



# Technical Memorandum: Environmental Investigations

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## Land Use

Land use data for the study corridor included land use data, correspondence with city planners, available comprehensive master plans and zoning information from the City of Jefferson. This information was supplemented with a review of aerial photography and windshield surveys.

### **a. Existing Land Use**

The study corridor is located in the heart of Jefferson City, Missouri. It is characteristically an urban environment with very little vacant or undeveloped land. The majority of the existing land uses within the study corridor can be separated into eight general categories: single-family residential, multi-family residential, commercial, industrial, institutional and public/semi-public, parks/recreation, parking areas and transportation. A discussion of land uses in the corridor follows.

#### *Single-Family Residential*

Single-family residential use includes single-family homes and does not include vacant properties. In Jefferson City, the single-family residences are primarily located on the south and east side of the city. Single-family residences are located along the corridor starting around Jackson Street and to the south and east along the corridor. A large portion of single-family residences is located just west of Lincoln University in the Old Munichburg neighborhood and beginning at Lafayette and continuing east.

#### *Multi-Family Residential*

Multi-family residential use includes condominiums, townhouses, duplexes and apartment complexes with three or more units. In Jefferson City, multi-family residential land use is scattered throughout the city. There is one public housing development within the study corridor at Elm and Chestnut. There are 50 units in the duplex or four-plex style buildings.

#### *Commercial*

Commercial land use includes office, commercial (non-office) and hotel/motel uses. In Jefferson City, the majority of commercial uses are focused along or near to Highway 50 and in the downtown area. In the study area the majority of the commercial uses are focused along Whitton, particularly in the western end of the corridor, including hotel, bank, office, etc. There is also a cluster of

commercial development at the far eastern end of the corridor near Eastland, consisting of office and retail.

### *Industrial*

Industrial use areas within the study corridor consist of light industrial. Industrial uses within the corridor are focused near Jefferson and Madison streets. These industrial properties include Coca-Cola and the Central Dairy.

### *Institutional and Public/Semi-Public*

Institutional uses within the study corridor include schools, churches, performing arts center and municipal/state/government facilities. Institutional uses are located throughout the study corridor. The public/semi-public portions in the corridor include three cemeteries.

### *Parks/Recreation*

Parks and recreation include public parks and recreation areas and other open space areas such as government/municipal building green space. Parks in the study corridor include East Miller Park which is located directly adjacent to Whitton at Chestnut and East Miller and Park Place located Pine Street and Olive Street just south of Park Avenue.

### *Parking Areas*

Parking areas near the study corridor consist of a few large pave areas at the intersection of High Street and Missouri Boulevard and several smaller parking areas scattered through downtown Jefferson City.

### *Transportation*

Transportation land use in the area consists primarily of major and arterial streets. Special transportation areas in Jefferson City include the Missouri Pacific Railroad and depot on the north side of the city near the Missouri River. These areas are outside of the study corridor.

## **b. Land Use Planning and Regulation**

The City of Jefferson adopted a Comprehensive Plan Update in March 1996. Contained in the update are a community analysis, goals and objectives and the development plan. The development plan looks at the proposed future land uses and major streets within the Jefferson City planning area. The Development Plan (the Plan) provides for nearly 11,000 acres for future urban growth. Recognizing that not all of this land is ideal for development due to terrain, floodplain, etc., assuming that half of this land would be unsuitable there is still more than double the projected requirement of 2,300 acres.

The City included three Sub-Area Plans in the Comprehensive Plan Update including the High/Chestnut Street Area, East McCarty Street Area and the downtown area. The goals and strategies for each sub-area are summarized as follows:

High/Chestnut Street Area – The plan deviates somewhat from the current zoning in this neighborhood. The Plan proposes the eventual transition to higher land uses, for instance from residential to commercial. In other cases, the Plan reflects the prevailing land use patten of medium density residential.

East McCarty Street Area – The Plan for this area reflects, for the most part, the current zoning district classifications. This area is generally outside of the Study Corridor.

Downtown – The Plan reflects the continuing use of this area as the hub of state government activity and the commercial/office center. The Plan proposes some expansion of commercial development into some areas currently occupied by residential uses. Improving the riverfront and linking it to downtown is also proposed by the Plan.

### **c. Agriculture/Prime Farmland**

There are no areas within the Study Corridor designated as having prime farmland soils. Therefore there are no areas subject to the Farmland Protection Policy Act.

### **d. Land Use Impacts**

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

#### *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.

#### *Mainline Build Alternatives*

All of the mainline build alternatives would have the same general impacts to existing land use patterns. Since all of these alternatives involve widening of the existing roadway, rather than a new alignment, the majority of improvements would occur within existing right-of-way. Regarding the areas within the study corridor and the areas adjacent to the corridor, there would be no anticipated major land use changes from those identified on the future land use plan as a result of implementing the proposed roadway.

#### *MSP Build Alternatives*

The MSP build alternatives, while realigning Clark Avenue are not expected to make major land use changes. The main purpose of these alternatives is to provide better access to planned development. These alternatives include mainly residential areas and this is not expected to change with the proposed improvements.

## **Social and Economic**

### **Social Characteristics**

Demographic and social characteristics were developed for this study based on the 2000 Census. The census data is presented in the tables for the Impact Area, Study Corridor, Study Area, the City of Jefferson, Cole County, and the state of Missouri. The Impact Area reflects those census blocks that are directly impacted by the Preferred Alternative. Because census block information is limited, study corridor-level data is not available for all types of demographic identifiers. The study corridor includes the census blocks that are adjacent to Whitton, as well as Lafayette Street and Clark Avenue. The study area is broader and includes the census block groups surrounding the study corridor.

## a. Demographic Data

### *Population*

Between 1990 and 2000 the state of Missouri, Cole County and Jefferson City all experienced growth from between nine and 11 percent. Each of the areas examined had a similar age distribution among the different populations. There is a pretty even distribution of male and female persons in all areas. In Missouri and the study corridor women hold the majority where the men hold the majority in the other areas.

**Table1: Study Area Population 1990 to 2000**

Population, Gender and Age	Missouri	Cole County	City of Jefferson	Study Area	Study Corridor
Total Population	5,595,211	71,397	39,636	10,052	2,193
Change from 1990	478,138	7,818	4,155	NA*	NA
% Change from 1990	9.3%	11.0%	10.5%	NA	NA
% Male	48.6%	51.4%	51.3%	55.4%	46.4%
% Female	51.4%	48.6%	48.7%	44.6%	53.6%
Under 20	1,587,834	19,344	9,524	2,412	670
% Under 20	28.4%	27.1%	24.0%	24.0%	30.6%
20-64	3,251,339	43,972	24,569	6,759	1,297
% 20-64	58.1%	61.6%	62.0%	67.2%	59.1%
Over 64	756,038	8,081	5,543	881	164
% Over 64	13.5%	11.3%	14.0%	8.8%	7.5%

Source: U.S.Census Bureau, Census 2000

\* Census block groups and blocks have changed since the 1990 census making the comparison inaccurate.

### *Education*

Data on educational attainment is shown in Table 2. The study area has the highest percentage, about 16 percent, of adults over 25 years in age with a 9<sup>th</sup> thru 12<sup>th</sup> grade education but no diploma. The rate for high school graduation or GED is nearly the same for Missouri, Cole County and the Study Area at about 32 percent. The Study Area has the highest percentage of persons over the age of 25 that did not attend college at about 53 percent. Jefferson City had the highest percentage of bachelors degrees at 20 percent where the Study Area had the lowest at 13 percent. Jefferson City also the highest percentage of persons over the age of 25 with graduate or professional degrees at almost 11 percent.

**Table 2: Study Area Educational Attainment**

<b>Educational Attainment - Persons over 25</b>	<b>Missouri</b>	<b>Cole County</b>	<b>City of Jefferson</b>	<b>Study Area</b>
Over 25 years of age	3,634,906	47,339	27,183	6,778
Less than 9th grade	237,618 (6.5%)	2762 (5.8%)	1464 (5.4%)	358 (5.3%)
9th thru 12th grade, no diploma	441,477 (12.1%)	4182 (8.8%)	2592 (9.5%)	1071 (15.8%)
High school grad or GED	1,189,670 (32.7%)	15144 (32.0%)	7468 (27.5%)	2179 (32.1%)
Did not attend college	1,868,765 (51.4%)	22088 (46.7%)	11524 (42.4%)	3608 (53.2%)
Some college, no degree	981,665 (27.0%)	12271 (25.9%)	7299 (26.9%)	1742 (25.7%)
Bachelors	507,892 (14.0%)	8639 (18.2%)	5429 (20.0%)	880 (13.0%)
Graduate or professional degree	276,584 (7.6%)	4341 (9.2%)	2931 (10.8%)	548 (8.1%)

Source: Missouri Census Data Center, Census 2000

### ***Minority Populations***

The percentage of non-white individuals is much higher in the study area and study corridor than in the city, county or state. Approximately 28 percent of the study area residents and 37 percent of study corridor residents are non-white. The range of minority population for the west alternatives is 22 to 31 percent, with the Parkway and Madison alternatives having the lowest percentage of minorities and the Viaduct being at the high end of the range. The east alternatives have minority populations ranging from 37 to 38 percent.

**Table 3: Study Area Minority Populations**

Racial Characteristics	Missouri	Cole County	City of Jefferson	Study Area	Study Corridor
Total 2000	5,595,211	71,397	39,636	10,052	2,139
White	4748083 (84.9%)	62158 (87.1%)	32303 (81.5%)	7276 (72.4%)	1376 (64.3%)
Black or african american	629391 (11.2%)	7084 (9.9%)	5828 (14.7%)	2316 (23.0%)	639 (29.9%)
American indian & alaskan native	25076 (0.4%)	239 (0.3%)	150 (0.4%)	46 (0.5%)	11 (0.5%)
Asian	61595 (1.1%)	625 (0.9%)	488 (1.2%)	73 (0.7%)	24 (1.1%)
Native hawaiian or other pacific islander	3178 (0.1%)	26 (0.0%)	20 (0.0%)	2 (0.0%)	0 (0.0%)
Other race	45827 (0.8%)	384 (0.5%)	246 (0.6%)	85 (0.8%)	20 (1.0%)
Two or more races	82061 (1.5%)	881 (1.2%)	601 (1.5%)	254 (2.5%)	69 (3.2%)
Hispanic or latino (of any race)	118592 (2.1%)	915 (1.6%)	616 (1.6%)	198 (2.0%)	68 (3.2%)
% minority (non-white)	16.2%	13.6%	19.3%	28.4%	37.2%

Source: U.S. Census Bureau, Census 2000

There are 14 blocks within the study corridor where more than 50 percent of the population is minority. One block is located at Jackson Street and McCarthy Street. Five of these blocks are located along Lafayette Street. One block is located at Riviera Street and Capitol Avenue. Six of the blocks are located along Elm Street between Lafayette Street and Clark Avenue. The final block is located on Dunklin between Madison and Monroe Streets.

## **b. Neighborhoods and Communities**

Neighborhoods and communities are described as self-contained areas where residents share common geographic identities and other ties or interests.

### *Old Munichburg*

Old Munichburg comprises approximately 14 blocks south of Whitton; west of Monroe and Poplar streets; north of Franklin Street and east of US 54 West. The neighborhood was settled by German immigrants in the Nineteenth Century. The northern portion of the community was removed when Whitton was originally constructed.

### *The Central East Side*

The neighborhood is bounded by the MSP site on the north; an area slightly east of Clark Avenue on the east; Whitton on the south and Adams Street on the west. The neighborhood has a mix of commercial, residential and public uses. A neighborhood planning study was conducted to provide guidance for the neighborhood's redevelopment. The neighborhood includes what was once the "Foot" neighborhood, a traditionally African-American neighborhood was centered around Lincoln University.

## **c. Impacts to Neighborhoods and Community Cohesion**

### *No-Build Alternative*

The No-Build alternative is not expected to impact existing neighborhoods in the study corridor.

### *Mainline Build Alternatives*

The mainline build alternatives would not sever or disrupt any existing established neighborhoods or communities. Whitton is an existing roadway and the Preferred Alternative will include widening on the current alignment and adding an interchange. The improvements to Whitton would not cause the current neighborhood configurations to change.

### *MSP Build Alternatives*

The additional interchange at Lafayette Street, while impacting some properties at the ramp locations would not affect the current layout of the street itself. The properties impacted are part of the Central East side neighborhood. The Lafayette interchange would require the closing of Elm Street at Lafayette.

The realignment of Clark Avenue would involve some property impacts but it would continue to be a city street and should not create a barrier within the Central East Side neighborhood. Access to the prison development is a goal of the neighborhood so the improvements on Clark would help to achieve that goal.

## **c. Housing Characteristics**

The housing characteristics of the study area are compared with the city, county and state characteristics in Table 4. The study area has the lowest percentage of occupied housing units at approximately 87 percent. The study area has the lowest percent of owner occupied units at 38 percent. The highest percent of owner occupied units is 70 percent for the state of Missouri. The study area also has the lowest average household size at 2.15 persons.

**Table 4: Study Area Housing Characteristics**

Housing Characteristics	Missouri	Cole County	City of Jefferson	Study Area
Total units	2,442,017	28,915	17,004	4,526
Total vacant units	247,423	1,874	1,197	593
Total occupied units	2,194,594	27,030	15,855	3,941
% occupied	89.9%	93.5%	93.2%	87.1%
Owner occupied	1,542,310	18,341	9,294	1,517
Renter occupied	652,284	8,699	6,521	2,424
Percent owner occupied	70.3%	67.8%	58.6%	38.5%
Avg household size	2.48	2.43	2.20	2.15
Avg family size	3.02	3.00	2.90	2.94
Median home value	\$89,900	\$97,200	\$98,700	\$46,900- \$133,000*
Median gross rent	\$484	\$441	\$434	\$256-\$513**

Source: Missouri Census Data Center, Census 2000

\* Range of Median Home Values

\*\* Range of Gross Rent

#### **d. Community Facilities and Services**

The community facilities and services located within the study corridor include public lands and facilities, municipal/government facilities, museums, community centers, schools, churches and public safety/emergency services. These are discussed below and are located on Exhibit III-5.

##### *Public Lands and Facilities [Sections 4(f), 6(f), UPARR]*

Publicly-owned parks, recreation facilities/areas (including some public school play areas), and wildlife and waterfowl refuges have special status under the provisions of Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966. [Historic resources also have special status under Section 4(f) but are discussed in a separate section of this chapter.] Before a transportation project is allowed to proceed with any encroachment on a Section 4(f) property, a specific evaluation must be conducted that tests all proposed alternatives. Before a Section 4(f) property can be used, an evaluation must lead to a finding that there is no feasible and prudent alternative to the taking of that park, recreation area or refuge, and that all possible planning to minimize harm to the resource has been undertaken. FHWA determines the applicability of Section 4(f) to the project under consideration.

During the early stages of this project, Section 4(f) parks and recreation facilities were mapped and identified as prime candidates for avoidance (there were no public school play areas or wildlife/waterfowl refuges within the study corridor). Avoidance is preferred unless such avoidance would have other, more extraordinary socio-economic, environmental or engineering consequences.

Early coordination with Jefferson City helped to identify the lands within the study corridor that are potentially Section 4(f) eligible.

The National Park Service (NPS) administers the Land and Water Conservation Fund [LWCF, known as Section 6(f) funds] for recreational land acquisition and development, and the Urban Park and Recreation Recovery (UPARR 1010) grants program for revitalization of park and recreation systems. In accordance with section 6(f) of the 1965 LWCF Act and UPARR Section 1010 program policies, a conversion of parkland (that has been the recipient of these funds) to other than public recreation use would require that the impacted parkland or facilities must be replaced with land or facilities of at least equal recreational utility and monetary value, and is subject to approval by the U.S. Department of the Interior (DOI). In addition, other funding sources that can apply to public lands were considered, including Community Development Block Grants (CDBG).

Some recreation areas or open space can be publicly owned as the result of “flood buyout” properties, which cannot be developed due to open space deed restrictions, which also prohibit the placement of fill for road construction or bridge abutments and piers.

The public lands and facilities within the study corridor that have the potential of being subject to the provisions of Section 4(f), 6(f) and/or UPARR are described below.

### **a. Public Parks and Recreation Facilities**

There are two public parks within the study corridor, owned by the City of Jefferson, which include: East Miller Park and Park Place. Both of these parks are 4(f) eligible, however, neither of them have been the recipient of Section 6(f) or UPARR funds.

East Miller Park is located north of Whitton, east of Chestnut Street and south of E. Miller Street. This park is 2.5 acres. Amenities include a fitness area, basketball court, playground, horseshoe pits and a parking lot.

Park Place park is two parcels located south of Park Avenue, east of Pine Street, west of Olive Street and separated by Center Street. There is a half-basketball court on the western end of the east portion. There is a playground on the west portion of the park.

There are two recreation areas within the study corridor that are not classified as city parks.

A running track and practice sports field is located just west of Simonsen 9th Grade Center on the northwest corner of Jackson and Miller Streets.

The Myrtle, Smith and Livingston Park is located at Lafayette and Elm Streets. The park includes three Lincoln University tennis courts. There is access to the existing Greenway trail from the park. The park is 4(f) eligible and the tennis courts were built using Land and Water Conservation Funds making them a 6(f) resource.

#### ***No-Build Alternative***

The No-Build Alternative would have any impacts on parks/recreation facilities in the study corridor.

#### ***Mainline Build Alternatives***

None of the mainline build alternatives would impact the parks/recreation facilities in the study corridor.

***MSP Build Alternatives***

Alternative A (Lafayette) – This alternative would have no park/recreation facilities impacts.

Alternative C (Clark Realignment) - The impact of the Clark realignment alternative is expected to be 0.1 acre. This is the amount of land that would be converted to a transportation use.

Alternative D (Lafayette Half Interchange and Clark Realignment) – This alternative is expected to be 0.08 acre that would be converted to a transportation use.

Alternative G (Lafayette Full Interchange and Clark Realignment)- This alternative is expected to be 0.08 acre that would be converted to a transportation use.

Alternative G is the Preferred Alternative and would impact a portion of Park Place. Park Place is a Section 4(f) resource so an evaluation has been completed and further discussion of this impact can be found in the Section 4(f) Evaluation.

**b. FEMA Buyout Properties**

There is one FEMA buyout property within the study corridor. The property is located in the eastern portion of the corridor north of Whitton and west of the Eastland Drive interchange. None of the Build Alternatives impact the FEMA buyout property discussed above.

**c. Pedestrian/Bicycle Facilities**

A major consideration in highway planning and design is the interaction among motorists, pedestrians and bicyclists. The pedestrian/bicycle facilities located within the study corridor include sidewalks on side streets, off-street pedestrian/bicycle trails, and existing, planned and proposed on-street and off-street bicycle routes.

In 2007, the Jefferson City Area Greenway Master Plan was developed. At the time the Plan was written, 8.7 miles of multi-purpose trails had been completed. One piece of these existing trails run through the study corridor.

The East Branch runs from Elm Street to McCarty Street and follows a channelized portion of Wears Creek. The trail runs underneath Whitton and runs north to McCarty Street. In addition to general bicycle and pedestrian use, the trail is used as an educational/fitness resource for Lincoln University. The trail is intended, in part, to help eliminate the perceived barrier between the neighborhoods and parks on opposite sides of Whitton. The trail is a 4(f) resource.

There are other planned and existing portions of the Greenway Trail, however, none of these are located within the Study Corridor.

***No-Build Alternative***

The No-Build Alternative would have any impacts on the Greenway Trail running through the study corridor.

***Mainline Build Alternatives***

None of the improvements associated with mainline build alternatives would impact the Greenway Trail facilities as these improvements are west of the crossing.

### ***MSP Build Alternatives***

Alternative A (Lafayette) – This alternative would have temporary impacts on the East Branch of the Greenway Trail during construction. The Trail would need to be closed during construction of the Lafayette interchange but could be reopened later following completion of the project.

Alternative C (Clark Realignment) - This alternative would not have any impacts on the East Branch of the Greenway Trail.

Alternative D (Lafayette Half Interchange and Clark Realignment) – This alternative would have temporary impacts on the East Branch of the Greenway Trail during construction. The Trail would need to be closed during construction of the Lafayette interchange but could be reopened later following completion of the project.

Alternative G (Lafayette Full Interchange and Clark Realignment)- This alternative would have temporary impacts on the East Branch of the Greenway Trail during construction. The Trail would need to be closed during construction of the Lafayette interchange but could be reopened later following completion of the project.

Alternative G is the Preferred Alternative and would temporarily impact the East Branch of the Greenway Trail. The East Branch is a Section 4(f) resource so an evaluation has been completed and further discussion of this impact can be found in the Section 4(f) Evaluation.

### **d. Schools**

The following two schools are located within the study corridor: The Simonsen Ninth Grade Center is located at 501 E Miller St. This school is a 9th grade only school. The Immaculate Conception School is located at 1208 McCarthy St. this school is a private school teaching kindergarten through 8th grade.

None of the Build Alternatives impact the schools within the study corridor.

### **e. Churches**

The following five churches and three cemeteries are located within the study corridor: The churches are; Second Baptist Church, located at 427 Monroe St., the Immaculate Conception Church, located at 1208 McCarthy St., the Quinn Chapel AME Church, located at 529 Lafayette St., the Zion Church of America, located at 728 E Miller St., the First Baptist Church, located at 301 Capitol Dr., the First United Methodist Church, located at 201 Monroe St., and the First Church of Christ Scientist, located at 415 Monroe St.

### ***No-Build Alternative***

The No-Build Alternative would not have impacts on any of the churches within the study corridor.

### ***Mainline Build Alternatives***

None of the improvements associated with mainline build alternatives would impact churches within the study corridor.

### ***MSP Build Alternatives***

Alternative A (Lafayette) – This alternative would impact the Quinn Chapel AME Church, located at 529 Lafayette Street.

Alternative C (Clark Realignment) - This alternative would impact a small portion of the Immaculate Conception Church property at the south west corner of the property.

Alternative D (Lafayette Half Interchange and Clark Realignment) – This alternative would impact a small portion of the Immaculate Conception Church property at the south west corner of the property.

Alternative G (Lafayette Full Interchange and Clark Realignment)- This alternative would impact the Quinn Chapel AME Church, located at 529 Lafayette Street. There would be an impact to a small portion of the Immaculate Conception Church property at the south west corner of the property.

## **f. Cemeteries**

There following three Cemeteries located within the study corridor are as follows: Fairview and Woodland Cemeteries are local cemeteries. The third cemetery is the National Cemetery. Fairview cemetery is located on the southeast corner of Chestnut and McCarthy St. Woodland cemetery is located on the east side of Fairview and the National Cemetery is located on the east side of Woodland. All three cemeteries are collectively one block long and one block wide located between Chestnut and Locust St. and McCarthy and Miller St.

### ***No-Build Alternative***

The No-Build Alternative would not have impacts on any of the cemeteries in the study corridor.

### ***Mainline Build Alternatives***

None of the improvements associated with mainline build alternatives would impact the cemeteries in the study corridor.

### ***MSP Build Alternatives***

None of the improvements associated with MSP build alternatives would impact the cemeteries in the study corridor.

## **g. Municipal/Government Facilities**

There is one of these facilities located within the study corridor as follows: The Etta and Joseph Miller Performing Arts Center is located at 501 Madison Street. The Center houses a theater, the Railton Art Gallery, the Jefferson City Academic Center and the Jefferson City School District's Adult Education programs. The Center is owned and operated by the Jefferson City Public School District.

### ***No-Build Alternative***

The No-Build Alternative would not have impacts on the Performing Arts Center.

### ***Mainline Build Alternatives***

Alternative 4 (Viaduct) – This alternative would not impact the Performing Arts Center.

Alternative 5 (Parkway) - This alternative would not impact the Performing Arts Center.

Alternative 6 (Madison Overpass) – This alternative would not require the acquisition of any property from the Performing Arts Center, however, a retaining wall would be placed at what is

currently the front entrance and drive for the center. This would eliminate access to the Center's front drive and parking from Madison.

#### *MSP Build Alternatives*

None of the improvements associated with MSP alternatives would impact the Performing Arts Center.

### **h. Public Safety and Emergency Services**

There is one of these facilities located within the study corridor as follows: The Jefferson City Police Department is located at 401 Monroe Street.

None of the Build Alternatives impact the police department.

## **Right of Way Acquisition**

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) and partial acquisition (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.

### **a. 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 the DEIS. The number of impacts could be reduced or increased as design details are developed.

#### *No-Build Alternative*

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

#### *Mainline Build Alternatives*

Alternative 4 (Viaduct) – There are no residential displacements with this alternative.

Alternative 5 (Parkway) - There would be one total displacement of a multi-family unit located at 601 Madison Street.

Alternative 6 (Madison Overpass) – There are two residential displacements with this alternative. These homes are located at the southeast corner of the intersection of Whitton Expressway and Madison Street.

#### *MSP Build Alternatives*

Alternative A (Lafayette) – This alternative would require the partial acquisition of nine single-family residences and the total acquisition of ten additional single-family residences. Most of the partial acquisitions consist of impacts to the rear yards of these homes. One partial impact is located at Lafayette Street and Capitol Avenue and would impact the side yard.

There are two multi-family properties that would be totally acquired due to the widening of Lafayette Street. One is located at Lafayette Street and School and the other is located at Lafayette and McCarty.

Alternative C (Clark Realignment) - This alternative would require the total acquisition of 20 single-family residences along the Clark realignment between Miller Street and Capitol Avenue. There are three properties that would experience the partial acquisition of a portion of the rear yard. All these properties are located on McCarty Street.

There would be partial acquisitions of two multi-family properties. One is a parcel at Chestnut and Elm along Whitton and the other is located between Capitol Avenue and Riviera Street.

Alternative D (Lafayette Half Interchange and Clark Realignment) – This alternative would require the total acquisition of 21 single-family residences. These impacts are mainly located at Lafayette and Miller Street and the properties from above that are impacted by the Clark realignment. There are eight partial acquisitions that include the taking of some rear yards of three properties along Miller Street and small portions of the front yards of two homes along Lafayette Street. The property at Clark Avenue and McCarty Street would also experience a partial acquisition of the rear yard. The two properties on McCarty would have portions of their front yards acquired.

There is one total acquisition of the multi-family property at Lafayette Street and School and three partial acquisitions of multi-family properties. Two of these partial acquisitions are areas between Whitton and Elm Street. The third is the property at Capitol Avenue and Riviera Street.

Alternative G (Lafayette Full Interchange and Clark Realignment)- This alternative would impact all of the properties listed above for the Lafayette Half Interchange and Clark Realignment. There are some additional acquisitions due to the impacts of the full interchange.

There would be one additional single-family total acquisition. The property at Lafayette and Miller Streets that was a partial acquisition with the half interchange, now becomes a total acquisition. There are five single-family properties along Miller Street, to the east of Lafayette, that will lose portions of their rear yards due to partial acquisitions.

There is one additional, partial multi-family acquisition along Whitton and Elm Street due to the addition of the ramp.

## **b. 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 is 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 tenant who has occupied a displacement dwelling 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.

### **c. Availability of Housing**

The single-family residences that would be acquired by the project alternatives range in value from 18,000 to 82,000 according to the City's parcel database. An internet real estate search (performed May 15, 2008) of available residential properties in the Jefferson City area indicated that, at the time, there were 84 residential properties on the market from \$25,000 to \$75,000; 135 from \$75,000 to \$125,000 and 293 from \$125,000 and up.

### **d. 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. The total acquisitions would result in displacement of would result in displacement of structures and the partial acquisitions would generally impact parking lots, access points, open/yard areas.

#### *No-Build Alternative*

The No-Build Alternative would not have impacts on the Performing Arts Center.

#### *Mainline Build Alternatives*

Alternative 4 (Viaduct) – This alternative would require the total acquisition of the Noble Hairstyling Salon at 514 Jefferson Street. There would be a partial acquisition of a vacant commercial lot at Missouri Boulevard and Whitton.

A total of seven parking areas would experience partial displacements. All of these areas are adjacent to Whitton. Approximately 80 spaces would be impacted in all seven areas. These parking areas include those for the Capitol Plaza hotel and St. Mary's Medical.

Alternative 5 (Parkway) - This alternative would have one partial displacement of the vacant commercial lot at Missouri Boulevard and Whitton. There is another partial displacement of the Noble Hairstyling Salon parcel adjacent to Whitton. This would affect a portion of the rear lot.

Impacts to parking areas would be the same as with the Viaduct alternative.

Alternative 6 (Madison Overpass) – There are three partial displacements with this alternative. The vacant lot and Noble parcel are impacted as stated above. There is one additional partial displacement at the southwest and northeast corners of the Central Bank property. The access to Central Bank will also change. The access to the parking from Madison Street will not be maintained. There will be a retaining wall along most of the east side of the property as the Madison Overpass comes back to grade. Visitors however, are still allowed to enter the parking lot from Miller Street. Central Court will become a dead end at Madison so those exiting from the drive-through area will have to turn right onto Central Court and then right again on Jefferson Street.

The parking area impacts are the same as those discussed above.

### ***MSP Build Alternatives***

Alternative A (Lafayette) – This alternative would have nine total commercial displacements due to the new Lafayette interchange and the widening of Lafayette Street to the MSP site. The first is located at 609 E. Elm and is the location of Johnson’s Barber and Beauty Shop. The second is a doctor’s office located at 500 Lafayette. A two part commercial property located at Lafayette and McCarty Streets is partially vacant. The other portion of the property includes Express Signs and Banners. The following four properties are situated at the corners of Lafayette and High Streets. Whaley’s East End Drugs, which is located at 630 High Street would be displaced along with A-1 Mobile Lock and Key at 301 Lafayette Street. Across High Street are Medical Offices at 701 E. High Street and Bertha’s Sewing Center at 633 E. High Street. Both of these properties will be displaced as well.

There are two partial commercial displacements with this alternative. The side yard of the Capitol Center Law Offices property at 700 Capitol Avenue would be acquired. The Boys and Girls Club property at 727 E. Elm would experience a partial acquisition of its property at the rear of the building adjacent to the new ramps.

Alternative D (Lafayette Half Interchange and Clark Realignment) – This alternative would have four total commercial displacements. The first is located at 609 E. Elm and is the location of Johnson’s Barber and Beauty Shop. The second is a doctor’s office located at 500 Lafayette. Both of these properties are impacted by the addition of the half interchange at Lafayette Street. The other two displacements are a result of the improvements at Clark Avenue and are listed above.

Alternative G (Lafayette Full Interchange and Clark Realignment)- This alternative would have the same total commercial displacements as those listed for the Lafayette Half Interchange and Clark Realignment. There is an additional impact from the addition of the eastern half of the Lafayette interchange. The Boys and Girls Club property at 727 E. Elm would experience a partial acquisition of its property at the rear of the building adjacent to the new ramps.

### **e. Availability of Commercial Property**

There is a wide variety of commercial property available in the Jefferson City area. The displaced commercial properties range in size. The structures have been there for many years and are in variable condition from poor to average.

There is significant development of new commercial space at the MSP site. Additionally there is vacant land and property in the study area. One listing showed 10 properties ranging in size from 1,000 square feet to 13,000 square feet.

## **Economic Characteristics**

### **a. Employment**

The number of persons employed in an area provides a direct measure of economic activity. Employment in higher paying jobs will provide economic stimulus. The educational, health and social services employment category has the highest percentage for the state of Missouri and the study area. The highest ranking category in Cole County and Jefferson City is public administration. This is understandable as Jefferson City is the state capitol and many state and federal agencies have offices in this location. Educational, health and social services have the second highest percentage of employed persons for Cole County and Jefferson City. The industry with the lowest number of employees across all of the areas is agriculture, forestry, fishing and hunting, and mining. This is not surprising considering the urban nature of most of the areas.

**Table 5: Study Area Employment**

<b>Employment Characteristics by Industry</b>	<b>Missouri</b>	<b>Cole County</b>	<b>City of Jefferson</b>	<b>Study Area</b>
employed person in CLF (civilian labor force)	2,806,718	36,120	18,981	4,405
Agriculture, forestry, fishing and hunting, and mining	58,415	404	97	13
construction	182,858	2,513	923	264
employed in manufacturing	393,440	2,888	1,351	421
wholesale trade	97,021	1,096	456	112
employed in retail trade	315,872	3,492	1,864	437
transportation and warehousing, and utilities	150,641	1,259	598	86
Information	80,623	879	492	191
Finance, insurance, real estate, and rental and leasing	177,651	2,128	1,174	186
professional, scientific, management, administrative, and waste management services	198,547	2,293	1,389	328
educational, health and social services	541,715	6,500	3,681	864
arts, entertainment, recreation, accommodation and food services	206,295	2,063	1,196	468
Other services (except public admin)	132,940	1,777	1,010	198
Public Administration	121,906	8,828	4,750	837

Source: U.S. Census Bureau, Census 2000.

The major employers in Jefferson City include the Missouri state government. Scholastic, Inc., Capital Region medical Center, St. Mary's Health Center and Jefferson City Public Schools each employ more than 1,000 individuals.

## **b. Local Sales and Use Tax Collections**

Another measure of economic activity is the amount of sales and use tax collections. Sales and use taxes are a substantial part of the local economy and their amount directly impacts revenues for local governments. The general trend in local sales tax collections data for Jefferson City and Cole shows a decrease in local sales and use tax receipts for both the city and the county since 2000.

### c. Income and Poverty

Table 6 identifies income and poverty characteristics. Of the state, county and city levels, the state has the lowest median household income at \$38,934. The Study Area has a range of median household income from \$12,800 - \$58,897. Cole County had the highest median household income at \$42,924 and the lowest number of persons below poverty level at eight percent. The study area has the highest percentage of persons below the poverty level at over 18 percent.

**Table 6: Study Area Income and Poverty**

Income and Poverty	Missouri	Cole County	City of Jefferson	Study Area
Total population	5,595,211	71,397	39,521	10,169
Median household income	\$38,934	\$42,924	\$39,628	\$12,800-\$58,897
Per capita income	\$19,936	\$20,739	\$21,268	\$7,196-\$23,667
Number of persons below poverty level	637,891	5,709	4,000	1,893
% of persons below poverty level	11.7%	8.0%	10.1%	18.6%

Source: Missouri Census Data Center, Census 2000

## Environmental Justice and Title VI Considerations

### a. Information Gathering

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, block groups and blocks. Block data is available for the Whitton study corridor and was employed to illustrate any impacts in regard to race, ethnicity and income considerations. The impact area includes those blocks that will be impacted by the Preferred Alternative. The composition of minority population in the area is illustrated and defined by those blocks between 51 and 75 percent minority population and those with between 76 and 100 percent of the Census block's residents being a minority.

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

The study team evaluated the project for local effects. Local effects include impacts to low-income and/or minorities living adjacent or near the project area. The Year 2000 Census block data was utilized to better understand the general socio-economic situation of the area's residents and identify minority populations. As discussed above, block group and block data for minorities was available for the Whitton Expressway Corridor and the neighborhoods impacted by the Prison Access Alternatives. Due to data limitations, the lowest level of low-income information available was for block groups. Based on the data, approximately 19 percent of the study area population lived below

the poverty level While the overall study area has a 37 percent minority population, the areas of actual impacts (right of way acquisition and/or construction) have a slightly higher minority population concentration. At the Lafayette interchange area, the minority population is at 75 – 100 percent and 50 – 75 percent in the census blocks to be directly impacted. The Clark extension includes two census blocks with minority populations of 75 – 100 percent.

When the census data is reviewed, it is shown that of the total population living on the census blocks impacted by the western alternatives, 22 to 31 percent are minority individuals. With the average minority percentage for those blocks ranging from 7 to 14 percent. Out of the total population, the percentage of minorities that live on blocks impacted by the eastern alternatives is between 37 and 38 percent. The average percentage of minorities living on those blocks is between 38 and 42 percent. No Limited English Proficiency populations were identified within the study area.

## **b. Environmental Justice and Title VI Impacts**

The demographic data, field investigations, community contacts, media and public involvement program provided information on special populations within the study corridor.

### *No-Build Alternative*

The No-Build Alternative would not have impacts on any of the churches within the study corridor.

### *Mainline Build Alternatives*

There are no residential acquisitions along the section of Whitton from Bolivar Street to Jackson Street. Improvements in this section will result in impacts to some commercial properties and parking.

### *MSP Build Alternatives*

The households in the study corridor between Lafayette Street and Clark Avenue have more diverse population characteristics than other areas along the corridor. Census data shows that there are several blocks within the study corridor where minorities make up over half of the population. These include six blocks bordering Lafayette Street between Elm Street and High Street. The preferred alternative would impact four single-family homes and one multi-family property within those six blocks. There will also be a total acquisition of Quinn Chapel AME Church which is located at Elm and Lafayette Streets.

There are an additional six blocks where minorities make up over 50 percent of the population along Elm Street between Cherry Street and Clark Avenue. Three of these blocks include the Jefferson City's public housing development. There are no residential impacts to any of these six blocks. There will only be small partial acquisitions right along Whitton.

There is one block, located at Capitol Avenue and Riviera Street, with over 76 percent minority population. This triangular shaped block includes a multi-family property with four building units. Impacts are expected to include two of the four units.

It is difficult to tell what the impacts to low-income populations will be since the data cannot be gathered at a low enough level to identify blocks where this is a specific issue. On the whole the block groups containing the areas where residential impacts are anticipated have between 37 and 41 percent of the population living below the poverty level.

As part of the public and stakeholder meetings that have taken place, the neighborhoods have been involved in discussions to help identify opportunities for further communication with any special population. Opportunities for project input were provided in numerous ways. The concerns that have been heard from residents include property impacts, impacts to cultural resources and traffic on residential streets. Quinn Chapel has expressed concerns about acquisition and relocation since their parish population lives within a couple of miles of the church.

Access will be added in the corridor to include a full interchange at Lafayette Street. The access is intended to provide better connectivity to the MSP site development and Lincoln University and Jefferson City High School.

The impacts that will occur with the various project alternatives are based on roadway layout and additional right-of-way required for each of those alternatives. During the course of the Whitton Expressway EIS process, there was a concerted effort to minimize residential and commercial displacements and to minimize other impacts to adjacent neighborhoods as discussed above. The project will have impacts of a similar nature regardless of the alternative chosen. The minority and low-income populations are similar for each of the alternatives.

The actual impacts (right of way acquisition and construction) of the project have the potential to impact a population that includes 38 percent minority individuals and take an historic district associated with the historical African American Foot neighborhood. The original construction of Rex Whitton divided the Foot Neighborhood to the north and south of the alignment. These factors have led FHWA to determine that the project has a disproportionately high and adverse effect on minority and low-income populations. FHWA also has acknowledged that due to the nature of this project and its location, other than selecting the No-Build Alternative, there was no possibility of avoiding disproportionately high and adverse effects on minority and low-income populations.

MoDOT and FHWA have looked at opportunities to minimize impacts to the minority populations by evaluating alternate interchange designs at the Lafayette Street location. In the future as the project moves into the design phase, MoDOT and FHWA will look at ways to continue to reduce right of way acquisition.

MoDOT and FHWA will take the following steps, once the project has received funding, to mitigate impacts to minority populations through:

- 1) Expanded assistance in the relocation of any businesses within the project boundaries. MoDOT will assist displaced businesses in the search for a comparable business location.
- 2) MoDOT will work beyond the Uniform Act in assisting relocated residential tenants to become homeowners, as desired, by providing educational sources of information for preparing to become a homeowner.
- 3) MoDOT will work with the community to determine aesthetically pleasing treatments to retaining walls, bridge wings and bridge facings.
- 4) MoDOT will be conducting additional research and providing context on the historical African American community in relation to the Lincoln University President's Home property and the Craftsman/Monastery Historic District per the Memorandum of Agreement signed by MoDOT, FHWA and the Missouri State Historic Preservation Office. The final product will be a report that will be made available to SHPO, Lincoln University and the Missouri River Regional Library. Additional copies shall be provided to the appropriate local historical societies and retained by MoDOT. MoDOT will prepare a pamphlet and presentation based on the Architectural and

Archaeological surveys and the report prepared above. These materials can be used by Lincoln University, the Cole County Historical Society, other local organizations and residents in order to preserve and share the history of the area.

5) MoDOT will incorporate an OJT (On the Job Training) program into the construction contract for this project, with a concentration on prompting OJT for African Americans within the project area.

### **c. 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.

### **d. Summary**

The impacts that will occur with the various project alternatives are based on roadway layout and additional right-of-way required for each of those alternatives. During the course of the Whitton Expressway EIS process, there was a concerted effort to minimize residential and commercial displacements and to minimize other impacts to adjacent neighborhoods as discussed above. The project will have impacts of a similar nature regardless of the alternative chosen. The minority and low-income populations are similar for each of the alternatives. The study team did not find disproportionately high adverse impacts on minority or low-income populations based on the Whitton Expressway alternatives.

## **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 Whitton study corridor is home to many of the commercial and government centers within Jefferson City. The Whitton project would have a positive impact on the future development of these commercial and government centers. Development plans for the MSP site are expected to provide for future growth and enhancements to this part of Jefferson City. Efficient and safe highway travel and access to these centers would be critical for current and future developments. Bicycle and pedestrian access is also important to the development of the neighborhoods and businesses and would help eliminate barriers.

## **Air**

The Federal Clean Air Act Amendments (CAAA) of 1970 required the adoption of air quality standards. These were established to protect public health, safety and welfare from known or anticipated effects of sulfur dioxide (SO<sub>2</sub>), particulates (PM<sub>10</sub>, 10 microns and smaller; PM<sub>2.5</sub>, 2.5 microns and smaller), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), and lead (Pb).

In addition to these pollutants, the State of Missouri has established additional criteria for hydrogen sulfide (H<sub>2</sub>S) and sulfuric acid (H<sub>2</sub>SO<sub>4</sub>). The Missouri and National Ambient Air Quality Standards (NAAQS) for these pollutants are listed in Table 7.

**Table 7: Missouri and National Ambient Air Quality Standards**

Pollutant	Primary Stds.	Averaging Times	Secondary Stds.
Carbon Monoxide	9 ppm (10 mg/m <sup>3</sup> )	8-hour(1)	None
	35 ppm (40 mg/m <sup>3</sup> )	1-hour(1)	None
Lead	1.5 µg/m <sup>3</sup>	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m <sup>3</sup> )	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM <sub>10</sub> )	Revoked(2)	Annual(2) (Arith. Mean)	Revoked(2)
	150 µg/m <sup>3</sup>	24-hour(3)	Same as Primary
Particulate Matter (PM <sub>2.5</sub> )	15.0 µg/m <sup>3</sup>	Annual(4) (Arith. Mean)	Same as Primary
	35 µg/m <sup>3</sup>	24-hour(5)	Same as Primary
Ozone	0.08 ppm	8-hour(6)	Same as Primary
	0.12 ppm	1-hour(7) (Applies only in limited areas)	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arith. Mean)	-----
	0.14 ppm	24-hour(1)	-----
	-----	3-hour(1)	0.5 ppm (1300 µg/m <sup>3</sup> )
Hydrogen Sulfide (H <sub>2</sub> S)(8)	70 µg/m <sup>3</sup> (0.05 ppm)	One-half Hour(9)	
	42 µg/m <sup>3</sup> (0.03 ppm)	One-half Hour(10)	
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )(8)	10 µg/m <sup>3</sup>	Twenty-four Hour(11)	
	30 µg/m <sup>3</sup>	One Hour(12)	

(1) Not to be exceeded more than once per year.

(2) Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM<sub>10</sub> standard in 2006 (effective December 17, 2006).

(3) Not to be exceeded more than once per year on average over 3 years.

(4) To attain this standard, the 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m<sup>3</sup>.

(5) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m<sup>3</sup> (effective December 17, 2006).

(6) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(7) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

(8) Missouri Air Quality Standards.

(9) Not to be exceeded more than twice per year.

(10) Not to be exceeded more than twice in any five consecutive days.

(11) Not to be exceeded more than once in any ninety consecutive days.

(12) Not to be exceeded more than once in any two consecutive days.

Source: <http://www.epa.gov/air/criteria.html>, last updated on Friday, February 8, 2008 and Missouri 10 CSR 10 – 6.010 Ambient Air Quality.

The CAAA of 1977 required all states to submit to the U.S. Environmental Protection Agency (EPA) a list identifying those air quality control regions, or portions thereof, which meet or exceed the NAAQS or cannot be classified because of insufficient data. Portions of air quality control regions that are shown, by monitored data or air quality modeling, to exceed the NAAQS for any criteria pollutant are designated "non-attainment" areas for that pollutant.

The 1990 CAAA established procedures for determining the conformity of state implementation plans with the requirements of the federal regulations. These procedures are published in 40 CFR Parts 51 and 93.

The Whitton project is located in Jefferson City, Missouri which is located in Cole County. The study area is in Air Quality Control Region 137. This AQCR is currently in attainment status for all criteria pollutants.

The purpose of this project is to address capacity, traffic operations and safety on Whitton and provide a more direct access from Whitton to the MSP development site. The mainline build alternatives for Whitton either completely grade separate the facility or provide an overpass at Madison Street which would eliminate one of the existing signals along the expressway. Any of these improvements would increase safety and reduce emissions created by idling vehicles.

The MSP alternatives use one of two city streets either alone, or in combination with one another to provide a more direct access to the MSP site. This access will eliminate the need for most individuals trying to get to the MSP site in taking a variety of city streets to make their way to this location.

The improvements themselves will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the no-build alternative. MDNR has written a letter dated March 13, 2008, that states "The construction-related activities associated with this project should not significantly affect local or regional air quality." This project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special Mobile Source Air Toxics (MSAT) concerns. Consequently, this effort is exempt from analysis for MSATs.

## Noise

### a. 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 Policy<sup>1</sup>, 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 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 8. The noise level descriptor used is the equivalent sound level, Leq(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.

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<sup>1</sup> Traffic Noise Policy, Missouri Department of Transportation, MoDOT Preliminary Studies Group, Environmental Section, September 1997.

**Table 8: Noise Abatement Criteria hourly A-Weighted Sound Level-Decibels (dBA)**

Activity Category	Leq(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 April 2005  
MoDOT Traffic Noise Policy, September 1997

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

MoDOT has defined the NAC approach or exceed criteria for Activity Category “B” as being equal to or greater than 66 dBA Leq(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 Leq(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 will usually be necessary only where frequent human use occurs and lower noise level would be of benefit”.

## b. Traffic Noise Modeling

The FHWA Traffic Noise Model, (TNM® 2.5)<sup>2</sup> was used to model design year 2035 Leq noise levels. Existing noise levels were developed from field measurements. 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”<sup>3</sup>. The following parameters were used in this model to calculate an hourly Leq(h) at a specific receiver location:

- Distance between roadway and receiver;

<sup>2</sup> 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.

<sup>3</sup> 23 CFR, Section 772.17(b).

## Environmental Investigations

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

Eighty-one (81) representative receiver locations, labeled N1 through N73, FS-1 through FS-4, and FS-10 through FS-13, were selected to illustrate the noise impacts adjacent to the proposed project. Based on MoDOT's Traffic Noise Policy the traffic noise analysis was conducted for both developed and undeveloped lands. The undeveloped lands are lands for which development has been planned, designed and programmed. Receiver locations selected included residences; apartments; schools, churches, hotels, the Capital City Boys and Girls Club; parks, and commercial buildings.

Future 2035 design hour traffic data were used to model the design year  $Leq(h)$  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.

Existing design year  $Leq(h)$  noise levels within the project study area ranged from 45 to 73 dBA  $Leq(h)$ . The results of the peak hour traffic noise modeling are presented in Table 2.

Future design hour noise levels would exceed the NAC at 20 of the 81 representative receptors as shown in Table 2. These receptors represent 9 residences, 19 apartments, 1 school, 1 church, the Capital City Boys and Girls Club; 1 park, and 1 commercial building. Future  $Leq(h)$  noise levels at these receptors would range from 66 to 73 dBA. The increase in noise levels at these locations would range from 1 to 13 decibels. None of the receptors would be exposed to a substantial noise increase.

**Table 9: Design Hour Noise Levels, dBA Leq(h)**

Receiver I.D.(1)	Land Use(2)	# of Units	NAC Category	Noise Level, dBA Leq(h)			2035 dB Increase over Existing	Impact(3)
				NAC Level	Existing	2035 Build without Noise Walls		
N1	Com.	4	C	71	66	70	4	N
FS-1	Apts.	2	B	66	65	68	3	Y
N2	Hotel	1	B	66	61	65	4	N
N3	Apts.	1	B	66	66	69	3	Y
N4	Res.	1	B	66	68	70	2	Y
N5	Res.	1	B	66	69	71	2	Y
N6	Res.	1	B	66	62	65	3	N
N7	Res.	1	B	66	60	63	3	N
N8	Com.	1	C	71	64	67	3	N
N9	Com.	1	C	71	63	66	3	N
N10	Res.	1	B	66	62	63	1	N
N11	Com.	1	C	71	64	68	4	N
N12	Com.	1	C	71	65	69	4	N
N13	Res.	1	B	66	65	69	4	Y
N14	Res.	1	B	66	60	66	6	Y
N15	Apts.	2	B	66	55	66	11	Y
N16	Apts.	2	B	66	54	63	8	N
N17	Res.	1	B	66	49	57	8	N
N18	Park	1	B	66	54	61	7	N
N19	School	1	B	66	58	63	5	N
N20	Club	1	B	66	68	72	4	Y
N21	Apts.	4	B	66	65	67	2	Y
N22	Apts.	3	B	66	63	65	2	N
N23	Apts.	3	B	66	61	63	2	N
N24	Apts.	1	B	66	69	70	1	Y
N25	Apts.	1	B	66	69	70	1	Y
N26	Apts.	2	B	66	62	63	1	N
N27	Apts.	4	B	66	64	65	1	N
N28	Apts.	2	B	66	65	66	1	Y
FS-4	Apts.	4	B	66	66	66	0	Y
N29								
N30	Apts.	2	B	66	65	66	1	Y
N31	Apts.	2	B	66	63	63	0	N
N32	Com.	1	C	71	58	59	1	N
	Res.	1	B	66				
N33	Park	1	B	66	65	67	2	Y
N34	Park	1	B	66	69	70	1	Y

Receiver I.D.(1)	Land Use(2)	# of Units	NAC Category	Noise Level, dBA Leq(h)			2035 dB Increase over Existing	Impact(3)
				NAC Level	Existing	2035 Build without Noise Walls		
FS-11	Res.	6	B	66	45	49	4	N
N35	Com.	1	C	71	73	73	0	Y
N36	Church.	1	B	66	67	68	1	Y
N37	Res.	3	B	66	59	63	4	N
N38	Res.	2	B	66	57	64	7	N
N39	Res.	1	B	66	53	64	11	N
N40	Res.	1	B	66	55	62	7	N
N41	Res.	1	B	66	60	67	7	Y
N42	Res.	3	B	66	60	63	3	N
N43	Res.	1	B	66	59	61	2	N
FS-3	Res.	1	B	66	60	62	2	N
N44	Com.	1	C	72	60	62	2	N
N45	Res.	4	B	66	61	62	1	N
N46	Church	1	B	66	64	65	1	N
FS-2	School	1	B	66	64	67	3	Y
N47	Com.	1	C	71	61	63	2	N
N48	Com.	1	C	71	63	67	4	N
N49	Res.	1	B	66	58	62	4	N
N50	Res.	6	B	66	59	61	2	N
N51	Com.	1	C	71	63	69	6	N
N52	Hotel	1	E	52	42	47	5	N
N53	School	1	B	66	64	65	1	N
N54	School	1	B	66	58	58	0	N
FS-13	Church	1	B	66	62	59	-3	N
N55	Res.	1	B	66	59	62	3	N
N56	Res.	1	B	66	59	59	0	N
N57	Res.	1	B	66	60	61	1	N
N58	Res.	1	B	66	60	61	1	N
N59	Res.	1	B	66	51	62	11	N
N60	Res.	1	B	66	51	58	7	N
N61	Res.	2	B	66	60	61	1	N
FS-10	Res.	8	B	66	45	49	4	N
N62	Res.	6	B	66	49	62	13	N
N63	Res.	1	B	66	50	60	10	N
N64	Apts.	1	B	66	60	61	1	N
N65	Res.	1	B	66	49	61	12	N
N66	Res.	2	B	66	55	56	1	N
Res.N67	Res.	1	B	66	51	61	10	N
N68	Res.	1	B	66	49	62	13	N

Receiver I.D.(1)	Land Use(2)	# of Units	NAC Category	Noise Level, dBA Leq(h)			2035 dB Increase over Existing	Impact(3)
				NAC Level	Existing	2035 Build without Noise Walls		
N69	Res.	1	B	66	60	62	2	N
N70	Res.	1	B	66	60	61	1	N
N71	Res.	1	B	66	56	58	2	N
N72	Res.	7	B	66	58	64	6	N
FS-12	Res.	4	B	66	59	65	6	N
N73	Res.	4	B	66	60	66	6	Y

(1) Receiver Number on Exhibits

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

(3) Y = Impact, N = No Impact

### c. Abatement Measures

Various methods were reviewed to 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 walls 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, are 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 walls 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 5 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 judgement 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.”<sup>4</sup>

A segmented noise barrier was analyzed for the residences south of Hwy 50 east and west of Chestnut Street, N19 thru N31 and FS-4. A 22,469 square foot noise barrier, 1,686 feet in length ranging in height from 9 to 18 feet would provide 5 to 7 decibel reduction for 18 apartment units and the Capital City Boys & Girls Club. Therefore, by definition, this noise barrier would be feasible. The cost of this noise barrier, at \$18.00 per square foot, would be \$404,445. The cost per residence would be \$21,287 which meets MoDOT’s criteria of \$30,000 per residence. Therefore, the noise barrier is reasonable.

The Capital City Boys & Girls Club is located south of HWY 50 between Lafayette and Cherry Street along Elm Street. The building is of brick construction and air conditioned. There are about 65 children enrolled at this facility for summer camp. The exterior noise level at the building (N20, Figure --) would be 72 dBA Leq(1h). The play area between the proposed on ramp and the building would be exposed to noise levels of 72 dBA Leq(1h). Weather permitting; the play area is used daily as the children rotate through outdoor activities. This building was counted as one residence in the number of units attenuated.

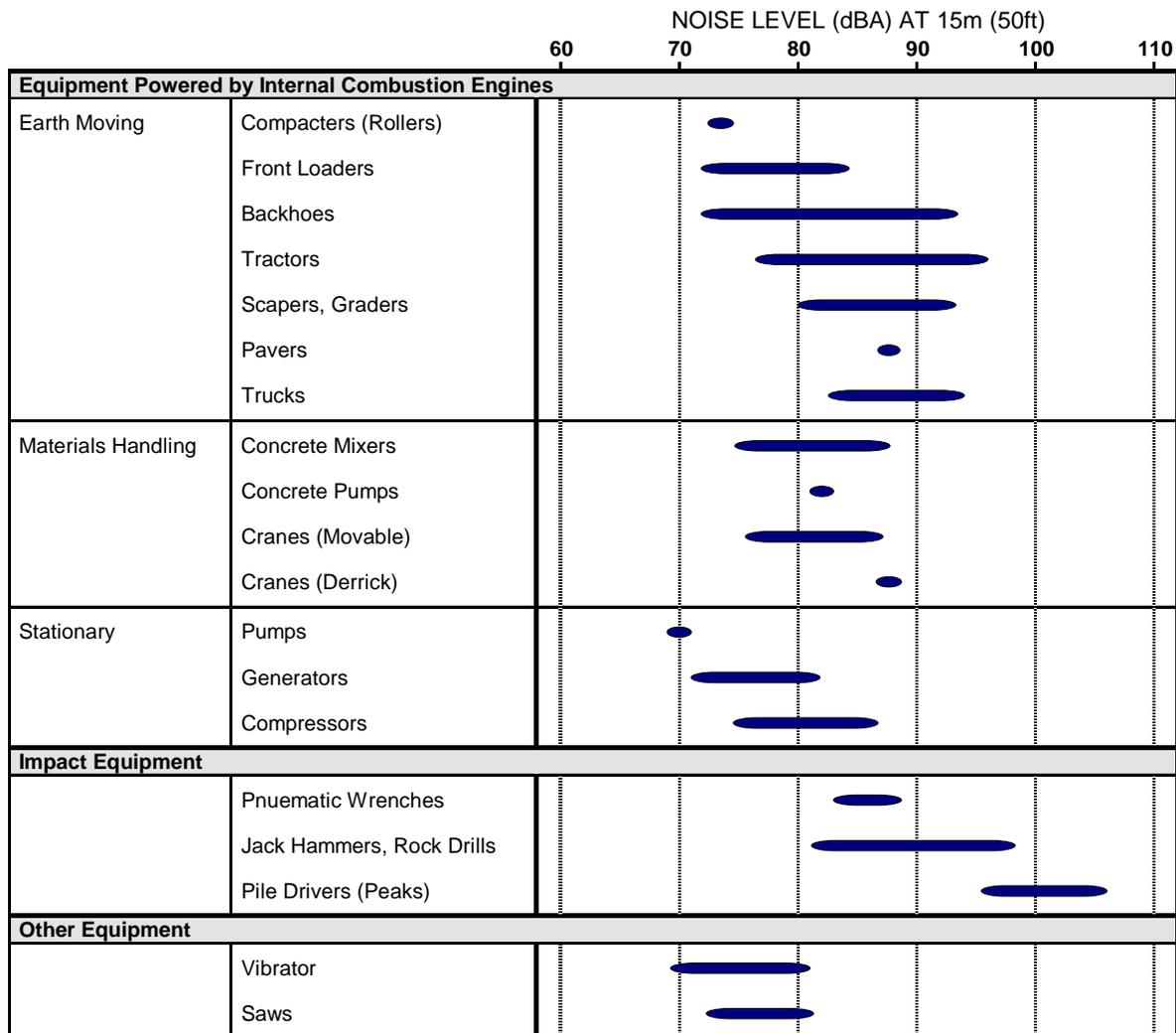
There are 15 individual receptors along the corridor that would exceed the NAC in the design year; FS-1, FS-2, N3 – N5, N13 - N15, N33 – N36, N41, N52, and N73. Due to local access requirements and the proximity to local street intersections it is impossible to design a noise barrier that would meet MoDOT’s feasibility criteria. In addition, it is impossible to design a barrier for single receptors that would meet MoDOT’s cost criteria of \$30,000.

#### **d. Construction Noise**

As directed by 23 CFR 772.19, the effects of the temporary increased noise levels during construction were considered. These noise impacts would occur within the immediate vicinity of the construction activities and generally be limited to working hours. Although noise impacts during project construction are of short duration, a large number of combustion engine powered equipment will be required to construct the proposed roadway. This equipment is expected to be the main contributor to the sound levels from highway construction. Table 10 lists some typical peak operating noise levels at a distance of 50 feet, grouping construction equipment according to mobility and operating characteristics.

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<sup>4</sup> 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 traffic noise impact.

**Table 10: Construction Equipment Sound Levels**

SOURCE: U.S. Report to the President and Congress on Noise, February, 1972.

The major construction elements of this project are expected to be bridge demolition, earth removal, hauling, pile driving, grading and paving. General construction impacts such as temporary speech interference for passerby and those individuals living and working near the project can be expected, particularly from earth moving equipment during grading operations. Overall, construction noise impacts are expected to be minimal since construction noise is relatively short in durations.

### e. Undeveloped Lands

The 66 dBA Leq(h) setback distance along the proposed Whitton Expressway improvements would range from 161 feet to 213. The range of distances is a function of traffic volumes and roadway elevation adjacent to the vacant lands. The setback distance indicates that noise levels within the setback distance, measured perpendicular to the centerline in either direction, is 66 dBA Leq(h) or greater. This setback distance was developed to assist local planning authorities in developing land

use control over the remaining undeveloped lands along the project in order to prevent further development of incompatible land use.

## **f. Conclusion**

Based on the study completed for the Whitton Expressway, one noise barrier would meet MoDOT's definition for feasible and reasonable noise mitigation. 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. Upon completion of the public information meetings, should the majority of affected residents concur that a noise wall is desired; MoDOT intends to install the noise barrier adjacent to the proposed expressway that is feasible and reasonable. 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. The Noise Report analysis will re-model the noise barrier with final roadway alignment and finished grade elevations at the right-of-way resulting in design level data for construction plans.

## **Water Resources**

In the preliminary inventory of existing water resources within the study corridor, data was gathered from USGS 7.5 minute quadrangle maps, the U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI) maps, the Natural Resources Conservation Service's (NRCS) Food Security Act (FSA) wetland mapping, aerial photography, and field investigations.

The NWI maps are based on a classification system known as the Cowardin System (named after its principal author, Cowardin et. al. 1979). This system classifies the types of ecosystems related to water resources which, in this region, include streams, lakes, ponds, and vegetated wetlands. After a review of the water resource data and aerial photography, it was determined that there were no Cowardin systems represented within the study corridor. Only one Cowardin system is near the corridor, that being the Wears Creek riverine system (R2UBG – Riverine, Lower Perennial, Unconsolidated Bottom, Intermittently Exposed). The only area of Wears Creek that is designated as a riverine system is from High Street to the Missouri River. There are no other NWI designated wetland systems within the study corridor.

Section 404 of the Clean Water Act regulates discharges of dredged or fill materials into "Waters of the U.S." (streams, lakes, wetlands, and ponds that are connected to streams). This project will involve the discharge of fill material into waters of the U.S., therefore a Section 404 Permit may be required. The U.S. Army Corps of Engineers (USACE) is the regulatory agency responsible for administering the Section 404 permit program. At the beginning of the EIS process, the USACE was contacted and a representative attended the Agency Scoping meetings as part of the agency's coordination on the project.

The inventory and investigations for Waters of the U.S. also included the task of gathering data to analyze "Significant Nexus" for jurisdictional determination, i.e. a significant physical or ecological connection with a Traditional Navigable Water.

## a. Streams

The streams within the study corridor that have discernible Ordinary High Water Marks include Wears Creek, two of its unnamed tributaries, and four unnamed tributaries of Boggs Creek. According to the USGS map, Wears Creek is shown as a perennial stream. The two tributaries of Wears Creek and the two tributaries of Boggs Creek are shown as intermittent, and the two other tributaries of Boggs Creek have no USGS designation within the study corridor, but are considered ephemeral based on field observations. All of these streams have discernible channels with OHWMs and are preliminarily considered under USACE jurisdiction as “Waters of the U.S.” Wears Creek is considered a Relatively Permanent Water (RPW), and the intermittent and ephemeral streams are considered Non-RPWs. None of the streams are on the list of designated Wild and Scenic Rivers.

### *No-Build Alternative*

The No-Build Alternative would have no direct impacts to streams.

The stream impacts for the alternatives would be in the form of fill material from culverts or culvert extensions, or from embankment placed within the OHWM of the stream (see Table 11). Where streams are bridged, these types of impacts would be avoided or minimized.

### *Mainline Build Alternatives*

Alternative 4 (Viaduct) – This alternative would result in a total of 295 linear feet of stream impacts, equating to 0.12 surface acre of impacts. Minor impacts to Wears Creek (Stream S-2) east of Missouri Boulevard, would occur as a result of culvert extension (10 linear feet) on the south side of the expressway. The tributary of Wears Creek (Stream S-3a on the south side of the expressway) would require 38 linear feet of culvert extension east of Broadway, a relocation or culverting of 225 linear feet of a portion of the stream channel (east of Washington) as a result of embankment fill being placed in the channel, and a culvert extension (22 linear feet) on the west side of Jefferson Street. Streams S-1, S-3b, and S-3c would not be impacted by this alternative.

Alternative 5 (Parkway) – This alternative would result in a total of 1454 linear feet of stream impacts, equating to 0.54 surface acre of impacts. Minor impacts to Wears Creek (Stream S-2) east of Missouri Boulevard, would occur as a result of culvert extension (10 linear feet) on the south side of the expressway. The tributary of Wears Creek (Stream S-3a & S-3b on the south side of the expressway) would require 38 linear feet of culvert extension east of Broadway (Stream S-3a) and the majority of this tributary would be placed in a box culvert between Broadway and Monroe as a result of embankment fill for roadway widening (641 linear feet of Stream S-3a and 765 linear feet of Stream S-3b). Streams S-1 and S-3c would not be impacted by this alternative.

Alternative 6 (Madison Overpass) – This alternative would result in a total of 202 linear feet of stream impacts, equating to 0.08 surface acre of impacts. Minor impacts to Wears Creek (Stream S-2) east of Missouri Boulevard, would occur as a result of culvert extension (10 linear feet) on the south side of the expressway. The tributary of Wears Creek (Stream S-3a & S-3b on the south side of the expressway) would require 38 linear feet of culvert extension east of Broadway (Stream S-3a), a relocation of 100 linear feet of the stream channel east of Washington (Stream S-3a) as a result of embankment fill being placed in the channel, and 54 linear feet of culvert extension (Stream S-3b) west of Monroe Street. Streams S-1 and S-3c would not be impacted by this alternative.

*MSP Alternatives*

Alternative A (Lafayette Interchange) – The concrete-lined tributary of Wears Creek (Stream S-3d west of Lafayette Street) would be bridged by the mainline and interchange ramps of this alternative and would therefore not be impacted by fill material. There would be no other streams impacted by this alternative.

Alternative D (Lafayette 1/2 Interchange and Clark Realignment) – The stream impacts for this alternative are similar to those described in Concepts A and C above.

Alternative G (Lafayette Full Interchange and Clark Realignment) – The stream impacts for this alternative are similar to those described in Concepts A and C above.

**Table 11: Stream Impacts by Alternative**

ALTERNATIVES & STREAM SEGMENTS	OHWL WIDTH (Lin. Ft)	IMPACT LENGTH (Lin. Ft)	IMPACT AREA (Acres)
<b>MAINLINE ALTERNATIVES</b>			
<b><i>Alternative 4 (Viaduct)</i></b>			
Stream S-1	10	0	0
Stream S-2	45	10	0.01
Stream S-3a	17	285	0.11
Stream S-3b	15	0	0
Stream S-3c	24	0	0
<b>Total</b>		<b>295</b>	<b>0.12</b>
<b><i>Alternative 5 (Parkway)</i></b>			
Stream S-1	10	0	0
Stream S-2	45	10	0.01
Stream S-3a	17	679	0.27
Stream S-3b	15	765	0.26
Stream S-3c	24	0	0
<b>Total</b>		<b>1454</b>	<b>0.54</b>
<b><i>Alternative 6 (Madison Overpass)</i></b>			
Stream S-1	10	0	0
Stream S-2	45	10	0.01
Stream S-3a	17	138	0.05
Stream S-3b	15	54	0.02

## Environmental Investigations

Stream S-3c	24	0	0
Total		<b>202</b>	<b>0.08</b>

### MSP ALTERNATIVES

#### **Alternative A (Lafayette Interchange)**

Stream S-3d	24	0 (bridged)	0
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#### **Alternative D (Lafayette 1/2 & Clark)**

Stream S-3d	24	0 (bridged)	0
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#### **Alternative G (Lafayette Full & Clark)**

Stream S-3d	24	0 (bridged)	0
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The Mainline Alternative 5 (Parkway) is the only alternative that would exceed the ½-acre threshold to fall under a Section 404 Nationwide Permit #14 (Linear Transportation Projects). These impacts would be a result of filling most of the tributary of Wears Creek (Streams S-3a and S-3b) for road widening. Consequently, an Individual 404 Permit would then be required. During the design phase and the permit process, when impacts are more specifically determined, coordination with the USACE will ascertain Section 404 Permit applicability.

## **b. Wetlands**

Areas that are mapped as vegetated wetlands on the NWI maps (PEM – Palustrine Emergent, PSS – Palustrine Scrub-Shrub, PFO – Palustrine Forested) have the potential of being regulated as special aquatic sites by the USACE. The regulatory definition of wetlands, as adopted by the EPA and USACE to administer the Section 404 permit program is as follows:

*(Wetlands are) those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, and similar areas (EPA, 40 CFR 239.2 and CE, 33 CFR 328.3).*

This definition emphasizes the fact that wetlands must possess the following three essential characteristics before a positive determination of a wetland can be made: hydric soils, a prevalence of hydrophytic vegetation, and a persistent wetland hydrology. Jurisdictional wetland determinations performed for regulatory purposes are not dependent on the NWI Cowardin classification system, but on these three mandatory characteristics.

Within the study corridor, there are no areas shown on the NWI maps that are classified as vegetated wetlands. Through field investigations, one area adjacent to an unnamed tributary of Wears Creek was discovered that appeared to have the potential for meeting wetland criteria. However, it was preliminarily determined that this area did not meet all three of the wetland criteria parameters to be considered a jurisdictional wetland (a final determination will be made by the USACE). The areas adjacent to the streams in the remainder of the study corridor were also

checked for ponding or saturation, however, no other areas above the OHWM of streams were found to exhibit wetland characteristics.

In addition to the mapping sources listed above, data was also gathered from NRCS soil survey maps to determine the presence or absence of hydric soils. This data indicated that there were no hydric soils, nor soils with hydric inclusions within the study corridor.

Based on the preliminary findings of the field determinations, there are no jurisdictional wetland areas, nor ponds within the study corridor.

### *Impacts*

Based on the preliminary findings of the field determinations, there are no jurisdictional wetland areas, nor ponds within the study corridor.

## **c. Compensatory Mitigation**

Construction activities requiring discharges into jurisdictional “Waters of the U.S.,” may require a Department of the Army Permit under Section 404 of the Clean Water Act (permits are discussed in more detail in Section O. of this chapter). Streams are regulated below the limits of the ordinary high water mark (OHWM).

During the project design phase, specific impacts to “Waters of the U.S.” will be assessed to determine if those impacts can be avoided or minimized, and to determine the applicability of the Section 404 Permit. At that time, if stream mitigation is required, an evaluation will be performed based on the Missouri Stream Mitigation Method, in order to determine mitigation credits required and appropriate mitigation options for stream impacts. Coordination will take place with the USACE and appropriate resource agencies during the permitting process to develop appropriate mitigation strategies. Where appropriate, possible mitigation strategies for stream impacts could include new channel construction (stream relocation to partially offset filled streams), utilizing in-stream 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 stream banks and buffer zones, or by providing an in-lieu fee for stream mitigation at other locations through programs such as the Stream Stewardship Trust Fund.

## **Water Quality**

### **a. Surface Water Quality**

The study corridor is located within the Lower Missouri-Moreau watershed (Hydrologic Unit # 10300102). Surface water resources include Wears Creek and two of its unnamed tributaries, and four unnamed tributaries of Boggs Creek. Wears Creek and Boggs Creek flow directly into the Missouri River, which is approximately .4 mile to 1.25 miles northeast of the study corridor. The study corridor travels through an urban area, and consequently there are no ponds or wetlands within the study corridor. The quality of all water resources varies depending upon such factors as water permanence, type of shoreline/bank and surrounding vegetation, substrate, presence or absence of in-flowing streams, and surrounding land use.

The federal Water Pollution Control Act, section 303(d), requires that each state identify those waters that are not meeting the state's water quality standards (i.e. for which existing required pollution controls are not stringent enough to implement state water quality standards). For these waters, states are required to establish total maximum daily loads according to a priority ranking. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards.

The Revised Environmental Protection Agency Consolidated 2002 Missouri 303(d) List (made available in January 2004) and the Missouri Department of Natural Resources' Proposed 2004/2006 303(d) list of impaired waters (dated March 7, 2007) were reviewed. It was determined that none of the water resources in or near the study corridor are on either of these lists. (The 2008 Section 303(d) List for Missouri is currently in the development stage and not yet completed or submitted to the EPA)

There are no Outstanding National or State Resource Waters within the study corridor, and none of the streams have been given a "classification" and "use designation" by MDNR.

In this type of urban environment, major concerns include construction site erosion (siltation), channelization or other alteration of natural stream channels, and residential and commercial use of pesticides and fertilizers.

#### ***No-Build Alternative***

The No-Build Alternative would have no direct impacts to water quality, however, indirect impacts could occur as a result of the on-going operation and maintenance-related pollutants from roadways, and the runoff that will occur from adjacent existing land developments.

#### ***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 earth-moving equipment, and storage of construction materials and supplies, and could include pollutants such as petroleum products and sedimentation, and nutrients that could leach from seeded and mulched bare areas. Temporary impacts to water resources in and adjacent to the study corridor can be prevented or minimized by following the management practices outlined by the Missouri Department of Conservation (MDC) including the State Channel Modification Guidelines when modifying channels or relocating streams.

The National Pollutant Discharge Elimination System (NPDES) permit, administered by the 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, if appropriate, would also be designed and installed to lessen water quality impacts by trapping sediment and other contaminants, while reducing erosive storm surges. Stream crossings that utilize culvert extensions would be designed to maintain the low-flow characteristics of the streams.

The project will also 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; 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 construction period.

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.

### **c. Groundwater Quality**

The groundwater level may be near the surface in the alluvium of the Wears Creek/Missouri River alluvial plain (near the intersection of Whitton Expressway and Missouri Boulevard), and thus the source and recharge of the alluvial groundwater is from Wears Creek and the Missouri River. In the remainder of the area, groundwater is found at various depths in the Jefferson City Formation as well as deeper aquifers. Source and recharge of these aquifers is largely outside the study corridor, but a small amount is recharged locally.

Karst or cave forming is known to occur in the Jefferson City Formation, but no caves are known to exist in the study corridor. However, a paleokarst or paleosink feature was encountered during construction of the interchange of US 50/63 and Eastland Drive. In the surrounding area, paleosinks are numerous in the Jefferson City Formation.

Public water supply wells, as well as individual wells, are located within the study corridor. These public supply wells are either located within the alluvium of the Missouri River or in the Ordovician, Cambrian and Precambrian age bedrock aquifers. The area is not located in a sole source aquifer.

In the area of the geologic Jefferson City Formation, there may be some potential for sinkhole collapse. During the design phase of the project, it will be determined if karst features exist, and if so, care will be taken during construction activities to avoid spills or discharges in or near these areas. If known well locations are impacted, or if wells are discovered during the construction of the roadway, mitigation measures will include proper sealing of the wells to prevent ground water pollution from construction and from future road maintenance. In addition, vegetated slopes and swales, and detention systems in appropriate locations can provide treatment of potentially polluted run-off from the roadway, thereby avoiding or minimizing impacts to groundwater quality.

## **Floodplain**

As this project is located in an urban area with development located within the floodplain, it is especially important that the flood elevations do not increase as that may have an adverse effect on existing property. Therefore, all improvements would be designed to not increase flood elevations, and to maintain the existing conditions. The preliminary design phase will include backwater and scour analyses as necessary to verify the hydraulic adequacy of the proposed alternatives. The proposed structures will be sized to accommodate the calculated 100-year frequency flows and to maintain floodway crossings free of significant hydraulic obstruction.

The data used to create the floodplain map was derived from the Flood Insurance Rate Maps for Cole County Missouri (dated December 2, 2005). Panels 133 and 129 were utilized. Exhibit XXX shows the extent of the base 100-year floodplain and the regulatory floodway boundaries throughout the study corridor.

The streams within the study corridor that have a designated FEMA mapped floodplain include Wears Creek, North Branch Wears Creek, and East Branch Wears Creek as named in the FIRM. East Branch Wears Creek is referred to as Tributary to Wears Creek on the exhibits and the North Branch Wears Creek is not called off as it is located on the most northwestern limits of the project and is not impacted due to this project.

At the northwestern limit of the study corridor, US-50 crosses (via a double box culvert) Wears Creek approximately 3,000 feet upstream of the Missouri River confluence. Wears Creek generally flows from the south to the north at this location, and the floodplain averages approximately 1,200 feet wide. Wears Creek has a natural channel, with vegetation and small trees in the sideslope area. The majority of the floodplain is developed, consisting mostly of parking lots. The Wears Creek regulatory floodway at this location is approximately 100 feet wide. Just downstream of the US-50 Wears Creek crossing, the North Branch of Wears Creek merges with Wears Creek, approximately 2,800 feet upstream of the Missouri River confluence. The North Branch of Wears Creek is a natural channel with vegetation and small bushes, but no trees. The study corridor has no impacts to the North Branch of Wears Creek.

Just upstream of the US-50 crossing, the East Branch of Wears Creek (Tributary to Wears Creek) flows into Wears Creek. This tributary runs parallel to US-50. From the most downstream point of the tributary to approximately 1,400 feet upstream, the tributary is contained in an underground culvert on the south side of US-50. Upstream of the underground culvert, the tributary continues to run parallel to US-50 in a natural channel, with vegetation and small trees on the side slopes. This channel continues upstream and flows under US-50 to the north side through a triple RCB at Monroe Street, which is located approximately 3,300 feet upstream of the confluence with Wears Creek. Upstream of Monroe Street, the Tributary to Wears Creek is a trapezoidal shaped concrete channel throughout the remainder of the project limits. The tributary flows along the north side of US-50 for approximately 2,500 feet where it again passes under US-50 through a bridge. Throughout the study corridor, the Tributary to Wears Creek floodplain averages approximately 400 feet wide and the floodway averages approximately 80 feet wide. The majority of the floodplain is developed, consisting mostly of parking lots and businesses.

## **a. Alternatives Effect on Floodplain**

### *Mainline Build Alternatives*

All of the mainline build alternatives involve widening of the existing roadway, rather than a new alignment. These mainline alternatives are located in the western portion of the project limits and will impact the floodplains of both Wears Creek and the Tributary to Wears Creek.

Alternative 4 (Viaduct) - This alternative would impact approximately 3.4 acres within the designated FEMA floodplain. This includes existing right-of-way and proposed slope limits. This alternative would result in a total of approximately 290 linear feet of channelization. Approximately 220 feet of this channelization includes relocating a portion of the Tributary to Wears Creek adjacent to a proposed retaining wall (a result of proposed embankment fill being placed in the channel) just east

of Washington Street. The remainder of the linear feet of channelization is in areas where culverts will be extended.

Alternative 5 (Parkway) - This alternative would impact approximately 6.8 acres within the designated FEMA floodplain. This includes existing right-of-way and proposed slope limits. This alternative would result in a total of approximately 1440 linear feet of channelization. Most of this channelization (1410 feet) would occur along the Tributary to Wears Creek from just west of Washington Street east to Monroe Street. This includes replacing the open channel in this reach with a box culvert as a result of embankment fill for roadway widening. The remainder of the channelization is in areas where culverts will be extended.

Alternative 6 (Madison Overpass) - This alternative would impact approximately 4.2 acres within the designated FEMA floodplain. This includes existing right-of-way and proposed slope limits. This alternative would result in a total of approximately 200 linear feet of channelization. Approximately 110 feet of this channelization includes relocating a portion of the Tributary to Wears Creek adjacent to a proposed retaining wall (a result of proposed embankment fill being placed in the channel) just east of Washington Street. The remainder of the linear feet of channelization is in areas where culverts will be extended.

### ***MSP Build Alternatives***

The purpose of the MSP build alternatives is to provide better access to the planned development. These mainline alternatives are located in the eastern portion of the project limits and will only impact the Tributary to Wears Creek.

Alternative A (Lafayette) – This alternative would impact approximately 0.6 acres within the designated FEMA floodplain. This includes existing right-of-way and proposed slope limits. The concrete-lined Tributary to Wears Creek would be spanned by the proposed mainline and interchange ramp bridges. No fill material will be placed within the floodway; however there will be some fill material that is placed within the floodplain.

Alternative D (Lafayette Half Interchange and Clark Realignment) - This alternative would impact approximately 0.6 acres within the designated FEMA floodplain. This includes existing right-of-way and proposed slope limits. The concrete-lined Tributary to Wears Creek would be spanned by the proposed mainline and interchange ramp bridges. No fill material will be placed within the floodway; however there will be some fill material that is placed within the floodplain.

Alternative G (Lafayette Full Interchange and Clark Realignment) - This alternative would impact approximately 0.6 acres within the designated FEMA floodplain. This includes existing right-of-way and proposed slope limits. The concrete-lined Tributary to Wears Creek would be spanned by the proposed mainline and interchange ramp bridges. No fill material will be placed within the floodway; however there will be some fill material that is placed within the floodplain.

## **b. Floodplain Issues**

### ***Flooding Risks***

The proposed roadway modifications and bridge and culvert 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. All improvements would be designed to not increase flood elevations, and to maintain the existing conditions. Consequently, risks of flooding

to users of the roadway, and the potential for property loss and hazard to life due to this project is minimal.

This project would result in an increase in impervious pavement. 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 and storage (surface and/or underground).

***Impacts on Natural and Beneficial Floodplain Values***

The footprint of the roadway fill placed in the floodplain is minimal when compared to the total floodplain area. The proposed bridge and culvert structures will be sized to accommodate the calculated 100-year frequency flows and to maintain floodway crossings free of hydraulic obstruction. Thus, impacts on natural and beneficial floodplain values are not significant.

***Support of Probably 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.

***Measures to Minimize Floodplain Impacts and Measures to Restore and Preserve the Natural and Beneficial Floodplain Values***

The project construction will incorporate those features necessary to meet NFIP standards, FEMA, SEMA and local agency guidelines, and the regulatory requirements of the Corps of Engineers that apply to Wears Creek and its floodway and floodplain. All practical measures to minimize impacts to the floodplain will be incorporated into the project design.

# Geotechnical

## a. Physiography and Topography

### *Topography*

The study area is located in Northern Cole County, Missouri. The study area is located at the boundary of the Glaciated Plains and the Salem Plateau and at the boundary of the alluvial valley of the Missouri River and its tributary Wears Creek with the uplands of the Springfield Plateau.

The topography can be generally characterized with the northwestern area as the nearly level alluvial plain of Wears Creek near its connection to the Missouri River progressing to the steeper hills and bluffs adjacent to valley characterized as steep hills with eroded ravines.

### *Geology*

The area is complex for the fact that it is located along physiographic, topographic and geologic boundaries. The lowest and most level area of the study area is the Wears Creek/Missouri River alluvial plain near the intersection of Whitton and Missouri Boulevard. This area is characterized by the moderately thick alluvium of Wears Creek and the Missouri River. Thickness of alluvium – depth to bedrock can be in the order of 100 feet. Ordovician Age Bedrock of the Jefferson City Formation make up the outcrops and underlying rock of the study area.

Eastward along US 50/63 the highest point is approximately at the crossing of Whitton Expressway and Chestnut Street. The uplands are characterized by loess and thin to moderately thick residual soils derived from the cherty dolomites of the Jefferson City Formation.

The Jefferson City Formation is described as light gray to light brown medium to finely crystalline, cherty dolomite. Thin to medium bedded and contains beds of green shale and sandstone. The thickness of the Jefferson City Formation ranges from 125 to 350 feet, its average thickness is 200 ft (Stratigraphic Succession in Missouri, Thompson 1995).

Karst or cave forming is known to occur in the Jefferson City Formation, but no caves are known to exist in the study area. Springs have been noted in the area.

A paleokarst or paleosink feature has been noted in the vicinity of the interchange of US 50/63 and Eastland Drive. During the foundation construction of the Eastland Drive interchange, a paleosink was encountered. In the surrounding area paleosinks are numerous in the Jefferson City Formation.

## b. Soils

The soils of the uplands are characterized as loess and soils derived from weathering of loess and to a lesser extent, residual soils formed from the long term weathering of the underlying bedrock materials

Soils of the alluvial plain are characterized as sandy and silty, with lesser amounts of clay.

### *Mining*

No past or present mining is noted in the study area. Sand is dredged locally from the Missouri River.

### *Seismic Hazards*

The study area is located and classified according to the American Association of State Highway and Transportation Officials (AASHTO) as Seismic performance Category A – requiring no special seismic design considerations.

## **Permits**

Permits applicable to the Preferred Alternative 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 the Proposed Action. Construction permits serve as regulators of construction activities to protect the adjacent environs. State or local government agencies typically operate roadway construction permit programs.

### **a. Regulatory Permits**

#### *Sections 404 (USACE) and 401 (MDNR) of the Clean Water Act*

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 US Army Corps of Engineers (USACE). Section 404 is the primary Federal statute that implements federal regulatory policies concerning the protection of wetlands and other “waters of the U.S”. as specified in various orders and regulations. The USACE, Kansas City District, has an agreement with the Missouri Department of Natural Resources to process requests for Section 401 water quality certifications jointly with the Section 404 permit application. Specific conditions of Section 401 Water Quality Certification also become conditions of the Section 404 permit.

Based on map review and field reconnaissance, 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. Preliminary findings indicate that the only potential jurisdictional “waters of the U.S.” impacted by the Proposed Action are the streams that would be crossed. Fill material placed below the Ordinary High Water Mark of these streams may require a Section 404 permit from the USACE.

If the loss of surface area of water resources is less than ½ acre, a project may qualify for authorization by a Section 404 Nationwide Permit number 14, which authorizes discharges in “waters of the U.S.” as a result of linear transportation stream crossings. 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. During the design phase and the permit process, when impacts are more specifically determined, coordination with the USACE will ascertain Section 404 Permit applicability.

#### *NPDES Permit*

The National Pollutant Discharge Elimination System (NPDES) permit (Section 402 of the federal Clean Water Act and the Missouri Clean Water Act), administered by MDNR, requires that slopes and ditches be properly designed to prohibit or reduce erosion. The application for this permit will be done at the same time as the Section 404 Permit application.

### ***Floodplain Development Permit***

Portions of the Proposed Action 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, some portions of the Proposed Action occur within a regulatory floodway, and as such, a “No-Rise” certificate and statements as to the effects of possible flooding are required. The municipalities are responsible for providing a no-rise certificate to SEMA prior to its issuance of the Floodplain Development Permit for the project, which will occur during the design phase. In addition, a hydraulic study will be required that will show that there are no effects on the floodway elevations.

### **b. Construction Permits**

In order to protect the adjacent environment from sedimentation and construction material pollutants discharged from construction activities, erosion and sedimentation control procedures and specifications (BMPs) will be utilized for the highway construction. This will satisfy 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.

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.

## **Natural Terrestrial Communities**

The majority of the study corridor is comprised of urban built-up land. The only area where you might expect to find natural communities would be along Wears Creek or that of its tributary. However, in the study corridor much of Wears Creek has been channelized in order to conform with the urban landscape. There are no identified natural communities occurring in the study corridor.

## **Wildlife Impacts**

### **a. Wildlife**

The study corridor is located in a highly urbanized/developed area, and the original natural habitat has been disturbed. In general, some of the species of wildlife that have adapted to living in this urbanized area include many species of birds, such as the northern cardinal (*Cardinalis cardinalis*), the rock dove or pigeon (*Columba livia*), the mourning dove (*Zenaida macroura*), the American goldfinch (*Carduelis tristis*), the blue jay (*Cyanocitta cristata*), the northern mockingbird (*Mimus polyglottos*), the American robin (*Turdus migratorius*), the American tree sparrow (*Spizella arborea*) and the house wren (*Troglodytes aedon*).

Some of the mammals that have adapted to the area include the Virginia opossum (*Didelphis virginiana*), the striped skunk (*Mephitis mephitis*), the gray squirrel (*Sciurus carolinensis*), the eastern cottontail rabbit (*Sylvilagus floridanus*), the raccoon (*Procyon lotor*), and the white-tailed deer (*Odocoileus virginianus*).

## **b. Threatened and Endangered Species (Federal and State Listed)**

Under the U.S. Endangered Species Act, the USFWS has primary responsibility in the protection of federally endangered and threatened species and designation of critical habitat areas for these species. All federally endangered and threatened plants and animals are protected by the Endangered Species Act of 1973 (ESA). The MDC determines species' state status in Missouri under constitutional authority (3CSR10-4.111 Endangered Species). Species that are listed in the Wildlife Code under 3CSR10-4.111 are protected by State Endangered Species Law 252.240.

Correspondence was conducted with the USFWS concerning species listed as federally endangered or threatened that could occur in or near the study corridor. The USFWS has determined that no federally listed threatened or endangered species or critical habitats are known to occur within the project area under consideration. A review of the Natural Heritage Database was conducted to see if there are any rare species or rare natural communities that have been known to occur in or near the study corridor. There were no known locations or recorded occurrences directly within the study corridor. The Missouri River is home to a number of rare and endangered species and any project conducted along or involving a new river crossing would require additional information.

## **Cultural Resources**

### **a. Introduction**

The cultural resource investigations were performed according to the Scope of Services prepared by MoDOT. The cultural resource investigations consisted of an archival search, an architectural survey, and an archaeological evaluation.

### **b. Previous Investigations**

An archival search was performed in order to gain an understanding of the historical background of the project area and to identify any previously recorded cultural resources. These previously recorded cultural resources included, but were not limited to, properties eligible for the National Register of Historic Places (NRHP), properties and districts determined eligible by the State Historic Preservation Office and the Landmarks Commission of Kansas City, cultural resource management studies, archaeological (historic and prehistoric) sites, bridges and tunnels, local landmarks, cemeteries, cultural landscapes, mines, schools, churches, parks, hospitals and other public facilities. The study area was defined as 500 feet on either side of existing Whitton, and 50 feet on either side of the two alternatives along Lafayette Street and near Clark Street, which will provide access to the prison.

Several sources were consulted for the archival search. The records at the Missouri Department of Natural Resources, State Historic Preservation Office were search to locate previously recorded National Register properties and architecture previously determined to be eligible within the Rex Whitton study area. The Historic Preservation Commission of the City of Jefferson was also consulted in order to identify any previously recorded local historic districts and landmarks. A list of bridges and culverts within the study area was provided by the Environmental and Historic Preservation Section, Missouri Department of Transportation.

#### ***Architecture***

As of March 2008, the Area of Potential Effect (APE) contained eight individual properties listed on the NRHP and three historic districts listed on the NRHP. These include the Missouri State Capitol

Historic District, the Broadway-Dunklin Historic District, and the Capitol Avenue Historic District. There are seven local historic landmarks within the study corridor that are not listed on the NRHP. Detailed descriptions of individual NRHP properties and districts within the Whitton APE can be found in the *Cultural Resource Archival Review* in Appendix X and are located on the alternative plates. Tables 12 and 13 provide a listing of the properties and districts as well.

**Table 12: Individually Listed NRHP Properties and Districts Within or Near the Rex Whitton Study Area**

Name	Location	Significance	Construction Date
Jefferson City Community Center	608 E. Dunklin Ave.	Criterion A: Ethnic Heritage and Social History – African American	1943
Jefferson City National Cemetery	1024 E. McCarty Ave.	Criterion A: Military History, Criterion C: Late Victorian-Classic Revival	1867
Missouri State Penitentiary Warden's House	700 E. Capitol Ave.	Criterion A: Law, Criterion C: Queen Anne	1888
Tergin Apartment Bldg.	201 W. McCarty Ave.	Criterion C: Art Deco- Art Moderne	1938-1939
Parker, Lester S. and Missouri "Zue" Gordon House	624 E. Capitol Ave.	Criterion B: Person, Lester S. Parker, Criterion C: Classical Revival	1900
H.E. Gensky Grocery Store	423 Cherry St.	Criterion A: Commerce-Social History, Criterion C: Missouri-German Vernacular	1915
Albert and Wilhelmina Thomas House	224 W. Elm Ave.	Criterion A: Ethnic Heritage-European Criterion C: Eclectic Revival	1874; 1930
East End Drugs	630 E. High St.	Criterion A: Commerce, Drug Store	1900
Missouri Capitol Historic District	Missouri Capitol Historic District	Criterion C: Architecture	1898-1911
Broadway-Dunklin Historic District	Broadway-Dunklin Historic District	Criterion A: Ethnic Heritage Criterion C: Architecture	1869-1929
Capitol Avenue Historic District	Capitol Avenue Historic District	Criterion A: Community Planning and Development Criterion C: Architecture	1870-1947

### *Local Landmarks*

Jefferson City, Historic Preservation Commission has designated a number of local landmarks. Some of these have been placed on the NRHP and are listed above. Other landmarks have not been determined as eligible for inclusion into the NRHP at this time but are nonetheless considered locally significant. The landmarks that are considered eligible for inclusion into the NRHP are listed in Table 13.

**Table 13: Local Historic Landmarks Within the Whitton Study Area, Not on the National Register of Historic Places**

Name	Location	Year Made a Landmark
City Cemetery	900-1000 Block E. McCarty St.	1994
Lincoln University President's Home	601 Jackson St.	2001
Immaculate Conception Church	1206 E. McCarty St.	2001
St. Mary's Hospital (original building)	601 W. Elm St.	2006
Etta and Joseph Miller Performing Arts Center	501 Madison St.	2006
Missouri Penitentiary Wall	Lafayette St. & Capitol Ave.	2006
International Shoe Company	1101 E. Capitol Ave.	1995

*Previously Recorded Bridges*

All of the previously recorded bridges within the study area are listed in the MoDOT Transportation Management System (TMS) database. There are a total of eight bridges and six culverts in the study area. The structural types of the previously recorded bridges include: two slab, three frame and three stringer. None of the bridges or culverts are on the NRHP, nor have they been recommended eligible.

**Table 14: Previously Recorded Bridges and Culverts within the Whitton Study Area**

Bridge #	Structure Type	Structure Material	Year Built
A0564	Culvert	Concrete	1959
A0565	Culvert	Concrete Continuous	1959
A0566	Frame	Concrete	1959
A0567	Stringer/ Multibeam	Steel Continuous	1959
A0568	Frame	Concrete	1959
A0569	Frame	Concrete	1959
A0722 (2 bridges)	Slab	Concrete Continuous	1960
A0790	Culvert	Concrete Continuous	1960
A1420	Slab	Concrete Continuous	1964
A1424	Culvert	Concrete Continuous	1964
A5362	Stringer/ Multibeam	Prestressed Concrete	1995
A5363	Stringer/ Multibeam	Prestressed Concrete	1995
2180023	Culvert	Concrete	1988
2180035	Culvert	Concrete	1992

*Archaeology*

The records and literature search did not uncover any previously recorded archaeological sites.

**c. Architectural Survey**

A survey was completed to identify and document all architectural resources (i.e., buildings, structures, objects, bridges, and districts/landscapes) within the APE. The primary APE represented an area approximately 200 feet on either side of the centerline of the existing US 50/Rex Whitton Expressway with an additional 10 foot buffer on each side. The APE for Lafayette Street was limited to properties that faced Lafayette, starting at Elm Street at the south to Capitol Avenue at the north, while the Clark Avenue realignment corridor was limited to an approximately 130 foot wide corridor that passed through properties between Elm Street at the south to just north

of Capitol Avenue. The interchange at Madison and Whitton was also extended slightly, starting with Dunklin Street to the south and Miller Street to the north.

Properties within the APE were given consecutive property numbers from west to east; properties missed during numbering or the initial survey were given the same number as its neighbor with an added letter (a, b, c, etc.). Properties contained within the Lafayette and Clark MSP alternatives and the Madison Street interchange, surveyed after the mainline properties, were given consecutive numbers from south to north continuing after the last mainline property number.

Survey methodology can be found in the *Architectural Survey of the Proposed Improvements to the Rex Whitton Expressway* ..

### *Eligibility Criteria*

The architectural survey of the Whitton APE resulted in the identification of 327 properties. Of these, 250 properties contained pre-1967 buildings and 46 properties contained buildings constructed post-1967. Three properties were landscapes, 16 were vacant lots, eight were parking lots, and four contained structures. Out of all of the properties and bridges surveyed, nine properties and three districts were recommended eligible for the NRHP; no bridges or landscapes are thought to be NRHP eligible. This number does not include the four properties that are contributing elements to the existing NRHP Missouri State Capitol Historic District, Boundary Increase 1, the seven properties that are contributing elements to the NRHP Capitol Avenue Historic District, the three individual NRHP properties, the two eligible NRHP properties, and five properties (not on the NRHP or in an NRHP district) that are on the Jefferson City Local Historic Landmarks list. The two properties that were previously considered eligible due to modern alterations; these current recommendations were agreed upon by both MoDOT and SHPO during a drive-by of the property area that took place January 11, 2008.

### *Individually Eligible Architectural Resources*

Out of the 327 properties surveyed, nine were recommended as individually eligible for the NRHP. For those properties recommended under Criterion C, the period of significance for each property is its respective construction date, and the boundaries are the lot boundaries of each individual property. The eligible properties are listed in Table 15.

**Table 15: Individually Eligible Properties within the Whitton APE**

Property #	Address	Name	Date	Style	Criterion
2b	627 W. McCarty/417 Bolivar	J.B. Bruns Shoe Co./ JCD Furniture 4 Less	1905	Commercial	A & C
29a	604 Jefferson	Jefferson City Coca-Cola Bottling Plant	1941	Art Deco	A & C
36	610 Madison	Central Dairy	1939-1943	Two-Part Commercial Block/Tile	A & C
47	310 E. Miller	Apartments	1920	Craftsman	C
59	601 Jackson	Lincoln University President's House	1913	Williamsburg	B & C
76	529 Lafayette	Quinn Chapel	1955	Colonial Revival	A
146a	1206 E. McCarty	Immaculate Conception Church	1923	Romanesque	C
244a	700 E. High St.	Vacant Commercial	c.1898	Queen Anne	A & C
260a	1130/1144 E. McCarty	Residence	1892	Queen Anne	C
295	1101 Capitol	International Shoe Company	c.1905	Vernacular Industrial	A & C
296	620 Madison	Busch's Florist	1920	Two-Part Commercial Block	A

***Eligible Districts***

There are three districts recommended as eligible within the Whitton APE: the Jackson/E. Miller district, the Craftsman/Monastery district and the Stone Veneer district. The boundaries of each district are defined by the lots of its contributing properties. Tables 16 through 18 list the contributing properties for each district.

The Jackson/E. Miller Eligible District is located at the corner of Jackson and E. Miller Streets, just north of Whitton.

**Table 16: Jackson/E. Miller Eligible District**

Property #	Address	Date	Style	Criterion
55	510 Jackson	1915	Tudor	B & C
56	508 Jackson	1916	Craftsman	C
57	504 Jackson	1915	Queen Anne	C
63	500 E. Miller	1910	Prairie	B & C
64	504 & 504a E. Miller	1910	Queen Anne	C
65	506 E. Miller	1900	Vernacular w/Mission	B & C

The Craftsman/Monastery Eligible District is located on Lafayette Street just north of Whitton.

**Table 17: Craftsman/Monastery Eligible District**

Property #	Address	Date	Style	Criterion
74a	508 Lafayette	c. 1915	Craftsman	A & C
74b	506 Lafayette	c. 1915	Craftsman	A & C
74c/"The Monastery"	504 Lafayette	c. 1915	Craftsman	A, B & C
75	502 Lafayette	c. 1915	Craftsman	A & C

The Stone Veneer Eligible District, are located on E. Miller Street just north of Whitton.

**Table 18: Stone Veneer Eligible District**

Property #	Address	Date	Style	Criterion
180	1502 E. Miller	1942	Minimal Traditional/Stone Veneer	C
181	1504 E. Miller	1940	Minimal Traditional/Stone Veneer	C
182	1506 E. Miller	1940	Minimal Traditional/Stone Veneer	C

#### **d. Archaeological Survey**

An archaeological survey was conducted for the preferred alternative for Whitton on April 9, 2008. The entire construction easement was examined revealing that most of the preferred alternative was within areas previously disturbed during the original construction of US 50. A few locations represented yard areas behind private homes that could not be surveyed due to lack of landowner permissions.

One prehistoric site was surveyed within the study corridor. Shovel tests recovered some artifacts, however, construction of past buildings and roadways, in particular Whitton, has destroyed the site.

##### *Potentially Eligible Archaeological Resources*

One site represents the remains of the Duke and Estella Diggs home. This site is being recommended as eligible for the National Register under Criterion A for African American history, and for Criterion D as it could provide new information on the lives of Jefferson City citizens at the start of the 20<sup>th</sup> century. It is recommended that this site be avoided or further tested to better assess the potential for having intact significant remains.

#### **e. Cultural Resources Impacts**

The potential impacts of the alternatives are discussed below for historic and archaeological resources identified during the cultural resources investigations and analysis. The properties and districts are either on or eligible for the NRHP.

##### *No-Build Alternative*

The No-Build Alternative would not have impacts on any property or district that is on or eligible for the NRHP.

##### *Mainline Build Alternatives*

The Mainline Build Alternatives would not impact any property or district that is on or eligible for the NRHP.

### *MSP Build Alternatives*

Alternative A (Lafayette) – This alternative would have an adverse effect on two individually eligible properties including Property 59, Lincoln University President’s House and Property 244a, a vacant commercial property. The Craftsman/Monastery eligible district on Lafayette street would be adversely impacted by this alternative. The following individually listed NRHP properties would be adversely impacted: East End Drugs at 630 High Street; Parker, Lester S. and Missouri “Zue” Gordon House at 624 E. Capitol Avenue; and Missouri State Penitentiary Warden’s House at 700 E. Capitol Avenue.

Property 59, located at 601 Jackson, contains the Lincoln University President’s House, a limestone building, was constructed in the Williamsburg Style in 1913. The property is eligible for the NRHP under Criteria B and C, for both its historic relationship to an individual, Hugh Stephens, and its local significance in architecture. The southwest ramp of the Lafayette interchange would directly impact a contributing element of Lincoln University President’s House property (601 Jackson Street); a small outbuilding or “well house” and limestone wall at the northern edge of the property will be affected by benching of the existing rock cut that faces Whitton. This rock benching is needed to address safety and maintenance concerns.

Property 244a, located at 700 E. High Street, contains a Two-Part Commercial Block Building constructed c. 1898. Recommended as eligible under Criteria A & C, the building is located at the corner of High and Lafayette Streets, in an area that was once a major commercial center. This area is an example of a “neighborhood commercial node” that provided easy access (within walking distance) to grocery, drug, and dry good stores. As this building was at one time an integral part of this neighborhood, it is eligible under Criterion A, for commerce, along with Criterion C, for its Queen Anne architecture. The commercial space of the building is currently vacant, although it is unknown if the residential apartments there are still in use. The property would be impacted by the widening of Lafayette, requiring the full acquisition of that parcel.

The Craftsman/Monastery Eligible District, consisting of properties 74a-c and 75, is located on Lafayette Street just north of Whitton. The district contains four buildings that were constructed at the same time in an identical Craftsman style. This district contains buildings that possess both social historical and architectural significance as they are located in what was the “Foot” neighborhood. The period of significance for this district under Criterion A would be from c. 1915 to the early 1960s, after the construction of Whitton. All four of the homes that make up this district would be impacted by the northwest ramp of the new Lafayette interchange. All four properties would be totally acquired based on the estimated impacts.

The East End Drugs property would be a total acquisition because of the widening of Lafayette Street. The Parker, Lester S. and Missouri “Zue” Gordon House and Missouri State Penitentiary Warden’s House would each experience partial acquisitions on the Lafayette Street side of those properties.

Alternative D (Lafayette Half Interchange and Clark Realignment) – This alternative would have an adverse effect on 59, Lincoln University President’s House and the Craftsman/Monastery eligible district on Lafayette street. This property and district are described in detail above.

The southwest ramp of the Lafayette interchange would directly impact a contributing element of Lincoln University President’s House property (601 Jackson Street); a small outbuilding or “well house” and limestone wall at the northern edge of the property will be affected by benching of the existing rock cut that faces Whitton. All four of the homes that make up this district would be

impacted by the northwest ramp of the new Lafayette interchange. All four properties would be totally acquired based on the estimated impacts.

Property 260a is a duplex located at 1130/1144 E. McCarty sits on a parcel which will be partially impacted at the rear of the property and where a garage will have to be removed to accommodate the Clark Realignment. However, there is a single-family residence on the same parcel (Property 260b) which is not eligible and the garage is associated with that residence. Because of this, the Clark Realignment will not have any cultural resource impacts.

Alternative G (Lafayette Full Interchange and Clark Realignment)- This alternative would have the same adverse effects as Alternative D.

## Hazardous Waste Sites

### a. Survey Methodology

A Phase I hazardous waste assessment was conducted for the Whitton Expressway study area. The purpose of the waste assessment was to identify sites within the study corridor that are contaminated or potentially contaminated with hazardous materials or waste. Sites containing excessive solid waste were also screened. Where sites were identified, discussions of their potential severity and impacts to the project have been developed.

For the purposes of this assessment, hazardous wastes and materials are defined as products or wastes regulated by the U.S. Environmental Protection Agency (EPA) or the State of Missouri Department of Natural Resources (MDNR). These include substances regulated under the Comprehensive Emergency Response, Compensation, and Liability Act (CERCLA), The Resource Conservation and Recovery Act (RCRA), The Toxic Substances Control Act (TSCA), The Federal Insecticide Fungicide, and Rodenticide Act (FIFRA), solid waste management, and storage tanks.

The hazardous waste assessment for the Whitton Expressway study corridor involved data collection efforts, including review of government agency lists and, and a field reconnaissance of the study corridor. The documents reviewed include the following: EPA and MDNR computer databases provided by Environmental Data Resources (EDR), Inc. (July 2007).

A summary table from the Technical Memorandum No. 1, Hazardous Waste Material Screening, is included below.

### b. Potential Hazardous Waste Sites

In all, 121 sites were identified within the study corridor as having the potential for hazardous or solid waste contamination. State and federal agency lists document all of the sites. All the sites are summarized in Technical Memorandum No 1.

All of the 121 sites have regulatory documentation. These sites store or generate hazardous material; are former or operating service stations with known or unknown underground or above ground storage tanks; are suspected to be contaminated with hazardous materials by nature of land use or business; were reported to emergency spill response authorities; or store considerable amounts of solid waste.

Some of the sites generate or store regulated hazardous materials under EPA cradle to grave regulations, have or had underground storage tanks, have had spills of hazardous materials requiring documentation, or are on various EPA regulatory lists. Although these properties were not thoroughly inspected, potential for contamination at these sites are considered low to moderate and

are not thought to pose a considerable action in time and expense to remediate or delay construction of the improvements.

Much of the study areas land use is industrial and commercial dating back 100 years or more. Former uses and possible contamination associated with former uses was not investigated, however, no documentation exists of contamination.

Numerous residential and smaller commercial properties along with the industrial properties were constructed prior to enactment of asbestos regulations. All structures predating 1980 planned for demolition have the potential for Asbestos Containing Material (ACM) and should be surveyed for content and properly removed prior to demolition.

## Visual Characteristics

### a. Visual Quality

#### *Existing Visual Environment*

The study corridor is located in a highly developed urban area of Jefferson City. It includes the existing Whitton Expressway four-lane highway facility, located between Missouri Boulevard at the west terminus (about two blocks south of the Capitol building) and Eastland Drive at the east terminus. The majority of the surrounding area is developed with office, hotel, institutional (schools, churches, hospitals), retail, residential, a few light industrial buildings, and several large surface parking lots. In contrast to the built environment, there are also some scattered open/undeveloped areas that include stream corridors, cemeteries, parks, and recreation areas.

The most notable visual resources within the study corridor are the few streams and their adjacent riparian corridors, which provide visual relief from the built environment. In contrast, the Capitol building and its surrounding multi-story institutional buildings, although outside of the study corridor, can be considered notable visual resources, as they provide interesting distant views by being situated at higher elevations than the roadway.

#### *Visual Assessment Units*

The areas within a project corridor can be visually distinct, can exhibit unique and consistent visual characteristics, and can possess varying degrees of visual quality. The study corridor can be divided into separate areas or units within which there are consistent visual characteristics and a uniform visual experience. These areas, called “Visual Assessment Units,” have direct relationships to physiography and land use and can be thought of as “outdoor rooms.” The boundaries of the visual assessment units occur where there is a change in visual character. The strongest determinations of the visual boundaries are *topography* and *landscape components*.

**Topography** – Topography influences many natural systems such as drainage, vegetation, geology, aspect, etc. These natural systems often have distinct and variable characteristics with visual consequences.

**Landscape Components** – Landscape components are distinct elements in the visual environment. Natural land cover elements such as trees, water, rocks, and open areas; developed land uses such as roads, bridges, and buildings; and identifiable patterns such as power line corridors and agricultural crops, constitute landscape components.

The visual assessment units were determined by studying the major landscape components and topography of the study corridor, studying aerial photography, and conducting windshield surveys. Given the variety of visual characteristics present within the study corridor, it was necessary to group various visual characteristics into the following separate Visual Assessment Units for analysis purposes (see Visual Assessment Appendix):

**Open / Undeveloped Areas** – These areas include the streams and their adjacent riparian corridors (Wears Creek and unnamed tributaries [Figures x253 & x266]), parks (East Miller Park [Figure x302]; Myrtle Smith Livingston Park [Figure x306]), recreation areas (Keith Major Field), and cemeteries (Jefferson City National Cemetery [Figure x304], Woodlawn Cemetery [Figure x303], Fairview Cemetery). These areas are located in the western half of the study corridor. In addition, there are undeveloped areas, both open and wooded, most of which are located in the eastern quarter of the study corridor (Figure x316). All of the open/undeveloped areas mentioned above provide visual relief from the built-up character that is prevalent throughout most of the corridor.

**Single-family Residential** – These areas consist of older one and two-story homes (Figures x294 & x301). Although a few small pockets of residences exist in the western third of the study corridor, most of the single-family residences are concentrated in the middle third of the corridor.

**Multi-family Residential** – Although there are some individual multi-family buildings scattered throughout the study corridor, there are three multi-family complexes. These include the public housing (Figure x312) on the south side of the expressway near Chestnut Street, the three-story apartment buildings (Figure x305) on the west side of Myrtle Smith Livingston Park, and the three-story apartment complex (Figure x283) located at the northeast quadrant of the Eastland Drive/Whitton Expressway interchange.

**Office-Hotel-Institutional** – These areas are somewhat scattered throughout the study corridor, but concentrated mostly in the western and eastern thirds of the corridor. They include buildings such as the following:

Saint Mary's Health Center (Figure x251) located at the west terminus;

The Capitol Plaza Hotel (Figure x257), State Health Laboratory (Figure x259), Harry S. Truman Building, Hotel DeVille located west of Broadway Street;

The Central Bank, Performing Arts Center (Figure x272), Hotel LaBella (Figure x320), City Annex & Police Department, all located from Jefferson Street to the east side of Monroe Street on the north side of the expressway;

Office buildings on each side of the expressway near Madison and Monroe Streets (Figures x276 and x);

Simonsen Junior High, located east of Jackson Street, on the north side of the expressway;

Quinn Chapel Ame Church (Figure x310) located on the east side of Lafayette Street, south side of the expressway;

Immaculate Conception School, located east of Clark Avenue, on the north side of the expressway;

State Highway Patrol Headquarters (Figure x298) located west of Nelson Drive, on the south side of the expressway;

Office park with low-profile buildings (Figure x287) located west of Eastland Drive, on the south side of the expressway;

Two to three-story office buildings (Figure x278) located west of Eastland Drive, on the north side of the expressway.

Retail – Although there are some individual retail stores scattered throughout the study corridor, the main concentration of retail buildings is located south of the Eastland Drive interchange (Figure x277). This area contains fast-food stores, convenience stores, and other stores selling consumer goods.

Light Industrial – There are two areas that have visual characteristics of light industry. One is located between Washington Street and Madison Street, on the south side of the expressway, and includes warehousing/distributing buildings (Figure x271). The other area is located west of Chestnut Street, on the north side of the expressway, and includes buildings and storage areas related to the City’s street maintenance activities.

Parking Lots – Concentrated mostly in the western third of the study corridor are several surface parking lots (Figure x269) that are adjacent to, and highly visible from the expressway. The vast areas of automobiles can appear as chaotic elements encroaching on the visual environment.

Most of the retail, office, hotel, institutional, and light industrial areas within the study corridor are somewhat lacking in harmonious or cohesive aesthetic relationships when compared to the buildings of the State Capitol Historic District visible to the north of the expressway. However, there are some exceptions such as the low-profile office park. In contrast, most of the residential areas are less intrusive and more aesthetically pleasing, depending upon architectural styles and maintenance practices.

**Visual Quality Rating**

The “visual assessment units” described above were studied to determine a visual quality rating. The quality of the visual environment can be collectively defined using the attributes of *vividness*, *intactness*, and *unity*. *Vividness* is the relative strength of the seen image, *intactness* is the visual integrity of the natural or man-made landscape and its freedom from encroaching elements, and *unity* is the overall visual harmony of a composition and the degree to which the various elements combine in a coherent way. The identified visual assessment units present within the study corridor and the relative existing visual quality rating of each (on a scale of low, moderate, or high) is presented in Table 19.

**Table 19: Visual Quality and Visual Receptors**

Visual Assessment Units	Visual Quality Rating	Relative Concentration Of Sensitive Visual Receptors
1. Open/Undeveloped Areas	High	Low to Moderate
2. Single-family Residential	Moderate to High	High
3. Multi-family Residential	Moderate	High
4. Office-Hotel-Institutional	Low to Moderate	Moderate
5. Retail	Low	Low
6. Light Industrial	Low	Low
7. Parking Lots	Low	Low

### *Viewers*

Visual quality impacts are determined by the degree of *change* in the visual environment as related to viewer response. For the purpose of highway project assessment, there are two distinct categories of viewer response to be considered in regard to the visual environment: viewers who are users of the project facility (views *from* the road), and the “visual receptors” or people who can observe the roadway from an adjacent vantage point (views *of* the road). Individuals that have the potential for undesirable views *of* the road are referred to in this discussion as “Sensitive Visual Receptors.” As shown in Table 16, the relative concentration of Sensitive Visual Receptors is high in the residential areas and low to moderate in all other areas of the study corridor.

Views FROM the Road – The most notable existing high quality views from the road occur in the areas where the expressway crosses the riparian corridor of Wears Creek (Figure x261) and parallels its tributary between Broadway Street and Jackson Street (Figure x265), and at the parks and other open or undeveloped areas. High quality views from the road also occur in the western third of the corridor, where the State Capitol and its surrounding buildings come into distant view (Figure x269).

Views OF the Road – The Sensitive Visual Receptors, who have undesirable views of the road, are concentrated in the residential areas and, to a lesser extent, in the parks (East Miller Park, Myrtle Smith Livingston Park), and at Quinn Chapel Ame Church (Figure x310). Views of the road are usually not undesirable to commercial and industrial receptors.

## **b. Visual Impacts**

Visual quality impacts are determined by the degree of change in the visual environment as related to the two distinct categories of views: (1) views *from* the road, and (2) views *of* the road, i.e. the “sensitive visual receptors” that would have the potential for undesirable views *of* the road (from residential areas and parks). (Views of the road are usually not undesirable to commercial and industrial receptors.)

In addition, roadway encroachments have the potential to negatively effect 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.

### *No-Build Alternative*

The No-Build Alternative would not physically alter the existing visual quality of the environment. Since there would be no new roadway traveling through the area, the views *of* the road and *from* the road, and the existing visual environment would essentially remain the same as current conditions.

### *Mainline Build Concepts*

#### Concept 4 (Viaduct)

Views From the Road – The most notable high quality views from the road would occur where the roadway crosses the Wears Creek riparian corridor, where it parallels the Wears Creek Tributary (south side of the expressway), and looking to the north and northeast where the State Capitol building and associated institutional buildings come into distant view.

Views Of the Road – Undesirable views of the road would occur from the few pockets of residential areas that are close to the expressway located east of Wears Creek, east of Broadway Street, and at Jackson Street. Although there is an existing roadway already in place, the new elevated portion of the roadway viaduct would become an additional visual intrusion on the surrounding environment. However, the area where the elevated roadway occurs is void of sensitive visual receptors (residences).

Visual Quality Impacts – The existing visual environment is of high quality along Wears Creek and its tributary on the south side of the expressway. This alternative would have a low to high visual impact on these environments, depending upon the location. There would be a low degree of visual “change” at Wears Creek as a result of a culvert extension, but it would be moderate at the tributary as a result of relocating a portion of the tributary near Washington Street. In addition, there would be a high degree of visual change in the area between Jefferson Street and Monroe Street as a result of the mainline of the roadway being elevated and placed on top of a walled-structure (viaduct) that would enclose the service travel lanes at ground level. The degree of change along the remainder of the expressway would be low since there is already an existing roadway in place.

#### Concept 5 (Parkway)

Views From the Road – The most notable high quality views from the road would occur where the roadway crosses the Wears Creek riparian corridor, and looking to the north and northeast where the State Capitol building and associated institutional buildings come into distant view.

Views Of the Road – Undesirable views of the road would occur at the same locations and would be similar to those described in Concept 4 above.

Visual Quality Impacts – The existing visual environment is of high quality along Wears Creek and its tributary on the south side of the expressway. This alternative would have an overall high visual impact on this environment. There would be a high degree of visual “change” as a result of having to place the stream in a box culvert to allow for roadway expansion. In addition, there would be a high degree of visual change in the area between Jefferson Street and Monroe Street as a result of the mainline of the roadway being elevated on piers above the service travel lanes at ground level. The degree of change along the remainder of the expressway would be low since there is already an existing roadway in place.

#### Concept 6 (Madison Overpass)

Views From the Road – The most notable high quality views from the road would be the same as those described in Concept 4 above.

Views Of the Road – Undesirable views of the road would occur from the few pockets of residential areas that are close to the expressway located east of Wears Creek, east of Broadway Street, and at Jackson Street. However, these views would be similar to existing views that are currently experienced by those residents, since there is already an existing roadway in place.

Visual Quality Impacts – The existing visual environment is of high quality along Wears Creek and its tributary on the south side of the expressway. This alternative would have a low visual impact on this environment. There would be a low degree of visual “change” at Wears Creek as a result of a short length of culvert extension, and a low degree of visual change at the tributary as a result of relocating only a small portion of it near Washington Street. The degree of change along the remainder of the expressway would be low since there is already an existing roadway in place.

*MSP Concepts*

## Concept A (Lafayette Interchange)

Views From the Road – The most notable high quality views from the road would occur at East Miller Park (west of Clark Avenue), at the open areas near Clark Avenue, and at the open area of the Highway Patrol Headquarters near the east end of the improvements.

Views Of the Road – Undesirable views of the road would occur from the residential areas near Lafayette Street where the residents would be exposed to views of the new interchange ramps. Although there would be new roundabouts at the Clark Avenue interchange, the views would be similar to existing views that are currently experienced by those residents, since there are already existing ramps and streets in that location.

Visual Quality Impacts – The existing visual quality of the environment is high at the open space area near Lafayette Street. There would be a high degree of visual “change”, and thus the impact would be high, as a result of adding a new interchange in this location. The degree of change along the remainder of the expressway would be low since there is already an existing roadway in place.

## Concept D (Lafayette Half Interchange and Clark Realignment)

Views From the Road – The most notable high quality views from the road would occur at East Miller Park (west of Clark Avenue), at the open areas near Clark Avenue, and at the open area of the Highway Patrol Headquarters near the east end of the improvements.

Views Of the Road – Undesirable views of the road would be similar to those as described in Concepts A and C above, with the exception that the new Lafayette interchange would have ramps on only the west side of Lafayette. With this alternative, the Quinn Ams Chapel would be exposed to a view of the interchange ramp on the west side of Lafayette where open space currently exists.

Visual Quality Impacts – The existing visual quality of the environment is high at the open space area on the west side of Lafayette Street. There would be a high degree of visual “change”, and thus the impact would be high, as a result of adding new interchange ramps on the west side of Lafayette in this location. There would also be a high degree of change in the residential neighborhood where Clark Avenue would be realigned. The degree of change along the remainder of the expressway would be low since there is already an existing roadway in place.

## Concept G (Lafayette Full Interchange and Clark Realignment)

Views From the Road – The most notable high quality views from the road would occur at East Miller Park (west of Clark Avenue), at the open areas near Clark Avenue, and at the open area of the Highway Patrol Headquarters near the east end of the improvements.

Views Of the Road – Undesirable views of the road would be similar to those as described in Concepts A and C above.

Visual Quality Impacts – The existing visual quality of the environment is high at the open space area near Lafayette Street. There would be a high degree of visual “change”, and thus the impact would be high, as a result of adding a new interchange in this location. There would also be a high degree of change in the residential neighborhood where Clark Avenue would be realigned. The degree of change along the remainder of the expressway would be low since there is already an existing roadway in place.

### **c. Aesthetic Considerations / Visual Enhancements**

As roadway design plans are developed, urban design features could be integrated into the overall aesthetics of the Whitton Expressway corridor. Urban design elements and landscaping can also help to maintain the property values of the neighborhoods adjacent to the roadway, and to enhance the character and aesthetics of the urban environment. The bridges 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 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 noise abatement is desired by the residential neighborhoods. If noise 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 noise 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.

## **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.

### **a. No-Build Alternative**

The No-Build Alternative, due to its very definition 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.

### **b. Build Alternative**

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 could be anticipated during construction. 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 Whitton would result in reduced idling. This would reduce the use of gasoline and diesel fuel required for travel on the highway.

## 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, the City will work with the public to address concerns during the final design of the project and would provide further coordination with impacted parties and individuals.

The City's and MoDOT's standard specifications for street construction include, but are not limited to, air, noise, and water pollution control measures, and traffic control and safety measures to minimize construction impacts. 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 Missouri Department of Natural Resources (MDNR) regulations, particularly concerning batch plant operations, clearing and grubbing functions and asbestos inspections.

### a. 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, asbestos containing material 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.

### b. 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 streams. The sediment increase could be due to runoff from cleared areas within the construction limits, earthmoving, and construction activities in or near stream channels. Disturbance of a stream channel during culvert or bridge 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 streams. Turbid water and suspended solids may be discharged directly to streams from pumps used in de-watering activities during roadway, bridge and culvert construction. This would be a temporary impact during construction. Best Management Practices

(BMPs) will be used to minimize the turbidity of the waters 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.

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.

### **c. 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.

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.

### **d. 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.

#### **e. Vibration**

Due to the proximity of the alignment to residential areas, if drilling and blasting are necessary for construction, 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, and coordination with affected groups will continue during the detailed design phase.

#### **f. Utility Relocation**

Most utilities in the study area are located in utility easements. Utilities located within the study corridor include overhead power transmission lines, underground power lines, gas lines, storm sewer, sanitary sewer, underground telephone/fiber optic lines, and water lines. Although utilities would have to be relocated, impacts are expected to be minor and proper coordination with utility companies will take place.

## **Secondary and Cumulative Impacts**

When a project has direct impacts, they occur at the same time and place. Secondary or indirect impacts are caused by the project but occur later in time and are farther removed in distance, and are reasonably foreseeable. Cumulative impacts are impacts on the environment that result from the incremental impact of the project when added to other past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions.

In evaluating secondary and cumulative impacts of the proposed project, project activities by others within or near the study area needs to be considered. Planning and construction of the MSP site within the study area has provided impetus for the proposed project, due to the need to provide access and connectivity for this new development.

## **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.

#### **a. No-Build Alternative**

The No-Build Alternative would avoid the short-term and localized construction impacts. It would be continued maintenance of existing Whitton Expressway. 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.

#### **b. Build Alternatives**

The build strategies for Whitton 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 floodplain and stream to transportation use. An additional short-term consequence would be the inconvenience to residents, business owners, employees, and thru-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 development and associated employment growth for the region and state.

Improvements to the Whitton study 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.

## **Irreversible and Irretrievable Commitment of Resources**

### **a. 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.

### **b. Build Alternatives**

The impacts of each of the build alternatives are considered similar in magnitude. Land acquired for constructing or reconstructing Whitton 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 asphalt 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 not 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.

**Technical Memorandum No 1  
US 50/63 Whitton Expressway  
Jefferson City, Missouri  
HAZARDOUS MATERIAL  
SCREENING REPORT**

for

**MISSOURI DEPARTMENT OF TRANSPORTATION**

By  
**HNTB CORPORATION  
KANSAS CITY, MISSOURI**

**August 2007**

# TABLE OF CONTENTS

## **Section**

1.0 EXECUTIVE SUMMARY

2.0 INTRODUCTION

2.1 PROJECT DESCRIPTION

2.2 METHODOLOGY

2.3 LIMITATIONS

3.0 DOCUMENT REVIEW

3.1 EDR INC., DATABASE

3.1.1 EDR Database

3.1.2 Federal Records

3.1.3 State Records

4.0 FIELD RECONNAISSANCE

4.1 GENERAL

4.2 LAND USES WITHIN THE STUDY AREA

4.3 UTILITIES

4.4 RESIDENTIAL PROPERTIES

5.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

6.2 RECOMMENDATIONS

ATTACHMENT A: FEDERAL AND STATE DATABASE REPORT (EDR)

## **1.0 EXECUTIVE SUMMARY**

The purpose of this report is to describe the findings of the Preliminary Hazardous Material Screening for the Whitton Expressway Corridor. The study focuses on an area of the southern central business district of Jefferson City, Missouri.

The purpose of the hazardous material screening was to identify sites within the area which;

- are known to be contaminated with hazardous substances including petroleum,
- contain, produce, emit, or store hazardous materials,
- are currently operating or formerly operated above or below ground petroleum storage tanks,
- are solid waste disposal facilities,
- structures which may or may not contain asbestos containing material (ACM)
- involve the unpermitted dumping of solid waste in various quantities.

The intended scope of the screening was to identify properties which may require the time and expense of further site characterization or actual clean-up before construction could proceed. The study reflects the preferred method cited by the Federal Highway Administration (FHWA) and Missouri Department of Transportation (MoDOT).

Risks and potential impacts related to hazardous wastes are known as part of the decision making process and have an impact on construction schedule. Hazardous materials may also have an impact on the value of a property. Further site characterization or remediation of a property may be desirable before acquiring a property or commencing construction.

Where sites are identified, discussions of the impact to the facility as well as possible associated costs may be developed. Recommendations for further action regarding these sites may also be indicated.

The hazardous material screening for the Whitton Expressway Corridor involved data collection efforts, and a limited field reconnaissance taken from public traveled ways.

In all, no properties have been identified as possibly impacted by construction of the project. The regulatory database search and field reconnaissance has identified 121 properties on various lists.

None of the regulated sites were documented with serious environmental hazards, pose a fatal flaw, and are believed to require extensive time and cost to clean.

This hazardous material screening is limited to the information retrieved through document review, and observation of readily viewed area within the study area.

## **2.0 INTRODUCTION**

### **2.1 PROJECT DESCRIPTION**

The US 50/63 Whitton Expressway Corridor is a planned improvement of the existing four lane expressway on the south edge of the central business district of Jefferson City, Missouri. Variations of construction may include widening the existing pavement by several lanes, adding retaining walls, reconfiguring and adding interchanges as well as the addition of bridges across the existing expressway.

#### **Topography**

The study area is located in Northern Cole County, Missouri. The study area is located at the boundary of the Glaciated Plains and the Salem Plateau and at the boundary of the alluvial valley of the Missouri River and its tributary Wears Creek with the uplands of the Springfield Plateau.

The topography can be generally characterized with the northeastern area as the nearly level alluvial plain of Wears Creek near its connection to the Missouri River and the steeper hills and bluffs adjacent to valley characterized as steep hills with eroded ravines.

#### **Geology**

The area is complex for the fact that it is located along physiographic, topographic and geologic boundaries. The lowest and most level area of the study area is the Wears Creek/Missouri River alluvial plain near the intersection of Whitton and Missouri Boulevard. This area is characterized by the moderately thick alluvium of Wears Creek and the Missouri River. Thickness of alluvium – depth to bedrock can be in the order of 100 feet. Ordovician Age Bedrock of the Jefferson City Formation make up the outcrops and underlying rock of the study area.

Eastward along US 50/63 the highest point is approximately at the crossing of Chestnut Street. The uplands are characterized by thin to moderately thick residual soils derived from the cherty dolomites of the Jefferson City Formation.

The Jefferson City Formation is described as light gray to light brown medium to finely crystalline, cherty dolomite, thin to medium bedded and contains thin beds of green shale and sandstone. The thickness of the Jefferson City Formation ranges from 125 to 350 feet, its average thickness is 200 ft (Stratigraphic Succession in Missouri, Thompson 1995).

Karst or cave forming is known to occur in the Jefferson City Formation, but no caves are known to exist in the study area. Springs have been noted in the area.

A paleokarst or paleosink feature was been noted in the vicinity of US 50/63 in the area of Eastland Drive during the foundation construction of the Eastland Drive Interchange. In the surrounding area paleo sinks are numerous in the Jefferson City Formation.

### **Groundwater**

The groundwater level may be near the surface in the alluvium of Wears Creek/Missouri River. Source and recharge of the alluvial groundwater is from the Wears Creek and the Missouri River. In remainder of the area, groundwater is found at various depths in the Jefferson City Formation as well as deeper aquifers.

The entire study area relies on public water supplies. Water is supplied by Missouri American Water Co. Electricity and natural gas is provided by Ameren UE. Major utility relocation and construction is required for the project. Sanitary and storm sewers serve the entire area and are provided by the City of Jefferson City.

For the purposes of this screening, hazardous wastes and materials are defined as products or wastes regulated by the US Environmental Protection Agency (USEPA) or the Missouri Department of Natural Resources. These include substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), the Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act (TSCA), the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and the underground storage tank regulations (UST). Solid waste is defined as solid materials that are not hazardous under RCRA and which are regulated under solid waste management laws.

This report presents methodology and limitations of the hazardous waste assessment including:

- Findings of the document review, field reconnaissance.
- Discussions on the significance of the findings.
- Conclusions and recommendations.

## **2.2 METHODOLOGY**

The methodology employed for this waste screening included the following tasks:

- Document review.
- Field reconnaissance
- Data evaluation, analysis and reporting.

The document review consisted of obtaining and evaluating a profile database from Environmental Data Resources (EDR), Milford, Connecticut. These reports are the result of a computer search of existing databases to identify environmental sites of concern within the entire study area.

The field reconnaissance included a visual inspection of the general project area to identify potential hazardous and solid waste areas. The screening is an attempt to identify sites which may contain hazardous wastes. Hazardous wastes are defined as substances included in the lists of regulations and/or toxic, reactive, ignitable, or corrosive. Areas of unusual amounts of solid waste were also noted. Sewage lagoons or septic fields were not considered in the study unless noted otherwise. No environmental samples were collected as part of this study.

The data evaluation, analysis, and reporting tasks included the analysis of file information and field data collected and the preparation of the screening report. A site is considered to be impacted by the project if it is purchased and/or taken for construction by MoDOT. The judgment is in accordance with the accuracy of the plans at the time of the screening.

## **2.3 LIMITATIONS**

This screening was limited to the review of readily available reports and documents and visual observations of surface conditions within the study area. No sampling or laboratory analysis of waste materials or media was undertaken as part of this screening. The regulatory database is limited to the information provided to the regulatory authorities and the geographical extent identified in the report. The field reconnaissance was limited to available view from publicly traveled roadways. Inspection or site walk-overs were not conducted. No property ownership was established, nor were titles reviewed for hazardous material documentation or liens imposed. No building interiors were viewed nor were fire insurance maps obtained or reviewed. No guarantee of the conditions is intended

The screening addresses the likelihood of hazardous substance contamination resulting from past and current uses within the study area. As a result of certain conditions, such as, but not limited to, those listed below, the presence of hazardous materials may not have been revealed:

- Naturally occurring toxins in the soil, rock, water, or flora
- Toxicity of substances common in current habitable environments such as stored household products, building materials, and consumables.
- Biological pathogens
- Unknown site contamination which may occur following this investigation
- Contaminant plumes below the ground surface.
- Historic disposal practices not defined in the readily available information or apparent through visual observation.

### **3.0 DOCUMENT REVIEW**

To identify known and potential waste sites within the study area, available public records were reviewed and/or requested. The documents reviewed include the following:

- EDR computer database search (July 2007).

#### **3.1.1 EDR Database**

EDR is a private environmental information company that has access to federal and state databases listing potential environmental problem areas and/or activities. EDR was given the study location as identified in July 2007. As a result, EDR produced a report and maps detailing the sites/facilities that have been identified within the databases for the specified area. The EDR report and maps allows for early identification and concentration of efforts on those sites/facilities that may be potential environmental problem areas and consequently affect the selection of a particular alignment alternative. In some cases, the locations of sites/facilities cannot be mapped by EDR due to incomplete database information such as a missing number in an address or a rural location. An attempt was made to identify the unknown locations of these facilities in relation to the study area. The results of the EDR database search is included.

### **3.1.2 Federal Records**

The EDR Federal Records Summary is extracted from USEPA records and is included in this document. USEPA has the following databases available for access:

- CERCLIS - Comprehensive Environmental Response, Compensation and Liability Information System.
- CERCLIS-NFRAP – CERCLIS No further Remedial Action Planned
- NPL - National Priorities List (Superfund)
- Proposed NPL
- Delisted NPL
- CORRACTS – Corrective Action Report
- ERNS - Emergency Response Notification System.
- RCRA TSD
- RCRA LGG - Resource Conservation and Recovery Information System - Large Quantity Generators (>1000 kg per month).
- RCRA SQG - Resource Conservation and Recovery Information System - Small Quantity Generators (100kg - 1000kg per month).
- CONSENT – Superfund (CERCLA) Consent Decrees
- ROD – Record of Decision
- DELISTED NPL – National Priority List Deletions

- FINDS – Facility Index System/Facility Initiative Program Summary Report
- HMIRS – Hazardous Materials Information Reporting System
- US ENG CONTROLS
  - US INST CONTROL
  - MLTS – Material Licensing Tracking System
  - MINES – Mines Master Index File
  - NPL LIENS – Federal Superfund Liens
  - PADS – PCB Activity Database System
- DOD – Department of Defense Sites
- FUDS
- UMTRA
- ODI
- LUCIS
- DOT OPS
  - ICIS
  - US BROWNFIELDS – A listing of Brownfield Sites
  - RAATS – RCRA Administrative Action Tracking System
  - TRIS – Toxic Chemical Release Inventory System
  - TSCA – Toxic Substances Control Act
- FTTS
- HISTORIC FTTS
- CDL
- RAD INFO
- LIENS 2
- PADS
- MLTS
  - MINES
- SSTS – Section 7 Tracking Systems

The CERCLIS database is a list of all sites that the USEPA has investigated or is currently investigating under CERCLA, none were identified in the study area. Sites on the CERCLIS list are not necessarily on the NPL but may be considered for inclusion in the future. Most of the CERCLIS sites once evaluated receive a finding of no further

action by the regulatory agencies but remain on the database. The NPL list includes sites listed or proposed for the Superfund National Priorities List of which none were identified in the study area.

The ERNS database identifies information on reported releases of oil or hazardous substances. The database contains information from spill reports made to federal authorities including the USEPA, the US Coast Guard, and the National Response Center and the Department of Transportation. The RCRIS database is a list of the facilities that generate and/or store hazardous waste regulated under RCRA (Resource Conservation and Recovery Act). The TSD database is a list of facilities that treat, store or dispose of hazardous waste regulated under RCRA. The Federal Records Summary identified the following 21 sites/facilities within the total possible build area of the improvement:

Total number in search	Facility type	Number adjacent to US 50/63
0	NPL	0
0	CERCLIS	0
2	CERCLIS-NFRAP	0
19	RCRIS-LQG&SQG	2

Note: A particular location may be included in multiple lists.

Of the 21 Federal Records Sites, none have a potential effect on the construction of the facility.

### 3.1.3 STATE RECORDS

EDR State Records Summary is a database similar to the Federal Records for information extracted from the MDNR records and is included in the Attachment B of this document. MDNR has the following databases available for access:

- SHWS – Registry of Confirmed, Abandoned or Uncontrolled Hazardous Waste Disposal Sites
- SWF/LF – Solid Waste Facility List.
- HIST LF
- LUST – Leaking Underground Storage Tanks.
- UST – Petroleum Storage Tanks.

- LAST
- VCP – Sites Participating in Voluntary Cleanup Program.
- AST – Aboveground Storage Tanks
- RRC - Certified Hazardous Waste Resource Recovery Facilities
- SPILLS - Environmental Response Tracking Database
- DEL SHWS – Registry Sites Withdrawn or Deleted
- AUL – Sites with Controls
- CDL – Environmental Emergency Response System
- Dry Cleaners
- Brownfields
- NPDES

The Missouri Department of Natural Resources Leaking Underground Storage Tank (LUST) inventory is a listing of underground storage tank facilities and locations where a leak has occurred, while the Underground Storage Tank (UST) list is a listing of underground storage tank locations regulated and permitted by MDNR. The MDNR Solid Waste Facilities (SWF) are lists of the names and locations of landfills, solid waste processing facilities, and solid waste recycling facilities, either currently operating or closed. The MDNR (SHWS) includes sites considered to be actually or potentially contaminated and presenting a possible threat to human health and the environment. These sites are listed by the state to warn the public as part of an investigation and clean-up program managed by the state.

The following 13 entries were identified from state records as being located within the potential improvement area:

Total number in search	Facility type	Number adjacent to US 50/63
0	SHWS	0
23	LUST	2
27	UST	2
1	AST	0
2	VCP	0
1	Inst Control	0
44	Dry Cleaners	0

Note: UST sites may have multiple tanks at each location.

Of the 4 state record sites, none is a fatal flaw to the project.

2 LUST or leaking underground storage tank sites were identified by the EDR database search. Of the 2 locations, all have been excavated and contamination remediated.

- Central Maintenance Garage 830 E. Millet
- Central Education Facility 214 E. Miller

### **Tribal Records**

The following Tribal Records were also searched

- Indian Reserv
- Indian LUST
- Indian UST

### **EDR Proprietary Records**

The following proprietary records were also searched

- Manufactured Gas Plants

### **Orphan Sites**

EDR reported the presence of 27 orphan (unmapped) sites. None of the orphan sites were identified as being located within the study area.

## **4.0 FIELD RECONNAISSANCE**

### **4.1 GENERAL**

#### **Methodology**

A field reconnaissance was carried out for the study area in August of 2007. This reconnaissance consisted of visually inspecting properties within the study corridor for evidence of uncontrolled solid waste and possible hazardous waste contamination. Visual inspection involved driving all passable public roads within the corridor. Examples of evidence of solid waste and hazardous waste contamination include the presence of drums; abandoned aboveground or underground storage tanks; paint fuel or lubricant containers, piles of debris; operating or abandoned landfills; ponds of liquid waste; or noticeable stress on vegetation or unusual staining.

Land uses and abandoned or former uses of buildings were also observed.

### **4.2 LAND USES WITHIN THE STUDY CORRIDOR**

Land use within the study corridor consists primarily of commercial, industrial, and residential.

### **4.3 UTILITIES**

Associated with the electrical transmission grid is the use of transformers. Typically substations and intermittent power pole locations house transformers that may or may not contain Polychlorinated Biphenyl's (PCB's). Currently there are no regulatory or economic incentives for utilities to remove and replace PCB transformers. Standard practice is to remove and replace these during routine maintenance. Further consideration may be necessary when this situation is involved with construction, to include soil testing for PCB's near transformers. Actual transformer removal is typically performed by the utility company except for private transformers owned by business.

### **4.4 RESIDENTIAL PROPERTIES**

Numerous residential and a few small commercial properties were observed within the study area. It is common for households to store and use small quantities of hazardous materials such as paints, batteries, fertilizers, herbicides, pesticides, gasoline, motor oil,

and cleaners/solvents. Residences and small buildings may have been constructed with asbestos containing material (ACM) such as insulation, roofing, siding and ceiling tile. It is possible that contaminants are present on these properties and inspections may be required to identify areas of concern. During the field reconnaissance, a few residences and commercial sites were noted for general poor housekeeping practices by storing large than usual quantities of items considered to be scrap or solid waste.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 CONCLUSIONS**

The review of environmental agency lists and files along with a limited field reconnaissance revealed the presence of no potential hazardous waste or solid waste sites which may affect the construction of the facility. .

### **5.2 RECOMMENDATIONS**

- Conduct further investigations of commercial sites - Perform Phase I investigations including inspection for the presence of asbestos containing material.
- For residential structures taken for the facility, inspections for hazardous materials are recommended. The inspections should include determination of asbestos containing material. Proper removal of asbestos containing material should be accomplished before demotion commences. Proper time should be allowed for the inspection, permitting and removal process. The inspections should be accomplished and asbestos containing material removed prior to allowing owner salvaging of construction materials or before structures are moved to offsite locations. Household hazardous waste such as paints, cleaners and automotive products may be present. Abandoned containers (full or empty) of these materials may be encountered at these locations. Characterization and proper disposal of these materials are recommended. A public agency or private contractor should be available to dispose of the expected household hazardous materials left by the present owners.
- Where utility or pipelines are encountered, relocated, or removed for the proposed project, coordination with the applicable companies is recommended to identify hazards present at the specific locations. Further investigations may be necessary based upon site-specific data from the utility.

**WHITTON EXPRESSWAY  
Cole County, Missouri  
City of Jefferson City**

**PRELIMINARY JURISDICTIONAL DETERMINATIONS**

**Regulatory Background**

Section 404 of the Clean Water Act (CWA) prohibits the discharge of dredged or fill material into “Waters of the U.S.” unless exempted or authorized by the U.S. Army Corps of Engineers (USACE). Section 404 is the primary Federal statute that implements federal regulatory policies concerning the protection of wetlands and other waters of the U.S. as specified in various orders and regulations. The St. Louis District USACE maintains jurisdiction over the water resources in the area in which the Whitton Expressway corridor is located.

The inventory and investigations for Waters of the U.S. included the task of gathering data to analyze “Significant Nexus” for jurisdictional determination. The classes of water bodies that are automatically jurisdictional under the CWA are Traditional Navigable Waters (TNWs) and their adjacent wetlands, Relatively Permanent Waters (RPWs) that flow directly or indirectly into TNWs, and wetlands directly abutting RPWs that flow directly or indirectly into TNWs. According to the EPA and USACE, an RPW (or perennial stream) is a tributary that is not a TNW and that typically flows year-round or has continuous flow at least seasonally (typically 3 months). Other water bodies that require a “Significant Nexus” finding in order to assert jurisdiction include:

- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs.
- Non-RPWs that flow directly or indirectly into TNWs (a Non-RPW is an intermittent or ephemeral waterway, i.e., one that does not flow year-round and typically less than 3 months).
- Wetlands adjacent to Non-RPWs that flow directly or indirectly into TNWs.

For isolated (interstate or intrastate) waters, including isolated wetlands, the USACE will elevate the action to USACE Headquarters for a review based on the USACE/EPA Memorandum Regarding *CWA Jurisdiction Following Rapanos*.

The USACE/EPA jurisdictional determination guidance also indicates that swales and erosional features, such as gullies and small washes characterized by low volume, infrequent, and short duration flow, “are generally not Waters of the U.S. because they are not tributaries or they do not have a significant nexus to TNWs.” The same holds true for “ditches (including roadside ditches) excavated wholly in and draining only uplands, and that do not carry a relatively permanent flow of water.”

**APPROVED JURISDICTIONAL DETERMINATION FORM**  
**U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

**SECTION I: BACKGROUND INFORMATION**

**A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):**

**B. DISTRICT OFFICE, FILE NAME, AND NUMBER:**

**C. PROJECT LOCATION AND BACKGROUND INFORMATION:**

State: \_\_\_\_\_ County/parish/borough: \_\_\_\_\_ City: \_\_\_\_\_  
Center coordinates of site (lat/long in degree decimal format): Lat. ° **Pick List**, Long. ° **Pick List**.  
Universal Transverse Mercator: \_\_\_\_\_

Name of nearest waterbody: \_\_\_\_\_

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: \_\_\_\_\_

Name of watershed or Hydrologic Unit Code (HUC): \_\_\_\_\_

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

**D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**

Office (Desk) Determination. Date: \_\_\_\_\_

Field Determination. Date(s): \_\_\_\_\_

**SECTION II: SUMMARY OF FINDINGS**

**A. RHA SECTION 10 DETERMINATION OF JURISDICTION.**

There **Pick List** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

Waters subject to the ebb and flow of the tide.

Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

Explain: \_\_\_\_\_

**B. CWA SECTION 404 DETERMINATION OF JURISDICTION.**

There **Pick List** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

**1. Waters of the U.S.**

**a. Indicate presence of waters of U.S. in review area (check all that apply):<sup>1</sup>**

- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- Relatively permanent waters<sup>2</sup> (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands

**b. Identify (estimate) size of waters of the U.S. in the review area:**

Non-wetland waters: \_\_\_\_\_ linear feet: \_\_\_\_\_ width (ft) and/or \_\_\_\_\_ acres.

Wetlands: \_\_\_\_\_ acres.

**c. Limits (boundaries) of jurisdiction based on: **Pick List****

Elevation of established OHWM (if known): \_\_\_\_\_

**2. Non-regulated waters/wetlands (check if applicable):<sup>3</sup>**

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.

Explain: \_\_\_\_\_

<sup>1</sup> Boxes checked below shall be supported by completing the appropriate sections in Section III below.

<sup>2</sup> For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

<sup>3</sup> Supporting documentation is presented in Section III.F.

### SECTION III: CWA ANALYSIS

#### A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is “adjacent”:

#### B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are “relatively permanent waters” (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody<sup>4</sup> is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: **Pick List**

Drainage area: **Pick List**

Average annual rainfall: inches

Average annual snowfall: inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

Tributary flows directly into TNW.

Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.

Project waters are **Pick List** river miles from RPW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Project waters are **Pick List** aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW<sup>5</sup>: .

Tributary stream order, if known: .

<sup>4</sup> Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

<sup>5</sup> Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

- Tributary is:**  Natural  
 Artificial (man-made). Explain: \_\_\_\_\_  
 Manipulated (man-altered). Explain: \_\_\_\_\_

**Tributary properties with respect to top of bank (estimate):**

- Average width: \_\_\_\_\_ feet  
Average depth: \_\_\_\_\_ feet  
Average side slopes: **Pick List**.

**Primary tributary substrate composition (check all that apply):**

- |  |  |                                   |
|--|--|-----------------------------------|
| <input type="checkbox"/> Silts                 | <input type="checkbox"/> Sands                           | <input type="checkbox"/> Concrete |
| <input type="checkbox"/> Cobbles               | <input type="checkbox"/> Gravel                          | <input type="checkbox"/> Muck     |
| <input type="checkbox"/> Bedrock               | <input type="checkbox"/> Vegetation. Type/% cover: _____ |                                   |
| <input type="checkbox"/> Other. Explain: _____ |  |                                   |

**Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:** \_\_\_\_\_

**Presence of run/riffle/pool complexes. Explain:** \_\_\_\_\_

**Tributary geometry: **Pick List****

**Tributary gradient (approximate average slope):** \_\_\_\_\_ %

(c) Flow:

**Tributary provides for: **Pick List****

**Estimate average number of flow events in review area/year: **Pick List****

Describe flow regime: \_\_\_\_\_

**Other information on duration and volume:** \_\_\_\_\_

**Surface flow is: **Pick List**. Characteristics:** \_\_\_\_\_

**Subsurface flow: **Pick List**. Explain findings:** \_\_\_\_\_

Dye (or other) test performed: \_\_\_\_\_

**Tributary has (check all that apply):**

- |   |   |
|---|---|
| <input type="checkbox"/> Bed and banks  |   |
| <input type="checkbox"/> OHWM <sup>6</sup> (check all indicators that apply): |   |
| <input type="checkbox"/> clear, natural line impressed on the bank            | <input type="checkbox"/> the presence of litter and debris          |
| <input type="checkbox"/> changes in the character of soil                     | <input type="checkbox"/> destruction of terrestrial vegetation      |
| <input type="checkbox"/> shelving   | <input type="checkbox"/> the presence of wrack line                 |
| <input type="checkbox"/> vegetation matted down, bent, or absent              | <input type="checkbox"/> sediment sorting                           |
| <input type="checkbox"/> leaf litter disturbed or washed away                 | <input type="checkbox"/> scour                                      |
| <input type="checkbox"/> sediment deposition                                  | <input type="checkbox"/> multiple observed or predicted flow events |
| <input type="checkbox"/> water staining                                       | <input type="checkbox"/> abrupt change in plant community           |
| <input type="checkbox"/> other (list): _____                                  |   |
| <input type="checkbox"/> Discontinuous OHWM. <sup>7</sup> Explain: _____      |   |

**If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):**

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> High Tide Line indicated by:   | <input checked="" type="checkbox"/> Mean High Water Mark indicated by: |
| <input type="checkbox"/> oil or scum line along shore objects      | <input type="checkbox"/> survey to available datum;                    |
| <input type="checkbox"/> fine shell or debris deposits (foreshore) | <input type="checkbox"/> physical markings;                            |
| <input type="checkbox"/> physical markings/characteristics         | <input type="checkbox"/> vegetation lines/changes in vegetation types. |
| <input type="checkbox"/> tidal gauges                              |  |
| <input type="checkbox"/> other (list): _____                       |  |

(iii) **Chemical Characteristics:**

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: \_\_\_\_\_

Identify specific pollutants, if known: \_\_\_\_\_

<sup>6</sup>A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

<sup>7</sup>Ibid.

(iv) **Biological Characteristics. Channel supports (check all that apply):**

- Riparian corridor. Characteristics (type, average width): .
- Wetland fringe. Characteristics: .
- Habitat for:
  - Federally Listed species. Explain findings: .
  - Fish/spawn areas. Explain findings: .
  - Other environmentally-sensitive species. Explain findings: .
  - Aquatic/wildlife diversity. Explain findings: .

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

(i) **Physical Characteristics:**

(a) General Wetland Characteristics:

Properties:

Wetland size:        acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain: .

Surface flow is: **Pick List**

Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .

Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting

Not directly abutting

Discrete wetland hydrologic connection. Explain: .

Ecological connection. Explain: .

Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List**.

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) **Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) **Biological Characteristics. Wetland supports (check all that apply):**

- Riparian buffer. Characteristics (type, average width): .
- Vegetation type/percent cover. Explain: .
- Habitat for:
  - Federally Listed species. Explain findings: .
  - Fish/spawn areas. Explain findings: .
  - Other environmentally-sensitive species. Explain findings: .
  - Aquatic/wildlife diversity. Explain findings: .

3. **Characteristics of all wetlands adjacent to the tributary (if any)**

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately (        ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)      Size (in acres)      Directly abuts? (Y/N)      Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

### C. SIGNIFICANT NEXUS DETERMINATION

**A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.**

**Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:**

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

**Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:**

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

### D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:

- TNWs:      linear feet      width (ft), Or,      acres.  
 Wetlands adjacent to TNWs:      acres.

2. **RPWs that flow directly or indirectly into TNWs.**

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
- Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).  
 Other non-wetland waters: acres.  
Identify type(s) of waters: .

**3. Non-RPWs<sup>8</sup> that flow directly or indirectly into TNWs.**

- Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: linear feet width (ft).  
 Other non-wetland waters: acres.  
Identify type(s) of waters: .

**4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.  
 Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .  
 Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

**5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

- Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

**6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

- Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

**7. Impoundments of jurisdictional waters.<sup>9</sup>**

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- Demonstrate that impoundment was created from "waters of the U.S.," or  
 Demonstrate that water meets the criteria for one of the categories presented above (1-6), or  
 Demonstrate that water is isolated with a nexus to commerce (see E below).

**E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):<sup>10</sup>**

- which are or could be used by interstate or foreign travelers for recreational or other purposes.  
 from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.  
 which are or could be used for industrial purposes by industries in interstate commerce.  
 Interstate isolated waters. Explain: .  
 Other factors. Explain: .

**Identify water body and summarize rationale supporting determination:** .

<sup>8</sup>See Footnote # 3.

<sup>9</sup>To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

<sup>10</sup>Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.





Figure x253 – Wears Creek.



Figure x266 – Tributary of Wears Creek.



Figure x302 – East Miller Park



Figure x306 – Myrtle Smith Livingston Park.



Figure x304 – Jefferson City National Cemetery.



Figure x303 – Woodlawn Cemetery.



Figure x316 – Open area along roadway.



Figure x294 – Single-family residential.



Figure x301 – Single-family residential.



Figure x312 – Public housing near Chestnut St.



Figure x305 – Apartments near Myrtle Smith Livingston Park.



Figure x283 – Apartments near Eastland Drive.



Figure x251 – Saint Mary's Health Center.



Figure x257 – Capitol Plaza Hotel.



Figure x259 – State Health Laboratory with Harry S. Truman Building in the background.



Figure x273 – Central Bank.



Figure x272 – Performing Arts Center



Figure x320 – Hotel LaBella.



Figure x276 – Office building near Monroe St.



Figure x310 – Quinn Chapel Ame Church.



Figure x298 – State Highway Patrol Headquarters.



Figure x287 – Low-profile office buildings.



Figure x278 – Two to three-story office buildings.



Figure x277 – Retail area at Eastland Drive.



Figure x271 – Light industrial buildings.



Figure x269 – Surface parking lot.



Figure x261 – Wears Creek riparian corridor.



Figure x265 – Riparian corridor of Wears Creek tributary.



Figure x269 – Distant view from the road, toward State Capitol building complex.



Figure x310 – View of the road from Myrle Smith Livingston Park (Quinn Chapel is on the right).