FHWA-WY-EA-05-01
ENVIRONMENTAL ASSESSMENT

Wyoming Project HP-4019-00(003)

Cheyenne Norris Viaduct, Laramie County

Prepared for:

U.S. Department of Transportation
Federal Highway Administration

WYOMING DEPARTMENT OF TRANSPORTATION

CITY OF CHEYENNE

Prepared by:

OLSSON ASSOCIATES

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Prepared for

City of Cheyenne, Wyoming,
Wyoming Department of Transportation
and
U.S. Department of Transportation, Federal Highway Administration

Submitted Pursuant to
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Approved:

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Date of Approval	Date of Approval	Date of Approval

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Comments on this Environmental Assessment are due by March 15, 2005
and should be sent to Tom Mason at the above address.

EXECUTIVE SUMMARY

S.1 INTRODUCTION

The City of Cheyenne is proposing to replace an existing viaduct, known as the Norris Viaduct, and improve adjacent roadways. This project is intended to maintain and improve an important transportation link over the Union Pacific Railroad Company's (UPRR) mainline tracks that separate the north and south sides of the City of Cheyenne in Laramie County, Wyoming (Figure 1.1).

The project entails replacing the viaduct, which currently extends from the intersection of Duff Avenue and East 7th Street on the south to Logan Avenue and Nationway on the north, and spans eight UPRR tracks. In addition, roadways from the south end of the viaduct to the intersection of East 1st Street and Morrie Avenue would be improved, and a shared-use path for pedestrians and bicyclists would be constructed.

The principal needs addressed by a grade separation structure at this location are:

- Replace an aging and deficient viaduct and adjacent roadways;
- Maintain and improve the existing transportation system linkage between the north and south parts of the City of Cheyenne;
- Provide an acceptable Level of Service (LOS) based on design year traffic volumes;
- Provide safe vehicular travel and efficient emergency vehicle access to the residential neighborhood and adjacent businesses;
- Provide safe pedestrian and bicycle travel from the Crow Creek Greenway to the north side of the UPRR tracks;
- Improve aesthetics along the roadway corridor and minimize barriers within the neighborhood.

The EA considers a range of alignment alternatives, including alignments developed in earlier studies and newly developed alignments. One build alternative and the no-build alternative have been carried forward for detailed analysis.

NEPA COMPLIANCE. The EA and environmental review process are in full compliance with the National Environmental Policy Act (NEPA). According to the Federal Highway Administration (FHWA) Guidance for Preparing and Processing Environmental and Section 4(f) Documents, the primary purpose of an EA is to help FHWA decide whether or not an EIS is needed. As such it includes an evaluation of project alternatives, a description of existing social, economic, and environmental conditions in the study area, and a consideration of the potential social, economic, and environmental impacts of each of the alternatives. According to the FHWA guidance, analysis is required only for those impacts whose significance is uncertain; therefore, only relevant resource categories, and not every possible resource category, have been addressed.

S.2 DESCRIPTION OF PROPOSED ACTION

The north and south parts of Cheyenne are separated by a large Union Pacific Railroad (UPRR) rail yard and by Interstate 80, both of which run roughly east-west. As a result, there are few through north-south vehicle routes. The route of Morrie Avenue – E. 5th Street - Duff Avenue - Norris Viaduct is the only through north-south route between Central Avenue and College Drive, a distance of two miles along I-80 and a distance of almost three miles along Lincolnway (US-30).

The viaduct and the streets connecting it to Morrie Avenue are an important part of the transportation network for the City, but the viaduct has reached the end of its design life and needs to be replaced to bring the structure into compliance with current design and safety standards. In addition, the adjacent roads are in need of improvements to meet current and future traffic demands.

The proposed project relocates the viaduct to the east of the current viaduct location, which will allow the traffic route to remain open during most of the construction period and which will minimize impacts to the adjacent neighborhood. A shared-use path for pedestrians and bicyclists would also be constructed for the length of the project.

S.3 OTHER MAJOR ACTIONS PROPOSED BY GOVERNMENT AGENCIES

Campstool Road improvements. Laramie County is planning to improve Campstool Road to the east of this project. The project will widen the road to four lanes to accommodate future traffic increases. The Campstool Road project will be located immediately to the east of the Norris Viaduct project.

S.4 REASONABLE ALTERNATIVES CONSIDERED

The planning process for this project extends back more than twenty years. Many alternative alignments have been considered over that time. An alignment has been developed that balances both the transportation needs of the City of Cheyenne and the needs of the residential neighborhood and nearby commercial and industrial facilities.

In this alignment, the viaduct approach is within the UPRR right-of-way and traverses the tracks to tie back into the Logan/Nationway intersection. The centerline of East 5th Street is offset approximately 50 feet to the north at the location of Duff Avenue. This alternative will require acquisition of all residential property to the east of the viaduct route. This alternative thus minimizes impacts to neighborhood cohesion and eliminates concerns for the safety of children needing to cross the viaduct route to walk or bicycle to school. Only commercial and industrial properties will remain to the east side.

The viaduct and the south approach will have four through traffic lanes. The proposed project includes a new signalized four-way intersection at the intersection with East 5th Street. The four-way intersection of Morrie Avenue and East 5th Street also will be signalized. East 5th Street would be reconstructed as four lanes, and Morrie Avenue between East 5th and East 1st Streets would be three lanes including a two-way left turn lane. The shared-use path will be located on the west side of Morrie Avenue, on the

north side of East 5th Street, and on the west side of the viaduct. Chapter 2 describes the alternative in more detail.

S.5 ENVIRONMENTAL IMPACTS

The social, economic, and natural environment impacts of the build alternative and the no-build alternative were investigated. Chapter 3 discusses these impacts in detail. These impacts are summarized below.

Neighborhood. The project will benefit the neighborhood by moving the through traffic route to the perimeter of the neighborhood. This will reduce commercial traffic on residential streets and eliminate the barrier between parts of the residential neighborhood that is created by the current viaduct location. In addition, emergency access to residences and industrial facilities will be improved.

Relocations. Approximately thirty residences will be relocated.

Environmental Justice. The project is located in an area that includes both low-income and minority people. Therefore, efforts have been made to include the neighborhood in the decision-making process. The benefits from this project will be equally available to low income and minority populations will have the access to the same benefits as others.

Transportation. The new four-way intersection at the viaduct approach and East 5th Street will require drivers to adjust to a new traffic pattern. In addition, a few residents will have to drive up to two additional blocks to access the viaduct, compared to existing travel trip lengths.

Pedestrians and Bicyclists. The existing sidewalk on the viaduct does not meet current standards, and bicyclists must share the road with vehicles or use the narrow sidewalk. The proposed shared-use path will improve safety for all users, and meet all standards, including requirements of the Americans with Disabilities Act.

Noise. The proposed viaduct will result in noise impacts to 7 residences. Due to the location and the nature of the project, noise abatement measures are not feasible.

Utilities. Several utility lines will require relocation in conjunction with the build alternatives. In addition, coordination with Union Pacific Railroad will continue throughout the design and construction phases to meet UPRR standards and minimize impacts to train traffic.

Environmental Risk Sites. There are several known environmental risk sites in the project vicinity, including Frontier Refinery. The possibility exists that contaminated soils, especially soils contaminated with petroleum products, could be disturbed during construction. In addition, structures may have lead paint or asbestos. If any environmental risks are identified during construction, appropriate measures will be taken for proper handling and disposal.

ENVIRONMENTAL ASSESSMENT
For
CHEYENNE NORRIS VIADUCT
Cheyenne, Wyoming

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
acc/mvm	Accidents per million vehicle miles
ADA	Americans with Disabilities Act
ADT	Average daily traffic
BMP	Best management practice
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation, and Liabilities Index System
Cfs	Cubic feet per second
dBA	Decibels weighted in A-frequency response (measure of noise level)
DEQ	Wyoming Department of Environmental Quality
DOT	U.S. Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information System
HCG	Hebard, Cole and Goins
HMIRS	Hazardous Materials Incident Report System
HSSIA	Historical South Side Improvement Association
HUD	U.S. Department of Housing and Urban Development
LCCC	Laramie County Community College
LCSD	Laramie County School District
LOS	Level of Service
LUST	Leaking Underground Storage Tank
MPO	Cheyenne Metropolitan Planning Organization
NAC	Noise abatement criteria
NBIS	National Bridge Inspection Standards
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
PCB	Polychlorinated biphenyls
PQI	Pavement Quality Index
RCI	Riding Comfort Index
RCRIS	Resource Conservation and Recovery Information System
ROW	Right of way
SAI	Structural Adequacy Index
SDI	Surface Distress Index

SHPO	State Historic Preservation Office
UPRR	Union Pacific Railroad
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
UST	Underground Storage Tank
WYDOT	Wyoming Department of Transportation
WGFD	Wyoming Game and Fish Department

ENVIRONMENTAL ASSESSMENT
for
CHEYENNE NORRIS VIADUCT
City of Cheyenne, Wyoming

1. PURPOSE AND NEED

1.1 INTRODUCTION

The City of Cheyenne is proposing to replace an existing viaduct, known as the Norris Viaduct, and improve adjacent roadways. This project is intended to maintain and improve an important transportation link over the Union Pacific Railroad Company's (UPRR) mainline tracks that separate the north and south sides of the City of Cheyenne in Laramie County, Wyoming (Figure 1.1).

The project entails replacing the viaduct, which currently extends from the intersection of Duff Avenue and East 7th Street on the south to Logan Avenue and Nationway on the north, and spans eight UPRR tracks. In addition, roadways from the south end of the viaduct to the intersection of East 1st Street and Morrie Avenue would be improved, and a shared-use path for pedestrians and bicyclists would be constructed.

1.2 PURPOSE AND NEED

The project purpose is to correct deficiencies in the Norris Viaduct and adjacent roadways, improve capacity and operational conditions along East 5th Street and Morrie Avenue, and construct a shared-use bicycle and pedestrian path. Correcting deficiencies, improving roadway capacity and operational conditions, and including a shared-use path will meet these principal needs of this project:

- Replace an aging and deficient viaduct and adjacent roadways;
- Maintain and improve the existing transportation system linkage between the north and south parts of the City of Cheyenne;
- Provide an acceptable Level of Service (LOS) based on design year traffic volumes;
- Provide safe vehicular travel and efficient emergency vehicle access to the residential neighborhood and adjacent businesses;
- Provide safe pedestrian and bicycle travel from the Crow Creek Greenway to the north side of the UPRR tracks;
- Improve aesthetics along the roadway corridor and minimize barriers within the neighborhood.

These needs are discussed in detail below.

<u>Replace an aging and deficient viaduct and adjacent roadways.</u> The Norris Viaduct, identified as Structure Number DDS, has reached the end of its design life and needs to be replaced to bring the structure into compliance with current design and safety standards.

Some specific examples concerning the structural adequacy and safety of the structure include:

- The annual average traffic count for the viaduct (December 2003) indicates an Average Daily Traffic (ADT) of 13,170 vehicles providing a Level of Service "C" for current conditions. The 25 year projected ADT of over 21,000 vehicles per day results in a Level-of-Service "E" that will prove unsatisfactory for the traveling public.

- The current clear roadway width on the Norris Viaduct is 30'-0" providing two 12'-0" lanes for traffic with a 5'-0" wide sidewalk on the west side of the structure. The 5'-0" wide sidewalk is slightly elevated from the roadway, however no positive protection between vehicles and pedestrians is provided on the structure creating a hazardous situation for pedestrians and bicyclists and does not meet current standards, including the standards of the Americans with Disabilities Act (ADA).

- The 32-inch height of the safety rail on the sidewalk does not meet current code requirements for pedestrian safety. The most recent inspection report (Wyoming Department of Transportation Inspection Report, Structure Number DDS, date inspected 12/18/2001) cites several locations where vehicular impact damage is apparent on the railings. The inspection report further cites locations where the railing anchorage devices are not functioning, and have excessive rusting. This creates an unsafe condition should further vehicular impacts occur.

- The inspection report further states that the steel girders are rusting and the rocker bearings that support the girders are not functioning due to severe rusting. The report shows that all of the pier columns have severe cracking and concrete spalling exposing reinforcing steel that in turn leads to further deterioration of the concrete.

- The deck drainage system has completely rusted away to the point that it no longer serves to carry runoff from the structure. Water from the deck falls directly onto the UPRR tracks causing erosion damage to the track ballast. This in turn could impact the railroad operations beneath the viaduct causing a derailment. A derailment could further damage the structure as the viaduct piers are not constructed with crash walls and are closer to the rails than the current minimum clear distance of 25 feet, according to UPRR standards (Guidelines for Design of Structures Over Railroad (Overhead Grade Separation), UPRR Standard Drawing 0035, March 31, 1998).

As a result of these and other deficiencies, inspection of the viaduct by WYDOT in 2001 resulted in a National Bridge Inspection Standards (NBIS) sufficiency rating of 35.2 out of 100. The current structure condition is discussed in more detail in the "Alternatives" section of this report (Chapter 2).

In addition to the condition of the viaduct, the adjacent roadways are in need of improvement. Morrie Avenue and East 5th Street do not have curbs and gutters, and the pavement is not in good condition. Pavement management reports from the City of Cheyenne rate pavement condition in several ways:

- Pavement Quality Index (PQI) is a single overall measure of pavement quality. This is rated on a scale of 0 (poor) to 5 (fair) to 10 (good).

- Riding Comfort Index (RCI) is a measure of pavement roughness. This is rated on a scale from 0 (poor) to 5 (fair) to 10 (good).

- Surface Distress Index (SDI) indicates the extent of pavement cracking and other defects. This is rated on a scale of 0 to 10, with a score below 7 to 7.5 indicating that the road section is at risk for accelerated deterioration.

- Structural Adequacy Index (SAI) is a measure of the ability of pavement to support the anticipated traffic load. This is rated on a scale of 2.5 to 10, with a score of 5 indicating adequacy for the load, and a score of 2.5 to 5 as structurally inadequate.

Table 1.1 indicates the pavement condition scores for the project area

Table 1.1
Pavement Condition in Study Area

	Morrie Avenue (I-80 to 5th St.)	**E. 5th Street (Morrie to Campstool)**
PQI (2004)	6.0	4.7
PQI (2000)	8.1	7.0
RCI	7.0	6.4
SDI	5.4	2.9
SAI	9.2	9.2

Source: City of Cheyenne Pavement Management Information (2004)

Thus, both Morrie Avenue and East 5th Street currently have pavement that is rated in the Fair range, and the pavement has deteriorated between 2000 and 2004. In particular, the pavement on these streets has a low SDI, indicating they are at risk for further rapid deterioration.

Maintain and improve the existing transportation system linkage between the north and south parts of the City of Cheyenne. The north and south parts of Cheyenne are separated by a large Union Pacific Railroad (UPRR) rail yard with numerous tracks that generally run east-west. This yard has few vehicular crossings and thus is a barrier to northbound and southbound through traffic. Interstate 80 (I-80) is another barrier to northbound and southbound traffic. Connectivity between the north and south parts of the City are vital to the economy of Cheyenne, access to residential neighborhoods and businesses, and access by emergency vehicles, but the combination of the rail yard and I-80 results in very few options for routing through north-south traffic in Cheyenne (Figure 1.2).

As Figure 1.2 shows, the route of Morrie Avenue – E. 5th Street - Duff Avenue - Norris Viaduct is the only through north-south route between Central Avenue and College Drive, a distance of two miles along I-80 and a distance of almost three miles along Lincolnway (US-

30). Thus, the viaduct and the streets connecting it to Morrie Avenue are an important part of the transportation network for the City.

This route is designated as an Urban Minor Arterial. An urban minor arterial provides connections and routes to supplement the principal arterial system. Trips tend to be of moderate length and have a lower level of travel mobility than principal arterials. An urban minor arterial provides a higher level of accessibility than its principal arterial counterpart. It may carry local bus routes and provide continuity between communities. Ideally, it does not divide a neighborhood.

In recent years, the southern part of the City of Cheyenne has grown rapidly. Businesses and residential developments have located along Fox Farm Road (WY-221) and East College Drive (WY-212). These recent developments have increased the volume of traffic using this urban minor arterial.

The large volume of traffic presently carried by the viaduct testifies to the importance of this north-south link in the City's transportation network. A Wyoming Department of Transportation (WYDOT) traffic counter is permanently installed on the viaduct. This counter provides documentation that traffic volumes have increased over the years (Table 1.2). According to WYDOT (2003), the Norris Viaduct has the highest average traffic count for monitored city streets that are not part of the state highway system.

Table 1.2
Traffic Counts on Norris Viaduct

Year	Average Daily Traffic (ADT)
1953-62	6,881*
1963-72	9,595*
1973-82	10,886*
1983-92 (excluding 1989)	10,767*
1993	12,027
1994	12,378
1995	12,191
1996	12,141
1997	12,178
1998	12,912
1999	12,558
2000	12.333
2001	12,418
2002	12,921
2003	13,170

*Annual average over 10-year period.
Source: WYDOT

The project purposes of correcting deficiencies and improving capacity and operational conditions will meet the need for maintaining and improving this transportation link.

Provide an acceptable LOS based on design year traffic volumes. Traffic counts conducted for this project confirm the high volumes of traffic on the viaduct, Duff Avenue, East 5th Street between the viaduct and Morrie Avenue, and Morrie Avenue south to East 1st Street (Figure 1.3, Existing Volumes).

The projected traffic volume for the design year (2028) indicates that traffic is expected to increase substantially on this route (Figure 1.4, Future Volumes). The future (2028) ADT on the viaduct is projected to be 21,600 vehicles per day, an increase of more than 70 percent over the existing ADT of 13,170. Future traffic volumes on adjacent streets are expected to increase sharply as well. On East 5th Street east of Morrie Avenue, the 2028 ADT is projected to be 16,600 compared to an existing ADT of 10,275. Morrie Avenue south of East 5th Street is also expected to increase from an existing ADT of 10,275 to 13,100 in 2028.

Existing traffic volumes place a high demand on the transportation network within the study area during the peak hours of operation. This results in delays for residents of adjacent neighborhoods, businesses, and through traffic utilizing this corridor. Emergency vehicles may also be subject to delays thus increasing response time to residences, schools, and businesses including the Frontier Refinery.

Achieving LOS C has been identified as acceptable for each intersection in the study area. The LOS can range from A (best) to F (worst). Table 1.3 indicates LOS characteristics.

TABLE 1.3
Level-Of-Service Characteristics

Level of Service	Description
A	Free flow with low volumes and high speeds.
B	Reasonably free flow, but speeds beginning to be restricted by traffic conditions.
C	In stable flow zone, but most drivers are restricted in the freedom to select their own speeds.
D	Approaching unstable flow; drivers have little freedom to select their own speeds.
E	Unstable flow; may be short stoppages
F	Unacceptable congestion; stop-and-go; forced flow.

Source: FHWA, Adapted from the AASHTO Green Book.

Existing conditions intersection capacity analysis reveals that some movements currently operate below LOS C during peak hours (Figure 1.5, Existing Conditions Capacity Analysis). These movements include eastbound traffic at East 5th Street and Morrie Avenue, and westbound traffic at East 5th Street and Duff Avenue. As delays increase, drivers are more apt to accept smaller gaps when trying to enter the main flow of traffic, which may increase the likelihood of crashes.

Under a no-build condition, traffic would incur an increased amount of delay. Additional movements would drop below LOS C. Figure 1.4 shows the projected traffic volumes for the future year (2028). Turning movements are projected to be very high at the two study intersections along East 5th Street (Morrie Avenue and Duff Avenue).

The project purpose of increasing capacity will meet the need of providing an acceptable intersection LOS for the future year (2028).

Provide safe vehicular travel and efficient emergency vehicle access to the residential neighborhood and adjacent businesses. The main flow of traffic south off the viaduct is to turn west on East 5th Street, then south on Morrie Avenue. The heavy traffic flows, close intersection spacing, and small gaps make it difficult to enter the corridor or the neighborhood via left-turns. The movements encountering the largest delays are the eastbound movement at East 5th Street and Morrie Avenue and westbound at East 5th Street and Duff Avenue.

East 5th Street becomes Campstool Road approximately a quarter-mile east of Duff Avenue. Campstool Road is the only roadway providing access to the land between Frontier Refinery and College Drive. It continues further east, providing access to commercial areas and Cheyenne LEADS Industrial Park. The entrance to the refinery's employee parking lots is off Campstool Road. Currently, traveling to the parking lots from the viaduct means making an unprotected left-turn against the flow of traffic at East 5th Street/Campstool Road and Duff Avenue. Similarly, entering the study corridor from Campstool Road can be difficult, particularly in the PM peak hour when workers leave the refinery.

The north/south flow of traffic through the study corridor involves two turning movements. Currently, there are no designated turning lanes, raised or painted median, or other dividers to separate on-coming traffic from turning traffic. There is one signalized intersection in the study area at Logan Avenue and Nationway. The intersections south of the viaduct (including the heavy turn movement intersections) are unsignalized.

The existing viaduct connects to Duff Avenue on the south, which runs through a residential neighborhood. Residents report a large number of accidents and near misses on Duff Avenue, East 5th Street, and Morrie Avenue. Accident data was collected and revealed that in the three-year period of 2000-2002, 28 crashes occurred along the project corridor. Eight of these occurred at the intersection of East 5th Street and Morrie Avenue. The accident rate for a section of the project corridor (Logan Avenue and Nationway to East 5th Street and Morrie Avenue) for this three-year period is 3.96 accidents/million vehicle-miles of travel. This rate is higher than the statewide average for urban minor arterials in any of these three years. In 2000, the statewide crash rate was 3.39; in 2001, it was 2.95; and in 2002, it was 3.19. Therefore, this corridor has a higher crash rate than comparable urban roadways in Wyoming.

In addition to the needs of the residents and businesses in the southside neighborhood for access and safe travel, the Frontier Refinery has specific traffic requirements that must be addressed. The refinery's main gate is located on East 5th Street, east of Alexander Avenue. Due to security issues in the wake of September 11, 2001, it is not desirable to

align the viaduct with the front gate of the refinery. The refinery requires a staging area located outside of its facility that will allow security checks to be performed before trucks enter the site. The project should accommodate these security issues while improving access to the industrial areas, including the refinery.

Due to the Norris Viaduct's location near the Frontier Refinery and the UPRR rail yard, the viaduct and Morrie Avenue are potentially important routes for emergency vehicles to access these sites or for evacuation of the southeast part of the southside neighborhood. The Norris Viaduct and the I-180/Central Avenue viaducts are the only through routes to the north, and Morrie Avenue and I-180/Central Avenue are the only through routes to the south. The Cheyenne Fire Department and the Police Department have emphasized the importance of this route for emergencies, as well as the importance of minimizing the length of time this route is closed for construction. An alignment offset from the existing viaduct would allow it to remain in service during construction, minimizing traffic disruption south of the viaduct.

The project purposes of correcting deficiencies and improving operational conditions will meet the need of providing safe vehicular access to the southside neighborhood residences and businesses.

Provide safe pedestrian and bicycle travel from the north side of the UPRR tracks to the Crow Creek Greenway. The existing viaduct is a two-lane, two-way structure, with a five-foot wide pedestrian walkway on the west side of the structure. The pedestrian walkway is separated from the roadway by a guardrail on the approaches, but by only a curb on the bridge itself. This path does not meet current ADA standards. Bicyclists must share the traffic lane with vehicles or walk their bicycles on the narrow pedestrian walkway.

Pedestrian and bicyclist safety within the neighborhood is also a concern. Hebard Elementary School is located on the south side of East 5th Street two blocks west of the East 5th Street and Morrie Avenue intersection, and therefore children walk or bicycle on or near this route while traveling to or from school. The Laramie County School District #1 is planning to rebuild schools in this neighborhood, and current plans call for the elimination of Hebard School possibly in the year 2011.

Pedestrians and bicyclists frequently have been observed using the bridge and residents of the neighborhood indicate that they use this route for walking and bicycling. This need for safe pedestrian and bicycle transportation on this route will increase in the future. Within the last few years, the Greenway trail has been constructed along Crow Creek extending east to the intersection of East 1st Street and Russell Avenue. The Greenway trail currently ends at this location but in the future, there will be a Greenway trail running along Nationway at the north end of the study area. The existing trail to the south of the viaduct and the future trails to the north are anticipated to increase the use of Morrie Avenue, East 5th Street, and the viaduct by pedestrians and bicyclists.

The project purpose of including a shared-use path will meet the need to provide for safe bicycle and pedestrian travel along the project route.

Improve aesthetics along the corridor and minimize barriers within the neighborhood. This need had been identified during prior planning studies for the neighborhood. During the scoping process for this project, many neighborhood residents asked how this project would tie into plans for neighborhood improvement, and expressed concerns that the project contribute to neighborhood aesthetics.

The southside Cheyenne neighborhood is one of the oldest in the City, being part of the "Original City" that was the first area platted in the late 1800s. The neighborhood in the vicinity of the project is somewhat younger, with houses dating mostly from the 1920s through the 1970s, but the lots and blocks are mostly the small sizes that were originally platted, and the residential neighborhood extended up to the border of the refinery.

When the Norris Viaduct was constructed in 1953 it connected to Duff Avenue. This resulted in several residential blocks at the east end of the southside neighborhood being isolated from the rest of the neighborhood. Over time, it has been recognized that this corridor acted as a barrier within the neighborhood, resulting in safety problems for residents and a loss of neighborhood cohesion.

Previous neighborhood planning studies have identified several needs to be addressed in the project area. The Hebard, Cole and Goins Neighborhoods Plan (Noblitt and Associates, 1995) called out four specific issues to address. Among these four were three that dealt with the study area:

- The possibility of a land use buffer adjacent to the refinery.
- The realignment of the Norris Viaduct.
- Discouraging traffic on East 5th Street.

The HCG Neighborhoods study recommended that a land use buffer strip be established between the residential neighborhood and the refinery on the portions of Morrie Avenue and East 5th Street that abut the refinery. The study also found that neither the existing alignment nor a previously proposed alignment connecting the viaduct to East 9th Street met the needs of neighborhood planning efforts, due to their action as barriers within the neighborhood. This study suggested considering closing the west and north legs of the intersection of East 5th Street and Morrie Avenue. The HCG Neighborhoods study did not recommend an alternative alignment for the viaduct, but recommended that it be "reconstructed in a manner that does not negatively affect the neighborhoods".

The project purpose of increasing capacity, correcting deficiencies, and providing a shared-use path will be consistent with previous planning efforts, and will meet the need for minimizing barriers and providing the opportunity for aesthetic improvement, including a land use buffer.

2. ALTERNATIVES

2.1 DESCRIPTION OF ALTERNATIVES

2.1.1 Design Constraints

Several constraints limit the potential location of a viaduct and through traffic routes at this location. These constraints include the following.

- UPRR rail yard. To the west of the existing alignment, the number of tracks to be crossed increases greatly. To keep the project cost-effective and acceptable to UPRR, alignment alternatives must be in the vicinity of the existing viaduct or to the east of this location.
- South-Side Cheyenne neighborhood. The project is located in the southeast part of the South-Side Cheyenne residential neighborhood, part of the "Original City" of Cheyenne. The neighborhood is a densely developed and mostly residential area. If possible, alignment alternatives should not create barriers and should be consistent with planning efforts.
- Frontier Refinery. The study area is adjacent to the refinery, which is a very large industrial facility with numerous above-ground storage tanks and underground pipelines. In addition, a land farm is located at the northwest corner of the refinery. This area has buried waste from the refinery that is of unknown content, and acquisition of right-of-way from the refinery would impact this area. Discussions with Wyoming Department of Environmental Quality (DEQ) indicated that this area should remain undisturbed if possible, and that disturbance might require remediation for the entire extent of the land farm site.

2.1.2 No Build Alternative

Under this alternative, the existing viaduct and adjacent streets would be maintained, but not improved.

The No Build Alternative will not meet the needs of the project. The existing viaduct will continue to deteriorate, with the potential for eventually becoming unsafe and requiring closure. This would remove a vital link in the transportation network for the City of Cheyenne and close one of the few routes that carry traffic across the UPRR tracks. If the viaduct closed, emergency access to the refinery and evacuation routes from the neighborhood would be reduced. This would create safety problems for refinery workers and neighborhood residents.

The existing access problems for the neighborhood and surrounding residential areas would continue with this alternative. The level of service at intersections such as East 5th Street and Duff Avenue and East 5th and Morrie Avenue would continue to be undesirable. The relatively high number of accidents on this section of road would continue as well. Concerns about safety for pedestrians and vehicles alike would occur within the neighborhood. As the Greenway trail system develops further, there would be no safe access to future trails along Nationway for either neighborhood residents or people using the Crow Creek trail.

Although there are no construction costs, the No Build alternative would not be without costs, from the potential of accidents, delays, and safety hazards from lack of access by emergency vehicles.

2.1.3 Build Alternatives

Prior Studies. The planning process for the Norris Viaduct extends back more than twenty years. The South Cheyenne Traffic and Inner Drive Feasibility Study (Jack Noblitt and Associates, 1982) originally recommended realigning the viaduct with East 9th Street, mainly in an effort to reduce through traffic on East 5th Street. The Cheyenne Metropolitan Planning Organization (MPO), originally the Cheyenne Area Transportation Planning Process, conducted the Ninth Street Corridor Study to further evaluate this alternative alignment (AVI, 1986).

The viaduct was included in the Cheyenne Area Master Transportation Plan (MPO, 1994). This study recognized that there were traffic and safety concerns in the study area. For example, the intersection of East 5th Street and Morrie Avenue ranked in the top 15 intersections within the Cheyenne corporate limits having the highest incidence of accidents. The study listed the reconstruction of the Norris Viaduct and Morrie Avenue as high priority projects and also recommended realigning the viaduct with East 9th Street. This study included a connector bicycle/pedestrian route on Morrie Avenue and East 5th Street in the study area.

The planning process for the viaduct continued with the Hebard, Cole and Goins Neighborhoods Plan (Jack Noblitt and Associates and EDAW, 1995). The purpose of this study was to identify particular action items that could assist in the redevelopment of these neighborhoods, which include the project study area. In particular, the study looked at four issues: re-use of Johnson Junior High School; possible land use buffer around Frontier Refinery; realignment of Norris Viaduct on East 9th Street; and ways to discourage through traffic on East 5th Street. This study evaluated impacts on the neighborhood for several viaduct alignment alternatives and included a public involvement process. Several alternative alignments were developed. These are shown in Figure 2.1.

These alternatives included:

- The alignment along East 9th Street that had been previously proposed (A).
- A new road along the south side of the UPRR right-of-way (B).
- Realignment of Norris Viaduct along Alexander Avenue (C).
- Realignment of viaduct along alley east of Alexander Avenue (D).
- Realignment of viaduct further east, connecting to Converse Ave (E).
- Realignment of viaduct further east, connecting to Hot Springs Ave (F).
- The existing alignment (G).

This study concluded that neither the existing viaduct location nor the relocation to East 9th Street would meet neighborhood planning or transportation needs. The study also concluded that none of these alternatives was clearly superior to others and that a more detailed analysis should be conducted.

Figure 2.1
Alternative Alignments from HCG Neighborhoods Plan

The Norris Viaduct Reconstruction Conceptual Plan (Benchmark, 1998) included a more detailed analysis of the benefits and drawbacks of the viaduct alignment alternatives developed in the previous study. The public, stakeholders, and agencies were involved in the analysis of the alternatives.

The two alternatives that realigned the viaduct further to the east (E and F) were eliminated due to not meeting transportation needs. Several of the alternatives were eliminated due to either not meeting transportation needs or to having unacceptable impacts on the neighborhoods.

This study concluded that the alignments with the least negative impacts on the neighborhood and the most transportation benefits were the alignments on Alexander Avenue and on the alley east of Alexander Avenue (C and D in Figure 2.1). Of these two, the alley east of Alexander Avenue (D) was the preferred alternative.

This alternative would align the viaduct with the front entrance of Frontier Refinery and this was seen as the best location for a signalized intersection. A bicycle and pedestrian shared-use path was included in this alternative, paralleling the roadway on the east and south sides.

Current Study. This study built on the results of the previous planning projects. However, the events of September 11, 2001 have changed the landscape for many projects, including the Norris Viaduct. An alternative that lines up with the front gate of the refinery (Alignment D in Figure 2.1 which was previously the preferred alignment) is now seen as a drawback rather than a benefit. The concern is that terrorists could target the refinery, creating a disastrous scenario not only for the refinery but for the South-Side Cheyenne neighborhood as well.

With this in mind, the results of the planning process that had been conducted over the last few years were modified slightly. Public input was solicited during the public meetings to assist in the development of alternatives. Some alternatives suggested during the public meetings were not considered, such as the eastern alignments that were eliminated in the HCG Neighborhoods Plan. These would not meet the transportation needs of the City. Another suggested alignment would eliminate both right turns on the existing alignment, by cutting a direct route through the neighborhood. However this alternative would have unacceptable impacts to the neighborhood and therefore was not considered.

As a result of the previous studies and the public meetings, alternatives that were developed were within a study area in the vicinity of the 1998 study preferred alignment. These alternatives were:

- **Alternative A.** This alternative is located on the existing alignment of the Norris Viaduct. The roads would be improved, and signalized intersections would be added at East 5th Street and Morrie Avenue, and East 5th Street and Duff Avenue. In order to increase the safety of neighborhood access to and from the route and viaduct by encouraging the use of signalized intersections, this alternative closes the intersections of Duff Avenue at both 6th and 7th Streets, and the intersection of Bradley Avenue at East 5th Street. Neighborhood access would be via 5th Street at Morrie and Alexander Avenues. This would lead to an increased travel trip length to access the viaduct for residents living east of Morrie Avenue. The most impacted residents are those living near Duff Avenue and 7th Street, who would have an increased trip length of approximately eight blocks to access the viaduct. This alternative will not address the concerns that the viaduct isolates residents in the small part of the neighborhood to the east. Figure 2.2 shows this alignment.

- **Alternative B.** This alternative offsets the viaduct alignment and viaduct approach to the east. This would allow the existing viaduct to remain open while the new viaduct is constructed. The remainder of the alignment is similar to alternative A. Figure 2.3 shows this alignment.

- **Alternative C.** This alternative eliminates one of the right-angle turns in the route. The viaduct is offset to the east to connect at the approximate location of Alexander Avenue, and a new four-way intersection would be constructed at East 5th Street and the viaduct approach that would allow the main flow of traffic to continue without turning. The north leg of this intersection would lead to the viaduct, the south leg to westbound East 5th Street, the east leg to eastbound East 5th Street/ Campstool Road, and the west leg to the neighborhood via East 6th Street. This intersection increases the access to the neighborhood by providing an additional signalized access compared to Alternatives A and B. This second access point reduces the maximum additional travel trip length for neighborhood residents from eight blocks to approximately two blocks. Figure 2.4 shows this alignment.

- **Alternative D.** This alternative is similar to C, but East 5th Street is offset to the north of its existing location. This allows a curve at the intersection of East 5th Street and Morrie Avenue rather than a signalized intersection. The west and north legs of the intersection would be closed to vehicular traffic. Closure of the west and north legs of the intersection was recommended in the 1998 Norris Viaduct Reconstruction Conceptual Plan. Closure was proposed in an effort to address neighborhood concerns about the through traffic on 5th Street and safety concerns near the Hebard Elementary School. Figure 2.5 shows this alignment.

- **Alternative E.** This alternative is similar to Alternatives C and D, but moves the viaduct approach portion of the roadway east into the UPRR property in an effort to minimize the barrier between residential properties. Similar to C, this alignment also closes the north leg of the Morrie Avenue/ East 5th Street intersection. Figure 2.6 shows this alignment.

- **Alternative F.** This alternative is a modified version of Alternative E, developed with input from the public. The viaduct approach is within the UPRR right-of-way and traverses the tracks to tie back into the Logan/Nationway intersection as described in alignments C, D, and E. The centerline of East 5th Street is offset approximately 50 feet to the north at the location of Duff Avenue. In addition, the north leg of the intersection at Morrie Avenue and East 5th Street is open. Right-of-Way acquisition under the alternative would be minimized through the use of Mechanically Stabilized Earth (MSE) walls. This alternative will require acquisition of all residential property to the east of the viaduct route. This alternative thus minimizes impacts to neighborhood cohesion and eliminates concerns for the safety of children needing to cross the viaduct route to walk or bicycle to school. Only commercial and industrial properties will remain to the east side. A minor reconfiguration of the business located immediately east of the proposed alignment would be required. This reconfiguration allows the business to remain operational. Figure 2.7 shows this alignment.

Figure 2.2
Alternative Alignment A

Figure 2.3
Alternative Alignment B

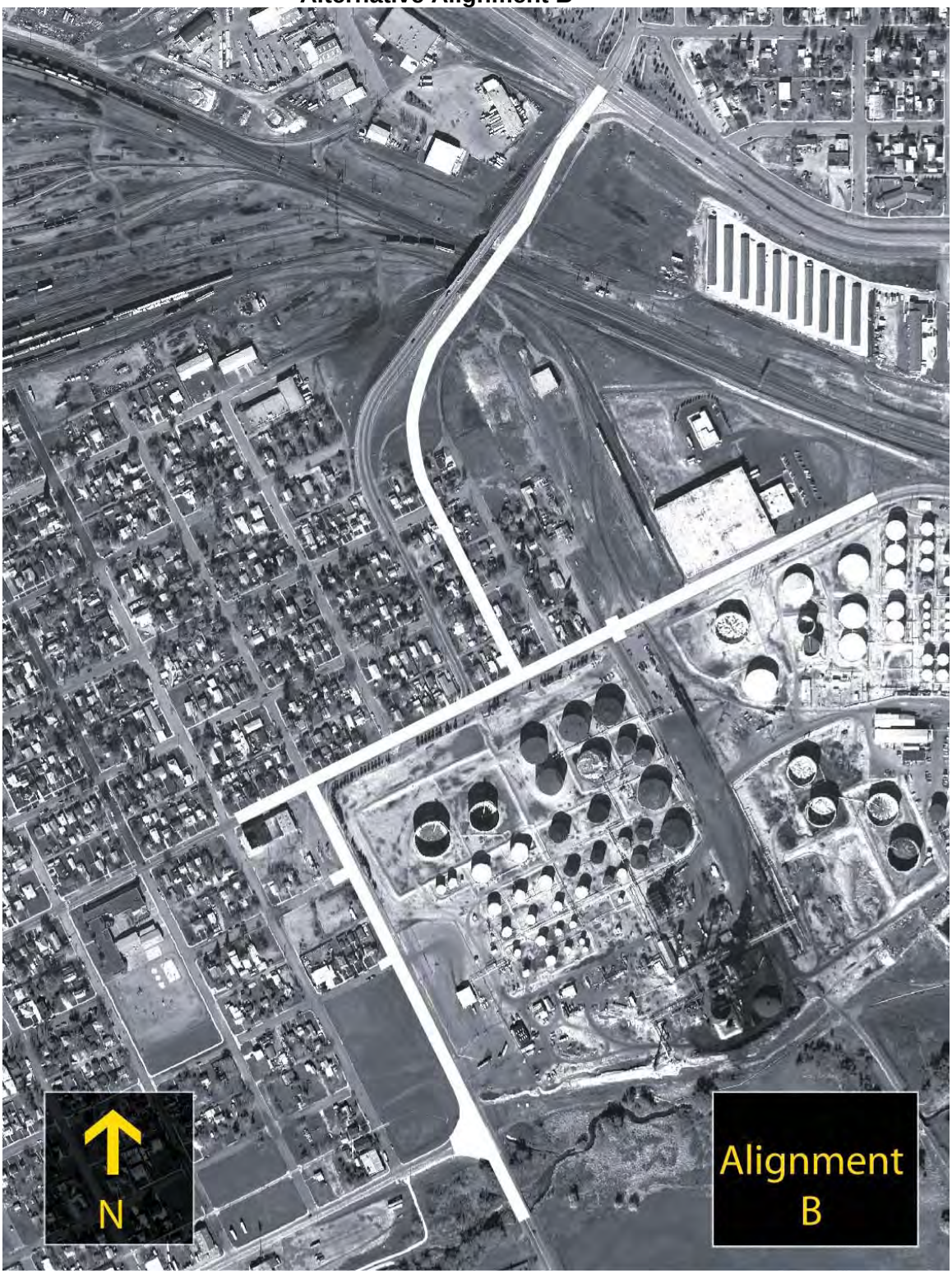


Figure 2.4
Alternative Alignment C

Figure 2.5
Alternative Alignment D

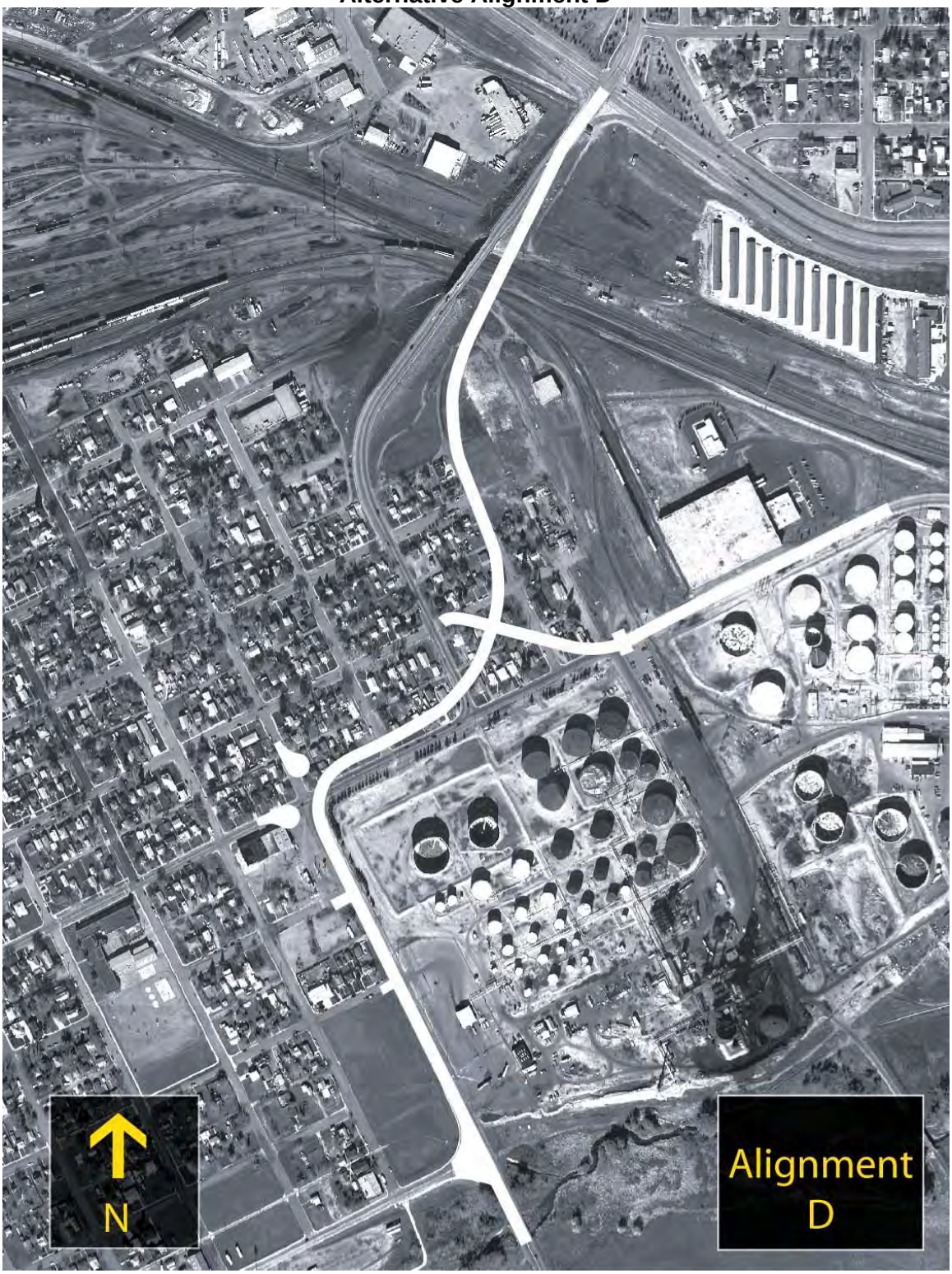


Figure 2.6
Alternative Alignment E

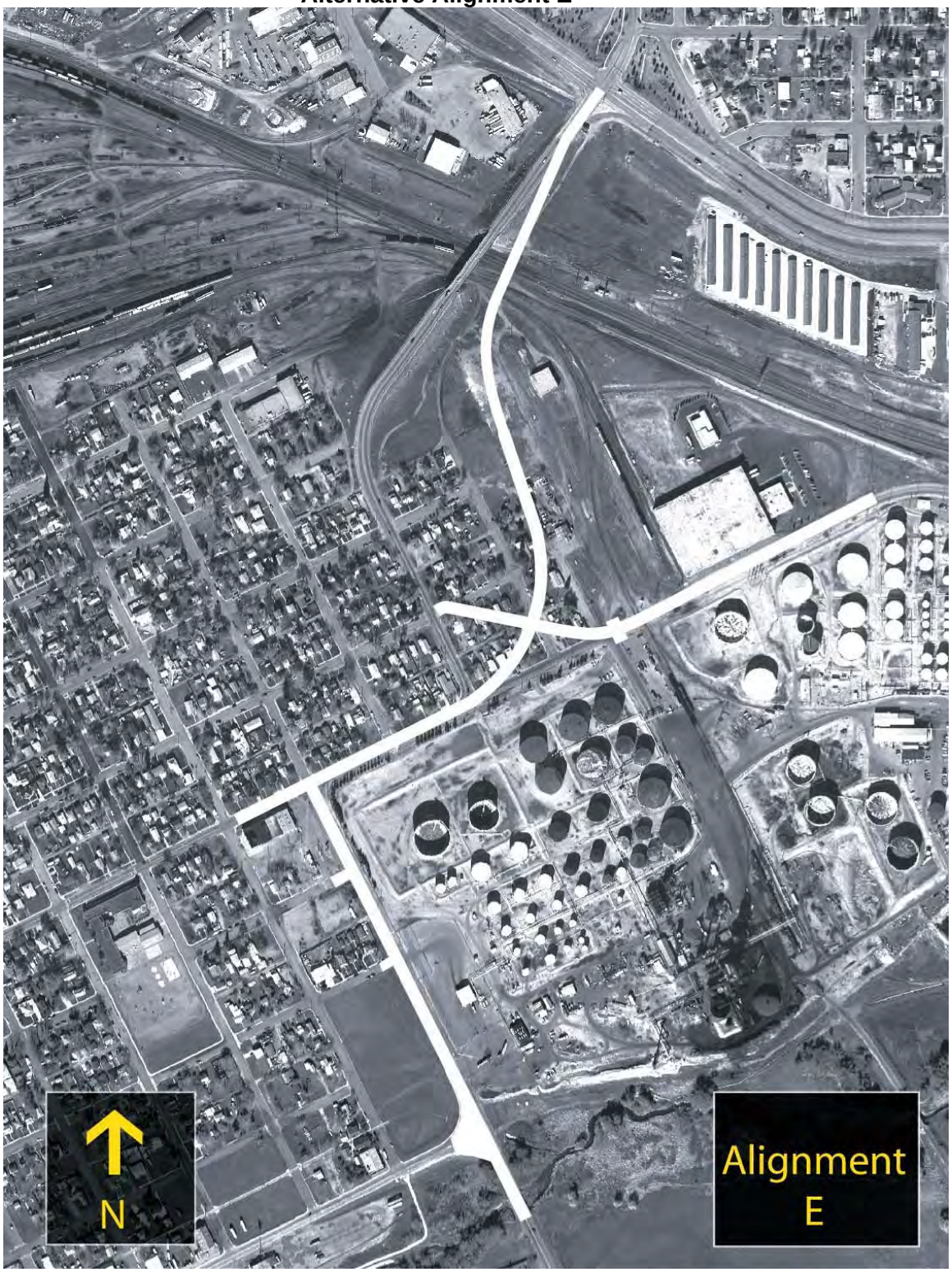
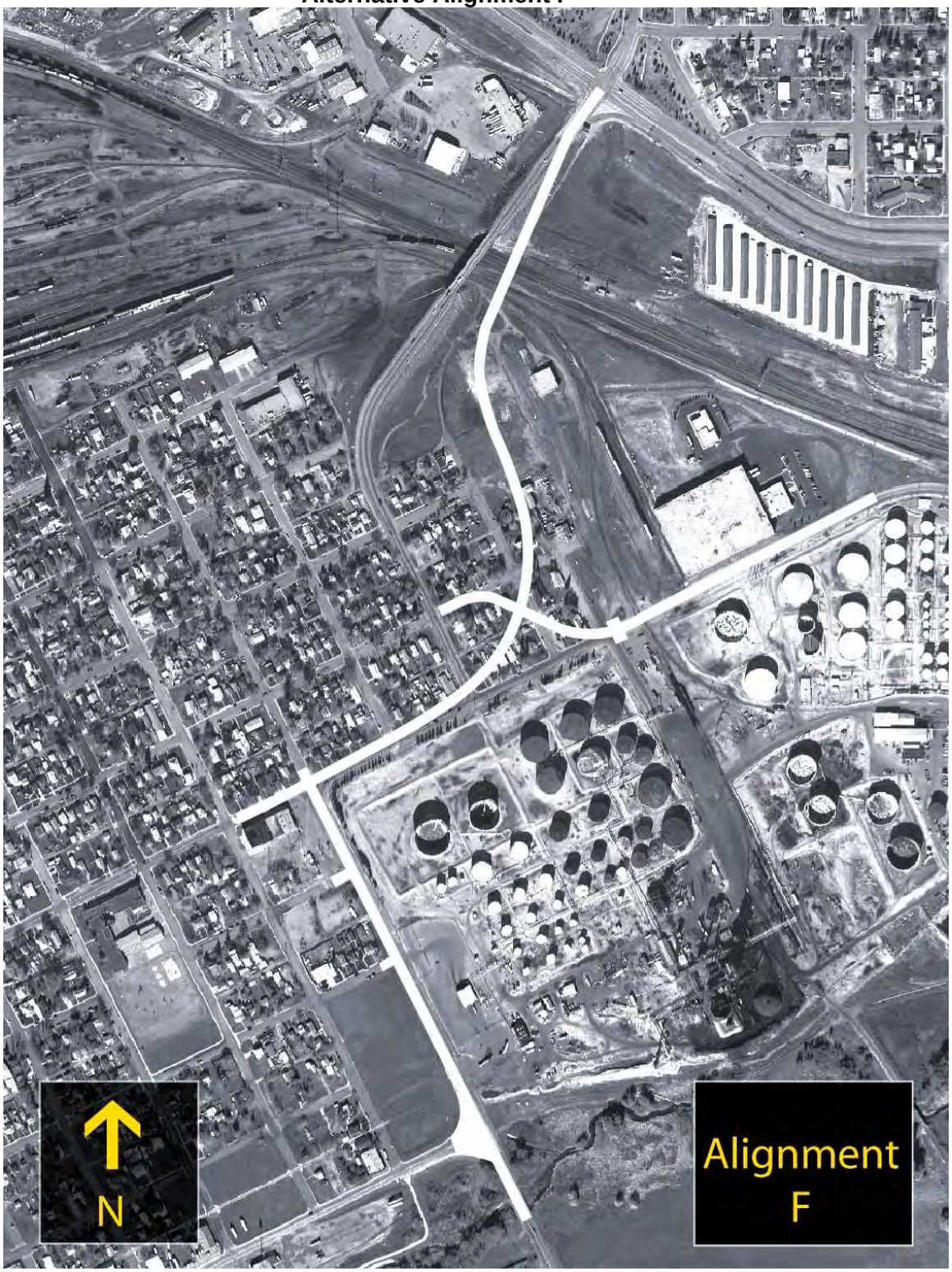


Figure 2.7
Alternative Alignment F



2.2 ALTERNATIVES EVALUATION

2.2.1 Screening of Alternatives.

The alternatives were screened utilizing the needs for this project. Criteria were developed that would assess whether an alternative met the need, partially met the need, or did not meet the need. These criteria were:

- Replace an aging and deficient viaduct and adjacent roadways: Does the alternative correct these deficiencies?

- Maintain and improve the existing transportation system linkage between the north and south parts of the City of Cheyenne. Does this alternative improve the transportation network, and keep this route open during construction with only short-term closures?

- Provide an acceptable Level of Service (LOS) based on design year traffic volumes. Will this alternative meet acceptable LOS?

- Provide safe vehicular travel and efficient emergency vehicle access to the residential neighborhood and adjacent businesses. Will this alternative provide safe, efficient access to the neighborhood and a secure staging area for the refinery?

- Provide safe pedestrian and bicycle travel from the Crow Creek Greenway to the north side of the UPRR tracks. Will this alternative provide a pedestrian and bicyclist route?

- Improve aesthetics along the roadway corridor and minimize barriers within the neighborhood. Does this alternative minimize barriers and create a land use buffer?

For each need, each alternative was evaluated to determine if it fully met the needs of the criterion, partially met the needs, or did not meet the needs.

2.2.2 Alternatives Not Advanced

Each of the alternatives were screened by the needs of the project. These are discussed in detail as follows.

Replace an aging and deficient viaduct and adjacent roadways: Does the alternative correct these deficiencies?

The No Build alternative does not meet this need. The viaduct and adjacent roadways will continue to be deficient.

Alternatives A, B, C, D, E and F all fully meet the needs of correcting the deficiencies. They will all result in a new viaduct built to meet current standards and improved roadways.

Maintain and improve the existing transportation system linkage between the north and south parts of the City of Cheyenne. Does this alternative improve the transportation network, and keep this route open during construction with only short-term closures?

The No Build alternative partly meets this need. This alternative will keep this route open, but does not improve this transportation link to meet the increasing demand of traffic.

Alternative A did not meet the need for maintaining a transportation linkage between the north and south parts of the City of Cheyenne, as it would require closing this route for an extended period of time during construction of the viaduct. Closure for an extended period of time results in the elimination of emergency access and evacuation routes. It further increases traffic delays since users are forced to find alternate routes around the closed facility.

An investigation into the feasibility of partial closure of the existing structure and allowing one-way travel controlled by timed stop lights was conducted. The investigation showed that the girder arrangement on the structure would allow partial closure. Some concerns with partial closure include:

1. Storage lengths for traffic queues on the north approach are not of sufficient length. Traffic analysis shows that the queue lengths would result in traffic backing into the Nationway/Logan Avenue intersection during peak hours.

2. Restricted access for emergency vehicles in the event of an accident at the refinery or emergency need in the neighborhood.

3. Limited ability to accommodate northbound traffic over the viaduct in the event of an evacuation.

Alternatives B, C, D, E and F all fully meet the needs of maintaining and improving the existing transportation system. The viaduct will need to be closed for only a short period of time for all of these alternatives.

Provide an acceptable Level of Service (LOS) based on design year traffic volumes. Will this alternative meet acceptable LOS?

The No Build alternative does not meet this need. Level of service will continue to deteriorate as traffic demands increase.

Alternatives A, B, C, D, E and F all fully meet the needs of providing an acceptable LOS.

Provide safe vehicular travel and efficient emergency vehicle access to the residential neighborhood and adjacent businesses. Will this alternative provide safe, efficient access to the neighborhood and a secure staging area for the refinery?

The No Build alternative does not meet this need. The higher than average crash rate is anticipated to worsen as traffic increases on this route. In addition, the alignment of the viaduct at right angles to the refinery fence is not desired by the refinery for security reasons.

Alternatives A, B and D do not meet this need. Alternatives A and B result in a "Tee" intersection at East 5th Street for southbound vehicles. This unrestricted access to the refinery north gate and fence could create security problems for the refinery. In addition, neither alignment allows for the construction of a truck inspection staging area and therefore do not address refinery security and neighborhood safety concerns.

In addition, Alternatives A, B, and D each provide only one access to the neighborhood from the project route, which can result in considerable additional trip length. Emergency vehicles may have to travel up to eight additional blocks for alternatives A and B. Alternative D closes the north leg of Morrie Avenue and the west leg of 5th Street intersection. This could result in difficult access into the neighborhood for emergency vehicles approaching from the north should an accident occur at the intersection of 6th Street and the north/south portion of the roadway. The roadway at 7th Street is still 7 to 8 feet above grade at this location so that vehicles could not enter the neighborhood at this location.

Alternatives C, E and F all fully meet the needs of providing safe access and refinery staging area and security concerns.

Provide safe pedestrian and bicycle travel from the Crow Creek Greenway to the north side of the UPRR tracks. Will this alternative provide a pedestrian and bicyclist route?

The No Build alternative does not meet this need. Pedestrians and bicyclists will continue to use either the narrow sidewalk or the roadway.

Alternatives A, B, C, D, E and F all fully meet the needs of providing a safe route for pedestrians and bicyclists.

Improve aesthetics along the roadway corridor and minimize barriers within the neighborhood. Does this alternative minimize barriers and create a land use buffer?

The No Build alternative does not meet this need. There will be no buffer between the residential neighborhood and the refinery. In addition, the viaduct will continue to act as a barrier between parts of the neighborhood will continue.

All the other alternatives will create a buffer between the refinery and the residential neighborhood, but most do not meet the needs of this criterion in other ways. Alternative D does not meet the project need of minimizing impacts to the neighborhood. This alignment would result in closure of the East 5th Street and Morrie Avenue intersection thereby rerouting through traffic onto additional neighborhood streets, most likely East 6th or 7th Streets.

In addition to the above concerns, alternatives A, B, C, D, and E would still result in a barrier between residences east of the viaduct route and the rest of the neighborhood. The minimization or elimination of this barrier is an identified goal of several neighborhood plans. There would be fewer houses remaining in this area, but there would be only one road connecting the east and west sides of the viaduct route, in contrast to the three roads currently connecting them. Alternatives A and B result in a fairly large number of houses isolated from the rest of the neighborhood by the viaduct. Alternatives C and E reduce this number considerably. Therefore, alternatives C and E were considered to partially meet the needs of the neighborhood by reducing the number of isolated houses.

Alternative F will not leave any residential properties isolated east of the viaduct. Thus, this alternative eliminates the barrier effect of the viaduct, and thus is the only alternative to fully meet the need of improving aesthetics and minimizing the effect of the viaduct as a barrier between parts of the neighborhood.

Table 2.1 summarizes the results of the evaluation of alternatives analysis. As can be seen in the table, six of the alternatives did not fully meet all of the needs for the project, including the No Build alternative and five alignment alternatives: Alternatives A, B, C, D, and E. Only Alternative F fully met all the project needs.

Thus, alternatives A, B, C, D and E were not advanced for more detailed analysis. Although the No Build Alternative did not meet the needs of the project, as required for NEPA analysis, it was advanced for comparison to the build alternative.

Table 2.1
Evaluation of Alternatives

Criterion	Alternative						
	No Build	A	B	C	D	E	F
Correct deficiencies	-	++	++	++	++	++	++
Maintain transportation linkage	+	-	++	++	++	++	++
Provide acceptable LOS	-	++	++	++	++	++	++
Neighborhood Vehicle Access	-	+	+	++	+	++	++
Pedestrian/ Bicyclist Route	-	++	++	++	++	++	++
Improve Aesthetics/ Minimize Barriers	-	-	-	+	-	+	++

- Does not meet need
+ Partially meets need
++ Fully meets need

2.3 ALTERNATIVE ADVANCED

Alternative F was advanced for further evaluation. This alternative is the only one that fully meets all of the purposes and needs of the project. This build alternative has these features:

- A pedestrian/bicyclist shared-use path on the west side of the north-south roadway and the four-lane viaduct, the north side of East 5th Street, and the west side of Morrie Avenue to the existing Crow Creek Greenway Connection at the 1st Street and Russell Avenue intersection.
- A five-foot wide sidewalk on the east side of the viaduct approach portion of the roadway and viaduct.
- Concrete barriers between the shared use path and vehicular traffic on the west side of the viaduct to provide protection for users of the shared use path.
- A similar system on the east side of the viaduct to provide protection for pedestrians on that side of the viaduct.

- A 10-foot tall steel welded wire mesh fence to provide protection to users from falling off the viaduct and to prevent vandals from damaging the rail cars beneath the viaduct.

Typical roadway and viaduct sections are shown in Figures 2.8 and 2.9 respectively.

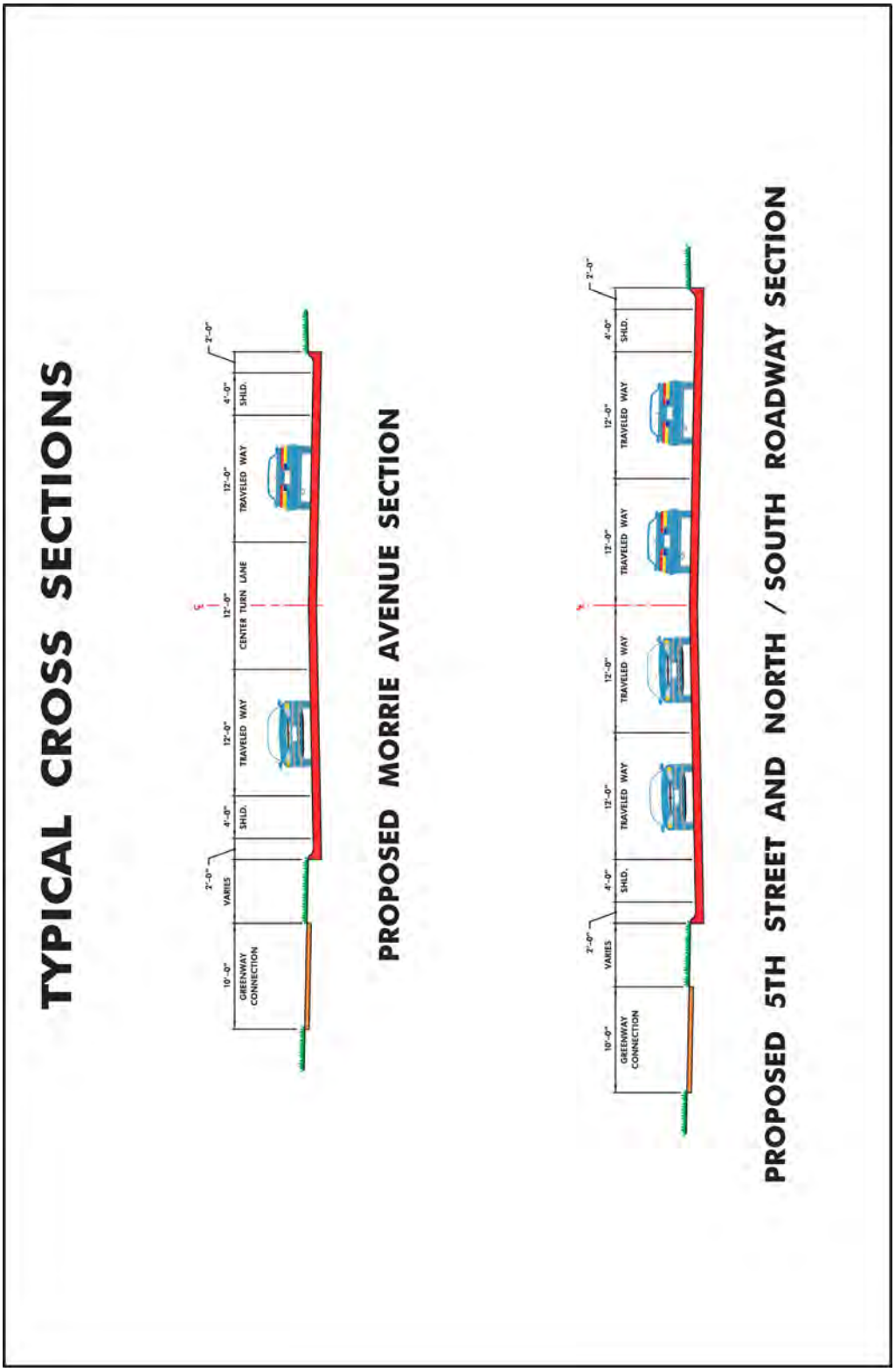


Figure 2.8
Typical Roadway Sections

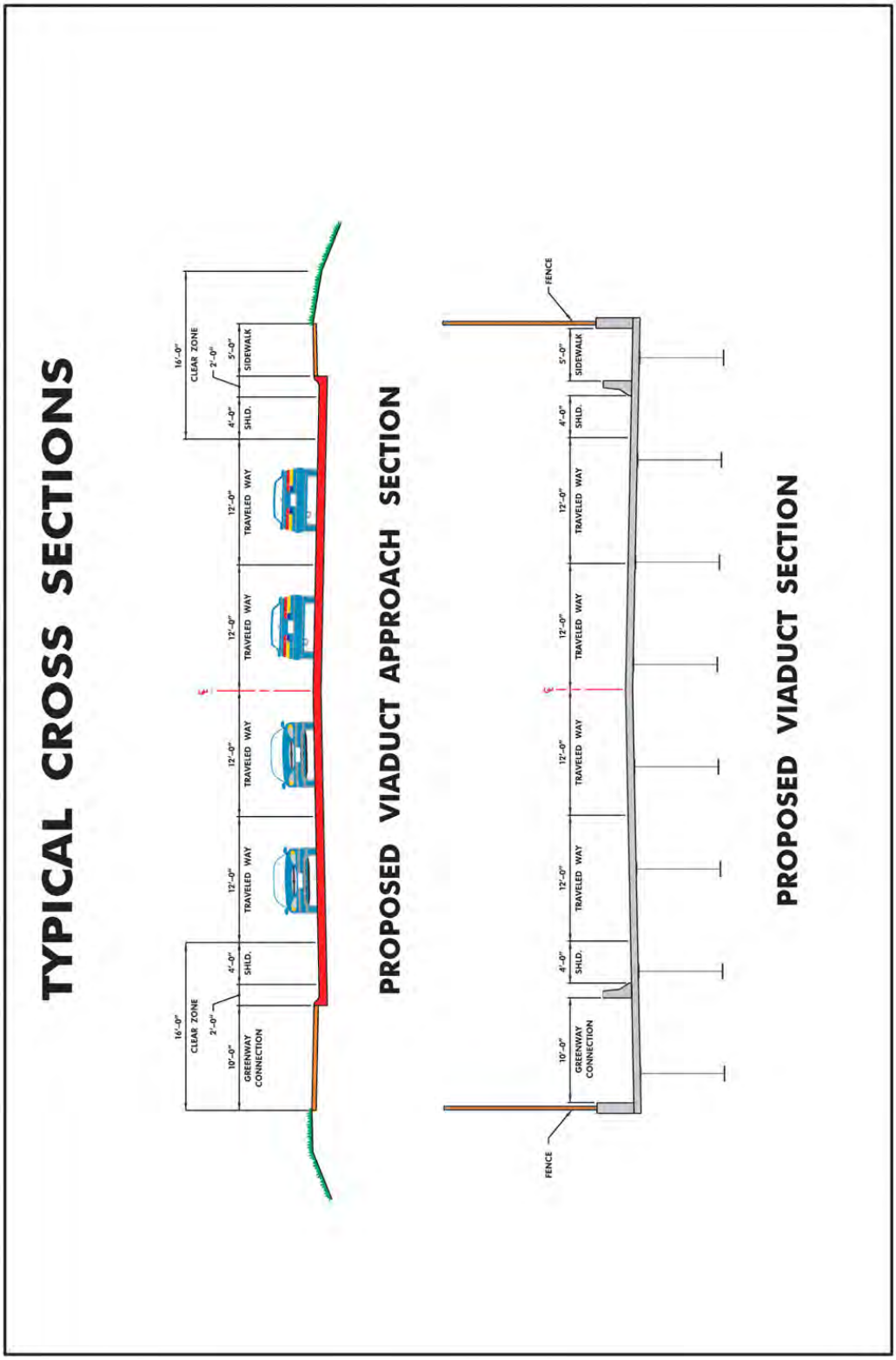


Figure 2.9
Typical Viaduct and Approach Sections

The advanced alternative is described in detail below.

Preferred Alternative (Alternative F)

Nationway/Logan Avenue Intersection to the Viaduct: The new four-lane section would be constructed using minor modifications to the existing geometry. Reverse curves immediately south of the existing intersection realign the roadway so that the replacement viaduct can be constructed immediately adjacent to the existing structure.

Viaduct to East 5th Street: The south end of the viaduct would align approximately with the alley east of Alexander Avenue. A new four-way signalized intersection would be located approximately 200 feet north and 40 feet west of the existing intersection of East 5th Street and Alexander Avenue. Instead of a three-way "tee" intersection at East 5th Street, this alignment would incorporate a curved roadway to eliminate the need for northbound or southbound traffic to make sharp left or right hand turns at the new intersection. The north leg would lead to the viaduct, the south leg would lead to westbound East 5th Street, the east leg would lead to eastbound East 5th Street and Campstool Road, and the west leg would lead to the neighborhood via East 6th Street. The viaduct approach and viaduct would be four lanes to meet the needs of future traffic volumes.

5th Street from the Viaduct Approach to Morrie Avenue: The east-west portion of the roadway would be located slightly north of the existing East 5th Street alignment which would allow for the construction of an inspection staging area for the Frontier Refinery on the existing street alignment. Existing intersections at Duff and Bradley Avenues would be closed to provide a continuous pedestrian/bicycle path north of the east-west alignment. The roadway would tie into the existing four-way intersection at East 5th Street and Morrie Avenue where a signalized light will control traffic movements.

Morrie Avenue between 5th Street and 1st Street: This section of Morrie Avenue is proposed to be three lanes: one lane in each direction and a two-way left turn lane in the center. Cross streets at East 1st, 2nd, and 3rd are proposed to remain open and the three lane section will transition back to the existing two lane section south of the East 1st Street intersection.

3. EXISTING CONDITIONS, IMPACTS, AND MITIGATION

3.1 INTRODUCTION

This chapter provides a description of the existing social, economic, and natural environmental resources and potential impacts and mitigation measures in the area potentially affected by the Norris Viaduct (viaduct) project. This chapter discusses the environmental consequences of the build alternative and the no-build alternative.

3.2 LAND USE AND ZONING

3.2.1 Existing Conditions

The project site is located within the City of Cheyenne, in Laramie County. Current land use in this area is urban. The project site includes residential development consisting primarily of single-family homes as well as commercial and industrial land uses. This part of the City is known as southside Cheyenne, and is part of the "Original City" that was platted in the late 1800s.

Although parts of the study area are residential, commercial and industrial facilities are interspersed with residences both in the study area and particularly to the north and east. The Norris Viaduct crosses the Union Pacific Railroad Company (UPRR) mainline tracks at the east end of the Cheyenne rail yard. UPRR owns property in the vicinity of these mainline tracks, and in the vicinity of spur tracks located to the east of the project area.

Frontier Refinery is adjacent to the project study area and is a large heavy industrial facility. The State of Wyoming Liquor Commission clearing house is also located adjacent to the study area.

The existing zoning in the area is primarily Medium Density Residential/Established (MR-1). There are a few commercial and light industrial facilities scattered in this zone, especially at the eastern and northern parts of the study area. The refinery is zoned as Heavy Industrial (HI), and the blocks between Russell and Morrie Avenues and 1st and 5th Streets are zoned as Light Industrial (LI). This light industrial area has a few residences scattered in among commercial and industrial uses. The area around the existing viaduct is also zoned LI. This area is currently vacant.

3.2.2 Impacts of the Alternatives

The build and no-build alternative would have no impacts on land use or zoning.

3.3 PHYSICAL SETTING

3.3.1 Topography

The topography in the vicinity of the viaduct is generally level, with slopes typically ranging from 0 to 2 percent. Surface water drains to the south and west in the study area. The existing viaduct is located on a fill embankment.

3.3.2 Geology

A geotechnical study of the Norris viaduct area was conducted in 1997 for a proposed viaduct alignment that lined up with the alley east of Alexander Avenue (Ingberg-Miller Engineers, 1997). Three soil borings were made on the proposed alignment, one to a depth of 53 feet, and the others to depths of 15 feet. The geotechnical report indicated that the soils consisted mostly of loose sand and fill materials in the upper seven to ten 10 feet. Below that, the borings indicated dense sand and stiff clay layers to a depth of approximately 51 feet. Between 51 and 53 feet, gravel and cobbles were encountered. Bedrock was not encountered in any of the borings.

According to the geotechnical report, ground water was found at a depth of approximately 13 to 15 feet below the surface.

Within historic times, at least two earthquakes greater than magnitude 2.5 on the Richter Scale and having their epicenters in Laramie County have been recorded, although there are no known surface fault zones in the area (Wyoming State Geological Survey, 2000). The Wheatland-Whelen fault system is located to the north of the County, and runs generally southwest to northeast in Platte and Goshen Counties. Earthquakes can also be caused by mining activities such as blasting. One of the strongest earthquakes in Wyoming history was caused by the partial collapse of a mine near the town of Little America in the southwest part of the state between Green River and Evanston.

3.3.3 Impacts of the Build Alternative

All of Wyoming is considered to be prone to seismic activity, even though the southeast part of the state is very much less likely to be affected by earthquakes than the northwest part of the state. The viaduct will be constructed to appropriate AASHTO standards for this area, and as a result, there should be no impacts to the viaduct or the surrounding areas.

A geotechnical investigation of the chosen alternative will be conducted to determine soil conditions. It is likely that the surface soils will be loose sands and other fill material as indicated in the prior geotechnical report. These materials may need to be excavated and replaced with compacted fill. The results of the geotechnical investigation will be used to determine the best design and construction methods during the final design phase.

3.4 TRANSPORTATION

3.4.1 Existing Conditions

The north and south parts of Cheyenne are separated by a large Union Pacific Railroad (UPRR) rail yard with numerous tracks that generally run east-west. This yard has few vehicular crossings and thus is a barrier to northbound and southbound through traffic. Interstate 80 (I-80) is another barrier to northbound and southbound traffic. Connectivity between the north and south parts of the City are vital to the economy of Cheyenne, access to residential neighborhoods and businesses, and access by emergency vehicles, but the combination of the rail yard and I-80 results in very few options for routing through north-south traffic in Cheyenne (Figure 1.2).

As Figure 1.2 shows, the route of Morrie Avenue – East 5th Street - Duff Avenue - Norris Viaduct is the only through north-south route between Central Avenue and College Drive, a distance of two miles along I-80 and a distance of almost three miles along Lincolnway (US-30). Thus, the viaduct and the streets connecting it to Morrie Avenue are an important part of the transportation network for the City.

This route is designated as an Urban Minor Arterial. An urban minor arterial provides connections and routes to supplement the principal arterial system. Trips tend to be of moderate length and have a lower level of travel mobility than principal arterials. An urban minor arterial provides a higher level of accessibility than its principal arterial counterpart. It may carry local bus routes and provide continuity between communities. Ideally, it does not divide a neighborhood.

In recent years, the southern part of the City of Cheyenne has grown rapidly. Businesses and residential developments have located along Fox Farm Road (WY-221) and East College Drive (WY-212). These recent developments have increased the volume of traffic using this urban minor arterial.

No City of Cheyenne public transportation routes use the study corridor. The South Bus Route runs east on East 1st Street and south on Morrie Avenue, and thus runs through the southern border of the study area.

3.4.2 Impacts of Build Alternative

The project will result in alterations in the traffic patterns in the neighborhood adjacent to the project. A new signalized four-way intersection is proposed to replace the existing three-way intersection at Duff Avenue and East 5th Street. The four legs of the intersection will connect to the viaduct on the north, to Campstool Road on the east, to East 5th Street on the south, and to East 6th Street on the west. While this will increase safety for vehicles, bicyclists, and pedestrians trying to access the neighborhood and nearby businesses, it also will require time for drivers to adjust to the new road patterns.

The intersection of Morrie Avenue and East 5th Street will also become signalized, but the traffic pattern at this intersection will remain the same, and therefore drivers will adjust quickly to this change.

Access to some of the neighborhood streets will also be limited. Duff and Bradley Avenues will end just north of East 5th Street, and East 7th Street will no longer intersect with the viaduct. Access to the neighborhood in the vicinity of the viaduct will be from Morrie Avenue and from the new four-way intersection, which will connect to East 6th Street. For residences near East 5th and 6th Streets, the trip distance to the viaduct will not be increased. For most residences near 7th, 8th, or 9th Streets, access will require an increase of two additional blocks as a result of closing the intersection of 7th Street at the viaduct.

The U.S. Bureau of the Census (2000) has data on means of travel to work and travel time. For 516 people surveyed in Block Group 1 of Census Tract 2, which includes the project area, 489 reported that they traveled to work by car, truck or van. Eleven reported that they walked to work, and 16 worked at home. No one reported taking public transportation or bicycling to work. Travel time to work was also reported for the

500 people who did not work at home. Table 3.1 shows the amount of travel time reported.

Table 3.1
Travel Time to Work for Workers over Age 16 in Block Group 1

Travel Time (minutes)	Number of Workers
Less than 5	34
5-9	172
10-14	104
15-19	140
20-24	8
25-29	0
30-34	6
35-39	0
40-44	0
45-49	17
60-89	15
90 or more	4

Source: U. S. Census

Therefore for the majority of workers an additional trip length of two blocks will make a negligible difference in the amount of time it will take to get to work.

3.4.3 Proposed Mitigation

As the viaduct is such an important part of the transportation network in Cheyenne, and there are few alternatives, the existing viaduct will be kept open through most of the construction process. Construction on the viaduct and on adjacent roadways will be phased so that only short-term closures will be necessary.

Although the intersection of East 1st Street and Morrie Avenue will be reconstructed for this project, it is anticipated that this intersection should remain open during construction, and thus the South bus route will be unaffected by the project.

The increased trip length for some residents to access the viaduct will be offset by the improved safety of the signalized intersections at 5th and Morrie and at 5th and the Viaduct approach.

3.4.4 No-build Alternative

Existing traffic problems will continue on this route, and are anticipated to worsen as more development of areas to the east and the south occur. The viaduct could to be closed for several months for necessary repairs, which would create problems for emergency vehicle access. Concerns will continue about the adequacy of the existing viaduct for evacuation of the neighborhood and the refinery, in the event of an emergency.

3.5 PEDESTRIAN AND BICYCLE ACCOMMODATIONS

3.5.1 Existing Conditions

The existing viaduct is a two-lane, two-way structure, with a five-foot wide pedestrian walkway on the west side of the structure. The pedestrian walkway is separated from the roadway by a guardrail on the approaches, but by only a curb on the bridge itself. Bicyclists must share the traffic lane with vehicles or walk their bicycles on the narrow pedestrian walkway.

Streets in the southside Cheyenne neighborhood have sidewalks on both sides, but there are no signalized crosswalks in the study area. Hebard Elementary School is located on the south side of East 5th Street two blocks west of the East 5th Street and Morrie Avenue intersection, and therefore children walk or bicycle on or near this route while traveling to or from school.

Within the last few years, the Greenway trail was constructed along Crow Creek extending east to the intersection of East 1st Street and Russell Avenue. The Greenway trail currently ends at this location but in the future, there will be a Greenway trail running along Nationway at the north end of the study area. The existing trail to the south of the viaduct and the future trails to the north are anticipated to increase the use of the viaduct by pedestrians and bicyclists.

3.5.2 Impacts of the Build Alternative

The project will improve safety for bicyclists and pedestrians in the neighborhood. The shared use path and the lane on the viaduct will provide a separation from the roadway that does not currently exist. In addition, the signalized intersections at East 5th Street and Morrie Avenue, and at the new four-way intersection leading to the viaduct will make crossing these roads much safer for pedestrians than with the current unsignalized conditions.

3.5.3 Proposed Mitigation

No additional mitigation beyond that included in the project design is proposed.

3.5.4 No-build Alternative

The current conditions will worsen as traffic increases on these roads.

3.6 RAILROADS, UTILITIES, AND PUBLIC SERVICES AND FACILITIES

3.6.1 Existing Conditions

Railroads

The Union Pacific Railroad (UPRR) rail yard is located just west of the viaduct. Numerous tracks run under the viaduct, including several main-line tracks and several siding tracks. Siding tracks are also located to the east of the study area, and serve several businesses, including the Frontier Refinery and the State Liquor Commission.

Utilities

Numerous utilities, sewer and water lines are located within the study area. Potential conflicts with all utilities will be determined during the Preliminary Design phase.

Public Services and Facilities
There are no public services or facilities located within the project area. The closest fire stations that provide emergency service are Firehouse #1, at 716 West 19th Street, and Firehouse #2, at 514 West Fox Farm Road. The Police Department is located at 2020 Capitol Avenue. The nearest school is Hebard Elementary School, located at 413 Seymour Avenue, two blocks west of the study area. The Laramie County School District #1 plans to rebuild Cole Elementary and to eliminate Hebard Elementary. Current plans call for this to occur in approximately the year 2011.

3.6.2 Impacts of the Build Alternative

Railroads
The proposed Norris Viaduct will span the UPRR tracks and not impact the siding tracks on the east side of the project area. The viaduct will meet all UPRR standards for clearance, and coordination with UPRR will continue throughout the design project.

Utilities
Various existing utilities would be relocated for the build alternative. Utility line relocations will be determined during the final design phase of the project. Any approvals for relocations will be obtained at that time.

Public Services and Facilities
Emergency vehicle access to the rail yard, refinery, and the neighborhood will be improved by the project. The increased viaduct will allow for faster access to the refinery from Firehouse #1, or faster evacuation of the refinery to the north in the event of an emergency.

Access to the neighborhood by emergency vehicles will be facilitated by the signalized intersections. At most, the change in traffic patterns would require emergency vehicles to travel two additional blocks.

3.6.3 Proposed Mitigation

Railroads
Accommodations will be made for train travel under the viaduct during construction. Construction will be coordinated with UPRR, and a construction permit for right-of-way access to railroad property will be obtained.

Utilities
Utility relocations will be determined during the final design phase. This will be done in close coordination with the utility companies.

Public Services and Facilities
Detours during construction will be kept to minimum length and duration. The viaduct will be kept open for almost all of the construction period, and closed only for short periods of time when the intersection at Nationway is being constructed. Access to residences and businesses for emergency vehicles will be maintained during construction.

After construction, the proposed design would include hammer-head turnarounds for emergency vehicles at the south end of Bradley and Duff Avenues, which will no longer connect to East 5th Street.

3.6.4 No-build Alternative

The no-build alternative would not have any impacts to railroads, utilities, public services and facilities.

3.7 PARKS AND RECREATION

3.7.1 Existing Conditions

The Cheyenne Greenway is located south of the project area. No other parks or other recreational areas are located nearby. None of the project area was purchased or developed with Land and Water Conservation Act funds, thus there are no Section 6(f) lands in the project area.

3.7.2 Impacts of the Build Alternative

No parks, recreational facilities, or other public lands will be impacted. There are no Section 4(f) properties in the project area.

The build alternative will include a shared-use path and a linear park feature along the west side of Morrie Avenue and the north side of East 5th Street, as well as a shared use path over the viaduct. This linear park will serve as a buffer between the refinery and the residential neighborhood, which is an important goal of neighborhood planning efforts.

3.7.3 Proposed Mitigation

No mitigation is proposed.

3.8 NEIGHBORHOODS

3.8.1 Existing Conditions

The study area is within a part of the City of Cheyenne known as southside Cheyenne or as the Hebard, Cole and Goins (HCG) Neighborhoods. This neighborhood encompass an area generally bounded by the UPRR rail yard to the north, I-80 to the south, I-25 to the west, and College Drive to the east. The southwest portion of the neighborhood extends south of I-80. The Norris Viaduct project is located in the east part of this neighborhood, between Central Avenue and the Frontier Refinery. Most of the neighborhood will not be impacted by the project.

The HCG neighborhood is one of the oldest in Cheyenne, and is a part of the City that was platted first, known as the “Original City”. As a result, lot sizes and houses are usually small. The neighborhood is mostly characterized by single-family housing, and has a large Hispanic population. Many of the families in this neighborhood have lived here for several generations, and the neighborhood as a whole is relatively stable.

Parts of the neighborhood, especially the eastern part near the project area, are more industrial and commercial in nature. This area abuts the refinery and other industrial facilities. On some blocks residences and commercial buildings are interspersed.

The South-Side "Original City" Neighborhood Revitalization Strategy Area Plan (City of Cheyenne, 2003) summarized many of the characteristics of this neighborhood. From Year 2000 U.S. Census Data, this report indicated that the neighborhood is in Census Tract 2 of Laramie County, Wyoming. The census tract has a total population of 3,810 people, with 2,120 of them white; 1,386 Hispanic; 145 African-American; 62 American Indian; 14 Asian, and 83 other or more than one race. In addition, Year 2000 census data indicate that there are 1,614 occupied housing units, of which 860 are owner-occupied and 754 are renter-occupied. The median year for construction was 1954; the median asking price $52,500; and the median rent asked $441.

The project area is within Block Group 1 of Census Tract 2, and includes Blocks 1002, 1004, 1005, 1009. 1010, 1011, 1012, 1013, 1020 and 1021. Year 2000 census data for these blocks indicates these characteristics of the people living here:

- The total population of this area is 193.
- Of this population, 133 identified themselves as white; 2 as African-American; 5 as American Indian; 44 as other race; and 9 as two or more races.
- 80 people identified themselves as Hispanic (of any race).
- There are 81 households in this area.
- Of these households, 19 include people 65 or older, and 12 include people 75 or older.
- There are a total of 87 housing units in the area, of which 6 were vacant.
- Of the 81 occupied hosing units, 50 were owner-occupied, and 31 were renter-occupied.

The neighborhood has been the focus of several planning studies by the City of Cheyenne. These studies, including the South-Side Plan mentioned above, and the Hebard, Cole and Goins Neighborhoods Plan (Jack Noblitt & Assoc, 1995) have identified neighborhood needs and possible revitalization solutions.

These planning studies indicated that the location of the existing viaduct acts as a barrier within the neighborhood, adversely affecting neighborhood cohesion. In addition, a land use buffer has been proposed in the HCG study that would separate the residential neighborhood from the refinery, and provide enhanced neighborhood aesthetics.

This area has a neighborhood association, the Historical South Side Improvement Association (HSSIA).

3.8.2 Impacts of the Build Alternative

The build alternative has been designed to be consistent with the neighborhood planning process. Moving the alignment of the viaduct to the east removes the barrier that divided the neighborhood, and also eliminates the potentially dangerous situation of children having to cross Duff Avenue to walk or bicycle to school. Under the proposed alternative, there will be no residences located to the east of the viaduct approach road.

In addition, the project will create a land use buffer between the neighborhood and the refinery, another goal of the neighborhood studies. This buffer will be a linear landscaped park, and will enhance the aesthetics of the neighborhood, and help keep up property values.

3.8.3 Proposed Mitigation
No mitigation is proposed.

3.8.4 No-build Alternative
The current situation will continue, with the viaduct serving to isolate houses on the east side. There will not be opportunity for a park or open space buffer between the refinery and the residential neighborhood.

3.9 ECONOMICS

3.9.1 Existing Conditions
The study area includes both residential and industrial uses. The study area contributes to the economy of the surrounding area through property tax revenues and employment opportunities.

Properties within Laramie County are taxed on an assessed valuation equal to 9.5 percent of their market value. There are several taxing entities that levy mills per $1000 of assessed valuation. Table 3.2 gives an example of the property tax for a house in the City of Cheyenne with a market value of $100,000 and an assessed valuation of $9,500.

Table 3.2
Example of Residential Property Tax on $100,000 House

Taxing Entity	Mills per $1000 assessed value	Tax
County	9.50	90.25
School District #1	26.00	247.00
State School Foundation Fund	12.00	114.00
County School Fund	6.00	57.00
City of Cheyenne	8.00	76.00
LCCC	10.00	95.00
County Fair	0.50	4.75
County Library	2.00	19.00
Conservation District	.50	4.75
Weed and Pest Control District	1.50	14.25
Total:	76.00	722.00

Source: Laramie County

3.9.2 Impacts of the Build Alternative
The build alternative will result in acquisition of thirty residences and therefore will result in a potential decrease of the tax base. However, the impact of the loss of these properties to the tax base in the City of Cheyenne will be negligible. According to data from the Laramie County Assessor's Office, in 2003 the total valuation of property in Laramie County was $538,688,179. The total value of property in School District #1, which includes the project area, was $499,696,020. For the City of Cheyenne, the total valuation of property was $333,028,981. The value of the property impacted by this project is approximately one-half of one percent of the City's total property value, and less for the other taxing entities. In addition, property taxes make up only approximately nine percent of the City of Cheyenne budget, so this loss of tax base is negligible compared to the overall City budget.

Property values overall are unlikely to be impacted by this project. The linear park between the road and the houses will act as a buffer, keeping the impact of increased traffic to a minimum. The park itself is likely to enhance the values of nearby properties.

No jobs are likely to be lost in the neighborhood.

Rebuilding the viaduct and adjacent roads will improve access to the industrial and commercial property east of the refinery, potentially encouraging more businesses to locate on the undeveloped ground in this area. This will increase the property tax base and employment opportunities in Cheyenne. Therefore, this project is likely to have an overall beneficial effect on the economy of the area.

3.9.3 Proposed Mitigation
No mitigation is needed, as there is likely to be an overall beneficial effect on the economy of the area.

3.9.4 No-build Alternative
The no-build alternative will not result in any impacts to the economy of the area.

3.10 ACQUISITIONS AND RELOCATIONS

3.10.1 Existing Conditions
The residences in the southside neighborhood consist mainly of small, single family houses on small lots. They typically are one (1), two (2) and three (3) bedroom houses, ranging in size from 525 to 1510 square feet. Most of the houses potentially affected by the project were constructed in the 1920s through the 1950s.

3.10.2 Impacts of the Build Alternative
Approximately thirty residences would need to be acquired for this project. In addition, some vacant parcels will be acquired as well. Figure 3.1 shows the approximate area that will need to be acquired for this project. In addition, there is the potential for the need to acquire right-of-way on the west side of Morrie Avenue. The alignment also will require the rearrangement of some of the buildings that make up the Miller-Stewart commercial business east of Alexander Avenue.

During the final design phase, the extent of this right-of-way acquisition will be determined.

3.10.3 Availability Of Replacement Structures
The approximately thirty residences that would be acquired by this project are currently determined to be valued at between $24,600 and $98,800 (Laramie County Assessor's Office, 2004). Seventeen of these are owner occupied, and thirteen are rental properties.

A search of similar priced properties within the same zip code on 20 August 2004 resulted in 32 properties for sale ranging from $20,000 to $99,950 (Realtor.com). Table 3.3 provides characteristics of the available properties.


NORRIS VIADUCT
ENVIRONMENTAL ASSESSMENT
FIGURE 3.1
1ST ST.
2ND ST.
3RD ST.
4TH ST.
5TH ST.
6TH ST.
7TH ST.
8TH ST.
9TH ST.
RUSSELL AVE.
MORRIE AVE.
BRADLEY AVE.
DUFF AVE.
ALEXANDER AVE.
NATIONWAY
LOGAN
TIMBERLAKE STORAGE TANKS
FUTURE SIDEWALK
LEGEND
ROADWAY
VIADUCT
PAINTED MEDIAN
GREENWAY CONNECTION & SIDEWALK
U.P.R.R. ACQUISITIONS
ACQUISITIONS
CITY R.O.W. RELINQUISHED TO U.P.R.R.
N
SCALE
0 100' 200'
ALIGNMENT F ACQUISITIONS

Table 3.3
Houses Listed for Sale in Zip Code 82007 on 17 August 2004

Price	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom	Multi Unit
$20,000-$29,950	0	0	3	0	0
$30,000-$39,950	0	0	5	0	0
$40,000-$49,950	0	0	1	1	0
$50,000-$59,950	2	0	0	0	0
$60,000-$69,950	0	1	2	0	0
$70,000-$79,950	0	2	3	2	1
$80,000-$89,950	0	4	3	0	0
$90,000-$99,950	0	0	1	0	1

Source: Realtor.com

3.10.4 Proposed Mitigation

Wyoming Relocation Assistance Act

The City of Cheyenne will assist eligible owners or tenants in finding a new place to live or to obtain a suitable location of a relocated business. Comparable decent, safe, and sanitary housing will be made available prior to the time of the required move. All replacement housing must be consistent with the requirements of the Civil Rights Act of 1968.

Following an appraisal, eligible property owners would be offered, and paid, fair market value for their residential or commercial property under the rules of the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 and amendment thereto. Owners can also choose to donate property. The payment would be through fee simple acquisition. In addition, the Wyoming Relocation Assistance Act provides displaced persons with various types of payments related to moving. The length of occupancy would determine eligibility for certain replacement-housing benefits, but moving costs would be available to all persons regardless of length of occupancy provided they are in occupancy as of the date of initiations of negotiations. The following sections outline the types of federal or local assistance available for residential and non-residential relocations. This section summarizes major mitigation benefits, but does not include every detail of the Uniform Relocation Act and the Wyoming Relocations Assistance Acts of 1973 and 1989, as well as applicable City of Cheyenne laws and regulations.

Residential Relocation Assistance

To help individuals and families move from their residential property, two moving cost options would be provided. One is the actual moving cost, in which the actual reasonable moving expenses are reimbursed when supported by evidence such as receipts. This option includes expenses such as storage of goods, transportation of personal property, insurance on the property while in transit, and other costs related to moving.

The second option is to reimburse on a fixed moving cost schedule based on the number of rooms in the vacated dwelling. This payment would be considered as covering any and all costs associated with the move.

Homeowner occupants who have owned the dwelling for at least 180 days prior to acquisition would receive a replacement housing payment, computed in accordance with relocation rules and regulations and not to exceed $22,500, for a decent, safe and sanitary replacement dwelling if purchased within one year of relocation. Homeowner occupants who have owned the dwelling for less than 180 days but at least 90 days would be eligible for a payment computed in accordance with relocation rules and regulations and not to exceed $5,250.

Displaced residential tenants who have lived in a rental property for at least 90 days would receive a rental assistance payment not to exceed $5,250 for a decent, safe and sanitary replacement dwelling unit if rented within one year of acquisition. This payment could also be used as a down payment on housing purchase.

Business Relocation Assistance

Business owners may be eligible to receive reimbursement for actual moving expenses, certain losses of personal property and expenses actually incurred in searching for a replacement location. In addition to actual moving expense reimbursement, a business owner may be eligible to receive a payment of up to $10,000 for actual reasonable expenses necessary to re-establish a displaced small business. In lieu of actual moving expenses and re-establishment expenses, the business owner may be eligible to receive a fixed payment of not less than $1,000 nor more than $20,000, based on business annual net income.

Additional information on relocation assistance can be obtained from the Wyoming Department of Transportation at (307) 777-4466 or 1-888-570-9908.

3.10.5 No-build Alternative

The no-build alternative will not require right-of-way or relocation impacts to businesses and residences.

3.11 ENVIRONMENTAL JUSTICE

3.11.1 Existing Conditions

President Clinton signed the Executive Order on Environmental Justice (EO 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,”) on February 11, 1994. The executive order requires that, to the extent practicable and permitted by law, neither low-income nor minority populations

may receive disproportionately high or adverse impacts as a result of a planned project. Federal agencies must take the appropriate and necessary steps to identify and address "disproportionately high and adverse" effects of federal projects on the health or environment of low-income and minority populations. Also, representatives of any low-income or minority populations in the community that may be affected by a project must be given the opportunity to be included in the impact assessment and public involvement process.

Department of Transportation Order 6640.23 defines "low-income," "minority," and "adverse effects," to be consistent with the definitions in EO 12898. For the purposes of conforming to these definitions, minority populations include Hispanic populations, black, American Indian, Asian, and other. The analyses in this section provide discussions of social, economic, and relocation effects on various socioeconomic groups, including minorities and low-income populations in accordance with Title VI of the Civil Rights Act of 1964 and related statutes. Title VI requires that no person, because of race, color, religion, national origin, sex, age, or handicap, be excluded from participation in, denied benefits of, or be subjected to discrimination by any federal-aid activity. Executive Order 12898 broadens this to require that disproportionately high and adverse health or environmental impacts to minority and low-income populations be avoided or minimized to the extent feasible. This study has been developed in accordance with the Civil Rights Act of 1964, as amended, Executive Order 12898, and FHWA Order 6640.23.

As indicated in Section 3.8 above, the study area is part of Block Group 1 of Census Tract 2, Laramie County. According to 2000 U. S. census data, this area includes Hispanic, black, and elderly people.

Discussions with neighborhood leaders and City governmental representatives indicated that although the project area has a relatively large Hispanic population, English is spoken almost universally. Data from the 2000 U.S. Census Bureau bear this out: A sample of 954 people surveyed in Block Group 1 which includes the study area found that 742 reported that they speak only English, 208 reported that they speak Spanish, and 4 reported that they speak another Indo-European language. Of the 212 foreign language speakers, 206 reported speaking English "very well" or "well". Only six people, all between the ages of 18 and 64, reported speaking English "not well". No one reported speaking English "not at all".

According to census data, this Block Group also has a 1999 median household income of $27,072 and a per capita income of $15,235. These figures compare to a median household income of $38,856 and a per capita income of $19,809 for the City of Cheyenne overall. For this block group, the census data indicates that approximately 16 percent of the population has an income below poverty level. This compares to approximately 9 percent for the City overall.

Thus, the project is located in a neighborhood that has a minority and low-income population.

3.11.2 Impacts of the Build Alternative

Due to the nature of the project, there are a limited number of alternatives that could be considered, and all would have the same overall Environmental Justice impacts. This

project will provide benefits to the surrounding neighborhoods in the form of improved safety and access, by removing a barrier that has divided the neighborhood, and by creating an aesthetic land use buffer between the residential neighborhood and adjacent industrial facilities. These benefits will be equally available to the low-income and minority parts of the neighborhoods.

Efforts have been made to include minority and low-income groups in planning for this project. Mailings have been sent to residents of the affected area. Presentations have been given to neighborhood associations, and to neighborhood leaders. Advertising for public meetings has been purchased in local newspapers, and radio and television shows have discussed the project and notified people of upcoming meetings.

This neighborhood also has a relatively large percentage of elderly people, and several of the relocations affect elderly persons. For these people, who are on fixed income, property taxes comparable to what they are currently paying and assistance with moving expenses are likely to be a concern. These concerns will be addressed under the Uniform Relocation Act and associated laws.

3.11.3 Proposed Mitigation
No mitigation is required.

3.11.4 No-build Alternative
The existing conditions will continue.

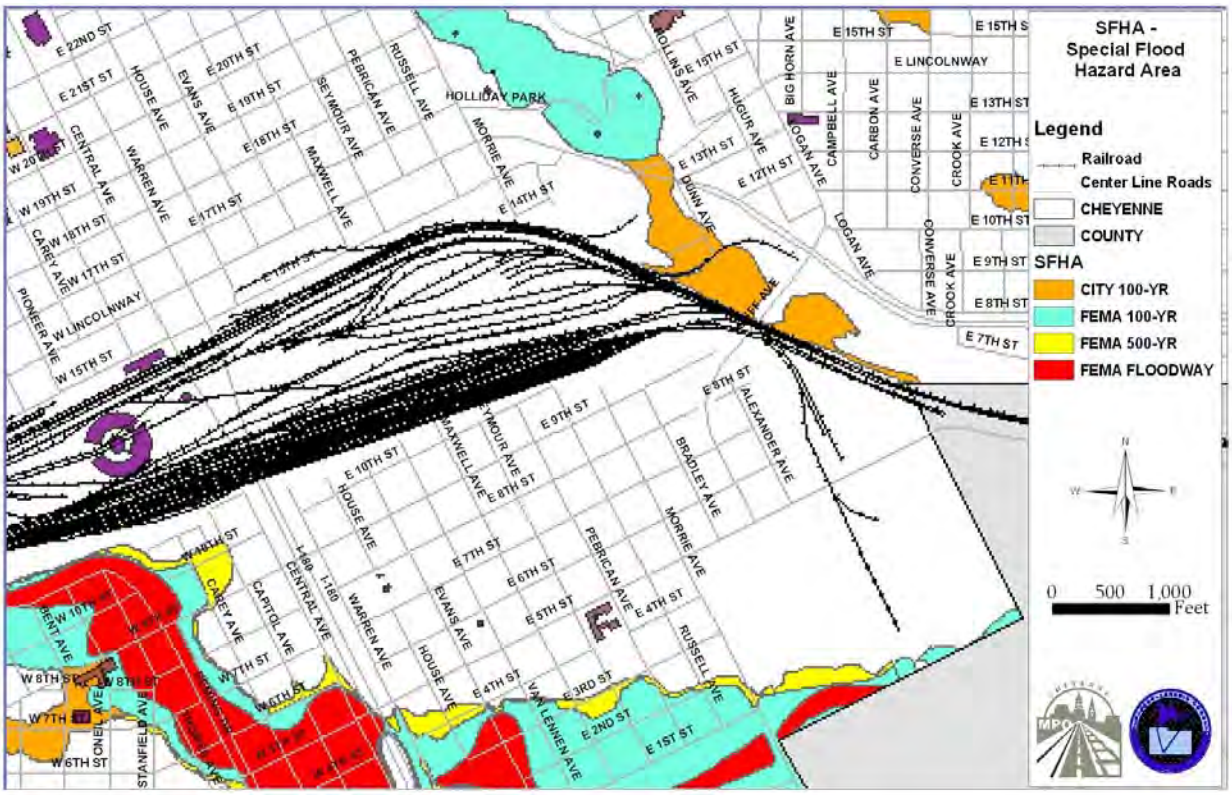
3.12 FLOODPLAINS

3.12.1 Existing Conditions
The City of Cheyenne and Laramie County participate in the Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP) that regulates construction within the 100-year floodplain. According to the FIRM Flood Insurance Rate Map of the City of Cheyenne, community panel number 560030 0010 E (revised March 2, 1994), the Crow Creek floodplain extends to the southern part of the project area. The limits of the 100-year floodplain reach just to the intersection of Morrie Avenue and East 1st Street.

One of the most devastating floods in Cheyenne's history occurred in 1985, when Crow Creek flooded. This flood resulted in the loss of twelve lives. The average flow in Crow Creek is approximately 5 cubic feet per second (cfs) and during that flood, peak flows were more than 8,000 cfs. Since that time, the USGS has installed a flood warning system on Crow and Dry Creeks in Cheyenne to assist with flash-flood warnings.

In addition to the Crow Creek floodplain, the City of Cheyenne has designated the area under the Norris Viaduct to be part of a special flood hazard area, although this area is not indicated as a floodplain by FEMA. Figure 3.2 shows the special flood hazard areas and FEMA-mapped floodplains in the project area.

Figure 3.2
Special Flood Hazard Areas



3.12.2 Impacts of the Build Alternative

The project will be designed so that there are no impacts to the floodplain. This alternative complies with Executive Order 11988 on Floodplain Management.

3.12.3 Proposed Mitigation

No mitigation is required.

3.13 WETLANDS

3.13.1 Existing Conditions

No wetlands exist in the study area. The only wetlands nearby are located adjacent to Crow Creek, and they will not be impacted by the project.

3.14 HABITAT AND WILDLIFE

3.14.1 Existing Conditions

There is no wildlife habitat in the project area. Most of the area is densely developed residential, commercial, and industrial property. There are a few vacant areas that are

sparsely vegetated. Species that are typical of urban areas are likely to be the only animals found in the study area. This would include mammals such as opossums, squirrels, and raccoons, and birds including crows, pigeons, starlings, and sparrows.

3.14.2 Impacts of Build Alternative
The build alternative will increase the amount of open space available to urban wildlife.

3.14.3 Proposed Mitigation
No mitigation is proposed.

3.14.4 No-build Alternative
The no-build alternative will have no impacts on wildlife or habitat.

3.15 THREATENED AND ENDANGERED SPECIES

3.15.1 Existing Conditions
No threatened or endangered species are known to inhabit the project area, and there is no suitable habitat for them.

3.16 WATER QUALITY

3.16.1 Existing Conditions
No streams, rivers, or other surface waters are located in the area. Crow Creek is located just to the south of the project area.

The project area has a storm sewer system along several of the roads. Petroleum products have been identified at times within the storm sewer, and the source of these contaminants is unknown.

3.16.2 Impacts of the Build Alternative
The project will require disturbance of soil during construction, but it will not directly impact surface waters.

After construction, runoff from the project will utilize the existing storm sewer system. This should not have any impacts on the ability of the system to handle runoff. It should not lead to additional water quality concerns compared to existing conditions, as traffic would be traveling within the same area.

3.16.3 Proposed Mitigation
During construction, efforts will be made to minimize water quality impacts to the river. Best Management Practice (BMP) measures for construction-related erosion and sedimentation control will be implemented. An NPDES permit will be obtained.

3.16.4 No-build Alternative
The no-build alternative will have no impact on water quality.

3.17 AIR QUALITY

3.17.1 Existing Conditions

Air quality in the area is generally good. According to the Wyoming Department of Environmental Quality, the state of Wyoming is in attainment and therefore meets air quality standards.

3.17.2 Impacts of the Build Alternative

Traffic counts on this project are too low to impact air quality.

3.17.3 Proposed Mitigation

No mitigation is needed.

3.17.4 No-build Alternative

The no-build alternative will have no impact on air quality.

3.18 ENVIRONMENTAL RISK SITES

3.18.1 Baseline Environmental Conditions

A Phase I Environmental Site Assessment (ESA) was conducted for this site. The text portion of the ESA is included as Appendix A. A brief summary of the environmental risk sites associated with this project follow.

Frontier Refining Inc. is located adjacent to the project site. Several issues have occurred at the refinery, including hazardous waste generation, hazardous waste treatment, storage or disposal (TSD), corrective actions (CORRACTS), inactive or uncontrolled hazardous waste site (CERCLIS), and the facility uses toxic chemicals. The northwest part of the refinery, at the southeast corner of East 5th Street and Morrie Avenue, was in the past used as a land farm to dispose of refinery materials. It is not known what materials are present in this land farm. Numerous above ground tanks are located in the vicinity of the project, and there is an underground pipeline connecting these tanks.

One LUST site (S & S Gas) is within the assessment area, while four others are within one mile of the site. Petroleum hydrocarbons, which have leaked from the facilities, may have impacted the soil and ground water beneath the assessment area.

One hazardous material spill was listed on the Hazardous Materials Incident Report System (HMIRS). The spill site was not identified. However, Cheyenne Crude Station is listed under the Voluntary Remediation Program Sites list, with the same address as the spill location.

A portion of the Cheyenne storm sewer system was reported to have gasoline odors emanating from storm drains. Tests indicated that ammonia, hydrogen sulfide, and organic vapors existed in the storm sewers, but no threat of flammable or explosive vapors was found.

Borings will be made within the project right-of-way to determine if there is any contamination in the soils. A report will describe the results of these borings.

3.18.2 Impacts of the Build Alternative

The project could potentially disturb soils that are contaminated with petroleum products or lead during construction, or houses that have lead paint or asbestos. Right-of-way acquisition and clearing and demolition activities would include identification of potential hazardous materials. Among potential hazardous materials that could be found are residential and commercial wastes including but not limited to: mercury thermostats; pesticide containers; Freon-based appliances; asbestos, abandoned vehicle batteries; lead-based paint debris; discarded agricultural chemical containers and packaging; light fixtures with PCB ballasts and mercury and lead solder bulbs; and paint can wastes. If determined to be necessary, limited testing of environmental media will be conducted at properties to be acquired for right-of-way.

3.18.3 Mitigation

Remedial measures for petroleum-contaminated soils would include excavation and replacement with clean fill material. Contaminated soil can be disposed of in a Subtitle "D" landfill following state and local regulations.

Contaminated water discharged from an excavation may require treatment before discharge to the ground. If an alternative is chosen that is down gradient from the landfill, leachate may be present in groundwater. Site conditions would also be monitored for worker safety.

If building materials containing asbestos or lead paint were encountered on the site, abatement would be completed in accordance with Wyoming Department of Health regulations.

Excavations for foundations would be monitored for worker safety, and if any unknown potentially hazardous materials were uncovered, testing would be done.

3.18.4 No-build Alternative

The no-build alternative will have no impact to existing environmental risk sites. However, if contaminants exist within the right-of-way, they will remain.

3.19 NOISE

3.19.1 Existing Conditions

A noise study was performed for the project area. This study can be found in Appendix B. The results of the study show that 25 receptors are impacted under existing conditions.

3.19.2 Impacts of Build Alternative

The build alternative will result in impacts to seven receptors. This number is much lower than under existing conditions, as many of the currently impacted residences will be relocated. The results of the Noise analysis are detailed in the Noise Study in Appendix B.

3.19.3 Proposed Mitigation

Noise abatement measures are discussed in the Noise Study in Appendix B. It was concluded that noise abatement measures such as noise walls or berms are not feasible here, as there is no room to install these structures. However, for most impacted

receptors, the increase in noise levels over no-build conditions would be 3 dBA or less, which is barely noticeable by the human ear.

3.19.4 No-build Alternative

The no-build alternative will impact 35 receptors. This number is higher than under Existing Conditions due to the increased amount of traffic, and it is higher than the Build Alternative because there will be no relocations with this alternative.

3.20 CULTURAL RESOURCES

3.20.1 Existing Conditions

A study of the project area for cultural resources was conducted by Rosenberg Historical Consultants in 1996 (Report of Historic Intensive Survey for the Norris Viaduct). No historic buildings were identified.

3.20.2 Impacts of the Build Alternative

No cultural resources will be impacted.

3.20.3 No-build Alternative

The no-build alternative will have no impact to cultural resources.

3.21 CONSTRUCTION IMPACTS

3.21.1 Impacts of the Build Alternative

There may be temporary impacts from construction activities. These would likely include:

- Increased dust generation from earth moving activities
- Increased erosion and sedimentation in off-site waterways from earth moving activities
- Increased noise from construction equipment (pile driving for piers and impact wrenches for steel erection)

3.21.3 Proposed Mitigation

With the exception of very brief periods of time, the existing grade crossing will remain open while the viaduct is being constructed. Therefore, with minor exceptions, no detours will be required for this project.

<u>Dust Suppression</u>

If objectionable dust levels occur, dust would be controlled by timely applications of water and temporary seeding to the construction areas.

<u>Erosion And Sediment Control</u>

Mitigation measures for construction related erosion and sedimentation control would include Best Management Practices (BMPs) to intercept and trap transported sediments during construction. Due to the proximity of the railroad tracks to the base of the bluffs, particular care will be taken to minimize soil disturbance and quickly revegetate and otherwise stabilize any disturbed areas.

<u>Noise Control</u>

Construction noise levels are typically a function of the scale of the project, the phase of construction, the condition of the equipment and its operating cycle, and the number of construction equipment units operating simultaneously. Measures that would be taken to reduce objectionable construction noise include designating haul routes away from sensitive receptors, controlling noise at the source, and limiting construction activities to certain hours of the day.

Community Awareness.
Although this will not mitigate noise, it is important for people to be made aware of the possible inconvenience and to know its approximate duration so they can plan their activities accordingly. This includes establishing and advertising a complaint mechanism so that construction operations can be responsive to community concerns.

3.22.4 No-build Alternative
The no-build alternative will have no construction impacts.

3.22 CUMULATIVE IMPACTS
This part of the southside Cheyenne neighborhood has been impacted in the past by its location near the Frontier Refinery, the UPRR rail yard, and I-80. It is one of the oldest neighborhoods in Cheyenne, and grew as these industries grew. Thus, as a result of this early relationship, the residential neighborhood is in close proximity to industrial facilities. There are no transitional land uses or buffers between the residential areas and the heavy industrial areas. Traffic on residential streets can therefore include a considerable amount of trucks.

Past transportation projects have contributed to the existing traffic loads within this neighborhood. For example, improvements done to Central Avenue in the past resulted in only two full intersections providing access to the neighborhood, at 9th Street and 5th Street, in addition to an underpass at 1st Street. As a result, traffic on 5th Street, which eventually becomes Campstool Road and thus is a through route, can be heavy at times.

Future projects proposed for this area include improvements to bridges on Crow Creek. This area is prone to flooding, and the City of Cheyenne has embarked on a multiple year program to improve flood conveyance on the Creek. In addition, the commercial area on Campstool Road east of this neighborhood has begun to be developed.

This project will have positive effects in terms of cumulative impacts. The road improvements are proposed due to the increased use of the existing viaduct and the predicted heavier use in the future as more development occurs to the east and south. This use will occur whether or not the viaduct and adjacent roadways are improved. The improvements proposed with this project will help protect the neighborhood from the adverse impacts created by the increased development and traffic demand.

3.23 PERMITS
The construction of the viaduct will require an NPDES permit for land disturbance.

4.0 PUBLIC PARTICIPATION AND AGENCY COORDINATION

Public and governmental agencies have been involved in the development of alternatives for the Norris Viaduct project from the earliest stages. Efforts have been made to involve all affected individuals, including local residents and businesses, and local, state, and Federal agencies.

This project has been widely publicized. Part of the funding for this project comes from the City of Cheyenne sixth-penny tax, which must be approved by voters. Before the November 4, 2003 election, informational material about the Norris Viaduct project was distributed in the City, and the project was publicized in newspaper articles and elsewhere. Some of the informational material is included in Appendix C. The sixth-penny tax to fund the Viaduct project passed with 68 percent of voters voting for the tax for this project.

At the start of the Environmental Assessment process, an Agency Scoping Meeting was held on January 27, 2004 for this project. Agency concerns included:

- Keeping the viaduct open through as much of the construction period as possible;
- Location and timing of traffic lights;
- Coordinating construction of the viaduct with other projects, such as the water main expansion;
- Accommodating a future expansion of the Greenway to the north;
- Providing access for emergency vehicles and for an evacuation route;
- Underground storage tanks;
- The potential presence of contaminated soils and ground water within the road right-of-way and on the refinery property, including the land farm on refinery property.
- UPRR spur line into the refinery and need for refinery staging area;
- Property acquisition and relocation process;
- Potential impact on 4(f) and/or 6(f) lands;
- Inefficiency of current traffic patterns, with two 90-degree turns;
- Neighborhood aesthetics.

The minutes of this meeting, as well as letters received from agencies, are included in Appendix D. Coordination with agencies will be ongoing throughout the project, as needed.

A Public Scoping Meeting was also held on January 27, 2004. Fliers, mailings, newspaper advertisements, radio talk show appearances, television news spots, and newspaper articles publicized the meeting. Materials are included in Appendix C. Approximately 170 people signed in at the January meeting. Over forty submitted written comments, which are in Appendix C. Issues that were brought up at that meeting include the following:

1. Maintain and improve traffic flow to other parts of Cheyenne, especially north/south patterns. This included considering heavier traffic loads as Cheyenne grows, and

better access for the neighborhood. This is addressed in Chapters 1 and 2 and Section 3.4 of the Environmental Assessment.

2. Improved traffic flow and patterns within neighborhood. This included reducing traffic within the neighborhood, better patterns of traffic flow, and providing easy access for emergency vehicles. This is addressed in Chapters 1 and 2 and Section 3.4 and 3.6 of the Environmental Assessment.

3. Consider alignment alternatives outside of the study area. This included a possible alternative further east. This is addressed in Section 2.1.3 of the Environmental Assessment.

4. Improved safety for cars, pedestrians, and bicyclists. This included comments to improve safety for pedestrians, bicyclists, cars, and trucks. This is addressed in Chapters 1 and 2 and Sections 3.4 and 3.5 of the Environmental Assessment.

5. Improvements for the neighborhood. These comments included incorporating a greenway, and minimizing barriers and impacts to homeowners. This is addressed in Chapters 1 and 2, and Sections 3.8 and 3.10 of the Environmental Assessment.

6. Attractive features and enhanced aesthetics. These comments asked that the bridge and approaches be designed attractively. This is addressed in Chapter 1 and Section 3.8.2 of the Environmental Assessment.

7. Concerns about the refinery. These comments included interest in creating a buffer between the neighborhood, and that neighborhood safety be a consideration. This is addressed in Chapters 1 and 2 and Section 3.8.2 of the Environmental Assessment.

8. Residential relocations. Concern was expressed about having to relocate from their homes. This is addressed in Section 3.10 of the Environmental Assessment.

9. Viaduct location and design. Suggestions included to rebuild it in place, or replace with a twin span with one-way couplet of roads. This is addressed in Chapter 2 of the Environmental Assessment.

People also were asked to comment on several preliminary alternative alignments, including an alignment along Duff Avenue similar to the existing alignment, an alignment along Alexander Avenue, and an alignment east of Alexander Avenue. Almost everyone preferred an alignment located to the east of the existing alignment, either along Alexander Avenue or along the alley east of Alexander.

In addition to the public meeting, presentations were made to neighborhood groups, including HSSIA (Historical South Side Improvement Association) and the South Cheyenne Development Association. Articles about the Norris Viaduct project appeared in the HSSIA newsletter as well as in the Cheyenne newspaper, the Wyoming Tribune-Eagle.

A second public meeting was held on June 22, 2004 public meeting to present five different potential alignments, Alignments A through E, for community members to review and respond to. 156 people signed into this meeting, and 90 returned feedback forms. These are also included in Appendix C.

Most people expressed support for the project at that meeting. Concerns were similar to those expressed at the January meeting. Support for each of the five alignments was rated as well. The alignment that garnered the most support was Alignment E, furthest to the east. This alignment was modified slightly as a result of comments obtained at the meeting, resulting in Alignment F, the preferred alternative.