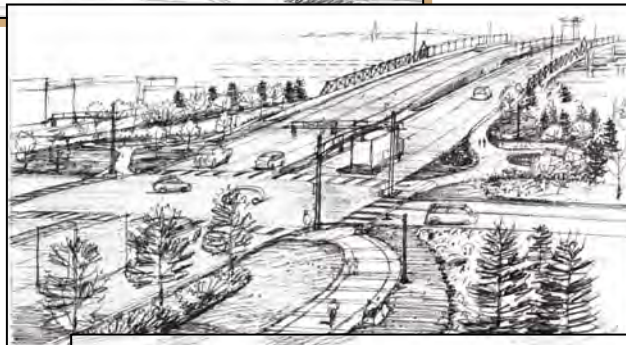


I-180 Enhancement Project - South Section – Final Report

Cheyenne MPO



SEH No. ACHMPO0306.00

December 30, 2005



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I-180 Enhancement Project - South Section

FINAL REPORT

1.0 Introduction

Short Elliott Hendrickson, Inc. (SEH) is pleased to provide this report for the I-180 Corridor Enhancement Project. The purpose of this report is to provide modification alternatives to improve pedestrian access, improve pedestrian safety, and enhance landscaping along the “south section” of I-180 that stretches from I-80 to the south end of the bridges over the Union Pacific Railroad (UPRR) in downtown Cheyenne.

1.1 Project Overview

A city’s appearance can greatly affect its economic development as well as the quality of life for its residents. If a city invests in improving the appearance of public spaces, the returns can be tremendous. Businesses prefer to locate in cities with a high quality of life for their employees to enjoy. The City of Cheyenne has an opportunity to improve the appearance of the I-180 corridor. Located in the southern part of Cheyenne, I-180 is an important entrance to the city. This short segment of interstate highway connects I-80 to downtown Cheyenne. For many travelers exiting I-80 and those traveling north on US 85 it is their first impression of Cheyenne. By improving the appearance of this area, Cheyenne can enhance the quality of life for its residents living along the corridor, and provide a positive experience for visitors.

I-180 is one of the shortest interstate highway segments in the country and one of the few interstates with traffic signals. Originally conceived as a controlled access ramp between I-80 and downtown Cheyenne, the highway was reclassified as an Interstate spur and designated as I-180 in 1969. Plans to construct an elevated highway were dropped in 1970 due to the high cost. The design of an at-grade roadway was completed by the Wyoming Highway Department (now the Wyoming Department of Transportation (WYDOT)) in the 1970’s. Construction began on the first segment in 1977 and the final segment was opened in 1984.

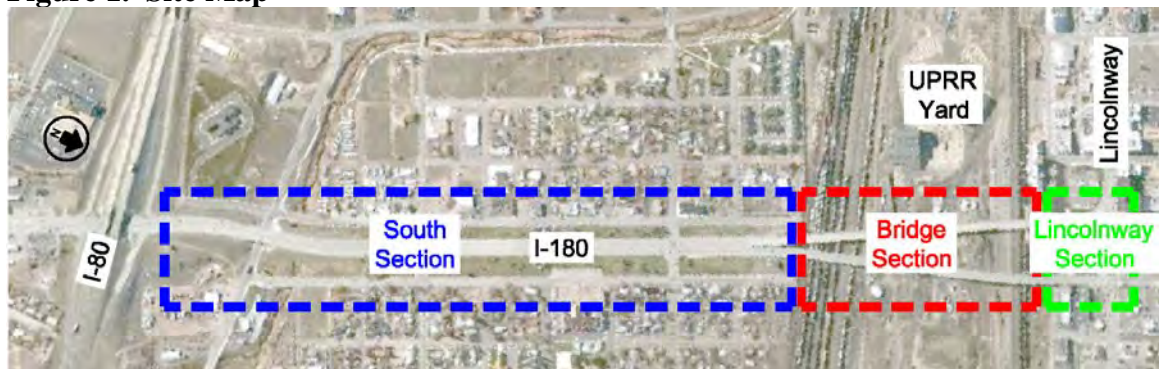
This project has been divided into three sections, including South, Bridge, and Lincolnway. While the overall goal for each of the sections is to improve the appearance of the corridor, each of these sections of the project has distinct challenges. Descriptions of these sections are provided below and illustrated on Figure 1.

South Section: The south section is the longest of the three sections and extends from I-80 to the south end of the bridges over the Union Pacific Railroad (UPRR) yard. I-180 is at-grade with the surrounding landscape in this area. Small businesses and residences primarily occupy the adjoining land.

Bridge Section: The bridge section consists of the two I-180 bridges over the UPRR. The area under the bridge is a railroad yard on the UPRR mainline. The two bridges are each over 1,800 feet long and consist of 13 steel girder spans. Each has a sidewalk with a pedestrian rail. A combination of relatively flat terrain and high piers (needed to provide clearance for trains) make these bridges visible from many parts of Cheyenne.

Lincolnway Section: The Lincolnway section is located in downtown Cheyenne and includes the intersections of north and southbound I-180 with Lincolnway in addition to the small stretch of Lincolnway between these two intersections. Depot Square and the Union Pacific depot are located at the southwest corner of Southbound I-180 / Lincolnway. The north side of Lincolnway is adjoined by small businesses. A parking lot for UPRR employees occupies the area south of Lincolnway between the two bridges.

Figure 1. Site Map



This study focuses on the “south section,” and discusses the existing conditions, goals for the section, and recommended improvements to achieve the goals.

2.0 Existing Conditions

The first impression for motorists northbound on I-180 entering Cheyenne is a mixed bag of positive features and some distracting negative elements. However, there is considerable potential for improving the city entry experience in this area. Most of the distracting, more negative elements have fairly clear solutions. The existing urban setting, the open space flanking the roadway, and the sense of arrival provide a very good basis for an excellent gateway streetscape for the city.

Traveling northbound on I-180 from I-80, a motorist has a clear feeling that he is approaching the City of Cheyenne. The Interstate is higher in elevation and the descending roadway grade provides a clear view of the urban area ahead. There is a discernable threshold of entry, as opposed to a gradual slow immersion into suburbia. The sides of the roadway are also flanked by open spaces, landscape, and clear distant views. There is also a minimal amount of commercial strip crowding this part of the corridor. These are all positive attributes that are a good basis for a number of gateway enhancements.

The negative or obtrusive elements are fairly typical of many urban areas. There are many large billboards and signs, large expanses of roadway pavement, few landscape refinements, and a lack of pedestrian accommodations. Figure 2 shows existing conditions looking northbound on I-180 north of I-80.

Walkways and sidewalks speak much about how welcome one feels when entering an urban area. Aside from providing important non-motorized access links, wide detached walkways with street trees elicit a welcome response from motorists. The impression or view from the roadway is one of a friendly, accessible community. On the other hand, an absence of walkways conveys a harsher, less friendly impression to motorists.

Approaching 5th Street northbound, a generous landscape flanks the roadway east and west. This is the single greatest asset and opportunity that this roadway corridor has for enhancement. There is a wide range of possibilities here, not only for the I-180 travelers, but also for the surrounding neighborhoods. Figure 3 shows the view as a motorist drives northbound towards 5th Street.

Figure 2. Facing Northbound on I-180 at I-80

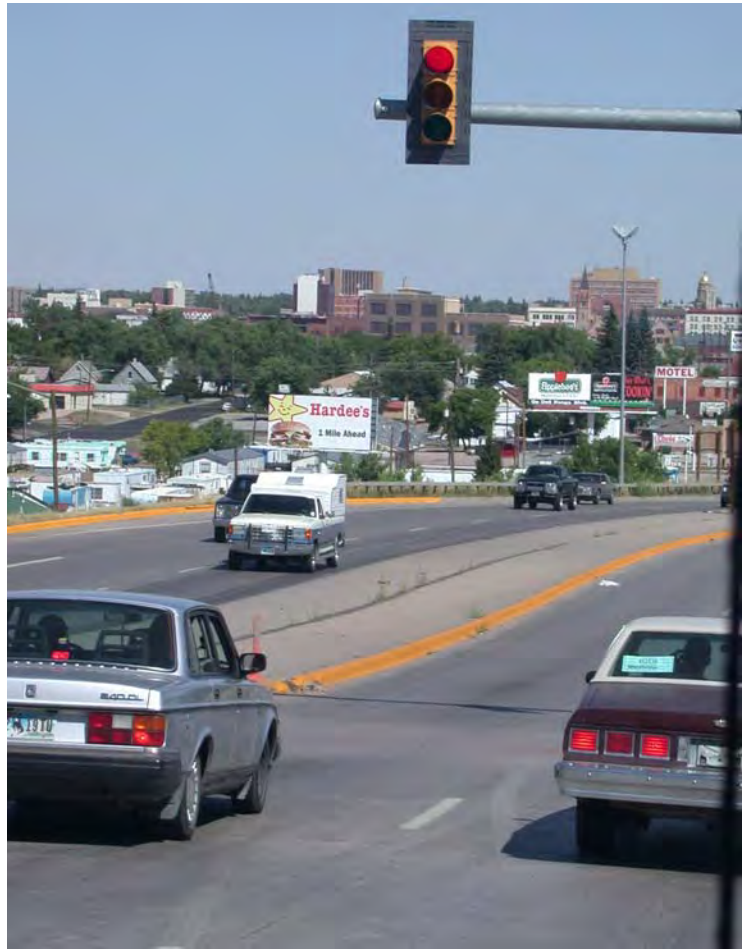


Figure 3. Looking Northbound Towards 5th Street



The roadway descends and enters the city street grid. The older established neighborhoods have some attractive architecture vernacular, which helps give the impression of permanence and stability. Unfortunately, the I-180 roadway appears to be an impediment for cross-neighborhood connectivity. The pedestrian overpass, although not unattractive, reinforces this impression. Once again, there are few pedestrian accommodations, crosswalks or walkways.

From initial analysis, the roadway median appears to have enough width and length to support substantial landscaping with some specialty pavements and attractive low maintenance xeriscape plantings. The landscape on the roadsides has an established reasonably well-maintained look. All in all, this is a very positive setting and resource for other landscape enhancements. A short chain link fence, apparently for deterring pedestrians, is another minor obtrusive element that could be removed when a landscaped median is constructed.

These roadside landscapes between 5th and 9th Streets consist primarily of a variety of deciduous and evergreen trees, most of which are about 20 or more years of age. The irrigated turf is a modest conventional blue grass, rye, and fescue lawn. The planted patterns are mostly random in character. Consideration may be given to removing some of the trees to create view corridors to businesses on the west.

North of 9th Street, this potential streetscape condition continues. The difference is that the bridge looms ahead, with the Union Pacific rail yard tower being a conspicuous landmark feature. The bridge has a rather stark utilitarian look, with pedestrian

walkways forced to the far edges. There are few, if any architectural enhancements. However, there is great potential for some sculptural enhancements to help create a grand gateway statement. In addition, there is room on the roadside embankment areas for some possible sculptural features that would frame the bridge. Figure 4 shows the view of I-180 approaching the Union Pacific rail yard tower from the south.

Figure 4. Northbound I-180 at 5th Street



Overall, the established landscape parkland that frames the roadway is a good background resource for most any kind of Cheyenne gateway streetscape. The older established mix of architecture in adjacent neighborhoods also makes this part of the corridor an excellent setting for an important gateway.

Another key area of opportunity exists in the surrounding walkway trail system. There is the ability to create pedestrian and bikeway connections from Crow Creek on the south to the Union Pacific Bridge on the north. There is generous room for curvilinear walkway promenades both east and west of I-180, creating a friendly and important multi-modal link to downtown. Extending the walkway south of I-80 would also provide a valuable link to the hotels and services in the area. Trail users and the local neighborhoods could all take advantage of these amenities. Landscape upgrades, new tree and shrub plantings, new water conserving irrigation systems, sculptural features, picnic areas, and lighting can all be part of this grand parkway scene.

Designated at-grade pedestrian crossings at 9th and 5th Streets across I-180 are important components of this pedestrian and trail system. The existing walkway overpass should remain as an alternative crossing.

3.0 Stakeholders Meeting

On October 6, 2003, a stakeholders meeting was held to present entry enhancement concepts for the entire I-180 Corridor Enhancement Project by SEH and FLMA, and to gather ideas from interested parties. A list of the attendees is contained in Table 1.

Table 1. Stakeholder Meeting Attendees

Name	Association
Mike Wright	Union Pacific Railroad
Larry Wessel	Union Pacific Railroad
Ron Naro	Union Pacific Railroad
Martin Matsen	Cheyenne MPO
Matt Ashby	Cheyenne MPO
Jay Gould	WYDOT - District Engineer
Gene Legerski	WYDOT - Traffic Program
Joel Meena	WYDOT - Traffic Program
Gregg Fredrick	WYDOT - Bridge Program
John A. Winkler	United Transportation Union
John T. Goodier	Cheyenne Art in Public Places
Alvin Wiederspahn	Downtown Development Authority
Larry Bressler	Cheyenne Historical Preservation Board
Paula Qualls	South Cheyenne Community Development Association
Frank Miltenberger	FMLA
Doug Wellock	SEH

The following is a summary of the discussions regarding the Lincolnway section of the enhancement project:

- Joel Meena said that removing the low fences along I-180 south of the Bridges over the Union Pacific Railroad yards might cause problems with mid-block pedestrian crossings. A pedestrian study might be needed. Jay Gould added that the FHWA needs to be involved in any decision to remove the fence. Access restrictions are in place due to the federal aid construction funding for I-180 as an Interstate Highway.
- Ron Naro said that the UPRR does not want a changeable display near the south end of the bridge with a spur track from the railroad yard, as shown on concept

board # 3, but might help fund a permanent display. (This comment refers to a concept that was rejected by the stakeholders.)

- The location of and the message on a sign identifying Cheyenne was discussed. Jay Gould said that people living in south Cheyenne may not like the implication that they are not part of Cheyenne. He suggested changing the wording to welcome to downtown Cheyenne or moving the sign south, closer to I-80. Larry Bressler suggested that the South Cheyenne Community Development Association may have input on this matter. (This comment refers to a concept that was rejected by the stakeholders.)
- Joel Meena discussed the signals and lighting shown in the preliminary concepts. He said that painted poles are now allowed, and that the existing signal masts are new but could be painted. He likes the lighting concept. If the lights are replaced, the City of Cheyenne will own and maintain them. Dark sky lighting will be possible.
- Larry Bressler said that billboards are not attractive and detract from Cheyenne. Mike Wright from the UPRR pointed out that the billboards are on UPRR property.

4.0 Public Meeting

On April 28, 2004, a public meeting was held in the lobby of the historic train depot to receive input on the proposed improvements for the I-180 Corridor Enhancement Project. Displays illustrating the existing conditions and proposed improvements were exhibited. Personnel from SEH and the Cheyenne MPO were present to answer questions. Comment forms were developed to solicit input from the public on some issues related to the theme of the project. Thirty-five individuals took the opportunity to fill out a comment form.

Three questions were included on the comment form. The questions and the responses are summarized below:

Question 1:

The I-180 Corridor is an important entrance into downtown Cheyenne.

Strongly Agree Agree No Opinion Disagree Strongly Disagree

Response to this question was overwhelmingly positive. The majority (27 or 77%) of responses strongly agreed with the statement. Six questionnaires had the agree box checked (17%). There was one no opinion and one disagree.

Question 2:

I feel the theme of any artwork placed along the I-180 corridor should be:

Wildlife Western Railroad Other _____

Opinion on the theme of artwork was mixed. More than one theme was selected on several forms. Each selection was counted when summarizing the results. The most

popular choice was the railroad theme with 18 selections or 35%. A western theme was selected by 15 individuals (29%) and wildlife was the choice of 8 people (16%). Written comments suggested modern with a railroad or western theme, railroad history, obelisks similar to the depot tower, and leaving the open space as is.

Question 3:

In my opinion the fence on the bridge should be painted:

Black Green Red Other _____

The most popular choice for the fence color was green with 13 nominations (34%). Second was black with 10 selections or 26%. Red was checked on 4 forms. Suggestions in the other category included brown, light color, and natural rust. Concern about the need for maintenance of paint on the rail was mentioned.

Written comments were included on some of the comment sheets. Relevant comments are included below:

- Improving the corridor will help create a more inviting and friendly atmosphere for South Cheyenne. The Historical South Side Improvement Association (HSSIA) has also been discussing some ideas of incorporating railroad and neighborhood history in the artwork. Maybe we can all work together.
- I would suggest sagebrush and big rocks in the modified open space areas. In addition, a fence to help stop the wind would be nice. You should make sure there are picnic tables and trash receptacles. I really like the proposed pathways. I would recommend that the earth be raised between the pathways and walkways to protect pedestrians and buffer noise.
- I think the existing open spaces should be kept as is. New trees are not necessary. The idea of a walking area is just that – an idea. The only people who walk in this area are those coming off the bus. If the pedestrians want to pay for something different from what we have now, that’s their choice. I still think it would be a waste of money. Currently, I don’t think the gateway looks bad as long as it’s watered and stays green during the summer. Given our current water restrictions, it appears the proposed design would require additional water to maintain.

5.0 Selected Alternative

A recommended alternative was prepared based on the input of the stakeholders and opportunities realized by the SEH team. Figures 5 and 6 illustrate the basic features recommended for enhancing this south gateway corridor. Because this simple concept was seen as such an obvious planning conclusion, there were no substantially different options investigated from what is shown here. However, variations on this theme are certainly possible. The components of the plan are described below:

Figure 5. Recommended Alternative – West End of Project to 6th Street



Figure 6. Recommended Alternative – 8th Street to East end of Project



I-80 to Deming Drive: Trail/walkway connections are perhaps the first practical major ingredient and unifying theme for this concept. The yellow lines on Figure 5 suggest that a link be constructed connecting the walkways under I-80 to Deming Drive to the north on both east and west sides of I-180. The trail would need to be constructed on an embankment slope and descend down to Deming Drive. Marked crossings at the entrance and exit-ramps for I-80 and for Deming Drive are recommended. The landscape opportunities for this reach of the trail are modest. Landscaping along the embankments sloping away from the roadway would not be particularly visible from I-180. Nonetheless, some sustainable and attractive landscape enhancements should be investigated.

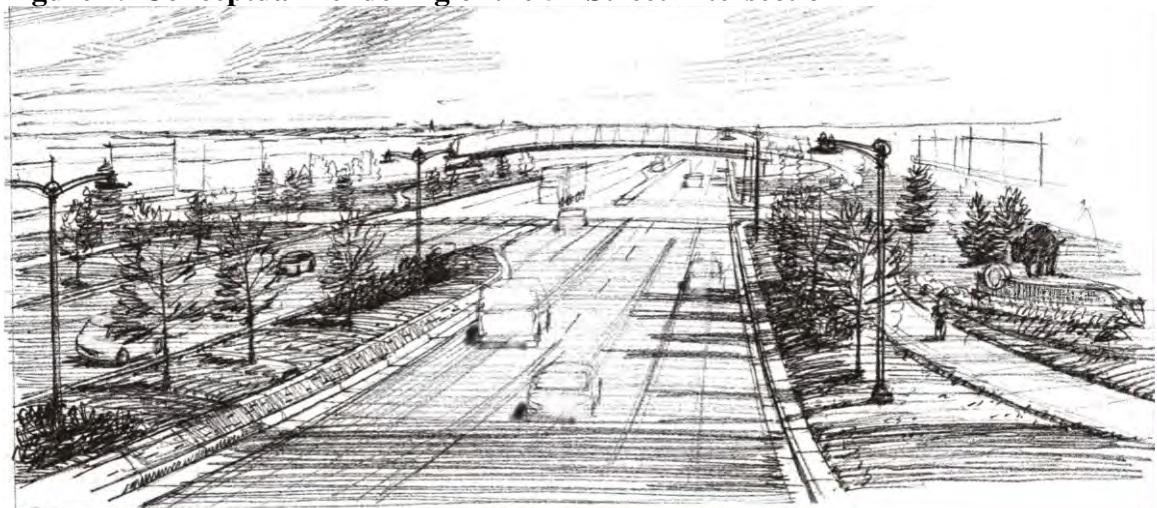
Deming Drive to 5th Street: Utilizing a wide radius curvilinear alignment, the stretch of trail from Deming Drive to 5th Street should be aligned to connect to an at-grade pedestrian crossing at 5th Street. On the east side, there is an opportunity for a gateway sculptural feature. This is at the point where the roadside landscape becomes more conspicuous at the outside of the curve heading north.

Median landscape development is recommended for this area as well as custom architectural lights as suggested in Figure 7. A combination of flowering trees shrubs, ground covers, and water conserving sub-surface drip irrigation can be utilized here. With proper xeriscape design there is no need for this landscape to require more water than the existing landscape. In fact, with careful turf selection it may require substantially less.

5th Street Intersection: The 5th Street intersection becomes the first threshold feature. Delineated crosswalks, enhanced pedestrian ramps, and pedestrian character lighting will give the traveler the impression that they have arrived in town. With the curving promenade walkways and enhanced landscape proceeding into the distance, it can be an elegant first impression.

The existing roadside landscape on the east and west sides can be supplemented with enhancement plantings that compliment the established foliage. Flowering trees, some flowerbeds, additional street trees, and a water conserving sub-surface drip irrigation system can be part of these upgrades. There is also room for picnic areas as well as additional open space areas for casual field activities. Also, note the trail connectivity to neighborhoods east and west of the corridor. This enhanced landscape will be an attractive foreground feature for those properties along Central and Warren Avenues. A sketch concept of the 5th Street intersection is presented in Figure 7.

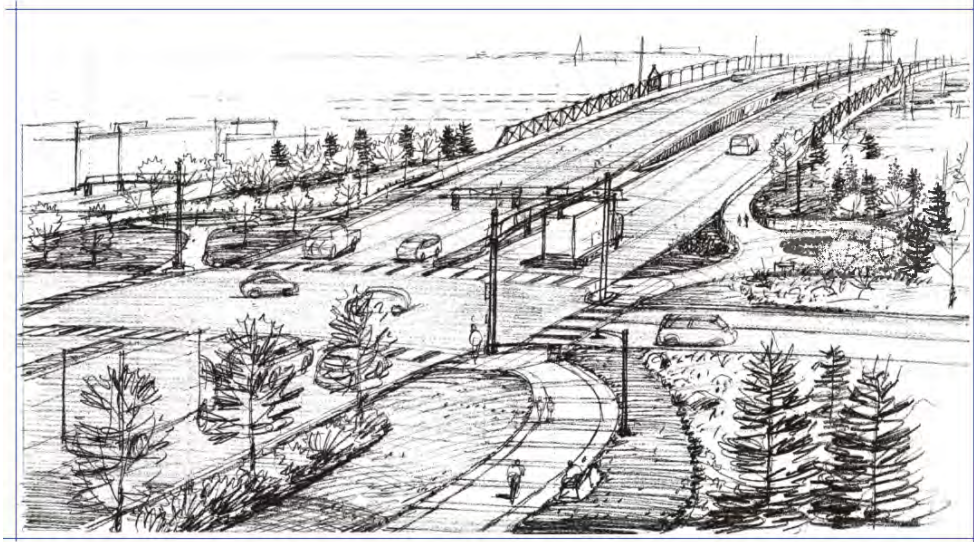
Figure 7. Conceptual Rendering of the 5th Street Intersection



5th Street to the Bridges: This boulevard streetscape continues to the north to the next transition; the bridge over the Union Pacific rail yards. Once again, striped signalized crossings are recommended for practical safety reasons as well as aesthetic considerations.

Conspicuous landscape areas at the bridge approach are excellent opportunities for creating plazas and possible sculptural features or obelisks. A plaza on the east and west sides of the bridge approach can create another elegant gateway statement to punctuate the terminus of this boulevard landscape. These urban landscape plazas can also help to visually enhance the bridge architecture. The promenade walkways should make their way through these plazas and connect to the bridge walkways. This provides connectivity for the important multi-modal link from downtown Cheyenne to the north. Concepts for enhancing this area are depicted in Figure 8. Note other features in Figure 8, including custom light fixtures and possible sculptural signal poles that are design details yet to be worked out. In addition, recent studies have been completed that address enhancing the bridge railings along the walkways over the bridges.

Figure 8. Additional Landscaping Features



A southward conceptual view for the 9th Street bridge area is illustrated in Figure 9. While not an entry experience, this view is also important. While descending the bridge, there will be a good view of this boulevard landscape. The plaza on the west depicts a water feature fountain. In arid landscapes, fountains have special allure and can become the focus of an attractive urban plaza. This view also shows how strategic tree planting can maintain view corridors to businesses along Central Avenue. The potential for median landscape north of 9th Street would need to be investigated.

Figure 9. South-Facing Rendering of 9th Street Bridge Area Concept



Sketches of alternative obelisks, as well as a list of potential plant species are provided in the Appendix for reference.

6.0 Cost Estimate

SEH has developed an estimation of probable construction costs to complete the project based on the conceptual designs for the south section project area (see Tables 2 and 3). Costs were separated into the following two phases:

- **Phase I: Basic Upgrades**
Phase I includes basic infrastructure enhancements to curb and gutter, pavement, walkways, and pedestrian lighting system.
- **Phase II: Enhancements**
Phase II includes the landscaping enhancements to the roadside, trails, center medians, as well as plaza details.

The estimated cost for Phase I is approximately \$860,000, while the cost of Phase II is roughly \$1,055,000. A detailed itemization of the two phases is provided in Tables 1 and 2 below:

Table 2. Phase I Probable Construction Costs

Item	Unit	Quantity	Unit Price	Cost
Preliminary Engineering Design	LS	1	\$97,000.00	\$97,000.00
Mobilization	LS	1	\$89,000.00	\$89,000.00
Contract Bond	LS	1	\$8,900.00	\$8,900.00
Construct medians, demo, curb gutter and pavements	LF	5200	\$60.00	\$312,000.00
Trail, Promenade 2 walkways, east and west, from 1-180 ramps to the UP Bridge north of 9th Street. 10ft. Wide concrete by 3700ft. long.	SF	74000	\$3.00	\$222,000.00
Pedestrian Lighting System	LS	1	\$10,000.00	\$10,000.00
Traffic Control	LS	1	\$10,000.00	\$10,000.00
Contingencies 15%, miscellaneous, signs, refuse containers, drinking fountains, minor fencing	LS	1	\$112,335.00	\$112,335.00
Total				\$861,235.00

Table 3. Phase II Probable Construction Costs

Item	Unit	Quantity	Unit Price	Cost
Design and engineering, landscape design construction documents	LS	1	\$60,000.00	\$60,000.00
Median landscape; soil, irrigation system trees, shrubs, ground covers	LS	52000	\$3.00	\$156,000.00
Roadside landscapes, minor regrading, irrigation system, additional trees, shrubs, flower beds	LS	390000	\$1.00	\$390,000.00
Plaza areas, focal landscapes, possible sculptures or fountains, special paving, low walls, benches, three separate areas	LF	1	\$300,000.00	\$300,000.00
Traffic Control	LS	1	\$10,000.00	\$10,000.00
Contingencies 15%, miscellaneous, signs, refuse containers, drinking fountains, minor fencing	LS	1	\$137,400.00	\$137,400.00
Total				\$1,053,400.00

7.0 Funding Options

Funding for the south section of the I-180 enhancement project will primarily come from the City of Cheyenne. Other potential funding sources and the enhancements their contributions may help fund are described below and in Table 4.

The I-180 enhancement project will qualify in the TEAS category. The TEAS process is handled through a written request to the WYDOT District Engineer which is evaluated and reviewed with consideration to its merit as an addition or enhancement to the State Highway System (SHS), a major consideration is its impact on highway safety. TEAS projects can be matched as high as 90.49% federal and 9.51% local/State, for projects with an obvious benefit to the SHS. WYDOT may opt to provide the required local/state match; such match determinations are the discretion of WYDOT.

Another category of funding that the I-180 enhancement project can take advantage of is the Cooperative Landscape Program. This program provides financial assistance to projects which encourage well-designed landscaping featuring low maintenance of native/adapted species. Financial assistance can be provided to organizations and public entities responsible for installation of landscape materials under WYDOT supervision. Xeriscapes are low maintenance landscapes composed of adaptive low water-use plants.

Grants are limited to a maximum of \$2,500 per occurrence and may only be used to purchase landscaping materials and rental of equipment. This type of grant can be best utilized by community groups wanting to contribute labor to beautify the area.

Sponsoring organizations must submit a completed grant application to be considered for the program. Grant applications may be obtained from the WYDOT District Engineer or from the Office of Local Government Coordination. Projects will be reviewed by a selection committee. WYDOT administers the grant funding. Proposed sites for roadway landscaping must be located where the planting would not be disturbed by scheduled roadway construction work.

Private grants are another possible source of funding. Private grants tend to be small but may be used to matching money for federal projects and provide amenities not covered in federal projects.

The Cheyenne Downtown Development Authority (DDA) is another possible source of funds. The DDA has help to fund streetscape improvements in the downtown area in the past. They have also contributed funds to the Cheyenne Depot. Funds for the bridge section and the Lincolnway section may be available from the DDA.

The Business Ready Community Grant and Loan Program has a funding category for community enhancement. Based on information found on the State of Wyoming web site, this funding category is designed "... to improve the communities esthetic character or quality of life through such activities as landscaping or recreational or convention facilities in order to make itself more attractive for business development under a specific or plan of action." Applications are due by October 3, 2005 and a maximum award is \$500,000.

Table 4. Possible Funding Sources

Possible Funding Sources	Landscaping	Sculptures
Art in Public Places		X
Cooperative Landscape Program (WYDOT)	X	
TEAS Grant (Administered by WYDOT)	X	X
Downtown Development Authority	X	X
Business Ready Communities Grant and Loan Program - Community Enhancement	X	

A contact list for the above possible funding sources is provided below for reference:

Art in Public Places

Marian Black
 Director of Purchasing
 City of Cheyenne
 2101 O'Neil Av
 Cheyenne, WY 82001
 (307) 637-6348

WYDOT

Jay Gould
 District Engineer
 Wyoming Department of Transportation
 3411 South 3rd Street
 Laramie, WY 82070
 (307)745-2100

**Cheyenne Downtown
 Development Authority**

Ms. Christian Cherek
 1714 Capitol Ave.
 Cheyenne, WY 82001
 (307) 433-9730

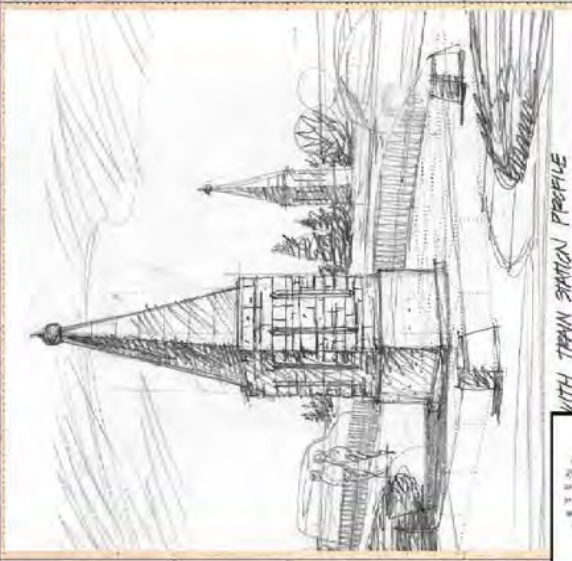
**Business Ready Communities
 Grant and Loan Program**

Shawn Reese
 Business Ready Community Program
 Wyoming Business Council
 214 West 15th Street
 Cheyenne, WY 82002
 (307) 777-2813

Appendix A

Obelisk Sketch Study

Plant Material List



Obelisks

Shown here are four sketches depicting various kinds of obelisk-like features ideas that might be appropriate for the I-180 Corridor. All of these are placed in a conspicuous location and are the focus of small plaza like landscape. Having two obelisks located east and west on the south side of the bridge can create a nice enhancement framing the view of the bridge for northbound travelers. To have any meaningful effect they should be between 20 and 30 ft in height.

UPPER LEFT: Classical obelisk shape and materials since ancient times. Concrete base with native stone masonry column. Sits in a small plaza with low seat wall. This type of feature is usually associated with some sort of memorial.

ABOVE CENTER: A somewhat classical shaped obelisk made of iron or steel reminiscent of bridge truss work, although more modern.

ABOVE RIGHT: A more sculptural type feature with a lighted spherical ball. Also utilizes some metal truss work reminiscent of bridges.

LOWER LEFT: This shape is derived from the steeple of the train station and consists of stone masonry and copper top. This can be one way of unifying the north and south sides of the bridge

- Construction costs: These are just concept level sketches so cost estimating is also sketchy. Some points about cost related aspects
 - More design iterations and structural investigations are needed to get a better grasp of what ideas are most popular and what the approximate costs might be.
 - The metal elements would likely require fabrication off site.
 - There might be some cost savings doing two metal features, probably less savings constructing two stone masonry obelisks.
 - \$30,000. may be the low end of the cost per one of these. A pair of obelisks and associated improvements may be upward of \$150,000 for the high end.
 - The all-stone masonry obelisks may be somewhat less expensive.



Cheyenne Metropolitan Planning Organization



INTERSTATE 180 ENHANCEMENT STUDY

Obelisk Sketch Studies

FM 3-23-06

SHEET 1 OF 1



Plant Material List

Species were selected on the basis of their nativeness and appropriateness to this immediate region.
Possible species include:

Large Deciduous Trees: 2 ½ inch call baled and burlapped, single straight leader, balanced crown.

Red maple - Acer rubrum
Hackberry - Celtis occidentalis
Honeylocust - Gleditsia triacanthos
Green Ash - Fraxinus pennsylvanica
American elm - Ulmus americana, new resistant varieties

Evergreen Trees: 6 to 10 ft height mix of sizes balled and burlapped, full crown, fully skirted.

Ponderosa pine - Pinus ponderosa-
Native juniper - Juniperus scopulorum
Douglas fir - Pseudotsuga menziesii
Colorado Spruce - Picea pungens

Small deciduous trees: 6-10 ft height multi stem, balled and burlapped, full balanced crown.

Species include:
Cockspur hawthorne - Crataegus crusgalli
American plum - Prunus americana
Crab apple - Malus sp.

Shrubs: No. 5 cont. plants, full and bushy, 3 stems min, 24 inch spread. Species include:

Large shrubs: small tree like;

Mountain Mahogany - Cercocarpus montanus
Choke cherry - Prunus melanocarpa
Service berry - Amelanchier alnifolia
New Mexican Locust - Robinia neomexicana

Smaller shrubs:

Three leaf sumac - Rhus trilobata
Wax currant - Ribes cereum
Native rose - Rosa woodsii
Russian sage - Pervoskia atriplicifolia
Common juniper - Juniperous communis
Buffalo juniper - Juniperous sabina 'buffalo'
Western Sand cherry - Prunus besseyi

Ground Covers: No. 1 cont. Plants,

Creeping Mahonia - Mahonia repens
Winter creeper - Euonymus fortunei coloratus
Kinnikinnick - Artosthylos uvaursi

Plant Material List (Continued)

Ornamental grasses: no. 1 cont. plants

Blue avena grass - Helictotrichon sempervirens

Indian Grass - Sorghastrum nutans

Blue grama grass - Bouteloua gracilis

Native Grasses: Grasses and forbs [wild flowers] seeded and native hay mulched. Mowed to a 6 inch min. ht twice per season. Non irrigated. Species include:

grasses; Western wheat grass, Buffalo grass, slender wheat grass, green needle grass, little bluestem.

'Lawn pasture': irrigated lawn - grass species, xeriscape blend, seeded and native hay mulched. Mowed to a 4 inch height monthly during the growing season. Non irrigated. Species include:

Buffalo grass, blue grama, sideoats grama, slender wheatgrass