and the property has remained vacant for periods of time sufficient to allow for shrubs and wood vegetation including trees to reclaim some of the previously developed sites. The habitat islands are often separated by transportation corridors such as railroad tracks, switching yards, streets and highways as well as commercial and industrial buildings. The floodplain/floodway forest located between the levees along the Missouri River and the parklands such as Kessler Park, Berkley Park and River Forest Park are the only significant areas of forest land within the project

corridor and these properties are subject to development due to their location and public ownership. Redevelopment activities are continuing at this time, the vacant ground west of I-29/35 has been master planned by the Kansas City Port Authority and the industrial areas adjacent to M-210/Armour Boulevard are being acquired to be redeveloped as commercial and residential areas. Given the long history of urbanization and the redevelopment activities both planned and underway at this time, the cumulative impacts or effects on the natural resources within the geographic area of this project are not expected to be significant. Direct impacts of the Preferred Alternative have been documented in other sections of this EIS. It is anticipated that there will be no cumulative impacts to natural resources present.

Cumulative impacts or effects on people and the built environment could include actions by other agencies within the project area such as the North Kansas City redevelopment project at M-210, 16th Avenue Development, Lewis and Clark Expressway, proposed Port Authority riverfront redevelopment, Paseo Boulevard, and the arena/Entertainment District/Bartle Hall/Performing Arts. These are development projects that are independent of the proposed action. These projects would be further supported by improved vehicular access to-and-from north Kansas City, traffic and pedestrian safety from the proposed action. The cumulative effect of the actions of other agencies, in relation to the above-named projects, may result in a more vital area, economically and socially within the Kansas City region. However, the reconstruction of the I-29/35 corridor will not introduce additional cumulative impacts.

Secondary impacts are the indirect effects of this specific action. The analysis of secondary and induced development is driven by the recognition that new or substantially improved transportation facilities are a key component of development. This is most often the case where a new facility is developed or when an existing facility is significantly improved, e.g. widening existing facilities, provision of access control or replacing intersections with interchanges. One or more of these may be present when a facility is upgraded.

Most of the secondary and induced developments normally associated with an interstate highway project have already occurred in the I-29/35 corridor. Development has already occurred all around the corridor. There are some areas where redevelopment is being planned or is occurring. The improvements being made to the roadway system are unlikely to induce additional development.

Secondary impacts of the No-Build Alternative could include those associated with a loss of accessibility within the corridor including increased delays traveling across the Missouri River. Lower levels of access to the Kansas City, Missouri CBD could lead to a decline in employment in this location and a shift of employment to areas outside the CBD. Short-term secondary impacts during construction could include a loss of accessibility to-and-from the north Kansas City area and the CBD leading to a possible minor short-term reduction in economic activity in the CBD. In addition, higher traffic volumes on M-9 and Armour Road may lead to a short-term increase in economic activity in the downtown area of North Kansas City. This increase in economic activity was reported to have occurred by the City of North Kansas City during the Paseo Bridge rehabilitation project in 2005.

Secondary impacts of the build alternatives are expected to be minimal. It is anticipated that the maintenance or improvement of accessibility to the CBD over time would help sustain the current level of employment or possibly support a small growth in employment and re-development of the CBD as an entertainment center.

V. Relationship of Local Short-Term Uses Versus Long-Term Productivity

All transportation projects require the investment or commitment of some resources found in the existing environment. Short-term refers to the immediate consequences of the project whereas long-term relates to its indirect or secondary effects on future generations.

1. NO-BUILD ALTERNATIVE

The No-Build Alternative would avoid the short-term and localized construction impacts. It would be continued maintenance of existing I-29/35. The projected traffic growth for the entire length of the project would further reduce the operation of the existing roadway, resulting in reduced traffic safety, mobility and the possible loss of economic growth opportunities.

2. BUILD ALTERNATIVES

The build strategies for the I-29/35 corridor would involve some minor short-term consequences. These minor consequences would involve items including: additional noise and air pollution from construction equipment; rerouting traffic; relocation of several businesses; removal of some private properties from tax rolls; and some conversion of woodland, wetland, floodplain and habitat to transportation use. An additional short-term consequence would be the inconvenience to residents, business owners, employees, and Missouri River traffic during construction.

Some of the long-term benefits that may be realized from the build strategies include: improved motorist safety, convenience and energy use; potential for new tax base; greater potential for area economic development because of improved transportation; enhanced industrial development and associated employment growth for the region and state; and improvement on the I-29/35 NAFTA Corridor. Also, there is the long-term potential for partnering with other resource agencies in providing joint development and enhancement opportunities within the I-29/35 corridor.

Improvements to the I-29/35 corridor are based on comprehensive transportation planning that considers the need for present and future traffic movement within the context of present and future land use development and the environment. The local short-term impacts and use of resources by the proposed improvements is consistent with the maintenance and enhancement of long-term productivity.

W. Irreversible and Irretrievable Commitment of Resources

1. NO-BUILD ALTERNATIVE

The money, time and transportation user hardship related to the anticipated higher rate of crashes associated with the No-Build Alternative would be irretrievable. The cost and time associated with the decreasing LOS for both auto and truck traffic would also result in irretrievable commitment of resources.

2. BUILD ALTERNATIVES

The impacts of each of the build alternatives are considered similar in magnitude. Land acquired for constructing or reconstructing the I-29/35 corridor is considered to be an irreversible commitment during the time the land is used for transportation purposes. Right-of-way requirements would convert land from commercial and natural environmental uses.

Large amounts of fossil fuels, labor and transportation construction materials such as steel, cement, aggregate and asphaltic material would be required to construct the build alternatives. Additionally, considerable labor and natural resources are used in fabricating and preparing construction materials. Those resources are generally non-retrievable, but their use would not have a substantial adverse effect on continued availability. Labor and funds are not retrievable, once spent; they are gone, regardless of magnitude.

The commitment of these resources is to a large part predicated on the basic concept that transportation systems contribute to health, safety and welfare of the local, county and state residents as well as those traveling from other parts of the country. The benefits such as improved access to businesses and community services, increased safety, reduced travel times and increased economic development are expected to outweigh the commitment of resources in the long term.

EVALUATION FACTORS	UNITS	PROJECT ALTERNATIVES	
		North Subcorridor (Armour Rd. to 14th Ave.)	
		No-Build	Build
ENGINEERING & TRAFFIC CONSIDERATIONS			
PROJECT COST			
Roadway Construction Cost Estimate ¹	\$ (Million)	\$22.5	\$51.1
River Bridge Construction Cost Estimate ¹	\$ (Million)	NA	NA
Right-of-Way and Relocation Cost ¹	\$ (Million)	NA	\$1.4
TOTAL PROJECT COST¹	\$ (Million)	\$22.5	\$52.5
30-Year Operations and Maintenance ¹	\$ (Million)	\$0.4	\$0.6
Unique Bridge Additional Cost	\$ (Million)	NA	NA
CONSTRUCTABILITY ISSUES			
Timing/Staging	Rating	○	●
Difficulty of Construction	Rating	○	●
Traffic Accommodation During Construction	Rating	○	●
Impacts to Adjacent Properties	Rating	○	●
RIVER BRIDGE MAINTENANCE	Rating	NA	NA
RIVER BRIDGE ENHANCEMENT OPPORTUNITY	Rating	NA	NA
RIVER BRIDGE TYPE OPTIONS	Rating	NA	NA
LEVEL OF SERVICE Mainline (2030)	Peak Hour LOS (AM / PM)	E / F	D / D
SAFETY²			
Crashes 2030 - (PDO)	Number	176	330
Crashes 2030 - (Injury)	Number	506	130
Crashes 2030 - (Fatal)	Number	0	0
Crashes 2030 - (Total)	Number	682	460
Crashes 2030 - (Rate)	Number (HMVMT)	246.1	121.6
SOCIAL CONSIDERATIONS			
TOTAL ACQUISITIONS			
Single-Family Residential	Dwelling Units	0	0
Multi-Family Residential	Dwelling Units	0	0
Business	Establishments	0	1
Public/Semi-Public Facilities ⁴	Buildings	0	0
PARTIAL ACQUISITIONS			
Single-Family Residential	Number	0	0
Multi-Family Residential	Number	0	1
Business	Number	0	6
Business	Buildings	0	0
Public/Semi-Public Facilities ⁴	Number	0	2
NEIGHBORHOOD/COMMUNITY COHESION	Rating	○	○
ECONOMIC CONSIDERATIONS			
ECONOMIC ACCESS ⁴	Rating	●	●

EVALUATION FACTORS	UNITS	PROJECT ALTERNATIVES	
		North Subcorridor (Armour Rd. to 14th Ave.)	
		No-Build	Build
ENVIRONMENTAL CONSIDERATIONS			
PARKLAND – Section 4(f)/6(f)	Number	0	0
Total Permanent Impacts	Acreage	0	0
RIVERFRONT HERITAGE TRAIL	Crossings	0	0
AIR QUALITY	CO	0	0
IMPACTED NOISE RECEPTORS	Dwelling Units	0	28
WATER RESOURCES			
Streams	Number	0	2
	Linear Feet	0	269
Wetlands	Acreage	0	0
Ponds	Acreage	0	0.56*
FLOODPLAINS	Linear Feet	0	1780
	Acreage	0	1.39
NATURAL COMMUNITIES			
Upland Forests	Acreage	0	0.04
Riparian Forests	Acreage	0	0.04
THREATENED & ENDANGERED SPECIES	Number	0	0
CULTURAL RESOURCES			
NRHP Listed Historic Properties - Adverse Effect	Number	0	0
NRHP Listed Historic Districts - Adverse Effect	Number	0	0
NRHP Eligible Architectural Resources - Adverse Effect	Number	0	0
NRHP Eligible Historic Districts - Adverse Effect	Number	0	0
NRHP Eligible Bridges - Adverse Effect	Number	0	0
Historic Archaeological Area of Interest - Adverse Effect	Number	0	0
HAZARDOUS WASTE SITES (Hi or Mod. Pot.)	Number	0	0
VISUAL QUALITY / AESTHETICS			
Views Of The Road ³	Rating	●	●
Views From The Road ³	Rating	●	●

Rating Scale: ○ Low Impact ● Low/Moderate Impact ● Moderate Impact ● Moderate/High Impact ● High Impact
 NOTE: Preferred Alternative shown as shaded.
 1 Assumes year 2005 dollars. Low End Cost Estimate = utilizing existing bridges at 16th Avenue, Bedford RR tracks, & Front Street RR tracks.
 2 Accident statistics and safety data summarized and presented in this table are protected under federal law. See Appendix A.
 3 Does not include public parks/recreation facilities subject to Section 4(f).
 4 Uses Impact Factors Rating Scale: ○ Strong Positive ● Positive ● Neutral ● Negative ● Strong Negative
 * Pond impacts relate to a non-jurisdictional pond.

Summary of Impacts - North Subcorridor

Summary of Impacts - River Crossing Subcorridor

EVALUATION FACTORS	UNITS	PROJECT ALTERNATIVES				
		River Crossing Subcorridor (16th Ave. to Dora St.)				
		No-Build	A	B-1	B-2	C
ENGINEERING & TRAFFIC CONSIDERATIONS						
PROJECT COST						
Roadway Construction Cost Estimate ¹	\$ (Million)	\$28.0	\$89.9	\$91.9	\$101.7	\$101.6
River Bridge Construction Cost Estimate ¹	\$ (Million)	\$9.5	\$49.1	\$54.4	\$54.4	\$54.4
Right-of-Way and Relocation Cost ¹	\$ (Million)	NA	\$3.8	\$3.8	\$4.1	\$8.4
TOTAL PROJECT COST¹	\$ (Million)	\$37.5	\$142.8	\$150.1	\$160.2	\$164.4
30-Year Operations and Maintenance	\$ (Million)	\$0.5	\$0.6	\$0.6	\$0.6	\$0.6
Unique Bridge Additional Cost	\$ (Million)	NA	\$14.1 to \$16.2	\$3.5 to \$39.5	\$3.5 to \$39.5	\$3.5 to \$39.5
CONSTRUCTABILITY ISSUES						
Timing/Staging	Rating		○	○	○	○
Difficulty of Construction	Rating		○	○	○	○
Traffic Accommodation During Construction	Rating		○	○	○	○
Impacts to Adjacent Properties	Rating		○	○	○	○
RIVER BRIDGE MAINTENANCE	Rating		○	○	○	○
RIVER BRIDGE ENHANCEMENT OPPORTUNITY	Rating		○	○	○	○
RIVER BRIDGE TYPE OPTIONS	Rating		○	○	○	○
LEVEL OF SERVICE Mainline (2030)	Peak Hour LOS (AM / PM)	F / F	D / D	D / D	D / D	D / D
SAFETY²						
Crashes 2030 - (PDO)	Number	272	365	399	399	399
Crashes 2030 - (Injury)	Number	837	212	155	155	155
Crashes 2030 - (Fatal)	Number	1	0	0	0	0
Crashes 2030 - (Total)	Number	1,110	577	554	554	554
Crashes 2030 - (Rate)	Number (HMVMT)	333.3	156.6	121.6	121.6	121.6
SOCIAL CONSIDERATIONS						
TOTAL ACQUISITIONS						
Single-Family Residential	Dwelling Units	0	0	0	0	0
Multi-Family Residential	Dwelling Units	0	0	0	0	0
Business	Establishments	0	0	0	0	0
Public/Semi-Public Facilities ⁴	Buildings	0	0	0	0	0
PARTIAL ACQUISITIONS						
Single-Family Residential	Number	0	0	0	0	0
Multi-Family Residential	Number	0	0	0	0	0
Business	Number	0	20	20	20	20
Business	Buildings	0	1	1	2	2
Public/Semi-Public Facilities ⁴	Number	0	7	7	6	6
NEIGHBORHOOD/COMMUNITY COHESION	Rating	○	○	○	○	○
ECONOMIC CONSIDERATIONS						
ECONOMIC ACCESS ⁴	Rating	○	○	○	○	○

EVALUATION FACTORS	UNITS	PROJECT ALTERNATIVES				
		River Crossing Subcorridor (16th Ave. to Dora St.)				
		No-Build	A	B-1	B-2	C
ENVIRONMENTAL CONSIDERATIONS						
PARKLAND - Section 4(f)/6(f)						
Total Permanent Impacts	Acres	0	0	0	0	0
RIVERFRONT HERITAGE TRAIL						
No. of Crossings		0	1	1	1	1
AIR QUALITY						
Exceedences		0	0	0	0	0
IMPACTED NOISE RECEPTORS						
Dwelling Units		0	0	0	0	0
WATER RESOURCES						
Streams	Number	0	1	1	1	1
Linear Feet		0	0	0	0	0
Wetlands						
Acres		0	0	0	0	0
Ponds						
Acres		0	0	0	0	0
FLOODPLAINS						
Linear Feet		0	120	120	370	370
Acres		0	0.2	0.2	0.49	0.49
NATURAL COMMUNITIES						
Upland Forests						
Acres		0	0	0	0	0
Riparian Forests						
Acres		0	0.6	0.6	0.6	1.25
THREATENED & ENDANGERED SPECIES						
Number		0	1	1	1	1
CULTURAL RESOURCES						
NRHP Listed Historic Properties - Adverse Effect						
Number		0	0	0	0	0
NRHP Listed Historic Districts - Adverse Effect						
Number		0	0	0	0	0
NRHP Eligible Architectural Resources - Adverse Effect						
Number		0	0	0	0	0
NRHP Eligible Historic Districts - Adverse Effect						
Number		0	0	1	1	1
NRHP Eligible Bridges - Adverse Effect						
Number		0	0	0	0	0
Historic Archaeological Area of Interest - Adverse Effect						
Number		0	0	0	0	0
HAZARDOUS WASTE SITES (Hi or Mod. Pot.)						
Number		0	1	1	2	2
VISUAL QUALITY / AESTHETICS						
Views Of The Road³						
Rating		○	○	○	○	○
Views From The Road³						
Rating		○	○	○	○	○

Rating Scale: ○ Low Impact ○ Low/Moderate Impact ○ Moderate Impact ○ Moderate/High Impact ○ High Impact

NOTE: Preferred Alternative shown as shaded. Alternative A or B is the Preferred Alternative for the River Crossing. This means that A, B-1 or B-2 could be selected.

1 Assumes year 2005 dollars. Low End Cost Estimate = utilizing existing bridges at 16th Avenue, Bedford RR tracks, & Front Street RR tracks.

2 Accident statistics and safety data summarized and presented in this table are protected under federal law. See Appendix A.

3 Does not include public parks/recreation facilities subject to Section 4(f).

4 Uses Impact Factors Rating Scale: ○ Strong Positive ○ Positive ○ Neutral ○ Negative ○ Strong Negative

Summary of Impacts - CBD North Loop Subcorridor

EVALUATION FACTORS	UNITS	PROJECT ALTERNATIVES		
		CBD North Loop Subcorridor (Dora St. to Broadway)		
		No-Build	A	B
ENGINEERING & TRAFFIC CONSIDERATIONS				
PROJECT COST				
Roadway Construction Cost Estimate ¹	\$ (Million)	\$40.2	\$44.6	\$75.1
River Bridge Construction Cost Estimate ¹	\$ (Million)	NA	NA	NA
Right-of-Way and Relocation Cost ¹	\$ (Million)	NA	\$1.0	\$1.0
TOTAL PROJECT COST¹	\$ (Million)	\$40.2	\$45.6	\$76.1
30-Year Operations and Maintenance Costs	\$ (Million)	\$0.4	\$0.5	\$0.5
Unique Bridge Additional Costs	\$ (Million)	NA	NA	NA
CONSTRUCTABILITY ISSUES				
Timing/Staging	Rating	○	◐	◑
Difficulty of Construction	Rating	○	◐	◑
Traffic Accommodation During Construction	Rating	◐	◑	◑
Impacts to Adjacent Properties	Rating	○	○	○
RIVER BRIDGE MAINTENANCE	Rating	NA	NA	NA
RIVER BRIDGE ENHANCEMENT OPPORTUNITY	Rating	NA	NA	NA
RIVER BRIDGE TYPE OPTIONS	Rating	NA	NA	NA
LEVEL OF SERVICE Mainline (2030)	Peak Hour LOS (AM / PM)	D / D	C / C	C / C
SAFETY²				
Crashes 2030 - (PDO)	Number	260	163	163
Crashes 2030 - (Injury)	Number	828	63	63
Crashes 2030 - (Fatal)	Number	1	0	0
Crashes 2030 - (Total)	Number	1,089	226	226
Crashes 2030 - (Rate)	Number (HMVMT)	577.5	121.6	121.6
SOCIAL CONSIDERATIONS				
TOTAL ACQUISITIONS				
Single-Family Residential	Dwelling Units	0	0	0
Multi-Family Residential	Dwelling Units	0	0	0
Business	Establishments	0	1	1
Public/Semi-Public Facilities ⁴	Buildings	0	0	0
PARTIAL ACQUISITIONS				
Single-Family Residential	Number	0	3	4
Multi-Family Residential	Number	0	0	0
Business	Number	0	4	4
Business	Buildings	0	0	0
Public/Semi-Public Facilities ⁴	Number	0	0	0
NEIGHBORHOOD/COMMUNITY COHESION	Rating	○	○	○
ECONOMIC CONSIDERATIONS				
ECONOMIC ACCESS ⁴	Rating	◐	◐	○

EVALUATION FACTORS	UNITS	PROJECT ALTERNATIVES		
		CBD North Loop Subcorridor (Dora St. to Broadway)		
		No-Build	A	B
ENVIRONMENTAL CONSIDERATIONS				
PARKLAND – Section 4(f)/6(f)	Number	0	0	0
Total Permanent Impacts	Acres	0	0	0
RIVERFRONT HERITAGE TRAIL	No. of Crossings	0	0	0
AIR QUALITY	CO Exceedences	0	0	0
IMPACTED NOISE RECEPTORS	Dwelling Units	0	78	78
WATER RESOURCES				
Streams	Number	0	0	0
	Linear Feet	0	0	0
Wetlands	Acreage	0	0	0
Ponds	Acreage	0	0	0
FLOODPLAINS	Linear Feet	0	0	0
	Acreage	0	0	0
NATURAL COMMUNITIES				
Upland Forests	Acreage	0	0	0
Riparian Forests	Acreage	0	0	0
THREATENED & ENDANGERED SPECIES				
CULTURAL RESOURCES				
NRHP Listed Historic Properties - Adverse Effect	Number	0	0	0
NRHP Listed Historic Districts - Adverse Effect	Number	0	0	0
NRHP Eligible Architectural Resources - Adverse Effect	Number	0	0	0
NRHP Eligible Historic Districts - Adverse Effect	Number	0	0	0
NRHP Eligible Bridges - Adverse Effect	Number	0	0	0
Historic Archaeological Area of Interest - Adverse Effect	Number	0	0	2
HAZARDOUS WASTE SITES (Hi or Mod. Pot.)	Number	0	0	0
VISUAL QUALITY / AESTHETICS				
Views Of The Road ³	Rating	◐	◑	○
Views From The Road ³	Rating	◐	○	○

Rating Scale: ○ Low Impact ◐ Low/Moderate Impact ◑ Moderate Impact ◑ Moderate/High Impact ◑ High Impact
 NOTE: Preferred Alternative shown as shaded.
 1 Assumes year 2005 dollars. Low End Cost Estimate = utilizing existing bridges at 16th Avenue, Bedford RR tracks, & Front Street RR tracks.
 2 Accident statistics and safety data summarized and presented in this table are protected under federal law. See Appendix A.
 3 Does not include public parks/recreation facilities subject to Section 4(f).
 4 Uses Impact Factors Rating Scale: ○ Strong Positive ◐ Positive ◑ Neutral ◑ Negative ◑ Strong Negative



LEGEND

- | | | |
|-------------------------|--------------------------------|-----------------------------------|
| Study Corridor | Existing Land Use | Vacant Non-Residential |
| City Limits | Single Family Residential | Heavy/General Industry |
| County Boundaries | Vacant Residential | Light Industry |
| Existing Right of Way | Condominium; Townhouse; Duplex | Public/Semi-Public/ Institutional |
| Proposed Lanes (A & B) | Multifamily (3 or more units) | Park |
| Neighborhoods | Office | Other Open Space |
| Potential Noise Barrier | Commercial (Non-Office) | Paved/Garage Parking |
| Noise Modeling Site | Hotel / Motel | Railroad |
| Noise Measurement Site | | Future Land Use |
| FS-1 | | Office Future LU Text |
| FS-2 | | |

Note: Only those potential noise barriers that are both feasible and reasonable are shown on this exhibit.

Note: Future land use is shown only where it differs from existing land use.

