

# Spokane County

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## Geiger Spur Transload Facility Study





# **Geiger Spur Transload Facility Study**

Prepared for the

**Washington State  
Department of Transportation**

By

**HDR Engineering, Inc.  
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**July 2007**



**Washington State  
Department of Transportation**

**Prepared by the State Rail Office, Freight Systems Division  
Washington State Department of Transportation**

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*Photograph on the cover:  
The Geiger Spur, looking west, adjacent to West McFarlane Road.*

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# Executive Summary

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The 2006 Washington State Legislature provided the Washington State Department of Transportation (WSDOT) and Spokane County with \$60,000 to study the need for a new transload facility which allows freight to be transferred between trucks and trains.<sup>1</sup> The study focuses on an area near Airway Heights, known as the Geiger Spur, which has a concentration of industrial sites served by a rail spur track that connects with the national rail network. The study is intended to help decision makers evaluate the need for a new transload facility along the Geiger Spur. The study also identifies some possible locations for a new transload facility, and provides important information regarding transload facility operations, land use implications, and commercial viability.

## What are the key findings of the study?

Based on coordination with key stakeholders, as well as research and analysis of the rail facilities and potential sites in the Airway Heights area, the project team has concluded that:

- A transload facility on the Geiger Spur could help support the economy of Spokane County by giving businesses more transportation options. Better connections between trucks and trains could help businesses reach more markets, provide greater flexibility in sourcing prime materials, and lower total transportation costs.
- There are approximately 200 acres of available land zoned for industrial uses along the Geiger Spur. However, the available parcels do not have sewer service at this time.
- Existing industrial shippers on the Geiger Spur use 250 to 300 rail cars per year. The majority of this traffic is structural steel beams and coil steel. Based on shipper surveys, a new transload facility could generate additional inbound and outbound traffic consisting of automobiles, machinery, lumber, and other materials. A transload facility with two or three tracks could potentially increase rail traffic on the Geiger Spur to 800 to 1,150 carloads per year.
- Rail service at the transload facility would be provided by three separate carriers:

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<sup>1</sup>2006 Washington State Legislature, Substitute Senate Bill 6241. PL, p. 39.

- the BNSF Railway Company (BNSF) would be the long-distance carrier, interchanging with the Eastern Washington Gateway Railroad at Cheney;
  - the Eastern Washington Gateway Railroad would interchange with Western Rail Inc. near Medical Lake;
  - Western Rail, Inc. would move cars between Medical Lake and the transload facility on the Geiger Spur.
- The project team identified four potential sites for a transload facility (see the following section for a more detailed discussion of these sites).
  - A well-used transload facility on the Geiger Spur may necessitate roadway improvements to handle greater volumes of truck traffic. South Hayford Road and its connection with West Geiger Boulevard, State Route 902, and Interstate 90 may need to be modified at some time in the future.

### **What locations were evaluated for potential transload facility sites?**

In fall of 2006, the project team was asked to consider possible transload facility sites in and around the city of Airway Heights and the industrial area along Geiger Spur. The project team reviewed existing aerial maps, topographic data and county parcel maps. Spokane County developed a list of five potential sites in the spring of 2007. Four of the five sites identified by Spokane County met the basic criteria developed by the project team and therefore were carried forward for further analysis. All of the sites that were evaluated are located immediately north or south of McFarlane Road, and are zoned for heavy industrial use. **Exhibit ES.1** presents the general location the proposed sites under consideration for the Geiger Spur transload facility.

### **What would be the general configuration of each potential transload facility site?**

Four sites were selected for further evaluation and a general configuration was developed. The following discusses each site and presents a general layout for the facility.

**Exhibit ES.1**  
**Locations of Potential Transload Facility Sites**

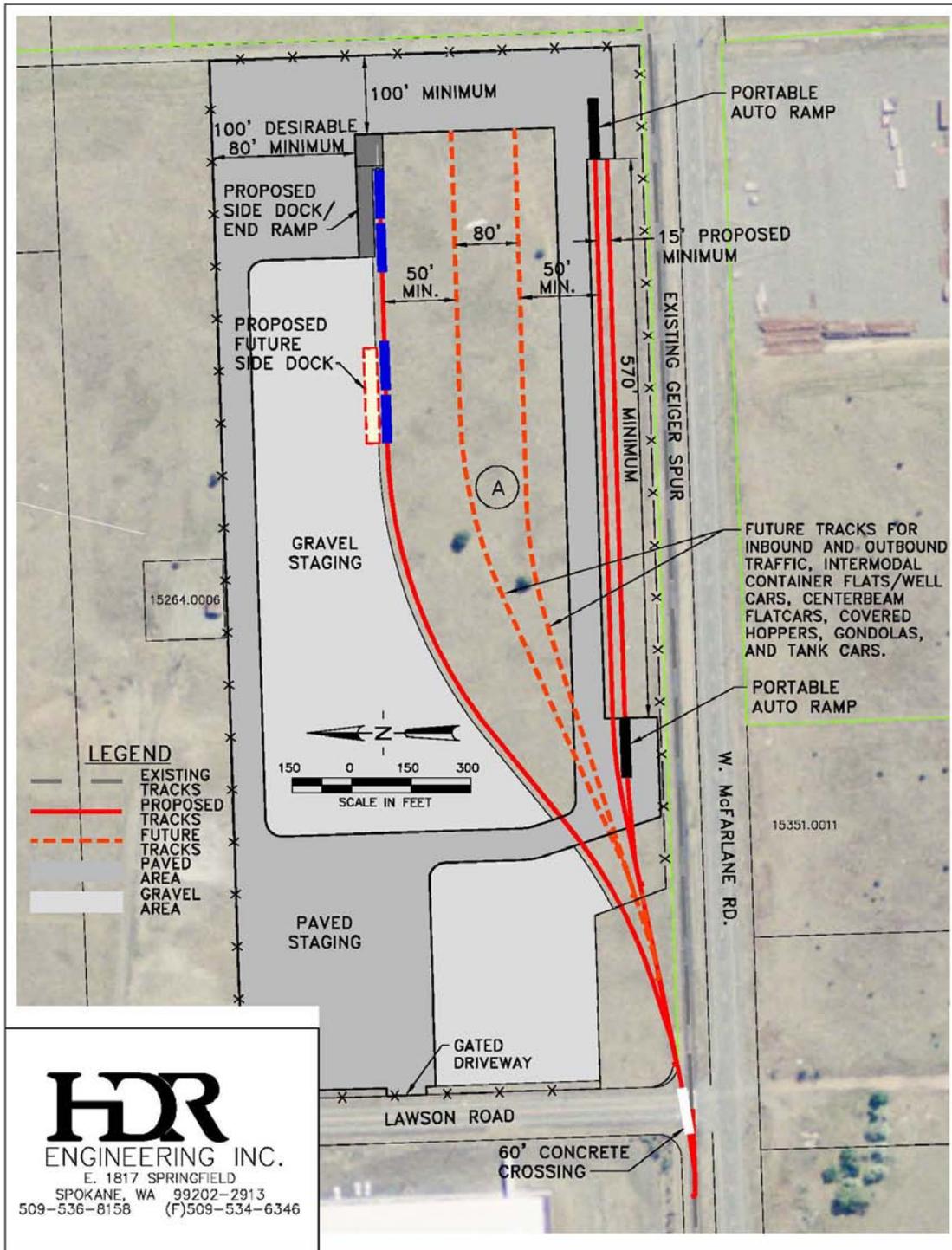


**Site A: 72.65 acres (Parcel Number 15264.0016)**

**Exhibit ES.2** presents the general design for this site. The following presents general information about the parcel:

- This site is owned by the city of Airway Heights.
- This parcel is oriented to use a parallel configuration design. The lot is of sufficient size in length and width to accommodate every desired feature.
- The city of Airway Heights has indicated that the parcel could be used for a rail transload facility. The City will not need this parcel to build and operate their future sewage waste treatment facility which is proposed to be built to the immediate north of this facility. In the immediate future, Site B (see discussion below) adjacent to this parcel could be considered for expansion of Site A. The arrangement of Site A is very conducive to this.

**Exhibit ES.2  
Site A: Potential Configuration**



- There is a well just to the north of the northern boundary of this parcel which requires a building setback of 100 feet.
- Road access is good with Lawson Road to the west. Possible access to Russell Road on the east could be achieved.

**Site B: 4.97 acres and 4.98 acres, respectively (Parcel Numbers 15253.0112, 15253.0111, 15253.0110, - 8.87 acres)**

**Exhibit ES.3** presents the general design for this site. The following presents general information about the parcel:

- The combined shape of these parcels is conducive to a perpendicular configuration design.
- Spokane County has indicated that these parcels are available but that expansion to the north is not desirable at this time.
- Possible access to Russell Road on the east could be achieved.

**Site C: 22.14 acres (Parcel Number 15351.0010)**

**Exhibit ES.4** presents the general design for this site. The following presents general information about the parcel:

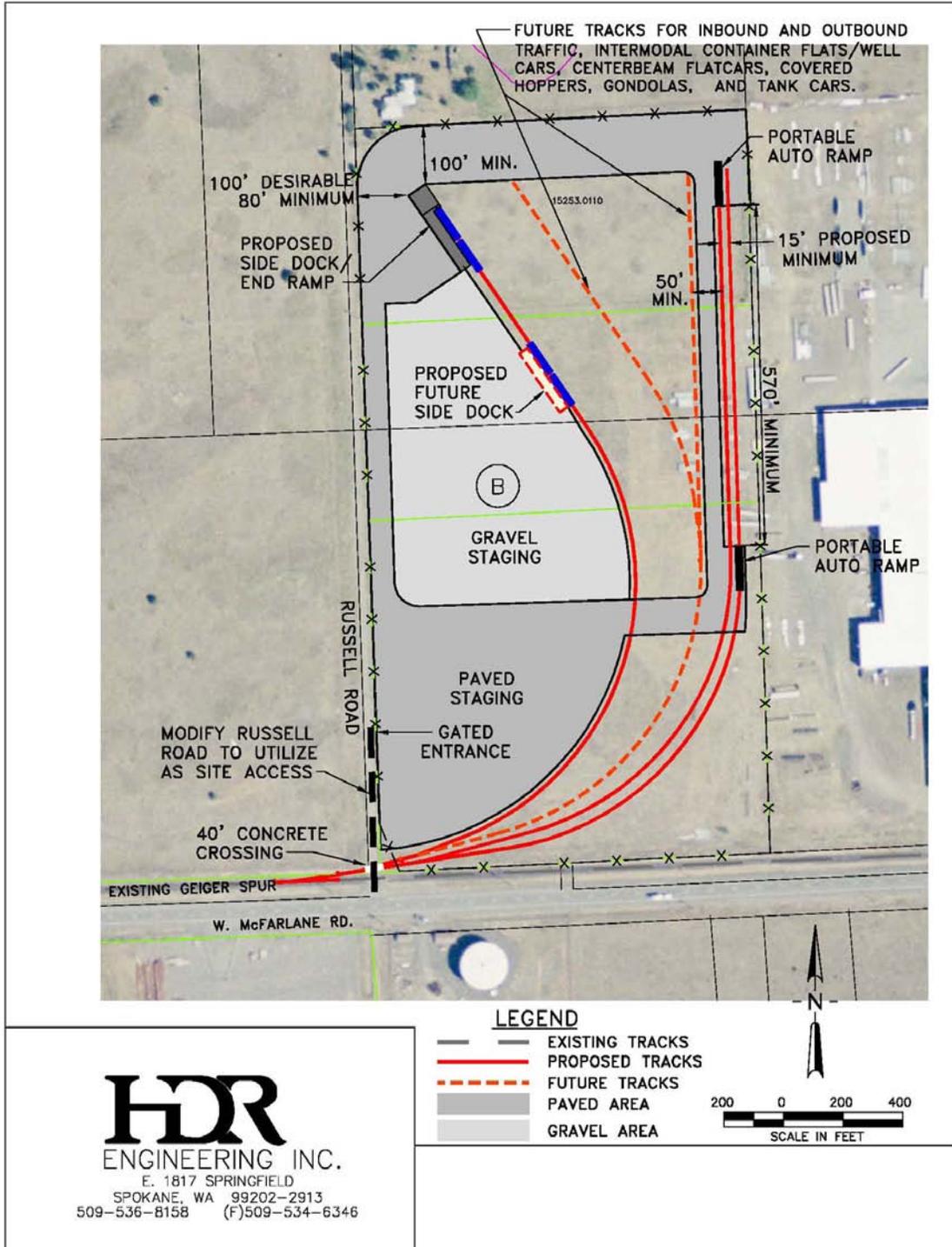
- This parcel requires an at-grade crossing of McFarlane Road. The preliminary design includes a signalized crossing for this collector road.

**Site D: 22.89 acres (Parcel Number 15253.0126)**

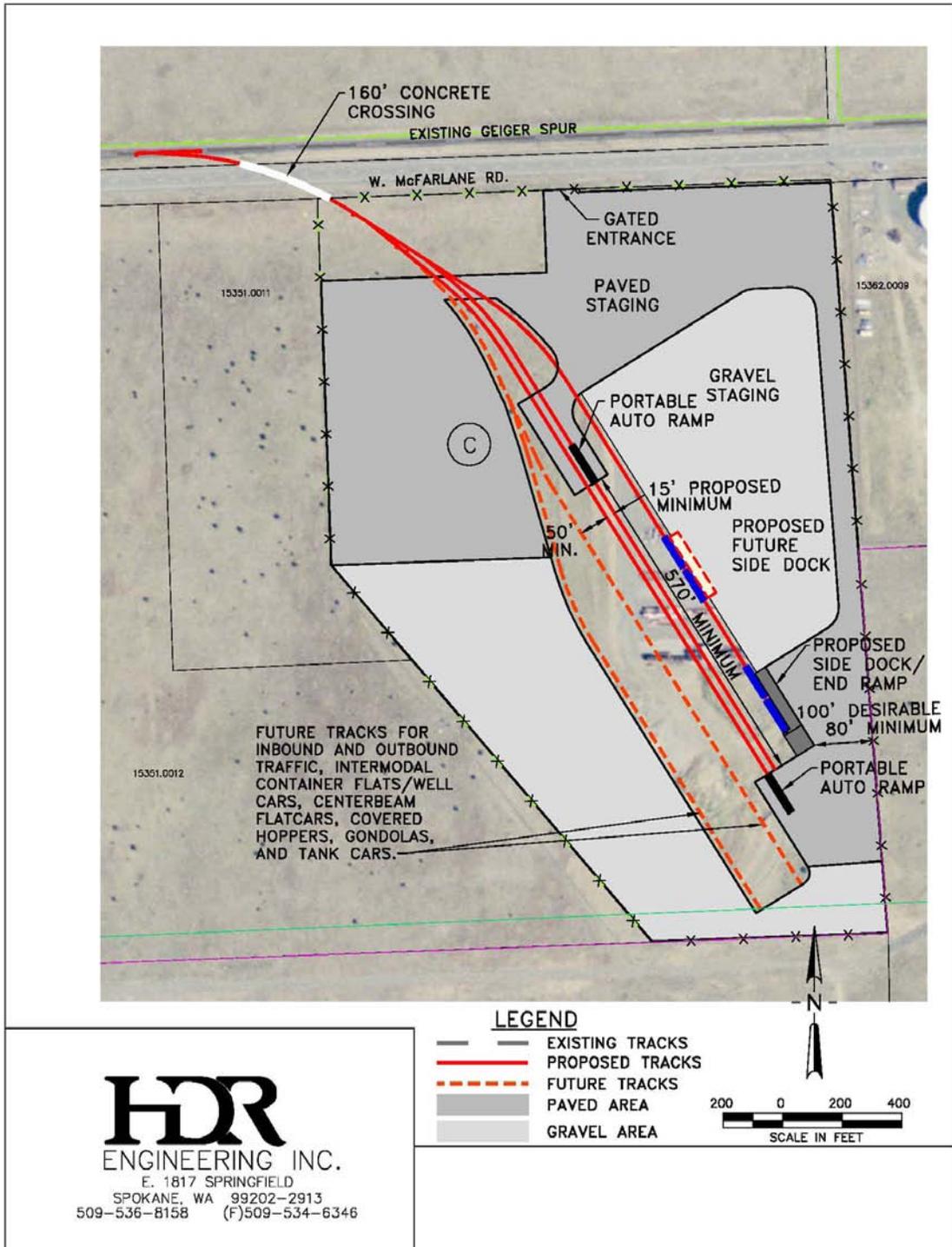
**Exhibit ES.5** presents the general design for this site. The following presents general information about the parcel:

- This parcel is owned by Western Rail, Inc. (WRI).
- Access will be from the southwest corner of the site.
- Per discussions with WRI, a proposed arrangement has been developed that moves Western's operations into a defined area with the balance of the entire property becoming the transload facility. WRI has indicated the arrangement is acceptable in concept and would make the property available for such an arrangement.
- The transload facility and WRI could have independent approaches to McFarlane Road.

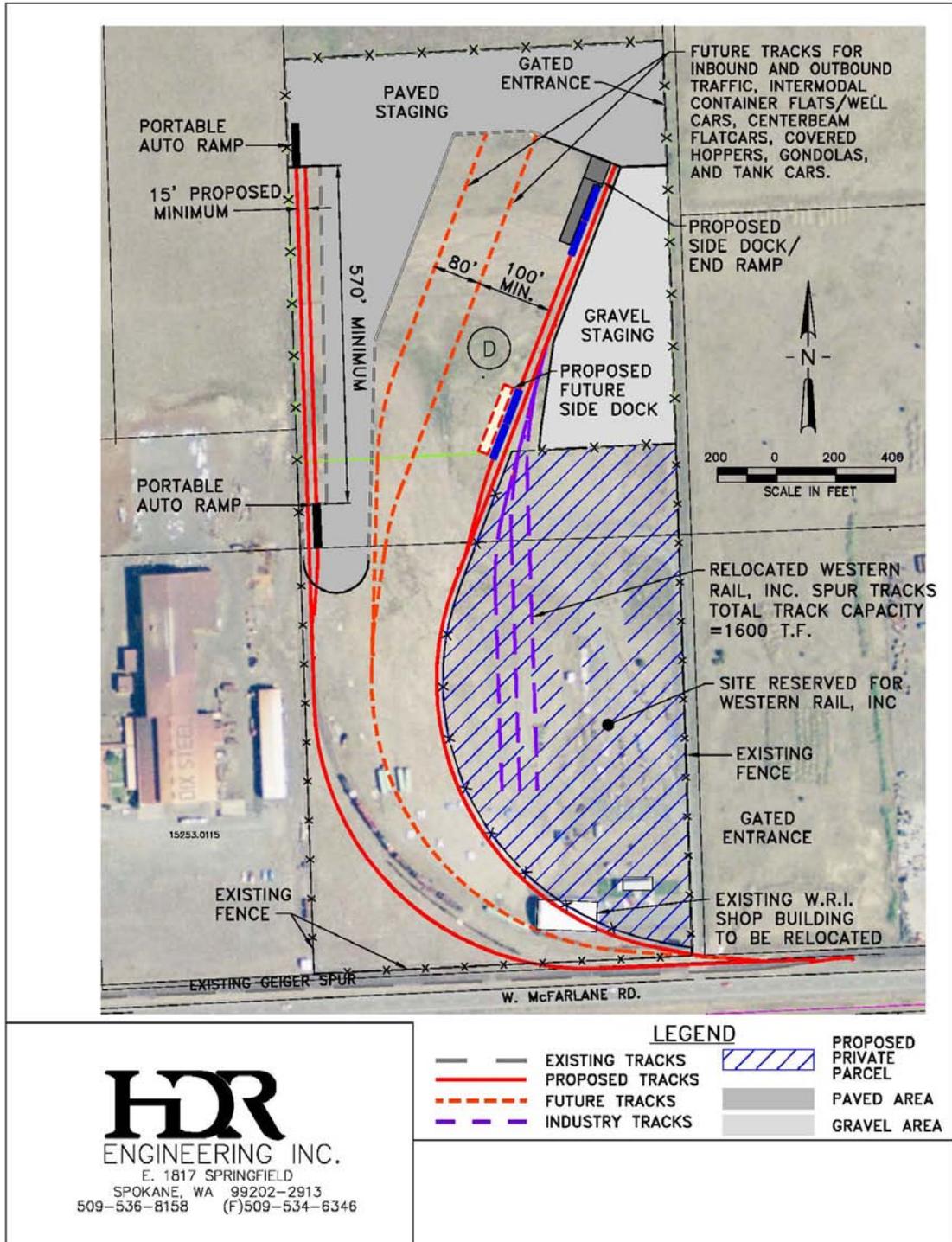
**Exhibit ES.3  
Site B: Potential Configuration**



**Exhibit ES.4  
Site C: Potential Configuration**



**Exhibit ES.5  
Site D: Potential Configuration**



## Were potential environmental elements evaluated?

All of the potential sites are located within an active industrial area, and all of the property is zoned for industrial land use. Prior to conducting a site review of the area, project planners and scientists reviewed GIS maps prepared by the Spokane County Department of Building and Planning. Maps reviewed included: *Fish and Wildlife Critical Areas Map*, *County Wetlands Map*, and the *Washington Department of Natural Resources Stream Types Map*. Soils surveys, topographic maps and aerial photographs were also reviewed in an effort to identify any regional conflicts that might represent a significant environmental or community impact and be incompatible with the proposed project. The project team then visited the project area and evaluated existing conditions at the potential sites. This review did not include detailed site investigations such as soil probes, or sampling of any kind. The work concentrated on evaluation of the proposed sites. In some cases, access to individual sites was not available, so information for the site was based on document information in maps, photographs, and documents. These reviews resulted in a general environmental overview that is presented below. Potential environmental concerns have been identified on some of the proposed parcels, but none of the conditions observed were deemed to represent fatal flaws for the project, generally because the area is so disturbed and because the area lacks any high quality natural resources.

### Site A

Site A is a portion of a large parcel that is mostly vacant land. There was what appeared to be a well house near the south/central part of the site. The site contains scattered pine trees and grasses. It appears to have been disturbed in the past, and is unlikely to contain sensitive natural resources. There is a trailer park located just north of the site, on the north side of Golden Road. No wetlands or streams were observed and habitat conditions are poor for most native shrub-steppe species. Depending on the extent and nature of the disturbance that has occurred at the site, cultural resources surveys may be required.

### Site B

Site B is adjacent to Site A, and is mostly vacant land. Native and non-native vegetation is present and the site appears to have been disturbed in the past. No wetlands or streams were observed and habitat conditions are poor for most native shrub-steppe species. An existing residence is located adjacent to the north property line of the northern-most parcel for the site. Depending on the extent and nature of the disturbance that has occurred at the site, cultural resources surveys may be required.

### Site C

Site C is a large trapezoidal parcel located on the south side of McFarlane Road. This site currently contains a materials handling facility and appears to have been extensively graded and disturbed. Due to the existing industrial use of the site, a hazardous materials review should be conducted. From a natural resources point of view, there is more potential to find seasonal wetlands or wildlife resources south of McFarlane Road, but the parcel reviewed has been severely modified and no such resources are present. The *Spokane County Fish and Wildlife Critical Areas Map* classifies the area south of the Airway Heights industrial area as Prairies and Steppe. Development outside of the industrial zone may require natural resource studies, but none should be required for Site C.

### Site D

Site D is partially developed. A portion of the north part of the site does not contain a facility, but appears on aerial photographs to be heavily disturbed. The north part of the parcel was not accessible during the site visit. Depending on the extent and nature of the disturbance that has occurred at the site, cultural resources surveys may be required. Due to the existing industrial use of the site, a hazardous materials review should be conducted.

## How much would it cost to build the transload facility and necessary rail improvements?

Cost estimates of probable construction costs were prepared for each parcel. Costs were developed using 2007 dollars, and are presented in **Exhibit ES.6**. Cost estimates presented in this study are conceptual.

**Exhibit ES.6**  
**Conceptual Construction Costs in 2007 Dollars**

Site	Description	Estimated Cost <sup>1</sup>
A	2 – Auto Unloading Tracks, 1 – Double sided track with side dock end ramp	\$3,193,000
B	2 – Auto Unloading Tracks, 1 – Double sided track with side dock end ramp	\$3,807,000
C	2 – Auto Unloading Tracks, 1 – Double sided track with side dock end ramp	\$4,523,000
D	2 – Auto Unloading Tracks, 1 – Double sided track with side dock end ramp	\$3,626,000

<sup>1</sup>These costs do not include the cost of preparing environmental (*National Environmental Policy Act (NEPA)* or *State Environmental Policy Act (SEPA)*) documentation.

# Chapter One

## Introduction

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Many businesses throughout Washington State rely on freight railroads to meet their shipping needs. The BNSF Railway Company (BNSF) is the primary Class I railroad<sup>1</sup> in Washington State. In addition to the BNSF, a number of regional short line<sup>2</sup> railroads provide freight rail service to local businesses.

The CW Branch, owned by the state of Washington (and operated by the Eastern

Washington Gateway Railroad) and Spokane County's Geiger Spur (operated by Western Rail, Inc.) are among the several short line railroads that provide freight rail service to local communities in eastern Washington. To provide increased rail service to local businesses, Spokane County wants to construct a transload facility along its Geiger Spur.



**Spokane County Geiger Spur**

### What is a transload facility?

A transload facility is a place where shipments are transferred from trucks to rail or from rail to trucks, thus making rail transportation available to customers not located on a rail line. Once their products are on a rail car, customers can ship their products throughout the United States via the national rail network. This study will help decision makers determine if a Geiger Spur transload facility is feasible, and if it will help attract new businesses to the Geiger Spur area.

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<sup>1</sup>As of 2004, a Class I railroad (as defined by the Surface Transportation Board) has an operating revenue exceeding \$277.7 million. There are seven Class I railroads in the United States. Short line railroads are classified as Class III railroads with annual revenue of \$20 million or less.

<sup>2</sup>Short line railroads are classified as Class III railroads with annual revenue of \$20 million or less. A short line railroad serves industries in small communities by providing a link to a larger, national rail network.

## Who is sponsoring this study?

The 2006 Washington State Legislature provided the Washington State Department of Transportation (WSDOT) and Spokane County with \$60,000 to study the need for a new transload facility which will allow freight to be transferred between trucks and trains.<sup>3</sup> During the course of this study, WSDOT and the County worked closely with representatives from the city of Airway Heights and the BNSF.

## Where is the project located?

The proposed transload facility would be located along Geiger Spur in the city of Airway Heights, six miles west of Spokane. **Exhibit 1.1** illustrates the general location of the Geiger Spur.

**Exhibit 1.1**  
**Regional Context: Geiger Spur Transload Facility**



<sup>3</sup>2006 Washington State Legislature, Substitute Senate Bill 6241. PL, p. 39.

## **What is the purpose of this study?**

As directed by the Legislature, the purpose of this study is to:

- Identify the need for transloading capability in Airway Heights that could be served by the Geiger Spur;
- Identify prospective transloader sites, operators and users;
- Identify the type, size and special needs of shippers/customers;
- Evaluate the costs associated with building and operating a transload facility; and
- Identify potential impacts to local roadways and surrounding land uses.

This report responds to this directive.

## **What is contained in this report?**

Following this introduction, Chapter Two discusses the purpose and need for this project, based on previous analysis conducted by Spokane County and other stakeholders. An overview of existing rail operations and businesses along the Geiger Spur is presented in Chapter Three. Chapter Four presents information regarding potential users and demand. Chapter Five provides a discussion of potential transload locations, as well as the facility's design configurations. Conceptual cost estimates are also included in this chapter. Transload operations are discussed in Chapter Six.

Technical appendices are also included in this document. Appendices contain interview results, conceptual cost estimates, and transload and rail design standards.

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## Chapter Two

# Purpose and Need for this Project

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Good rail service can help maintain existing businesses and attract new industries to an area. The city of Airway Heights is currently home to several businesses on Geiger Spur who are rail-dependent. The construction of a well-designed and properly located transload facility could improve the economic viability of these businesses and provide incentive for new businesses to locate in Airway Heights.

### What is the purpose of this project?

Spokane County wants to construct a transload facility on Geiger Spur. The County, the Spokane Area Economic Development Council (EDC), the Spokane Regional Chamber of Commerce, the city of Airway Heights, and the West Plains Chamber of Commerce have been working together to provide industrial growth and economic development opportunities in the Airway Heights industrial area.

As part of this economic program, two projects have been identified as key elements to the City's economic success:

#### Geiger Spur Project

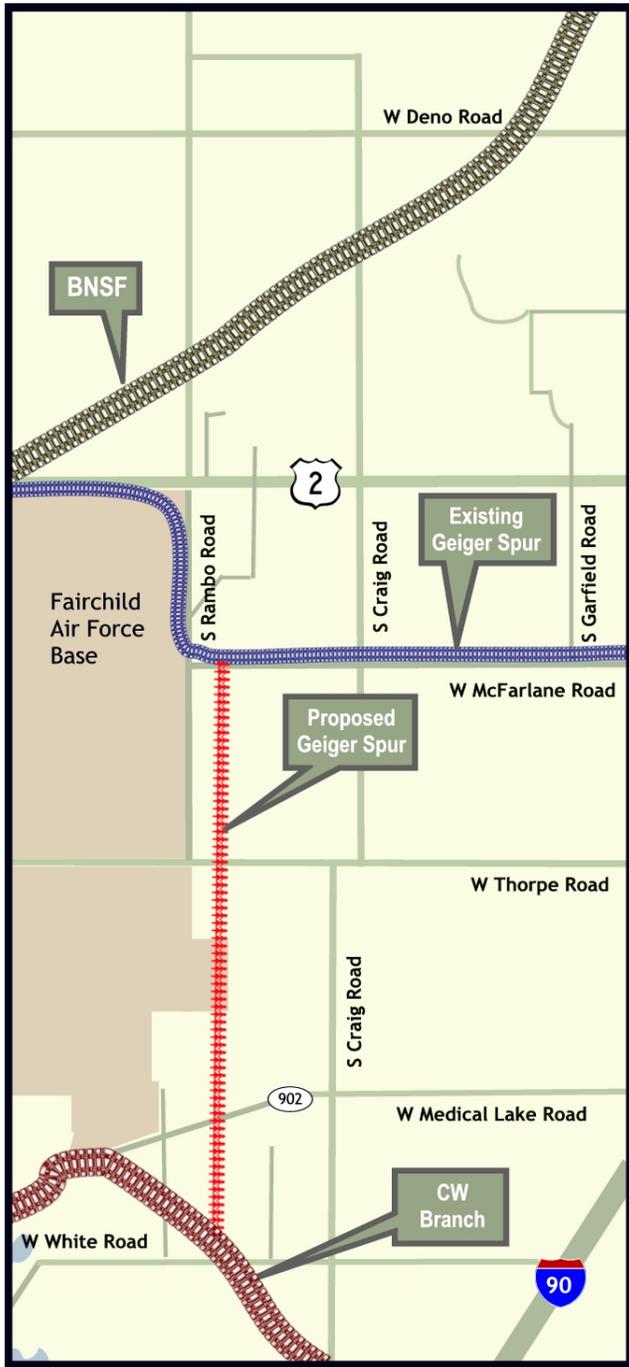
The Geiger Spur Project is a four mile track connecting the existing Geiger Spur rail line and the Washington State-owned CW Branch of the Palouse River and Coulee City Railroad (PCC). The CW Branch runs from Cheney to Coulee City. When completed, the realigned track will connect the Geiger Spur, just west of Craig Road, to the CW Branch. This connection will allow freight from Geiger Spur to connect with the BNSF Railway Company's (BNSF) main line in Cheney via the CW Branch. The realignment is scheduled to be complete in 2008.

#### Geiger Spur Transload Facility

The transload facility would be constructed after the Geiger Spur Project is completed. The proposed transload facility would enhance service on the realigned Geiger Spur by allowing new industrial customers direct access to rail service in west Spokane County.

**Exhibit 2.1** illustrates the general location of the existing Geiger Spur, the proposed new route, and the connecting railroads.

**Exhibit 2.1**  
**Location of Existing and Proposed Geiger Spur Project**



**How will these projects spur economic development?**

The economic development goals associated with the Geiger Spur Project (and the transload facility) is to retain 400 jobs and five rail-dependent manufacturers and in the future, create 5,000 to 7,000 new jobs in Spokane County, and an advanced international freight logistics hub.<sup>1</sup>

According to the EDC, the economic impact of the Geiger Spur Project currently is:

- \$67 million per year in local economic impacts;
- 400 manufacturing jobs; and
- \$6.7 million per year in local and state tax revenues.

The potential economic impact of the Geiger Spur Project and transload facility, when completed is:

- \$773 million per year in local economic impacts;
- 5,000 to 7,000 manufacturing and logistics jobs; and
- \$77 million per year in local and state tax revenues.

The potential for additional rail dependent industry in the Airway Heights area would be greatly enhanced with continued and improved rail service. There are over 140 developable acres located along the Geiger Spur. The Airway Heights area is the only area in Spokane County that can provide large acreage parcels (some larger than 20 acres),

<sup>1</sup>Spokane County Office of Economic Development

for industrial use along a rail line. **Appendix A** provides more information about the city of Airway Heights.

## **Is the project needed?**

Due to various infrastructure, real estate, and transportation conditions, industrial growth in the Airway Heights area has been at a standstill. In order to spur on development and increase jobs, increased investment in infrastructure, real estate, and transportation is needed.

### **Infrastructure for Industrial Development**

According to the EDC, the Airway Heights area along the Geiger Spur is home to 18 businesses that employ over 600 employees and covers 400 acres. Approximately 100 of those acres are being used for buildings with jobs that pay in excess of the average Spokane County wage. A little over 100 acres are being used for mining, and the remaining 200 acres are undeveloped flat land with infrastructure in close proximity.

The area along McFarlane Road (parallel to Geiger Spur) is within the city limits of Airway Heights and is zoned industrial. The city of Airway Heights provides sufficient water capacity for industrial uses. However, sewer is not provided to the properties. The city of Airway Heights is in the initial stages of designing a sewage treatment plant on property they have recently purchased on MacFarlane Road. The facility is scheduled for completion in 2009.

### **Land Value**

Property values are low in the Airway Heights area due to the lack of sewer service and the abundance of similar land. The city of Airway Heights recently purchased 73 acres along the rail line for \$4,000 per acre. If infrastructure was in place, this same land could potentially have been purchased at a higher cost. Marketing these properties will be difficult without sewer service, but the low price does make them attractive to developers, especially if a rail line and transload facility were in place.

Spokane County is not without other rail-serviced properties, primarily in the Spokane Valley and northeast Spokane. However, most of the properties are less than ten acres in size, and are scattered so they cannot be combined for larger acreage sites required by some businesses.

### **Freight Rail Transportation**

The current route of the Geiger Spur runs parallel to McFarlane Road for approximately three miles. It then runs on 1.5 miles of track within Fairchild

Air Force Base, under an agreement with the Air Force which expires in 2009. Rail service along the Geiger Spur is presently being provided by Spokane County through an agreement with Western Rail Inc. and the BNSF. Western Rail provides switching services for the BNSF on the Geiger Spur.

Current shippers on the Geiger Spur use approximately 250 to 300 rail cars per year. The rail line has not been maintained, as it has always been a marginal performing property for the BNSF. New industries have not located there due to the uncertainty of rail service and the lack of infrastructure.

### **Are there other transload facilities in the area?**

The only transload facility in the Spokane area is located at the Velox Industrial Park, east of Spokane in the city of Spokane Valley. The transload facility allows commodities to be transferred from truck to railcars for movement along the BNSF main line to Puget Sound ports or the eastern United States. The transload facility is made up of six tracks (totaling 2,300 feet and 24 loading spots).

The only intermodal facility<sup>2</sup> in the Spokane area is located between Spokane and Spokane Valley, in Parkwater. The intermodal facility allows trucks and containers to be loaded on and off railcars for movement along the BNSF main line to Puget Sound ports or the eastern United States. The ten acre intermodal facility is made up of one track totaling 1,900 feet.

### **Would construction of the Geiger Spur transload facility stimulate economic growth?**

With completion of the Geiger Spur Project and construction of a transload facility, and completion of sewer service to the industrial land in Airway Heights, the potential for attracting industry is greatly enhanced. Geiger Spur is the only area where large parcels of land are available and rail service to the national network is provided. Access to rail transportation can be an important factor for many industries when they are looking to relocate or expand operations. This is one of the key reasons why the EDC and others support the construction of a transload facility on the Geiger Spur.

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<sup>2</sup> *An intermodal facility is different than a transload facility because it handles special boxes or containers, that can be easily transferred between trucks, trains, and ships. A transload facility may handle containers, but may also handle other freight like farm equipment, lumber, and automobiles that are typically not transported in containers.*

## **Chapter Three**

# **Existing Operations and Users along Geiger Spur**

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Until 2004, the Geiger Spur was part of the BNSF Railway Company's (BNSF) rail network in Washington State. However, in 2001, Fairchild Air Force Base notified the BNSF of its desire to remove the rail spur from the Base. Homeland security was the major factor in this decision. The Base's notification and the poor condition of the rail line triggered the BNSF's decision to abandon the rail spur. In addition, the Air Force began to increase the BNSF's lease rate from \$1,000 to \$9,000 per year. In 2001 the BNSF began notifying shippers that the spur line would be abandoned in 2004.

To secure the future of rail service for the existing customers on Geiger Spur, Spokane County requested that the BNSF donate the rail spur to the County. This transfer of ownership took place in October 2004. Spokane County can operate trains through the base until 2009.

### **What is the Geiger Spur's current alignment?**

The Geiger Spur begins at the BNSF main line just north of the Base. It travels east through the Base, exiting on the east side and traveling nearly a straight route that parallels McFarlane Road in Airway Heights. It presently ends on the west side of Hayford Road.

### **How does the railroad operate on the Geiger Spur?**

The Geiger Spur currently runs from the BNSF Columbia River Subdivision at Fairchild Air Force Base to Airway Heights, ending at Hayford Road. The Geiger Spur handles roughly 300 carloads annually. The primary commodities handled by the railroad are structural steel beams and coil steel. Western Rail Inc., the current operator of the Geiger Spur, provides rail service to customers on an "as needed" basis. Western Rail transfers freight to/from the BNSF main line once per week. The railroad owns two small- to moderate-sized locomotives of 1,200 to 2,000 horsepower.

### **After Completion of the Geiger Spur Project**

After completion of the Geiger Spur Project, Western Rail will transfer freight to/from the Eastern Washington Gateway Railroad on the CW Branch near Medical Lake. Eastern Washington Gateway Railroad will then transfer freight to/from the BNSF line at Cheney. Cars will be dropped off by Eastern Washington Gateway Railroad and then brought by the BNSF to their

classification yard in Spokane. At the classification yard, cars will be sorted by destination and then connected to trains traveling east and west.

## **How do these rail facilities serve the area?**

In addition to the Geiger Spur, two other railroads provide current or future service to the businesses located in the greater Spokane area:

- CW Branch owned by the state of Washington and operated by Eastern Washington Gateway Railroad;
- BNSF Columbia River Subdivision (Wenatchee to Spokane- Latah Junction); and
- BNSF Lakeside Subdivision (Pasco to Spokane- Sunset Junction).

### **CW Branch**

The CW Branch runs from Cheney to Coulee City and is owned by the state of Washington. The short line railroad is operated by Eastern Washington Gateway Railroad. The railroad is primarily an agricultural based railroad which handles grain, sugar beets, fresh and frozen potatoes, fertilizers, and chemicals. The CW Branch is 84-miles in length and connects to the BNSF main line. Once the Geiger Spur Project is completed, freight from the Geiger Spur will be transferred to the CW Branch for shipment to the BNSF.

### **BNSF Facilities**

The BNSF has three east-west main lines which serve Washington State. Two of these main lines, the Stevens Pass and Columbia Gorge/Pasco East routes, extend through the area. In addition, the Columbia Gorge/Pasco East route (Lakeside Subdivision) connects to the CW Branch at Cheney. It is at this location in Cheney where freight cars will be delivered by Eastern Washington Gateway Railroad.

### **BNSF Spokane Yard**

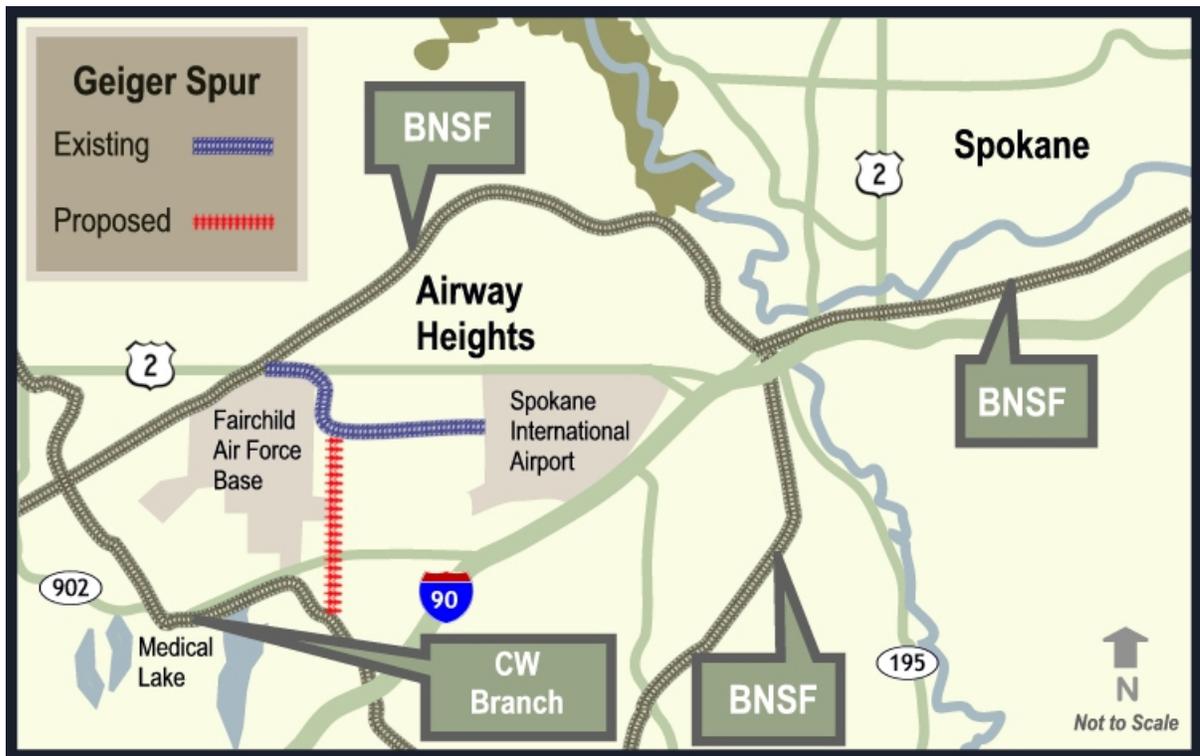
The BNSF Spokane Yard is important to Geiger Spur rail traffic because trains from the Geiger Spur which are transferred to the BNSF (currently at the junction just north of Fairchild Air Force Base, and in the future at Cheney) eventually are moved to the Spokane Yard.

Spokane is the junction where westbound rail traffic splits to go over the Stevens Pass, Stampede Pass, and Columbia Gorge routes and eastbound traffic is combined to go east. Trains arrive and depart (to points throughout the United States) from the Spokane Yard once they are combined and sorted.

Railcars from throughout the Spokane area and northeast Washington, including the Geiger Spur's cars, are sorted in Spokane and added to the appropriate trains. Cars for central Washington destinations arrive on trains

from the east and west and are made up into trains for delivery. The rail shipments originating or terminating on the Geiger Spur are sorted at Spokane Yard. **Exhibit 3.1** presents the general location of these rail facilities.

**Exhibit 3.1**  
**Rail Lines in the General Area**



### **Who are the current customers on the Geiger Spur?**

Five industrial users in Airway Heights are served by the Geiger Spur. These businesses ship a number of commodities, including steel and heavy equipment for fabrication. These Geiger Spur businesses employ nearly 400 people in manufacturing and heavy industry. The majority of these businesses use the Geiger Spur for inbound shipments. **Exhibit 3.2** lists more information about these businesses and **Exhibit 3.3** illustrates their general location.

**Exhibit 3.2  
Current Geiger Spur Customers**

Map Location*	Customer	Shipments (Direction)
1	Garco Building Systems	Steel (inbound)
2	Metals Fabrication Company	Steel (inbound)
3	Seaport Steel	Steel (inbound)
4	Spokane Culvert Company	Steel and Aluminum Coil (inbound)
5	Western Rail, Inc.	Locomotives and rail cars (mostly inbound)

\*Refer to **Exhibit 3.3**

**Exhibit 3.3  
Location of Current Geiger Spur Customers**



## Chapter Four

# Potential Users and Demand for Service

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The Washington State Department of Transportation (WSDOT), Spokane County, and the city of Airway Heights identified potential transload facility users. These potential users were interviewed in order to assess the demand for a Geiger Spur transload facility. **Appendix B** provides a summary of the interviews.

### How were potential users identified?

The project team worked with WSDOT, Spokane County, and the city of Airway Heights to obtain lists of potential transload facility customers. Between January 2006 and June 2007, formal and informal interviews with some of these customers were conducted.

Three types of potential users were interviewed: existing Geiger Spur customers; existing businesses located along Geiger Spur that do not currently use rail; and other industrial businesses in the general vicinity that do not currently use rail. Existing customers identified for interviews were selected based on current rail volumes and potential for growth due to the availability of a transload facility on Geiger Spur. Not all existing or potential rail customers were interviewed due to time constraints.<sup>1</sup>

### What was the purpose of the interviews?

The purpose of the customer interviews was to determine the company's current business needs, rail and truck/intermodal volumes, potential future rail volumes, and the impact that a new transload facility would have on their particular business now and in the future. Each customer was provided with background information on the proposed transload facility during the interviews.

### Would existing Geiger Spur customers use the transload facility?

The five existing Geiger Spur customers were asked about their future plans for growth and use of rail. **Exhibit 4.1** provides a summary of findings.

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<sup>1</sup>*At the direction of Spokane County, Allied Waste Industries was not interviewed as a potential user of the facility.*

**Exhibit 4.1**  
**Current Geiger Spur Customers: Interview Findings**

Map Location*	Customer	Findings
1	Garco Building Systems	Garco Building Systems uses rail for receiving shipments of steel and products for the manufacturing of buildings. They intended to ship in about a dozen cars of product in 2005, and were looking at more beyond that date. They also have a nine acre lot on the rail line that may be used for rail dependant industry.
2	Metals Fabrication Company	Metals Fabrication Company is a large steel fabrication operation that brings in over 200 car loads of steel per year. Many of their customers in the construction industry are doing very well; this trend is expected to continue into the near future. They intend to build additional facilities at their present location to increase their capabilities with cranes and production equipment.
3	Seaport Steel	This business is a large Seattle steel reseller that stores product in this location. They have found it very cost effective to ship steel into Airway Heights and truck it to clients throughout the Northwest rather than store it at their site in Seattle. Like Metals Fabrication, Seaport Steel is entirely dependent on shipment by rail.
4	Spokane Culvert Company	This business is doing quite well and will continue to occasionally use rail. They would experience significantly higher costs for shipping products they now sometimes put on rail if they did not have rail access when needed.
5	Western Rail Inc.	Western Rail is a locomotive rehabilitator and parts supplier for the railroad industry. They presently operate a shop leased from Pend Oreille Port District in Cusick, WA that rehabs locomotives. They own a fleet of locomotives that they lease to railroad short lines around the country. They recently purchased the 23 acre site with a spur on the west side to store locomotives and parts. They intend to add another building this year and expand their operations. They are presently considering other operations on the site such as a reload facility, a locomotive shop and other operations.

\*Refer to **Exhibit 3.3**

### **What potential new customers were interviewed?**

Two types of potential customers were interviewed – those users that are already located along the Geiger Spur but don't use rail, and potential users that are not currently located along the rail line. **Exhibit 4.2** lists these businesses and **Exhibit 4.3** illustrates their general location.

**Exhibit 4.2  
Potential Customers Interviewed**

Map Location*	Business	Map Location*	Business
1	DAA Norhtwest	6	St. John Hardware & Implement
2	Landmark Seed Company	7	Spokane Galvanizing (EZ Loader)
3	Lee Publishing/Target Media NW	8	Triumph Composite Systems
4	Mid-Mountain Machinery	9	Walter Implement
5	Rowand Machinery	10	WEMCO

\*Refer to **Exhibit 4.3**

**Exhibit 4.3  
Location of Potential Geiger Spur Customers**



## What were the findings from the interviews?

Expansion and additional rail car use by the five existing Geiger Spur customers is planned but will be moderate due to the nature of the specific businesses and the limited space at their existing facilities. Potential is greatest at the Western Rail site and the additional acreage at the Garco site. Each of the businesses will need to be encouraged to pursue additional operations that will use rail shipments to take advantage of the proposed rail loading facilities.

Some of the potential customers interviewed believe that trucking is more flexible and more suitable for their needs. Better transit times are a key advantage of trucking for some businesses.

One business in particular, Spokane Galvanizing, which is located on the Geiger Spur, could potentially increase its operations in the next few years. The galvanizing operation supports other metal fabrication industries in Airway Heights and is a subsidiary of EZ Loader Boat Trailers. EZ Loader officers stated they would be interested in moving their north Hamilton operation (which currently uses a transload facility) to Airway Heights when it becomes economically beneficial to do so and when it becomes too difficult to operate in the area (as land uses change from industrial to commercial and academic).<sup>2</sup> The company has sufficient property in Airway Heights to replace its Hamilton operations. The direct access to rail shipping is very appealing since they currently receive about 250 car loads per year. The company is hesitant to expand at the Airway Heights site because of their belief that the area lacks appropriate infrastructure and that rail service on the Geiger Spur in the long term is not certain.

## Is there demand for a transload facility?

The potential demand for a transload facility is based on traffic and customer interviews, which reveal that the bulk of traffic both inbound and outbound is automobiles and machinery. Other types of transload activities could occur if the facility is modified for specific customers.

A “good” dock at a transload facility in Airway Heights would be attractive to many businesses interviewed. Businesses are focused on good service and competitive pricing. Rail access allows for wider market penetration for goods and more flexibility in sourcing prime materials. Lower rail costs, relative to trucking, is desirable.

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<sup>2</sup> Interview with Spokane Galvanizing, 2007. See Appendix B for more information.

## Chapter Five

# Potential Transload Sites and Design

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Based on customer interviews, it was determined that large machinery and automobiles could potentially be transported both inbound and outbound via a new transload facility on the Geiger Spur. As such, an appropriate site and design – to accommodate such shipments -- is critical to the success of the facility.

### What would an optimal transload facility look like?

An optimal transload facility would include track, storage, and security to accommodate multiple users. The proximity of the users to the facility and their need for storage will determine how much space is required. The track configuration should be designed to be flexible, providing tracks which accommodate commodities requiring loading/unloading from both sides of the railcar (such as dimensional lumber) or long tangent tracks for loading/unloading automobiles. The optimal transload facility should also be designed to accommodate uses currently not considered such as intermodal activities. A facility with two or three tracks that could handle unloading by ramps could increase rail traffic on the Geiger Spur by an additional 550 to 850 cars per year.<sup>1</sup>

### What are the generic features of an optimal transload facility?

The *Transload Design Guide (Appendix C)* was used as the basis for the development of the optimal transload facility and conceptual plan for each site. The design and conceptual plan was based on features identified by the potential operators and users. **Exhibit 5.1** presents the features that should be included as part of the Geiger Spur transload facility, per the suggestions of potential users.

**Exhibits 5.2 and 5.3** illustrate optimal perpendicular and parallel transload facility configurations for the types of sites and businesses found along Geiger Spur.

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<sup>1</sup> *Transload Facility Analysis: Geiger Spur. Spokane County Economic Development Division, March 5, 2007.*

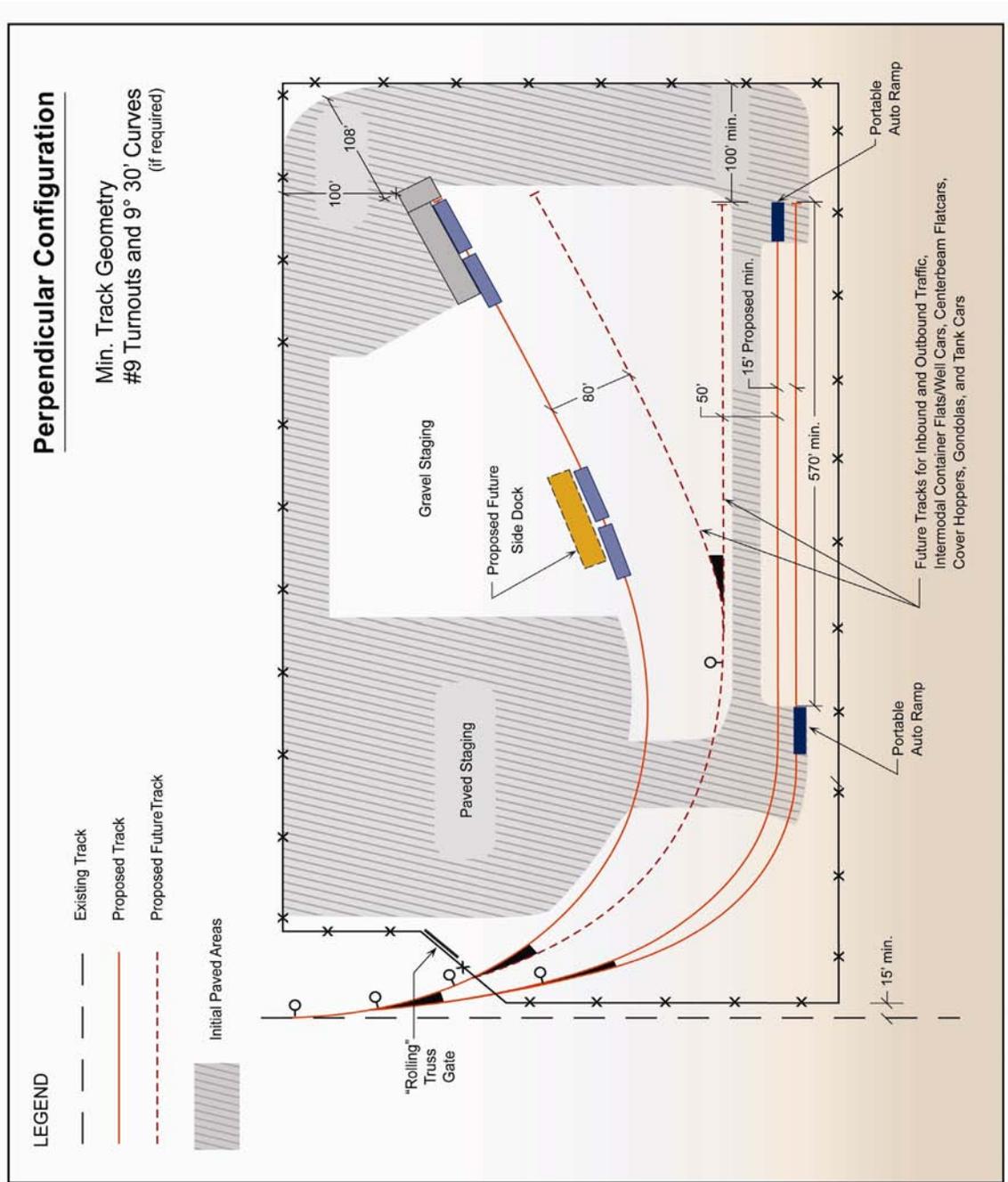
**Exhibit 5.1**  
**Optimal Design Features for the Geiger Spur Transload Facility**

Facility Component	Design
<b>Tracks</b>	<ul style="list-style-type: none"> <li>• One single track with access on both sides which could be used for loading and unloading railcars from both sides</li> <li>• One set of paired tracks on track centers of 30 feet desirable, 15 feet minimum for unloading autos and other machinery</li> <li>• The minimum length of tangent track for auto loading is 570 feet to accommodate six multi-level auto racks</li> </ul>
<b>Ramps</b>	<ul style="list-style-type: none"> <li>• End ramp with loading dock on the end of the single track</li> <li>• Concrete side ramp midway along one side of the paired tracks</li> <li>• Portable multi-level ramp for unloading autos</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>• Open storage</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>• Site lighting</li> <li>• Heavy duty pavement where forklifts and sideloaders operate and lighter duty pavement in the storage areas</li> <li>• Security fence</li> <li>• Water, sewer, electricity, gas</li> <li>• Gate</li> </ul>

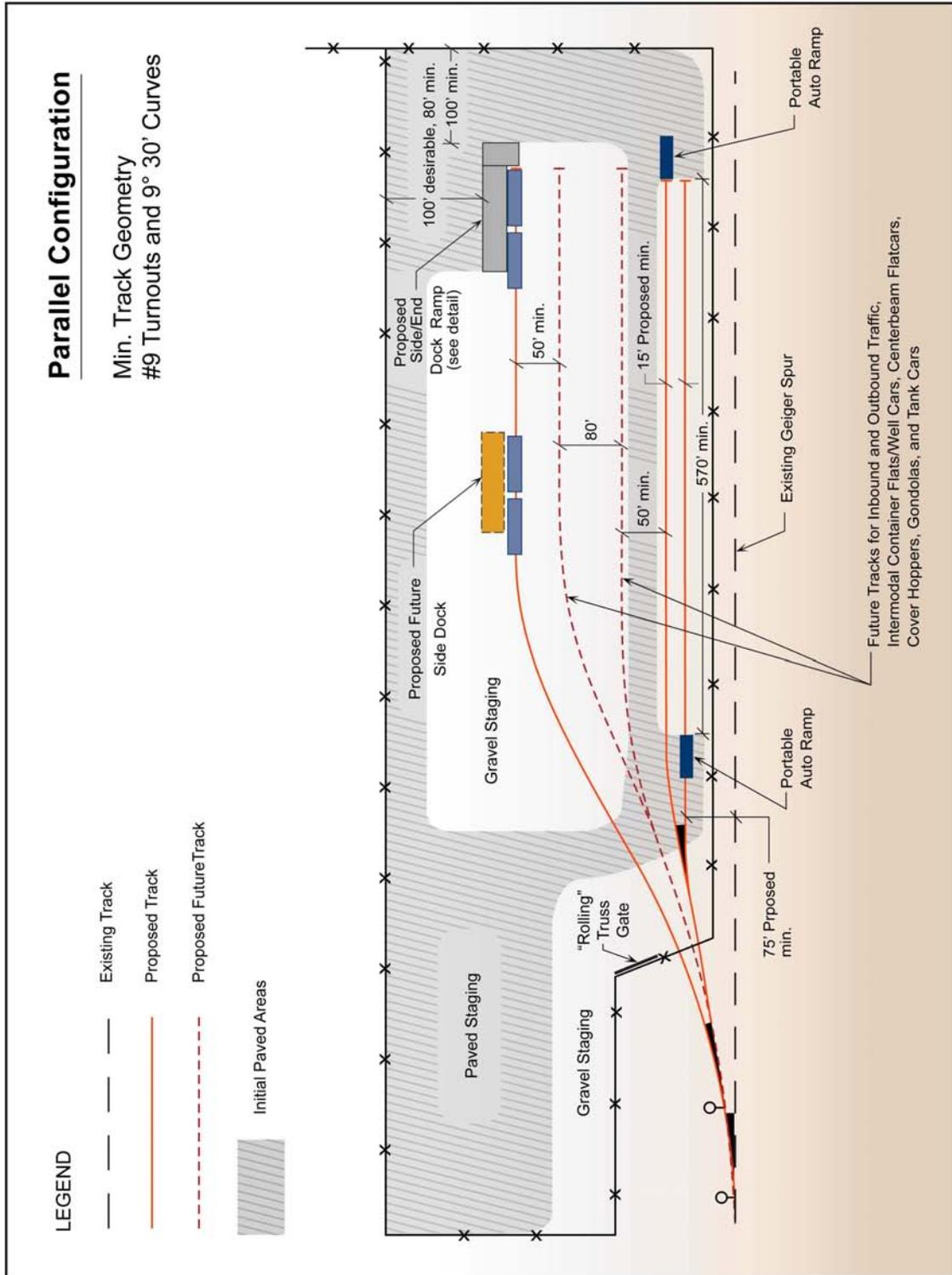
*NOTE: This optimal design was based on potential user interviews and includes the following assumptions:*

- Vehicles are removed immediately from the site.
- No covered storage is required.

**Exhibit 5.2  
Transload Design: Perpendicular Configuration**



**Exhibit 5.3  
Transload Design: Parallel Configuration**



## How was potential transload facility sites identified?

In fall of 2006, the project team was asked to consider possible transload facility sites in and around the city of Airway Heights and the industrial area along Geiger Spur. The project team reviewed existing aerial maps, topographic data and county parcel maps. In addition, project team engineers visited the sites and reviewed the general setting of each parcel. Spokane County developed a preliminary list of possible sites, and developed a second, revised list of five potential sites in the spring of 2007. The project team then applied site and design criteria to the final five sites offered by the County. **Exhibit 5.4** lists these criteria.

**Exhibit 5.4**  
**Criteria Used to Select Potential Transload Facility Sites**

Facility Component	Criteria
<b>Site Size</b>	<ul style="list-style-type: none"> <li>• At least nine acres or larger</li> </ul>
<b>Site Configuration</b>	<ul style="list-style-type: none"> <li>• Able to support a minimum transload layout of 1,200 feet in length and 400 feet in width</li> </ul>
<b>Site Characteristics</b>	<ul style="list-style-type: none"> <li>• Must be level with minimal grading required</li> </ul>
<b>Zoning</b>	<ul style="list-style-type: none"> <li>• Industrial</li> </ul>
<b>Location in Relation to Other Land Uses</b>	<ul style="list-style-type: none"> <li>• Potential sites that are not near, or do not impact, residential areas are preferred</li> <li>• No residential land can be adjacent to a potential site</li> </ul>
<b>Location in Relation to Transportation Facilities</b>	<ul style="list-style-type: none"> <li>• Within 200-feet of an existing railroad controlled track</li> <li>• Within five miles of an existing state highway or interstate</li> </ul>
<b>Land Value and Availability</b>	<ul style="list-style-type: none"> <li>• Improvement value should be no more than land value</li> <li>• Available for purchase</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>• No hazardous material or environmental concerns</li> <li>• No politically sensitive issues</li> <li>• Utilities available</li> </ul>

## Were all five sites carried forward?

No, after preliminary evaluation, the western-most site – Parcel 15274.9007 was determined to be unsuitable for further consideration for the transload facility. This parcel is located northwest of the intersection of Craig Road and McFarlane Road. The primary reasons for its elimination were:

- The site had the roughest terrain and appeared to have a large amount of surface rock (basalt) which may indicate the presence of large amounts of subsurface rock;
- The site was not level from end to end – the length of the site was about 1,900 feet and the elevation difference from end to end was 19 feet – meaning an average grade of one percent, which fails to meet the *BNSF Industrial Track Design Guidelines*.
- There was also at least one communications facility on the property that would have to be relocated or otherwise accommodated.

## What sites were further studied and evaluated?

The four remaining sites identified by Spokane County met the basic criteria presented in **Exhibit 5.4** and therefore were carried forward for further analysis. The optimal transload facility layout described in **Exhibit 5.1** was applied to each of the identified sites.

All of the sites that were evaluated are located immediately north or south of McFarlane Road, and are zoned for heavy industrial use. **Exhibit 5.5** presents the general location of the proposed sites under consideration for the Geiger Spur transload facility.<sup>2</sup>

## What design standards did the project team use for design of the transload facility?

The *Transload Facility Design Guide* discusses the features and design standards of a transload facility. These guidelines were used when identifying and designing a site for the Geiger Spur transload facility.

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<sup>2</sup> As presented in **Appendix D**, the Geiger Spur is an industrial lead track that terminates at two rail shippers on the east end of the line near Hayford Road. Most of the existing industry tracks come off the spur “facing point west” while the shippers at the end of the line are “facing point east”. All of the proposed sites are arranged with the “west end” connecting to the spur (facing point east) with the exception of the parcel that incorporates Western Rail Inc. The existing siding (run-around) track, which is adjacent to Western Rail Inc., has a capacity of only four cars.

**Exhibit 5.5**  
**Location of Potential Transload Facility Sites**



Tracks were designed based on the *BNSF Guidelines for the Construction of Industry Track*. This specification provides for wood or concrete tie, jointed or continuous welded rail, and ballasted track with 112 pound or heavier rail. Because of physical constraints of the perpendicular transload design and the potential site configurations, the design considered a 12° 30' curve the maximum acceptable curvature for this low speed track.

The project team assumed the operating standards of the existing railroad would control the operating design standards.

## What would be the general configuration of each potential transload facility site?

Four sites were selected for further evaluation and a general configuration was developed. The following discusses each site and presents a general layout for the facility.

### **Site A: 72.65 acres (Parcel Number 15264.0016)**

**Exhibit 5.6** presents the general design for this site. The following presents general information about the parcel:

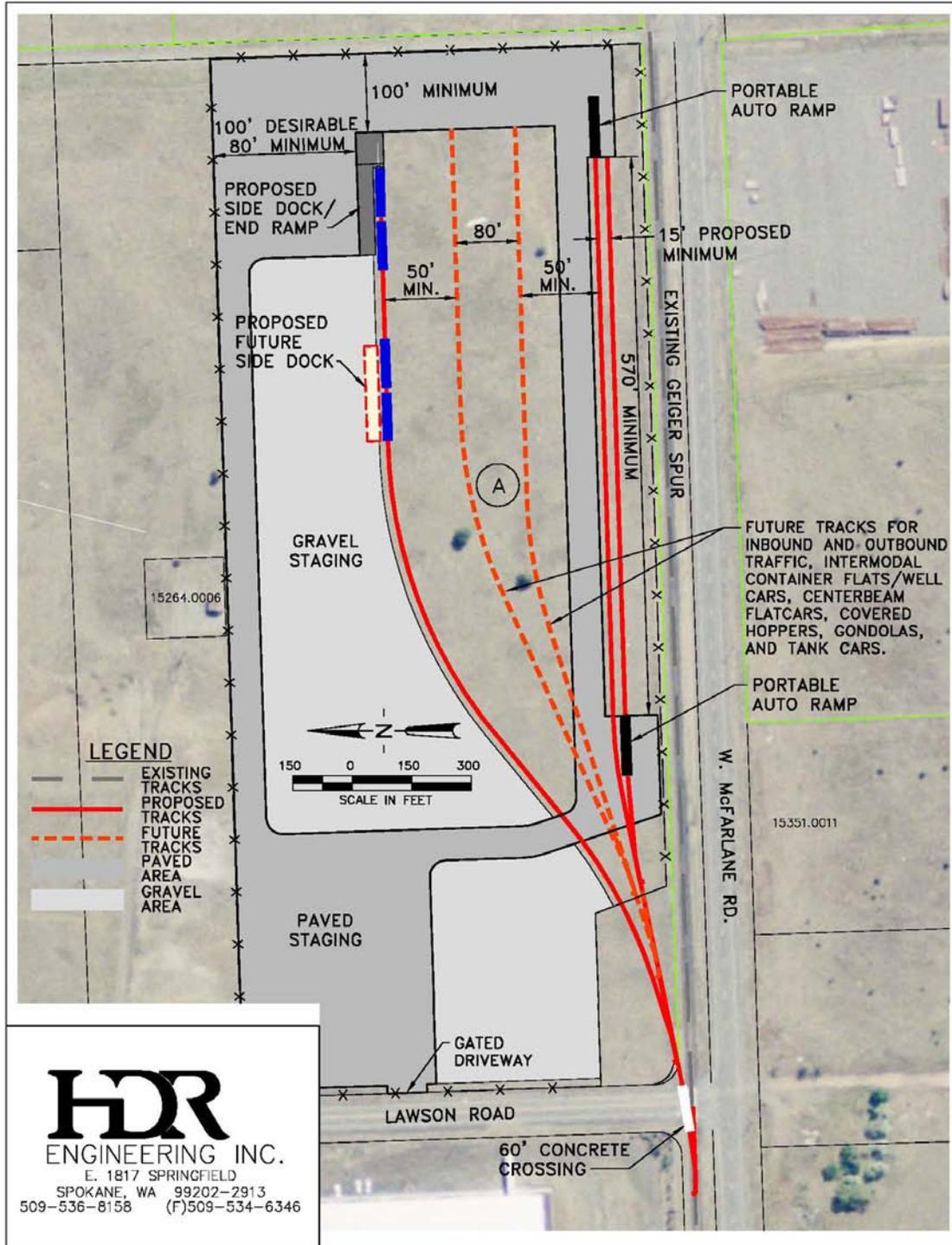
- This site is owned by the city of Airway Heights.
- This parcel is oriented to use the parallel configuration design. The lot is of sufficient size in length and width to accommodate every desired feature.
- The city of Airway Heights has indicated that the parcel could be used for a rail transload facility. The City will not need this parcel to build and operate their future sewage waste treatment facility which is proposed to be built to the immediate north of this facility. In the immediate future, Site B (see discussion below) adjacent to this parcel could be considered for expansion of Site A. The arrangement of Site A is very conducive to this.
- There is a well just to the north of the northern boundary of this parcel which requires a building setback of 100 feet.
- Road access is good with Lawson Road to the west. Possible access to Russell Road on the east could be achieved.

### **Site B: 4.97 acres and 4.98 acres, respectively (Parcel Numbers 15253.0112, 15253.0111, 15253.0110, - 8.87 acres)**

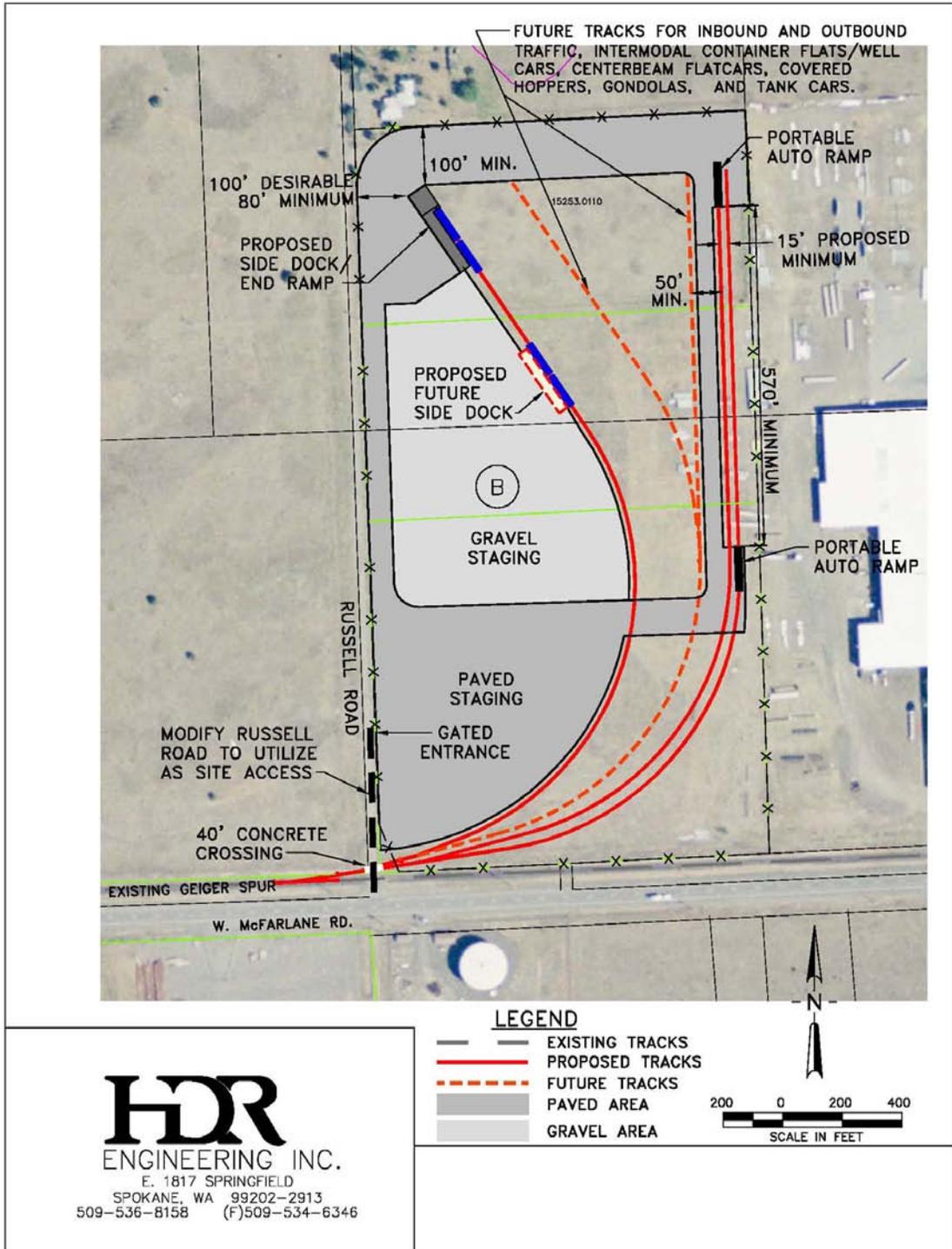
**Exhibit 5.7** presents the general design for this site. The following presents general information about the parcel:

- The combined shape of these parcels is conducive to the perpendicular configuration design.
- Spokane County has indicated that these parcels are available but that expansion to the north is not desirable at this time.
- Possible access to Russell Road on the east could be achieved.

**Exhibit 5.6  
Site A: Potential Configuration**



**Exhibit 5.7**  
**Site B: Potential Configuration**



**Site C: 22.14 acres (Parcel Number 15351.0010)**

**Exhibit 5.8** presents the general design for this site. The following presents general information about the parcel:

- This parcel requires an at-grade crossing of McFarlane Road. The preliminary design includes a signalized crossing for this collector road.

**Site D: 22.89 acres (Parcel Number 15253.0126)**

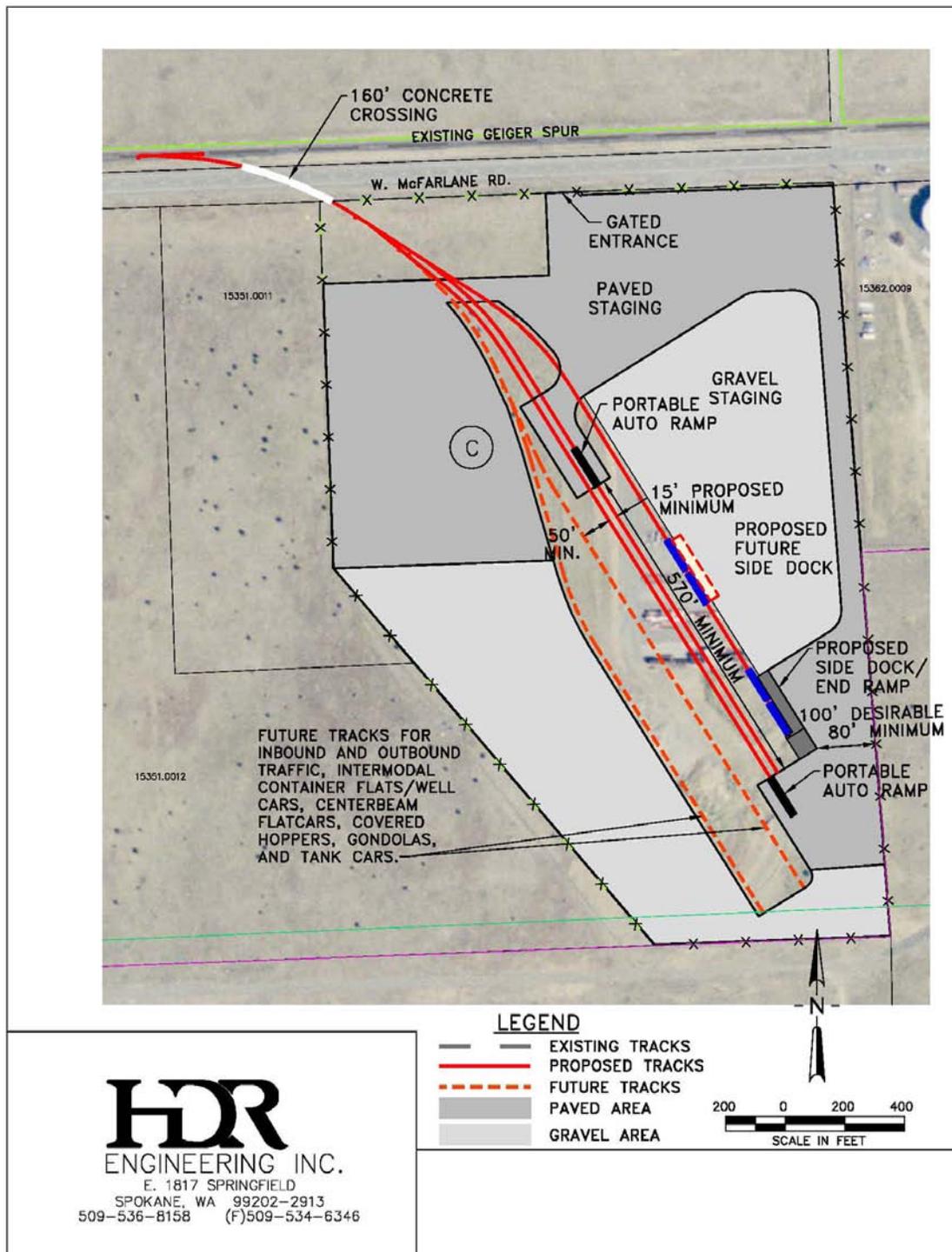
**Exhibit 5.9** presents the general design for this site. The following presents general information about the parcel:

- This parcel is owned by Western Rail, Inc. (WRI).
- Access would be from the southwest corner of the site.
- Per discussions with WRI, a proposed arrangement has been developed that moves Western's operations into a defined area with the balance of the entire property becoming the transload facility. WRI has indicated the arrangement is acceptable in concept and would make the property available for such an arrangement.
- The transload facility and WRI could have independent approaches to McFarlane Road.

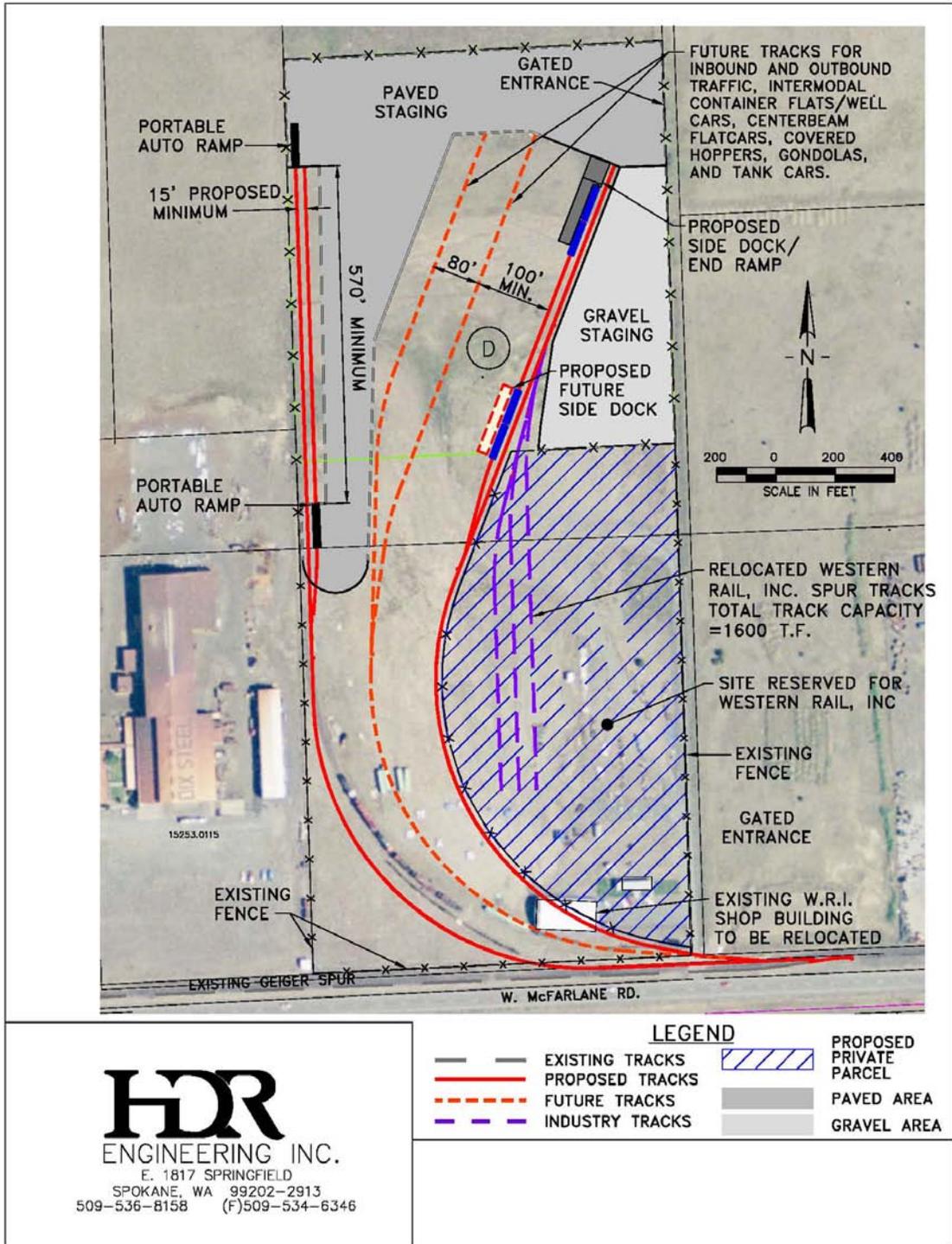
**Were potential environmental elements evaluated?**

All of the potential sites are located within an active industrial area, and all of the property is zoned for industrial land use. Prior to conducting a site review of the area, project planners and scientists reviewed GIS maps prepared by the Spokane County Department of Building and Planning. Maps reviewed included: *Fish and Wildlife Critical Areas Map*, *County Wetlands Map*, and the *Washington Department of Natural Resources Stream Types Map*. Soils surveys, topographic maps and aerial photographs were also reviewed in an effort to identify any regional conflicts that might represent a significant environmental or community impact and be incompatible with the proposed project. The project team then visited the project area and evaluated existing conditions at the potential sites. This review did not include detailed site investigations such as soil probes, or sampling of any kind. The work concentrated on evaluation of the proposed sites. In some cases, access to individual sites was not available, so information for the site was based on documented information in maps, photographs, and publications.

**Exhibit 5.8  
Site C: Potential Configuration**



**Exhibit 5.9  
Site D: Potential Configuration**



These reviews resulted in a general environmental overview that is presented below. Potential environmental concerns have been identified on some of the proposed parcels, but none of the conditions observed were deemed to represent fatal flaws for the project, generally because the area is so disturbed and because the area lacks any high quality natural resources.

### **Site A**

Site A is a portion of a large parcel that is mostly vacant land. There was what appeared to be a well house near the south/central part of the site. The site contains scattered pine trees and grasses. It appears to have been disturbed in the past, and is unlikely to contain sensitive natural resources. There is a trailer park located just north of the site, on the north side of Golden Road. No wetlands or streams were observed and habitat conditions are poor for most native shrub-steppe species. Depending on the extent and nature of the disturbance that has occurred at the site, cultural resources surveys may be required.

### **Site B**

Site B is adjacent to Site A, and is also mostly vacant land. Native and non-native vegetation is present and the site appears to have been disturbed in the past. No wetlands or streams were observed and habitat conditions are poor for most native shrub-steppe species. An existing residence is located adjacent to the north property line of the northern-most parcel for the site. Depending on the extent and nature of the disturbance that has occurred at the site, cultural resources surveys may be required.

### **Site C**

Site C is a large trapezoidal parcel located on the south side of McFarlane Road. This site currently contains a materials handling facility and appears to have been extensively graded and disturbed. Due to the existing industrial use of the site, a hazardous materials review should be conducted.

From a natural resources point of view, there is more potential to find seasonal wetlands or wildlife resources south of McFarlane Road, but the parcel reviewed has been severely modified and no such resources are present. The *Spokane County Fish and Wildlife Critical Areas Map* classifies the area south of the Airway Heights industrial area as Prairies and Steppe. Development outside of the industrial zone may require natural resource studies, but none should be required for Site C.

## Site D

Site D is partially developed. A portion of the north part of the site does not contain a facility, but appears on aerial photographs to be heavily disturbed. The north part of the parcel was not accessible during the site visit. Depending on the extent and nature of the disturbance that has occurred at the site, cultural resources surveys may be required. Due to the existing industrial use of the site, a hazardous materials review should be conducted.

## What would be the potential impact to local roadways?

Impacts to local roadways were the same for all transload sites considered. As the area is zoned Heavy Industrial, truck traffic already exists. Vehicle access to Sites B, C, and D was assumed to be from McFarlane Road. Vehicle access to Site A would be via Lawson Street and McFarlane Rd. State Route 2 is less than two miles away from each site. The most suitable truck route to State Route 2 would be via Hayford Road and McFarlane Road. Other roads connecting to State Route 2, including Craig Road, Lawson Street, and Garfield Road, are either not designed to handle heavy truck traffic or pass through residential areas.

Interstate 90 is less than five miles away from each site. The most suitable truck route between Interstate 90 and the transload sites would be via Hayford Road. It should be noted that the non-signalized intersections adjacent to Interstate 90 (Hayford Road and Geiger Boulevard, Geiger Boulevard and State Route 902) may need to be improved in the future in order to accommodate an increase of truck traffic caused by industrial development along the Geiger Spur. **Exhibit 5.10** presents the location of the major truck routes in the area.

## How much would it cost to build the transload facility and necessary rail improvements?

Cost estimates of probable construction costs were prepared for each parcel. Costs were developed using 2007 dollars, and are presented in **Exhibit 5.11**. Cost estimates presented in this study are conceptual. Foundations for cost estimates are included in **Appendix E**.

**Exhibit 5.10  
Transportation Corridors and Truck Routes**



**What are conceptual cost estimates?**

Cost estimates can be conceptual, preliminary, or final (or someplace in between each of these steps, depending upon the level of project design). For conceptual cost estimates, known information is compiled, and then industry-wide, standard format, “unit costs” are used to estimate how much a particular element would cost. For example, in order to estimate the cost of rail for a 10,000 foot siding, that length would be multiplied by the current, industry standard cost for the particular rail that would be used.

**Exhibit 5.11**  
**Conceptual Construction Costs in 2007 Dollars**

Site	Description	Estimated Cost <sup>1</sup>
<b>A</b>	2 – Auto Unloading Tracks, 1 – Double sided track with side dock end ramp	<b>\$3,193,000</b>
<b>B</b>	2 – Auto Unloading Tracks, 1 – Double sided track with side dock end ramp	<b>\$3,807,000</b>
<b>C</b>	2 – Auto Unloading Tracks, 1 – Double sided track with side dock end ramp	<b>\$4,523,000</b>
<b>D</b>	2 – Auto Unloading Tracks, 1 – Double sided track with side dock end ramp	<b>\$3,626,000</b>

<sup>1</sup>These costs do not include the cost of preparing environmental (*National Environmental Policy Act (NEPA)* or *State Environmental Policy Act (SEPA)*) documentation.

The specifics of construction are not available during the conceptual stage of engineering. The unknown site-specific information will cause the cost of the individual items to vary. Some items may cost less at completion and some more. Experience indicates that for the level of detail of the available information, a contingency<sup>3</sup> of 30 percent is sufficient for the cost-increasing details to be found during engineering in the corridor and the cost of environmental mitigation will generally be 10 to 20 percent of the construction total. This environmental contingency is used to ensure that any mitigation that may be necessary is accounted for in the conceptual cost. At the conceptual level, it is rarely known what, if any, mitigation would be required.

The estimates can also be affected by time. There can be significant unpredictable factors in addition to the normally predictable effect of inflation. In recent years, the costs of building materials, notably steel, concrete, and fuel have been volatile. As development spreads, property values for vacant land may increase considerably or land that was vacant at the time of the estimate may have been developed.

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<sup>3</sup>Contingency is an amount intended to mitigate the unknown. As the level of detail in project plans increases, the contingency in the estimate is reduced because there is less that is unknown. The contingency in the final engineered estimate is small because the estimate includes all information that it is possible to know without beginning construction. There are almost always surprises, but their effect is generally small enough to fall within the contingency amount. Occasionally, a surprise such as the discovery of historical artifacts or underground water can have an impact that exceeds the amount estimated for contingency.

## What is included in each cost estimate?

Costs were developed using 2007 dollars, and include:

- Track-Related Earthwork;
- Track;
- Structures;
- Striping;
- Paving;
- Security;
- Drainage; and
- Utilities.

The estimated cost of right of way acquisition was not included in these cost estimates. Mobilization,<sup>4</sup> 30 percent contingency, environmental mitigation (at an assumed rate of one percent of costs), engineering design, and construction management are also part of the estimates and varied based on the specific site. Sales tax of 8.6 percent was also applied to each estimate.

## What is not including in these cost estimates?

Cost estimates presented in this document do not include the cost of preparing environmental (*National Environmental Policy Act* (NEPA) or *State Environmental Policy Act* (SEPA)) documentation. Since both of these cost items will need to be negotiated and identified by the appropriate federal and state agencies, it was determined that their range of costs could vary significantly and therefore should not be included in the estimates.

## What are the benefits and drawbacks of each site?

Each site meets the minimum requirements identified earlier in this chapter. However, each site does have its own merits, potential problems, and expansion opportunities. **Exhibit 5.12** presents a qualitative summary of each site's benefits and drawbacks.

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<sup>4</sup>*Before the work can progress, the contractor must mobilize the necessary workers, equipment and supplies required to construct the rail line. Staging areas need to be set up and materials need to be brought to the construction area.*

**Exhibit 5.12  
Potential Benefits and Drawbacks of Each Site**

<b>Benefits</b>		<b>Drawbacks</b>	
<b>Transload Facility at Site A</b>			
<ul style="list-style-type: none"> <li>• Efficient use of lot space</li> <li>• Track geometry would be better than the other site options (9°30' curves versus 12°30' curves)</li> <li>• Length of functional track is greater than the other site</li> <li>• Possible east access to Russell Street</li> <li>• Owned by city of Airway Heights</li> <li>• Centralized location, within industrial area</li> </ul>		<ul style="list-style-type: none"> <li>• Cannot expand to the north or west</li> <li>• Existing well on north side of site could limit development opportunities</li> </ul>	
<b>Transload Facility at Site B</b>			
<ul style="list-style-type: none"> <li>• Large on-site storage capacities for commodities</li> <li>• Possible west access to Russell Street</li> </ul>		<ul style="list-style-type: none"> <li>• Ability to expand to the north unclear</li> <li>• Truck and vehicle access from McFarlane Road to site must cross both Geiger Spur and tracks into the facility</li> <li>• Inefficient use of lot space</li> <li>• Poor usable track lengths for future track construction</li> <li>• 12°30' track curves</li> </ul>	
<b>Transload Facility at Site C</b>			
<ul style="list-style-type: none"> <li>• Unobstructed approach to McFarlane Road for truck and vehicle traffic</li> <li>• Site is partially developed for on-site storage</li> <li>• Minimal track crossings within facility</li> <li>• Close proximity to Spokane International Airport</li> </ul>		<ul style="list-style-type: none"> <li>• Lead track will cross McFarlane Road and will require crossing signals</li> <li>• Existing borrow source location on site would need to be filled before future track construction</li> <li>• Limited on-site commodity storage</li> <li>• 12°30' track curves</li> </ul>	
<b>Transload Facility at Site D</b>			
<ul style="list-style-type: none"> <li>• Close proximity to Dealers Auto Auction (DAA)</li> </ul>		<ul style="list-style-type: none"> <li>• Property is only partially available</li> <li>• Access road construction across multiple tracks necessary to reach McFarlane Road</li> <li>• Existing business will need to be relocated on-site</li> <li>• Ability to expand is unclear</li> <li>• 12°30' track curves</li> </ul>	

## What are the recommendations?

Spokane County might consider a transload facility which accommodates auto and machinery unloading with flat-car and boxcar unloading. This recommendation is based on traffic and customer interviews, which reveal that the bulk of traffic both inbound and outbound is comprised of automobiles and machinery. The auto traffic would be handled in bi-or tri-level cars that would use a portable ramp. A single track with access from both sides and side or side/end dock could be used for a variety of potential commodities including dimensional lumber and other products that would be transported in cars such as tank cars and gondolas. A facility with two or three tracks that could handle unloading by ramps could increase annual rail traffic on the Geiger Spur by an additional 550 to 850 cars<sup>5</sup>. Other types of transload activities could occur if the facility is modified for specific customers.

### Site Recommendation

All sites considered meet the needs of the potential Geiger Spur transload facility. Site A is the recommended site because it is the least expensive to construct, has the best roadway access, has the fewest drawbacks, and can be expanded to accommodate additional transload services. Its estimated cost without contingency is \$2,456,000. With a contingency of 30 percent, the upper range of construction is estimated to be \$3,193,000.

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<sup>5</sup> *Transload Facility Analysis: Geiger Spur. Spokane County Economic Development Division, March 5, 2007.*

## **Chapter Six**

# **Transload Facility Operations**

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Western Rail Inc. (WRI) provides rail service to businesses located along the Geiger Spur. This service is provided on an as-needed basis. Today, cars are interchanged between WRI and the BNSF Railway Company (BNSF) near Fairchild Air Force Base - typically once a week. When the Geiger Spur Project is completed in 2008, cars will be interchanged with the Eastern Washington Gateway Railroad near Medical Lake and then with the BNSF at Cheney.

The BNSF currently has a scheduled train which runs between Spokane and Lind. This train, which runs up to six times per week, could deliver and pick up railcars for Geiger Spur customers at Cheney. It is anticipated that the new connection at Cheney will improve reliability and timeliness of freight rail transportation for businesses along the Geiger Spur.

Train schedules and train operations will dictate how the transload facility will be used by future customers. Other factors that will dictate how the facility is used include its ownership, management, and how much customers pay to transfer freight between trucks and trains.

### **What business models should be considered for the transload facility?**

The list below highlights some typical business models that could be put in place at the transload facility on the Geiger Spur. This list is not intended to be all-inclusive; other business models could be followed.

#### **Public ownership and public management**

In this scenario, the land, tracks, loading docks, ramps and other physical assets that make up the transload facility would be owned by a public agency or jointly owned by public agencies. Potential owners include the city of Airway Heights, Spokane County, the state of Washington, or a new public rail district.

The day-to-day management of the facility could also be performed by one or more public agencies. Public agency staff would be on-site to load and unload trucks and trains, position equipment, keep the site clean, perform security duties, process paperwork, and collect fees, if any, from users. If it is

determined that fees would be collected for using the facility, the fees could be used to offset day-to-day operating costs. If it is determined that fees would not be collected for using the facility, the public agency or agencies would need to identify a method for funding day-to-day operations.

### **Public ownership and private management**

In this scenario, the land, tracks, loading docks, ramps and other physical assets that make up the transload facility would be owned by a public agency or jointly owned by public agencies.

The day-to-day management of the facility could be performed by a private business that specializes in transload facility operations. The public agency owner or owners could hire a private business to perform all of the day-to-day work at the transload facility. The work could be performed for a fixed fee or at a varying fee based on use of the facility. If the facility becomes profitable, some profits could be shared with the public owner and used to offset construction costs.

### **Private ownership and private management**

In this scenario, the private sector would own and operate the facility. This arrangement could be feasible if demand for transload services was high and a fee structure for using the facility could generate a profit. It could also be feasible if the businesses using the transload facility enter into a cost-sharing agreement to pay for construction and day-to-day operating expenses.

## **Are there any risks associated with building and operating a new transload facility on the Geiger Spur?**

In this study, the project team interviewed rail-dependent businesses along the Geiger Spur and other businesses in the area that could use a transload facility if one existed. Based on these interviews, the study team forecasts that a transload facility could generate an additional 550 to 850 cars per year on the Geiger Spur.

This traffic forecast is only a projection; many factors will influence the use of the transload facility. Factors include local, regional, national, and international economic trends, fuel prices, the cost of labor and raw materials, tax structure, among others. Decision makers should consider both the benefits and potential risks of developing a transload facility using public funds. The public benefits that could be derived from a new transload facility on the Geiger Spur have been described throughout this report. Some of the risks that should be considered include:

- The number of customers using the transload facility proves to be lower than expected.
- Lower-than-expected traffic volumes could lead to ongoing public subsidies for transload facility operations.
- The combined shipping rates charged by the three railroads that will handle inbound and outbound traffic for the transload facility (Western Rail Inc., Eastern Washington Gateway Railroad, and the BNSF) may not be competitive with trucking rates.
- Transload facility traffic volumes may necessitate some roadway improvements to accommodate an increase in truck traffic. One area that may require roadway improvements is where Hayford Road, Geiger Boulevard, and State Route 902 connect with Interstate 90.

The study team recommends that local decision makers and stakeholders work together to develop a business plan for the new transload facility before construction begins. A detailed business plan should outline which business model is most suitable for the facility, how construction and operating costs should be shared, what fees, if any, should be charged for using the facility, and how risks will be managed over time. A detailed business plan will help all stakeholders get a more complete understanding of what would be required to manage and operate a successful transload facility. A detailed business plan would also help gain the popular and political support that would be needed if public funds are used to construct and operate a new Geiger Spur transload facility.

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## **Appendices**



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**Appendix A**

**City of Airway Heights  
Fact Sheet**

**Geiger Spur  
Transload Facility Study**

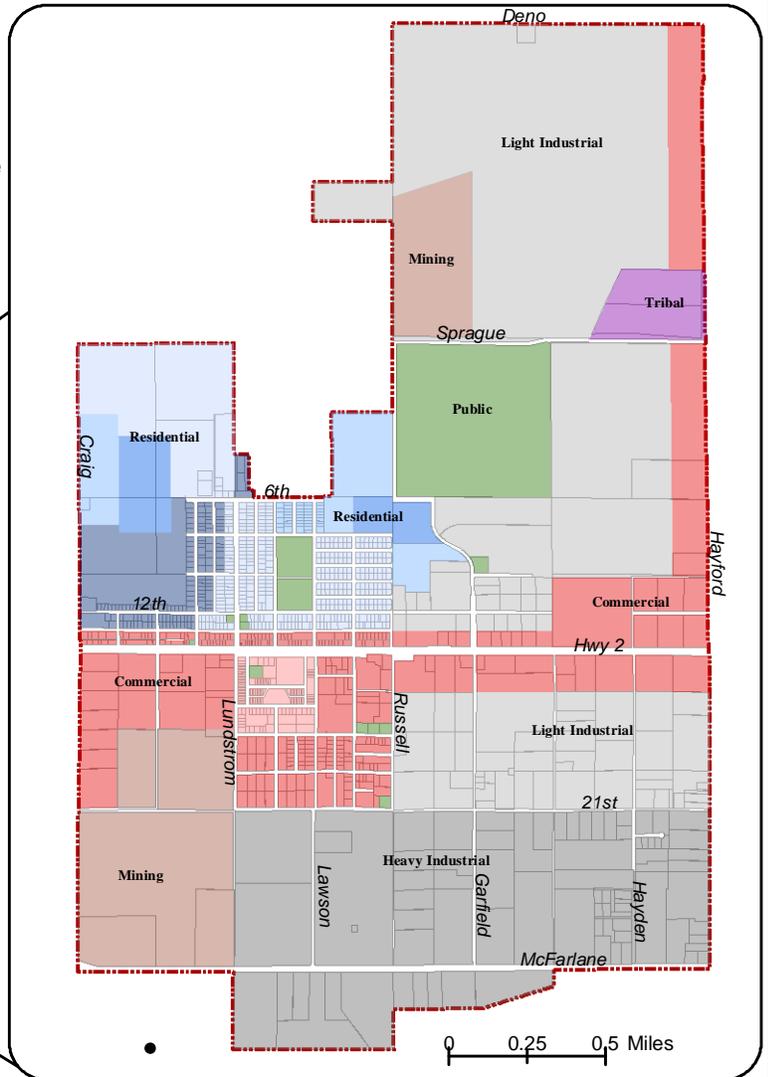
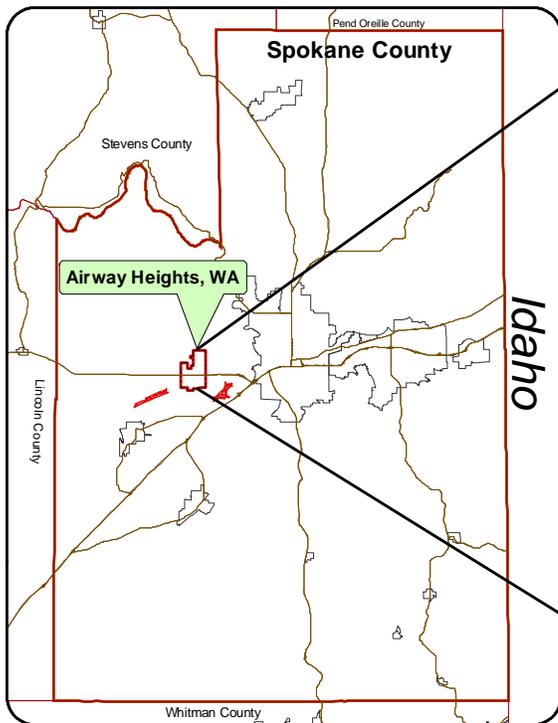
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# Airway Heights, Washington



Incorporated in 1955, Airway Heights is located in Eastern Washington, in west-central Spokane County approx. seven miles west of the City of Spokane, with Fairchild Air Force Base three miles further to the west and Spokane International Airport three miles to the southeast. The City is bisected by State Highway 2 and is located just north of Interstate 90.



Facts	
Land Area -	5 sq.mi. (3,211 acres)
Government -	Council/Manager
U.S. Congressional Dist. -	5th
Representative -	Cathy McMorris, R
Senators -	Maria Cantwell, D Patty Murray, D
W.S. Legislative District -	7th
Senator -	Bob Morton, R
Representative -	Bob Sump, R Joel Kretz, R
School District -	Cheney
Sewer -	Airway Heights
Water -	Airway Heights
Police -	Airway Heights
Fire -	Airway Heights

Employment	
Population 16-years and over -	3,813
In labor force -	1,538
Civilian Labor Force -	1,492
Armed Forces -	46

Development Activity	
2003	
New Residential Lots	
Applications -	2 (216 Lots)
Recordings -	2 (60 Lots)
New Commercial Lots	
Applications -	2 (6 Lots)
Recordings -	1 (2 Lots)
New Home Permits Issued -	25
Commercial Permits Issued -	6
Business Licenses issued 2004 -	146

Demographics	
(U.S. Census Bureau 2000)	
Total Population -	4,500 (100%)
Male -	3,261 (72%)
Female -	1,239 (27%)
Median Age -	33.8
Age Structure	
Under 5 years -	228 (5%)
18 years and over -	3,740 (83%)
65 years and over -	201 (4%)
Race Categories	
White -	3575 (79%)
Black or African Am. -	471 (10%)
Am. Ind. & Alaska Nat. -	144 (3%)
Asian, Haw. & Pac. Is. -	100 (2%)
Hispanic or Latino -	447 (10%)

Housing	
Total Housing Units -	1,095
Occupied Housing Units -	958
Owner Occupied -	536
Renter Occupied -	422

Income	
Median Household Income -	\$29,829
Number of Households -	970

Information	
City Hall -	509/244-5578
Community Dev. Dept. -	509/244-2552
Building Department -	509/244-5514
Police Department -	509/244-3707
Fire Department -	509/244-3322
Community Services -	509/244-4845
Public Works Dept. -	509/244-5429



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## **Appendix B**

### **Stakeholder and Potential Customer Interviews**



## Appendix B Stakeholder and Potential Customer Interviews

Customer	Key Interview Responses
<b>DAA Northwest (Dealers Auto Auction Yard)</b>	<ul style="list-style-type: none"> <li>• Handle 80,000 autos annual and expected to grow.</li> <li>• Bring autos in from Midwest, East, and Southeast</li> <li>• Bring in currently 50-100 autos a week via UP transload in East Spokane and 50 autos a week via BNSF transload in East Spokane. Rail traffic will grow</li> <li>• A transload on the Geiger Spur would save labor and time. Currently it takes 60-90 minutes and a van of labor to bring the autos to the main yard.</li> <li>• Smaller auto yards in Seattle Portland, Boise and larger yards in Denver and Salt Lake City.</li> <li>• A transload on the Geiger Spur would be great and Northwest would Consider handling the loading and unloading</li> <li>• Autos shipped in Bi-level cars</li> <li>• Third Party Jack Haley operates the UP/BNSF facilities.</li> <li>• Northwest has been in Spokane 11 years</li> <li>• Cars can be unloaded in 30 minutes each</li> <li>• Cars use a portable unloading ramp for the autos</li> <li>• Generally other firms arrange for the logistics and pay for the shipping of automobiles to DAA.</li> <li>• Current BNSF autorack traffic is handled at the “back 40” facility in Spokane (specifically just east of Yardley). The vast majority of the BNSF traffic is autos from Chicago area.</li> <li>• The cars are driven from the UP and BNSF facilities to DAA and “transporters” are not used.</li> <li>• Other east coast autos come in UP and BNSF.</li> <li>• Shipments can be up to 8 to 10 cars at a time.</li> <li>• Carloads per year are somewhat unclear because only BNSF route traffic can come to Airway Heights via the Geiger Spur. Rail shipping and rate structure is also unclear. Minimum anticipated traffic is 400 car loads.</li> <li>• Auto Ramp Services (Jack Hailey) provides unloading and staging for DAA and others at both the existing BNSF and UP Spokane auto transload facilities. DAA would entertain performing this service for themselves at a transload facility located in Airway Heights.</li> <li>• DAA preferred to have paving and lighting at a transload facility. They indicated that security would not necessarily be required in the form of fencing and that the automobiles would not be unloaded before they could be transferred to the DAA yard.</li> <li>• Sharing the transload facilities with other firms was not viewed to be problem.</li> </ul>
<b>Landmark Seed Company</b>	<ul style="list-style-type: none"> <li>• New Transload Facility in Spokane County would help look into other markets and reduce transportation cost via rail.</li> <li>• Destinations are Boise, Phoenix, Salt Lake City, East and Southeast US</li> </ul>

Customer	Key Interview Responses
<b>Lee Publishing / Target Media Northwest</b>	<ul style="list-style-type: none"> <li>• Handle inbound roll paper mainly from Inland Paper in Spokane</li> <li>• Also buy paper from Norpeck in Alberta and Longview, WA. Only possible rail move would be from Longview Fibre where 4 truck amounts move.</li> <li>• Rail allows for bringing in paper from other origins</li> </ul>
<b>Mid Mountain Machinery</b>	<ul style="list-style-type: none"> <li>• Handle Case tractors from Seattle and Los Angeles</li> <li>• Some tractors come in from Fargo, NO and other Midwest points</li> <li>• JLG equipment comes on from East</li> <li>• In past have had bad experience with rail, but would look in the future to use rail where economical.</li> <li>• Company pays freight</li> <li>• Could be set up to offload equipment</li> <li>• At times will handle large equipment order like 20 forklifts at one time</li> <li>• Freight from Mid-West is \$5,000-\$2,000 per unit.</li> <li>• Handles Case construction equipment and JLG equipment.</li> <li>• Has a growing rental fleet. Like Rowand this fleet is turned and some of this equipment could be rail shipped. This could result in 10 car loads.</li> <li>• With good service many pieces from the Midwest and East Cost could come via rail. This could be as many as another 20 car loads.</li> <li>• Mid-Mountain would require a dock.</li> </ul>
<b>Rowand Machinery</b>	<ul style="list-style-type: none"> <li>• Years ago used rail but today trucking is more flexible and better transit times</li> <li>• Tractors come in from Vancouver, Be, Seattle, Oakland from overseas and Moline, Davenport and Dubuque.</li> <li>• Handle 50 units form Oakland and 60-70 form Moline, Davenport and Dubuque.</li> <li>• Would look at Oakland and Moline, Davenport and Dubuque for future rail.</li> <li>• Big tractors weigh 78,000 -100,000 pounds each.</li> <li>• Most tractors are build to order</li> <li>• Some used equipment is sold to various points, could go out by rail</li> <li>• Big Sky Transport does local trucking</li> <li>• Facility has been around for 15 years</li> <li>• Truck rates from Midwest are \$5,000-\$10,000 per unit and are unit per truck.</li> <li>• Mainly handle John Deere and Hitachi equipment</li> <li>• Pays his freight on moves</li> <li>• Has large rental fleet. This fleet is “turned” and some of this equipment could be rail shipped. This could result in 15 car loads.</li> <li>• With good service many pieces from the Midwest could come via rail. This could be as many as another 15 car loads.</li> <li>• Rowand would require a dock and mentioned that security would be desirable.</li> </ul>
<b>Spokane Galvanizing</b>	<ul style="list-style-type: none"> <li>• Not using rail today</li> <li>• Major customers are Metal Fabrication, Garco, and Easy Loader (Company Owner)</li> <li>• Does metal fabrication for many local companies</li> <li>• Only raw material they bring in is 1,000,000 pounds of zinc from Trail, BC</li> </ul>

Customer	Key Interview Responses
	<ul style="list-style-type: none"> <li>• Employs 40-50 people</li> <li>• Parent Company, EZ Loader employs 150 people, Company makes boat trailers</li> <li>• Brings in 72 trucks of bar annually and some aluminum. Mainly brings in 6,000,000 pounds of tubing</li> <li>• EZ Loader uses BNSF transload</li> <li>• City property is only 3 acres and crowded</li> <li>• Could move to Geiger Spur in future</li> </ul>
<b>St. John Hardware and Implement</b>	<ul style="list-style-type: none"> <li>• Handles Case farm equipment</li> <li>• Have facilities at the stores in Moscow, Airway Heights, Fairfield, WA, St. Johns, WA, Nez Perce, Idaho and Spokane, WA</li> <li>• Company pays the freight</li> <li>• New Holland Equipment covers imports to Los Angeles, Seattle or Baltimore</li> <li>• Large farm equipment comes in from Fargo, ND or Grand Island, NE. Ship in 16-20 units a year or 8-10 rail cars.</li> <li>• Would consider rail if it were economical.</li> <li>• Having a ramp close would save labor and trucking cost.</li> <li>• Large equipment weight is 80,000-100,000 pounds</li> <li>• Current transloader. The BNSF dock they use now is in poor shape and is very inconvenient.</li> <li>• Up until about six years ago, they unloaded on the existing Geiger Spur dock.</li> <li>• Would likely use a transload facility in Airway Heights again if the facility included a "good" dock.</li> </ul>
<b>Triumph Composite Systems</b>	<ul style="list-style-type: none"> <li>• 90 percent of products go to Puget Sound or Moses Lake</li> <li>• Plant produces flooring and tubing for the Boeing 8 Others</li> <li>• Some work for Airbus</li> <li>• The Honey Comb flooring comes up from Pasadena, CA about 1 truck per week</li> <li>• Use small amounts of plastics/resins</li> <li>• Moves a truck a month of plaster from Kansas</li> <li>• Little product could go by rail today as plant has little room for inventory and most materials move just in time.</li> <li>• Flooring and tubing for Boeing.</li> <li>• Most finished product is handled by Boeing's own fleet of trucks.</li> </ul>
<b>Walker Implement</b>	<ul style="list-style-type: none"> <li>• Handle tractors from Heston, Kansas</li> <li>• No rail is used today</li> <li>• Tractors and 20,000-32,000 pounds</li> <li>• Today, tractors build to order versus having machines in inventory. It takes 90 days to fill an order.</li> <li>• Any tractors come in from Japan, South America and other foreign countries</li> <li>• Truck rates to bring 32,000-pound tractor is 2100 per unit from Kansas</li> </ul>
<b>WEMCO</b>	WEMCO does not use rail directly, but relies on Metals

Customer	Key Interview Responses
	Fabrication for work and is dependant on them receiving steel by rail.
<b>West Spokane Industrial Park</b>	West Spokane Industrial Park and the many industries located there do not use the rail on site, but have used the universal loading facilities to occasionally off-load equipment. The owner is presently building two 30,000 square foot buildings for new tenants and for speculation.
Other Stakeholder Interviews	Key Interview Responses
<b>BNSF Railway 7/05/07</b>	<ul style="list-style-type: none"> <li>• Paul Weber made the BNSF familiar with the scope and purpose of the study through his presentation.</li> <li>• BNSF recognizes that the service pattern for serving the customers on the Geiger Spur will change in 2007 as the Geiger Spur project is constructed.</li> <li>• No existing shippers will lose service as the new facilities are constructed. Provision to continue to serve FAFB has been provided.</li> <li>• BNSF has indicated it will approach the idea of a transload facility on the Geiger Spur with an open mind.</li> <li>• The proposed service level will change from the usual one day a week (usually Saturdays) to six days a week service at Cheney. Service is provided by the Lind Turn out of Spokane. Service to anything on the CW branch is currently and will remain provided by the Lind Turn.</li> <li>• BNSF made it clear that BNSF desires to interchange with one shortline, not two as suggested. (example: WATCO and Western Rail Switching). Whichever shortline is providing the service, the shortline must be qualified under BNSF Operating rules.</li> <li>• Because the WATCO sale not being finalized, it is unclear how the Geiger Spur will be served in the future.</li> <li>• BNSF made it clear that “velocity” must be maintained at all times, while supporting industrial development. The idea of a Transload facility is in line with BNSF’s goal of maintaining mainline velocity. However traffic moving to the west of Cheney in or out is probably undesirable.</li> <li>• BNSF has established effective transloading partners in Spokane – the primary one being Inland Empire Distribution Systems (IEDS). IEDS is handling the current demand with respect to traditional transloading although their additional capacity may be limited.</li> <li>• Initial size, flexibility, and expansion of the proposed sites are important considerations.</li> <li>• It does not raise any red flags with BNSF when considering a Cheney interchange with a shortline. The Cheney interchange has a capacity of 3,000 feet of track. The use of Marshall for interchange or staging is undesirable.</li> </ul>
<b>BNSF 7/26/06</b>	<ul style="list-style-type: none"> <li>• During the first meeting with the BNSF it was recommended that Cleo Childers of BNSF address intermodal specific questions concerning the viability to have automobile traffic, specifically for Dealers Auto Auction (DAA), originating and terminating at the proposed Geiger transload.</li> <li>• The BNSF positions stated in the first meeting were discussed, including one interchange partner at Cheney.</li> </ul>

Customer	Key Interview Responses
	<ul style="list-style-type: none"> <li>• BNSF’s Comments included (Cleo Childers):</li> <li>• To provide a transload facility off of the Geiger Spur, freight rates today would have to be reevaluated as there is an apparent difference for division of revenues if auto traffic is moved to the Geiger Spur through a shortline carrier and ramp facilities operation.</li> <li>• 70% of auto traffic comes from east to west in servicing the DAA.</li> <li>• BNSF is not opposed to the idea of an auto transload center on the Geiger Spur. A number of requirements must be met for an auto transload facility to work. These considerations include; who will provide “ramp services” for the customers, security provisions, illumination, paving, and being double ended.</li> <li>• Site observations indicate the current facility is very small and single ended. Some rail cars are turned on the balloon track at Yardley. BNSF provides “full service” with its ramp partner at this facility to its customers. The ramp and spur is isolated in area called “The Back 40” and cannot be reached without fouling the mainline.</li> <li>• Fouling the mainline is undesirable to BNSF. There is another rail shipper on this lead.</li> <li>• “Auto” is operated in various ways on BNSF – some facilities total service all inclusive in the service. Other facilities this is not the case as is the case on some of the coast port facilities. Spokane is “full service.”</li> <li>• Auto Ramp Services provides ramp facility operations and management for BNSF – Their rates are rolled up in BNSF’s and are based on per automobile. BNSF’s facility.</li> <li>• The rates in place today would need to be addressed as there is an apparent difference for division of revenues if this traffic is moved to the Geiger Spur – though a shortline carrier and ramp facilities operation.</li> <li>• G and L of Chicago are the folks that ship autos west to DAA – this is a significant piece of the business at the BNSF facility. 70 percent inbound from the east. There is essentially no auto traffic to the west – in or out of Spokane.</li> <li>• Security, illumination, paving, being double ended are all important design features. Isolation from other transload activities is very necessary.</li> <li>• BNSF is not opposed to looking at an operation of this type on the Geiger Spur.</li> <li>• Additional info Denny Hilleran with BNSF</li> </ul>
<b>BNSF Railway (9/19/06)</b>	<ul style="list-style-type: none"> <li>• During the first meeting with the BNSF it was recommended that Denny Gustin of BNSF address intermodal specific questions concerning the viability to have trailer and container traffic originating and terminating at the proposed Geiger transload.</li> <li>• The BNSF positions stated in the first meeting were discussed, including one interchange partner at Cheney.</li> <li>• Allied (Rabanco) (Ash to Trash) operation currently cohabitates with BNSF Domestic Intermodal operations at Parkwater Yard near Trent Avenue. Both operations use the same type of equipment (Sideloaders, chassis, intermodal railcars) which provides BNSF with flexibility in equipment utilization. This flexibility would be lost and may result in the need for extra equipment such as intermodal railcars.</li> <li>• Railcars for the Rabanco (Ash to Trash) operation are captive to that service for the most part. The railcars are loaded with full containers in Spokane, travel to Roosevelt, unload the containers from the railcar, empty the containers, reload</li> </ul>

Customer	Key Interview Responses
	<p>the railcars with empty containers, and return to Spokane.</p> <ul style="list-style-type: none"> <li>• BNSF Domestic intermodal at Spokane is minimal. The Rabanco operation cohabitating with domestic intermodal at Parkwater is a good fit for Spokane and raises utilization of labor and equipment. If Rabanco moves to Geiger, utilization of labor and equipment would be reduced thus not providing any direct savings to BNSF.</li> <li>• BNSF does conduct important intermodal service to companies such as UPS and Yellow Freight.</li> <li>• BNSF also provides storage of unneeded empty containers at the facility for Allied.</li> <li>• Rabanco (Ash to Trash) operation currently operates from Spokane to Roosevelt through Pasco.</li> <li>• Locating Rabanco along the Geiger Spur may not have the negative impact (reducing velocity) as originally thought. Clark Simmons stated that if you ran the Rabanco cars out everyday from the Geiger Spur, Rabanco might find that their trains may move quicker. It is his opinion that the line from Spokane to Roosevelt isn't that expeditious that it would make a difference where Rabanco unloads.</li> <li>• Train Operations Option 1: Loaded Rabanco cars with full containers destined for Roosevelt could be picked up at Cheney by the Linn Turn, returned to Spokane (Yardley), and placed into an outbound manifest train to Kelso via Pasco, setout cars at Roosevelt. Loaded Rabanco cars with empty containers picked up at Roosevelt by a manifest train destined for Spokane, after arriving in Spokane the cars placed on the Linn Turn and delivered to Cheney.</li> <li>• Train Operations Option 2: Loaded Rabanco cars with full containers destined for Roosevelt could be picked up at Cheney by manifest train to Kelso via Pasco, setout cars at Roosevelt. Loaded Rabanco cars with empty containers picked up at Roosevelt by a manifest train destined for Spokane, delivered to Cheney with the Linn Turn.</li> <li>• Option 1 increases cycle time which equates to need for additional equipment (container and railcar). Option 2 potentially increases use of the mainline by the manifest train which may reduce velocity of other trains on the mainline between Pasco and Spokane. This may rule out considering Option 2.</li> <li>• Rabanco trains from Spokane are run as manifest trains and not unit trains. However this train does not stop in Pasco.</li> </ul>

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## **Appendix C**

### **Transload Facility Design Guide**



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# Transload Facility Design Guide

## 1. Introduction

The intent of these guide standards is to provide general information regarding the Railroad's preferences and standards regarding design criteria, materials, equipment or other items pertaining to facility layout and operation.

The design guide does not relieve the design engineer from providing due diligence or performing the necessary engineering evaluation and conformance with codes, laws or industry standards where applicable.

## 2. Transload Facility Layout

The space required for a Transload facility is dictated by the length of cars, number of spots, frequency of crossings, length of the shipments (lumber units vs. pipe or structural steel for example). Drainage and track section is always an issue as well as access and security. All Transloading or team facilities are very limited if they don't provide access to both sides of a car. A minimum 75' separation between Transload track and a main track or lead is recommended. Each type of transload operation has unique features which need to be considered in the layout.

### **Building Material Transload Layout**

Following are the general layout requirements for a typical Transload Facility handling Building Materials including lumber, masonry, etc. as shown in Figures 1 and 2:

- Capacity: One train, 100 car spots on 2 tracks (ideal)
- Typical Car Length: 60 feet
- Railcar Storage/Setout to Working Track Ratio: 1.5 to 1 (ideal)
- One running track for double-ended track layout (ideal)
- Track spacing between Storage/Setout tracks: 15 feet
- Track spacing between Non-Dimensional Transload tracks: 30 feet
- Track spacing between Dimensional Transload tracks, 100 feet (minimum) 200 feet (desirable for grounded storage between tracks)
- The working length of the track is defined as the portion of the track with pavement a minimum of 30 feet from the centerline of track.
- Roadway aisles: 50 feet wide

- Truck parking Stalls: 55 feet x 11 feet (perpendicular) or 55 feet x 10 feet (angled)
- Administration Building should be located near the Inbound/Outbound gate.
- A combined inbound/outbound gate is desirable.
- A truck scale is desirable
- Inbound/Outbound gate queuing should be inside the facility along the perimeter of the facility.
- Ingress/Egress must be designed for the most restrictive truck turning movements.
- Internal truck circulation must be considered when laying out tracks, storage, and track crossings. Counter clockwise circulation is preferred for truck parking.



## Plastic Pellet Transload Layout

Following are the general layout requirements for a typical Transload Facility handling Plastic Pellets or other materials requiring a conveyor as shown in Figure 3:

- Capacity: One train, 100 car spots on multiple tracks
- Typical Car Length: 60 feet
- Railcar Working Tracks should be paired on 15 foot centers. The paired working tracks should be on 30 foot centers.
- Rail Working Tracks should be stub-ended with wheel stops.
- Track ladder design should double the turnout angle to maximize the length of all working tracks.
- Conveyor system should be located along the outside of the outside track.
- Administration Building should be located near the Inbound/Outbound gate.
- A combined inbound/outbound gate is desirable.
- Inbound/Outbound gate queuing should be inside the facility along the perimeter of the facility.
- Ingress/Egress must be designed for the most restrictive truck turning movements.
- A truck scale is desirable

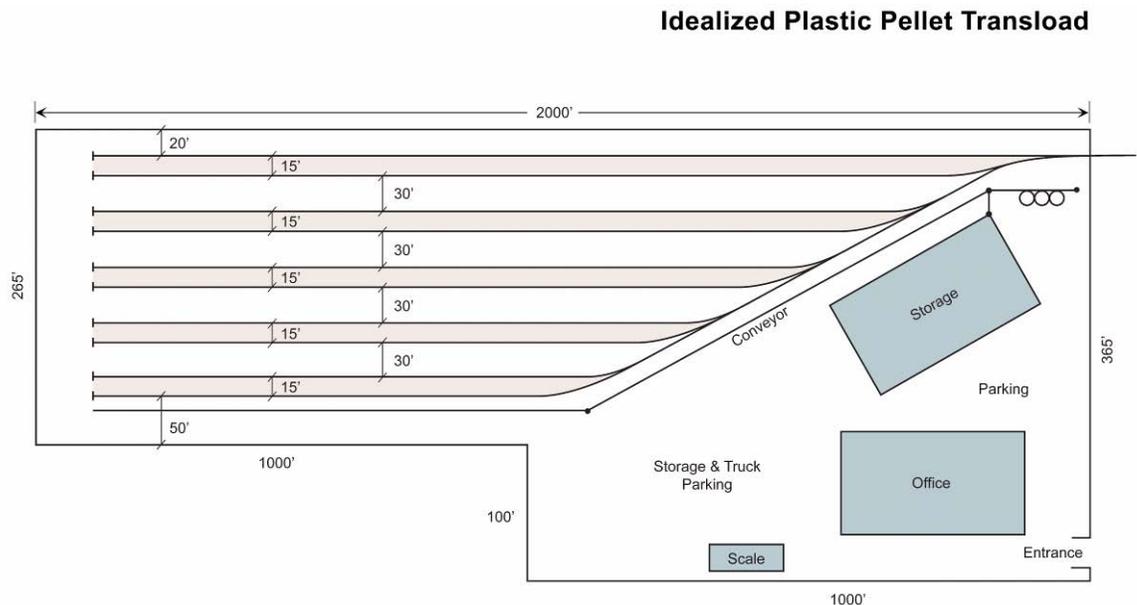


Figure 3

## **Transload Facility – General features**

*Pavement* - The entire site must be covered with an improved surface, appropriate for the type of use, with the exception of areas required for landscaping by zoning requirements; the minimum area possible will be landscaped in order to accommodate the maximum storage and working areas on the site. See Chapter 5, Pavements in Loading Area, and Chapter 6, Pavements in Non - Loading A, for pavement design criteria. Asphalt continuous in the track structure is to be avoided. Track crossings at each end and in the middle of the working track should be provided. See Chapter 4 for design criteria.

*Electricity and Telecommunication* - Electricity and telecommunication lines must be available for installation of buildings at a later date. See Chapter 10 Electrical and Chapter 11 Communications for design criteria.

*Site Lighting* - The site must have adequate lighting available for 24 hour operation. See Chapter 10 Electrical for design criteria.

*Sewer and Water Lines* - Connection to sewer and water lines must be provided. See Chapter 9 Utilities for design criteria.

### **Storage Sheds:**

Sheds are covered storage buildings either of the portable or permanent type, having incomplete exterior walls. Portable or transitory sheds are a prefabricated metal type of shelter that can be dismantled and moved to a more convenient location for reassembly. Due to their transitory nature, these types of sheds seldom have any utilities. Permanent sheds can be either wood, metal, concrete or masonry block, but are permanently anchored to the foundation. These types are more likely to have utilities such as lighting and fire sprinkler systems.

### Location

Sheds should be constructed on high ground, remote from water areas, and on terrain that is well drained to carry runoff away from the base of the structure. The ground should be level beneath the structure so that material stored on grade in a shed with unimproved base will not become unstable under high stacking loads. The grounds around the shed should be cleared of brush and low growth since these conditions reduce ventilation and provide cover for pests. They can be built with grade even with the road or raised such that the slab occurs at truck or rail dock height. Material that is in storage for a significantly long time can be stored out of the mainstream of facility activity in sheds that have a more limited accessibility.

### **Open Storage:**

Open storage areas are portions of the facility that are used for the storage of goods that do not require extensive protection from the elements. They are generally unimproved or semi-improved areas which do not provide any cover for the materials stored therein. These areas should be provided with the same access

that is given to warehouses and sheds as well as shipping and receiving facilities that are necessary for open storage functioning.

*Improved Areas* - Open storage areas which are the most flexible as storage sites are the improved areas. These sites are cleared of vegetation, graded, and provided adequate drainage, and then given some sort of hard treatment. This allows the storage of many items that would not be suitable on unimproved areas due to the increased bearing capacity of the surface and the high level of control of runoff. Typical materials used to surface the area are concrete slab and asphalt pavement. Less suitable materials would be steel mat and crushed and rolled stone. These latter methods of improving the surface will not allow maximum bearing capacities on the ground surface.

*Semi-improved Areas*- These areas are similar to improved areas in that they are graded and drained, but they are not provided with a hard top surface. The bearing capacity of semi-improved areas will change with the moisture content of the soil and in wet conditions will not bear as heavy a load as in dry conditions.

*Unimproved Areas* - Surfaces that have not been graded, drained, or hard-surfaced are classified as unimproved. Irregular surface contours do not allow uniform storage heights, and lack of grading and drainage tends to promote localized areas of water ponding and reduce bearing capacity due to saturation of the soil. This is the least desirable form of open storage area since it does not promote dense storage practices nor does it provide for acceptable access to the storage area.

## **Surfacing Requirements:**

### Choice of Pavement Type

The factors that affect the surfacing requirements of improved open storage areas include vehicle characteristics, traffic volume, and weight requirements of the stored material. Types of surfaces that are frequently used on improved storage areas: rigid pavements, flexible pavements and roller compacted concrete pavements (RCCP). The choice of type depends upon the usage requirements listed above. Rigid pavement applications such as concrete slabs are durable, long lasting, capable of resisting larger loads, and unaffected by the normal range of temperature fluctuation experienced throughout the year. They do require considerable labor in fabrication and are generally the more expensive method of providing improved surfacing. Flexible pavements are less durable, more sensitive to high temperatures, require greater base and subbase preparation, deflect more than rigid pavements under load, and in recent years have not provided much of a price advantage over rigid pavements. For flexible pavements, the mechanical handling equipment wheel characteristics vary to such an extent that for similar load-carrying capacities, different vehicles may require different surfacing requirements. The wheel loads, number of wheels per vehicle and their arrangement on the vehicle, the tire contact pressure, and the tire contact area all determine the pavement loading and consequently its thickness. Because of this variation in pavement requirements, the engineering construction and

maintenance effort may be several times greater for one vehicle than for another with equal load-carrying capability.

### Traffic Volume and Flow Patterns

Traffic volume is a primary consideration in the selection of the type of surfacing and its required thickness. It is essential that an adequate study be made to determine the number of passes and the operational flow patterns of each vehicle under consideration so that a reasonable design volume for a particular facility and vehicle can be selected. The material selectivity will also affect the type and thickness of the pavement. Selectivity involves the relative ease with which material can be located and removed from the storage area. Items stacked such that other items must be moved in order to access the needed item will require a number of vehicle passes dependent on the size and number of items to be moved. In this situation, the expected life of the pavement would be shortened due to the increased number of passes.

### Weight Requirements

The bearing capacity of the pavement will essentially determine the height to which open storage material can be stacked or the maximum weight of items in one area. The type and thickness of pavement will depend on these storage requirements. Summer heat affects most flexible pavement surfaces, and, subsequently, improper base and subbase construction can cause sinking and puncturing of the pavement surface under heavy loading. Dunnage is the name for the materials used in holds and containers to protect goods and their packaging from moisture, contamination and mechanical damage. Dunnage has the localized overloading effect as materials are stacked and must be considered in the pavement design.

### Aisle and Track Layout

Each open storage area will require specialized attention to provide the proper aisle and track layout for the particular material being stored on the area. The type of material will generally dictate the dimensions used and the proper mechanical handling equipment needed to accomplish transportation of the material. In general, though, efficient open storage layouts provide for straight-line flow of stock from loading and unloading areas to storage areas, ready access to each stock location, and both maximum and efficient utilization of road and track facilities. Aisles in open storage areas will be essentially roads since the dimensional requirements for mechanical handling equipment are large. Main aisles should be located in the longitudinal direction of the storage space, while cross aisles should be placed perpendicular to the main aisles. One efficient layout of main and cross aisles produces rectangular storage areas that are twice as long as they are wide.

### 3. Vehicle Terminals Facility Layout

#### Purpose and Facility Requirements

A vehicle loading terminal is generally designed for transferring tracked or wheeled vehicles on or off flatcars, or in the case of smaller wheeled vehicles, auto racks (trilevel cars). A vehicle terminal will contain: loading tracks to position on the flatcars; a nearby staging area to hold the vehicles; end ramps or multilevel ramps for transferring the vehicles to and from the railroad cars; a crew and communications facility; and a storage building for blocking and bracing material.

#### Track Spacing

When the loading tracks in a vehicle terminal are laid out parallel to each other (as is often the case), the tracks should be spaced far enough apart to accommodate one-way vehicle traffic, as shown in Figure 4.

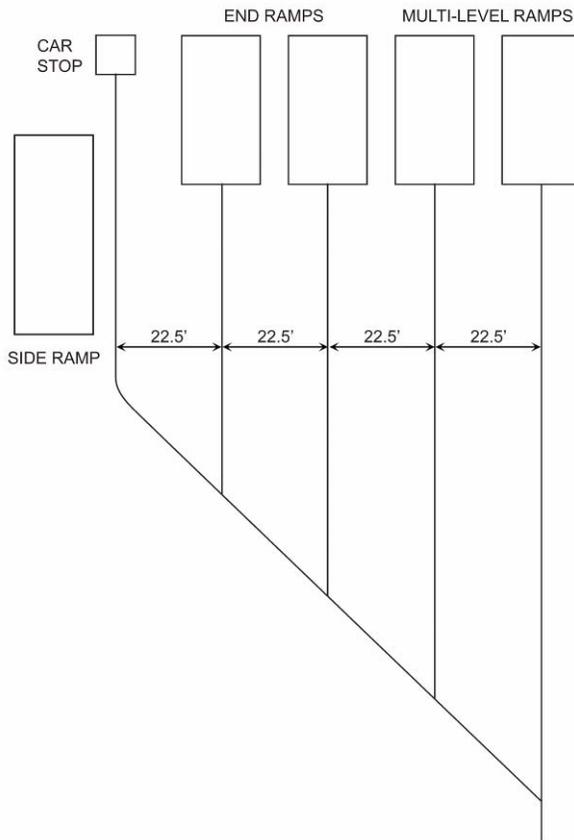


Figure 4

## Track Length and Number of Tracks

1. For vehicle loading, strings of between 10 and 20 cars are most effectively handled at a time: the lower limit of 10 to minimize switching requirements and the upper limit of 20 for efficient loading. Thus, each loading track should have a tangent length extending from 10 to 20 car lengths from the loading ramp, as shown in Figure 5.

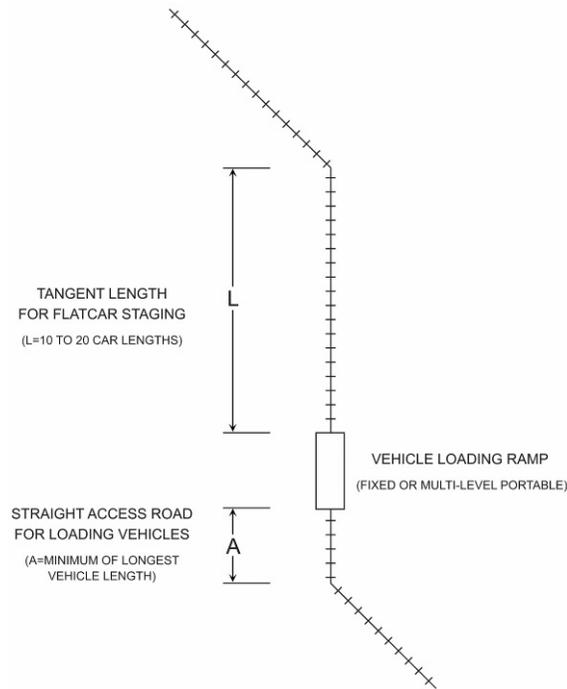


Figure 5

2. The number of tracks required can be determined from the traffic and operating information, the space available in the terminal area, and the criteria for track length above.

## Staging Area

1. The size and location of a staging area depend on terrain characteristics and availability of space. It is recommended that a staging area be located as close to the loading area as possible to facilitate better command and control. The staging area should be large enough to stage one full loading cycle of vehicular cargo, thus a loading terminal with a capacity of 50 flatcars would require a staging area with a capacity of 50 carloads of vehicles.
2. The staging area must include an access road (or approach) leading up to the loading ramp, which is straight and in line with the ramp for at least the full length of the longest vehicle to be loaded. If practical, this in-line approach should be twice the length of the longest vehicle to ensure that a vehicle can always be positioned ready to load as the first vehicle is driven up the ramp. It

is also preferable that this road not be directly adjacent to any tract to avoid a dust cloud from the approaching vehicles reducing the view of loading operations.

- 3. For operation after dark, staging areas need to be lighted with "parking lot" type lighting. Fencing may also be required if the cargo is security sensitive.

**End Ramps for Tracked and Larger Wheeled Vehicles**

- 1. Rapid loading of larger vehicles onto flatcars is best accomplished with permanent end ramps constructed at the end of the loading tracks. While end ramps may be constructed with concrete, wood, steel or earth, they must be capable of supporting the largest and heaviest vehicles being mobilized.
- 2. A general reinforced concrete ramp design is shown in Figure 6.

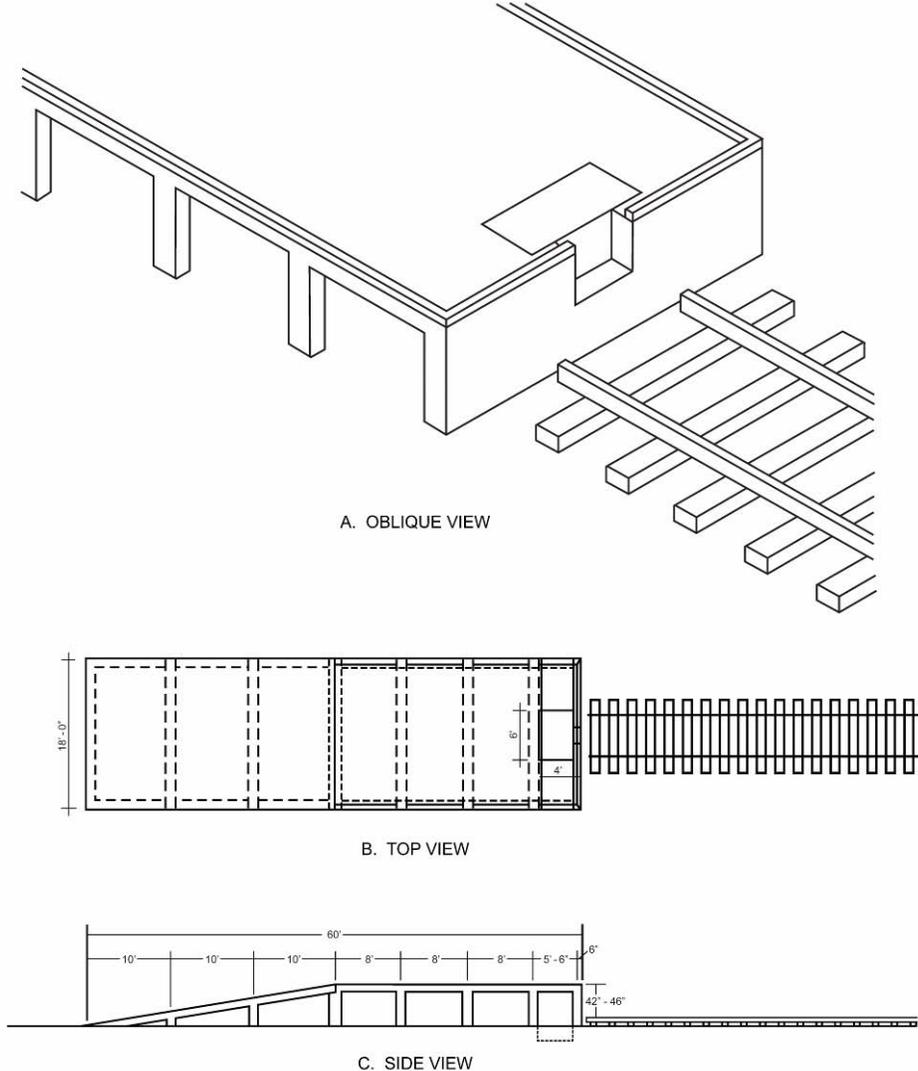


Figure 6

3. A well designed end ramp will:
  - a. Allow a vehicle to be driven onto a flatcar having the lowest platform height used in commercial railroad service. (Note: It is safer and easier to drive a vehicle from a lower ramp level to a higher flatcar level than vice-versa).
  - b. Provide ample width to enable guides to walk on both sides of a vehicle.
  - c. Provide sufficient level platform length to allow a vehicle to be in a completely horizontal position prior to proceeding onto the railcar.
  - d. Have the proper transition between the incline and the level platform so that a vehicle will not "high center" itself while negotiating the ramp.
4. To make vehicle loading easy, it is desirable to have the end of the car very close to the ramp platform. It is also necessary to protect both the car and the ramp from impact damage when cars are being positioned at the ramp. As car designs vary, this protection cannot be reliably provided by fastening wheel stops to the track.
5. The design in Figure 6 (above) incorporates a cut-out at the front of the ramp at the height of the car coupler. Behind the cut-out is a concrete block separated from the remaining ramp structure with cushioning (expansion joint) material. This concrete bumper block allows reduces the likelihood of impact damage to the ramp.
6. Other shock absorbing designs and devices can be used as well, including commercial railcar buffers. The designer should select the method best suited for the particular application. While the concrete bumper block could easily be incorporated into new construction, it might prove impractical during rehabilitation if the existing ramp platform will not be extensively modified.
7. To permit wheeled vehicles to cross the gap between the ramp and the flatcar, spanner boards may be necessary; tracked vehicles do not require spanner boards. Thus, if fixed spanners are used, they should be detachable so that they will not interfere with the loading and unloading of tracked vehicles. Mainline trains will most likely pick-up and set-out cars to a storage track parallel to the main.

### **Multilevel Ramps for Smaller Wheeled Vehicles.**

1. If an installation has a requirement to load large quantities of small wheeled vehicles, it is recommended that multilevel ramps be used to load bilevel and trilevel railcars. These ramps are portable pieces of equipment that can either be purchased or maintained by the commercial railroad. Like end ramps, multilevel ramps are positioned at the end of a track spur. A typical single

level ramp is shown in Figure 7. A typical multilevel ramp is shown in Figure 8.

2. It is important that the ground underneath a multilevel ramp be level and capable of bearing the weight of the ramp plus the heaviest vehicle being loaded. A Portland cement concrete pad is recommended to ensure good ramp stability.



Figure 7

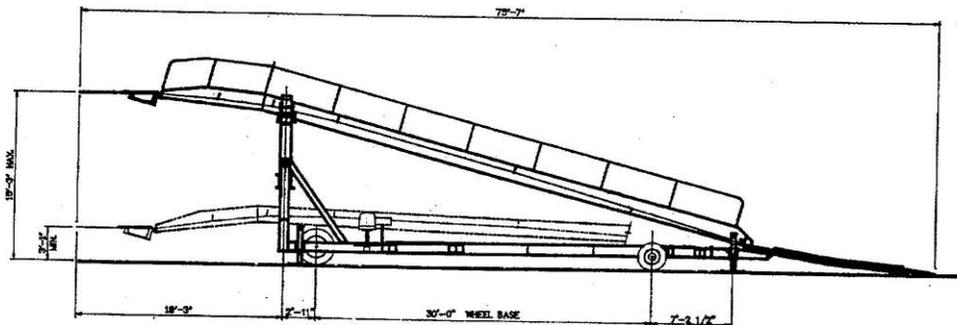


Figure 8

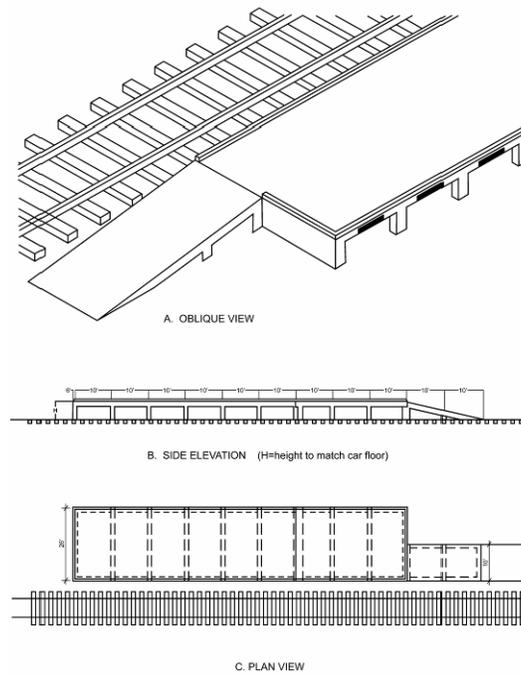
#### 4. Break Bulk (Small Cargo) Terminals Layout

Permanent side ramps, parallel to the track are recommended for loading break bulk cargo into boxcars. For staging cargo, large open areas are needed surrounding the ramps. Thus, where, several parallel tracks run through a terminal, the ramps should be constructed along the outermost tracks.

Side ramps must meet the following design criteria:

1. The ramp must be capable of supporting the weight of a fully loaded 4,000 pound forklift.
2. The ramp platform must allow sufficient area for a forklift to maneuver.
3. The ramp platform must be at a height convenient for a forklift to drive into a boxcar on the adjacent track as well as into a truck docked to at the ramp.
4. The ramp incline angle must be small enough for a forklift to easily negotiate it.

Figure 9 shows a diagram of a reinforced concrete side loading ramp.



**Figure 9**

## 5. Bulk Granular Solids Layout

### Unloading

#### Low volume

- Single or multiple-car systems
- Small under track pit with lading removal by conveyor or small mobile equipment

- Rotary dumps if lading tends to freeze or clog
- Various car sizes

### High volume – Unit Trains

#### Bottom dump

- Unload without uncoupling or switching of cars
- Unload in motion over a pit or trestle
- High mass flows
- Reliable feeders

#### Rotary dump

- Use train positioners and rotary coupler equipped cars
- Cars with lower tare weights thus higher capacities
- Reliability of the dumper machinery is key
- Train positioner must have sufficient power

## 6. Bulk Liquids Layout

### **Unloading**

#### Low volume

- Single or multiple-car systems
- Small under track pit with lading removal by pump or vacuum system
- Various car sizes

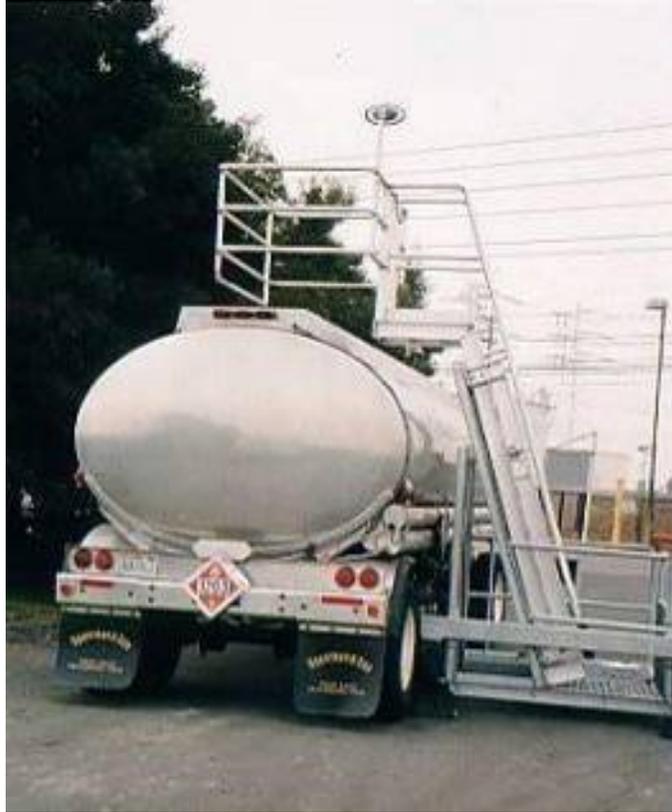
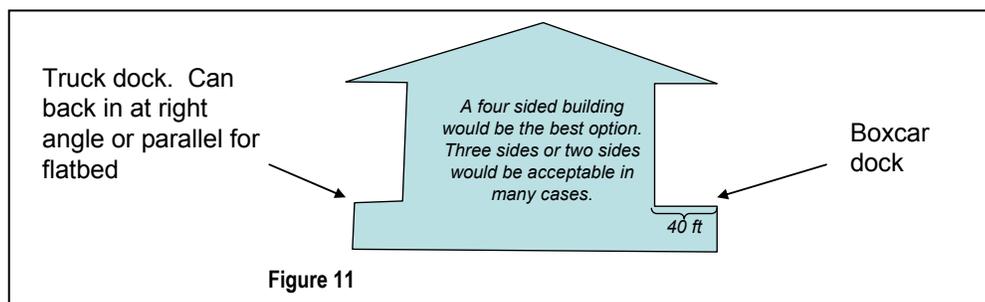


Figure 10

## 7. Warehouses

Warehouse design is intended to provide a dry environment for the purpose of storing goods and material that require protection from the elements. Warehouses must be designed to accommodate the loads of the material to be stored, the associated handling equipment, and the needs of the operating personnel as shown in Figure 11. The design of the warehouse space should be planned to best accommodate the physical dimensions of the material to be stored. The different types of warehouses include heated and unheated warehouses, refrigerated warehouses, and controlled humidity warehouses.



## 8. Docks

Dock space for shipping and receiving terminals is the same as that for most general purpose warehouses. Dock heights on the truck side of the terminal should be approximately 4 ft 4 in. above the pavement, with hydraulic ramps at each truck berth to bring the height of truck bed in line with the dock height.

An additional type of dock ramp is available, as shown in Figures 12 and 13. This hooks to the truck bed and rests on the dock floor for transition of the height differential. On the rail side of the terminal, dock heights should be 3 ft 9 in above the top of the rail. This will ensure that the average rail car floor is even with dock floor.



Figure 12



Figure 13

### Column Spacing

Columns supporting the outer edge of the roof should be so spaced as not to interfere with the spacing of rail car doors or truck berths. Dock widths should be wide enough to allow efficient maneuvering of forklift trucks and other expected types of material handling equipment. A minimum width should be 10 feet.

Forklift bumpers should be placed at both sides of all door jambs where forklift traffic will occur to prevent damage to the walls, door track and the door frame. Exterior dock space should be covered to protect workers and material from rain and snow accumulation.

### **Truck Docks**

Bumpers should be installed at the edge of the truck dock to protect the concrete from the impact of backing trucks. Wooden boards or rubber pads will serve this purpose. In addition there should be stairwells from ground level to dock height spaced along the dock if the dock runs the entire length of the building.

### **Interior Dock Space**

In colder climates, interior dock space may provide significant energy savings and more tolerable winter working conditions for dock workers. For this slightly larger than the opening of a standard tractor trailer and should be fitted with hoods that fit around the trailer to prevent heat loss from the work space. This method of docking requires a door for every truck berth, which is an added first cost; but the protection and energy advantages make it a feasible alternative. Additionally, receiving or shipping docks can be designed with recessed wells that contain the entire trailer within the warehouse. This method also prevents heat loss and eliminates the need for exterior berthing space, but it utilizes much of the heated space for truck parking.

## **9. Storage Sheds**

Sheds are covered storage buildings either of the portable or permanent type, having incomplete exterior walls. Portable or transitory sheds are a prefabricated metal type of shelter that can be dismantled and moved to a more convenient location for reassembly. Due to their transitory nature, these types of sheds seldom have any utilities. Permanent sheds can be either wood, metal, concrete or masonry block, but are permanently anchored to the foundation. These types are more likely to have utilities such as lighting and fire sprinkler systems.

### **Location**

Sheds should be constructed on high ground, remote from water areas, and on terrain that is well drained to carry runoff away from the base of the structure. The ground should be level beneath the structure so that material stored on grade in a shed with unimproved base will not become unstable under high stacking loads. The grounds around the shed should be cleared of brush and low growth since these conditions reduce ventilation and provide cover for pests. They can be built with grade even with the road, or raised such that the slab occurs at truck or rail dock height. Material that is in storage for a significantly long time can be stored out of the mainstream of facility activity in sheds that have a more limited accessibility.

## 10. Open Storage

Open storage areas are portions of the facility that are used for the storage of goods that do not require extensive protection from the elements. They are generally unimproved or semi-improved areas which do not provide any cover for the materials stored therein. These areas should be provided with the same access that is given to warehouses and sheds as well as shipping and receiving facilities that are necessary for open storage functioning.

*Improved areas.* Open storage areas which are the most flexible as storage sites are the improved areas. These sites are cleared of vegetation, graded, and provided adequate drainage, and then given some sort of hard treatment. This allows the storage of many items that would not be suitable on unimproved areas due to the increased bearing capacity of the surface and the high level of control of runoff. Typical materials used to surface the area are concrete slab and asphalt pavement. Less suitable materials would be steel mat and crushed and rolled stone. These latter methods of improving the surface will not allow maximum bearing capacities on the ground surface.

*Semi-improved areas.* These areas are similar to improved areas in that they are graded and drained, but they are not provided with a hard top surface. The bearing capacity of semi-improved areas will change with the moisture content of the soil and in wet conditions will not bear as heavy a load as in dry conditions.

*Unimproved areas.* Surfaces that have not been graded, drained, or hard-surfaced are classified as unimproved. Irregular surface contours do not allow uniform storage heights, and lack of grading and drainage tends to promote localized areas of water ponding and to reduce bearing capacity due to saturation of the soil. This is the least desirable form of open storage area since it does not promote dense storage practices nor does it provide for acceptable access to the storage area.

### **Surfacing Requirements**

#### Choice of pavement type

The factors that affect the surfacing requirements of improved open storage areas include vehicle characteristics, traffic and weight requirements of the stored material. Types of surfaces that are frequently used on improved storage areas: rigid pavements, flexible pavements and roller compacted concrete pavements (RCCP). The choice of type depends upon the usage requirements listed above. Rigid pavement applications such as concrete slabs are durable, long lasting, capable of resisting larger loads, and unaffected by the normal range of temperature fluctuation experienced throughout the year. They do require considerable labor in fabrication and are generally the more expensive method of providing improved surfacing. Flexible pavements are less durable, more sensitive to high temperatures, require greater base and subbase preparation, deflect more than rigid pavements under load, and in recent years have not

provided much of a price advantage over rigid pavements. For flexible pavements, the mechanical handling equipment wheel characteristics vary to such an extent that for similar load-carrying capacities, different vehicles may require different surfacing requirements. The wheel loads, number of wheels per vehicle and their arrangement on the vehicle, the tire contact pressure, and the tire contact area all determine the pavement loading and consequently its thickness. Because of this variation in pavement requirements, the engineering construction and maintenance effort may be several times greater for one vehicle than for another with equal load-carrying capability.

### Traffic Volume and Flow Patterns

Traffic volume is a primary consideration in the selection of the type of surfacing and its required thickness. It is essential that an adequate study be made to determine the number of passes and the operational flow patterns of each vehicle under consideration so that a reasonable design volume for a particular facility and vehicle can be selected. The material selectivity will also affect the type and thickness of the pavement. Selectivity involves the relative ease with which material can be located and removed from the storage area. Items stacked such that other items must be moved in order to access the needed item will require a number of vehicle passes dependent on the size and number of items to be moved. In this situation, the expected life of the pavement would be shortened due to the increased number of passes.

### Weight Requirements

The bearing capacity of the pavement will essentially determine the height to which open storage material can be stacked or the maximum weight of items in one area. The type and thickness of pavement will depend on these storage requirements. Summer heat affects most flexible pavement surfaces; and, subsequently, improper base and subbase construction can cause sinking and puncturing of the pavement surface under heavy loading.

### Aisle and Track Layout

Each open storage area will require specialized attention to provide the proper aisle and track layout for the particular material being stored on the area. The type of material will generally dictate the dimensions used and the proper mechanical handling equipment needed to accomplish transportation of the material. In general, though, efficient open storage layouts provide for straight-line flow of stock from loading and unloading areas to storage areas, ready access to each stock location, and both maximum and efficient utilization of road and track facilities. Aisles in open storage areas will be essentially roads since the dimensional requirements for mechanical handling equipment are large. Main aisles should be located in the longitudinal direction of the storage space, while cross aisles should be placed perpendicular to the main aisles. One efficient layout of main and cross aisles produces rectangular storage areas that are twice as long

as they are wide. In large open storage areas, every alternating main aisle should be equipped with double track to accommodate cars to be loaded on one track while rail-mounted loading cranes occupy the other track to facilitate loading or unloading. Double-track layouts shall have crossovers at intervals of 1,000 to 5,000 ft. Single-track layouts of more than 1,000 ft should have rail connections at both ends.

### Loading and Unloading Platforms

*Size.* Within each open storage area there should be at least one rail car loading and unloading platform. Side-loading platforms should be at least 20 ft wide and at least one car length long. The length is preferably two car lengths. The platform should be located such that the side face is 6 ft 2 in from the center line of the track, and the elevation of the top of the platform should be 3 ft 9 in above the top of the rail. Ramps up to the platform should have a slope no greater than 15 percent. If the platform is also to serve flat cars in which the cargo is to be unloaded from the end of the car, an end-loading platform should be constructed. The dimensions should be similar to the side-loading platform except that the width of the platform at the end-loading portion should be 32 ft wide (fig 10).

*Materials.* The platforms can be constructed of concrete, wood, or earth-filled timbers. The type of construction should be based on the expected service loads and environmental conditions that the ramp and platform will experience.

## 11. Sitework

### **Slope Seeding:**

Temporary and permanent seeding shall be in compliance with the Washington State Department of Transportation (WSDOT) specifications for all site areas not receiving a finished surface covering.

### **Detention Ponds:**

Detention ponds, if required and permitted by local zoning and environmental regulations/ordinances, shall be sized in accordance with established design criteria published by Spokane County. Detention ponds shall be sited to be capable of expanding to accommodate future development. Water quality measures will be implemented as required by Spokane County criteria.

### **Grading and Excavation:**

Grading shall be level along all tracks and paved work area in the direction of travel. Maximum longitudinal slope shall be 0.125% along the length of loading tracks, storage tracks and paved work area. Transverse or cross slopes in the loading track and paved work areas shall be designed to a maximum slope of 1.5% and a minimum slope of .5% away from the track. Grading shall be

designed to minimize grade breaks in loading and storage areas for all layout options and expansion plans.

**Aggregate Base and Subballast:**

Aggregate Base material, shall meet or exceed the minimum material, gradation and performance requirements as required by *WSDOT Standard Specifications for Construction* and as required by this document.

Subballast shall be clean, hard, angular and durable crushed granite or limestone conforming to *BNSF Standard Construction Specification Section 03300 - Subballast Source*, and characteristics of subballast materials shall be reviewed and approved by the BNSF prior to installation. The subballast section shall be in accordance with the Geotechnical Report recommendations, but in no case shall be less than 6 inches in thickness beneath the ballast.

**Landscaping:**

Landscaping, where required, shall be designed by a registered Landscape Architect and shall be designed in conformance with local codes and ordinances. Landscape design shall utilize low-maintenance materials and plants.

Landscaping, where required, shall include irrigation sprinklers/automatic control systems.

## 12. Trackwork

**General**

All track shall be designed in accordance with BNSF, *Design Guidelines for Industrial Track Projects*. Kansas City, KS, June 2005, the Federal Railroad Administration *Track Safety Standards, Part 213*, current revision, and the latest edition of The American Railway Engineering and Maintenance Association (AREMA) Manual for track construction except as modified below. Where conflicting standards exist, the most restrictive standard shall apply.

**Crossings**

All public road and primary facility crossings shall be precast, prestressed concrete road crossings per BNSF standard engineering drawings. All concrete crossings shall be installed on 10 foot timber cross ties. Other periodic or continuous crossings may be constructed using crossing systems such as the Omni “Tracast” (tub), the “Combination” and “Railguard, or the Epflex “Railseal” system.

**Track Alignment**

The maximum horizontal curve for yard leads, loading tracks and storage tracks is 9 degrees 30 minutes. When they cannot be avoided, 12 degree 30 curves can be used on tracks shorter than 1000 feet. Minimum length of tangent between reverse

curves shall be 60 feet. The average rate of change for vertical curves shall be no more than 0.40 per 100 foot station in sags, and no more than 0.80 per 100 foot station at summits. The average rate of change for vertical curves on lead tracks shall be no more than 0.60 per 100 foot station in sags, and no more than 1.00 per 100 foot station at summits.

### **Railroad Signals**

Railroad signal systems shall not be required inside the facility. However, design of the track connections must account for grade crossing and centralized traffic control signal systems. Any direct connections to main line tracks, as well as any connections within the fouling length of sidings will require interface with the centralized traffic control system.

## **13. Pavements in Loading Area**

### **Concrete:**

All concrete pavement sections shall be designed following procedures presented in the Portland Cement Association's (PCA) design manuals or other acceptable design methodology. Pavements designed for forklift loading (heavy pavement loading) shall follow PCA's *Design of Heavy Industrial Concrete Pavements* manual. Pavements designed for truck and/or vehicle loading shall follow PCA's *Thickness Design for Concrete Highways and Street Pavement* manual. The pavement in the loading areas shall be designed for the more restrictive of the two loadings.

Concrete pavements shall be designed using a minimum 650 psi flexural strength at 28 days; design period shall be a minimum of 20 years, with mix design based on reasonable uniform engineered sub-grade support. Materials and methods shall meet WSDOT Standard Specifications.

All concrete pavements shall have thickened edges where concrete abuts concrete crossings, changes in concrete sections (depths), and at all concrete edges.

All concrete pavements shall be designed with "joint control" and/or steel reinforcement to provide environmental and load related crack control, load transfer, and edge control. All joints shall be sealed with a self-leveling silicone sealant with backer rod.

### **Asphalt:**

All asphalt pavement sections shall be designed following procedures presented in the Asphalt Institute design manuals or other acceptable design methodology. Pavements designed for forklift loading (heavy pavement loading) shall follow the Asphalt Institute Manual, *Thickness Design Asphalt Pavements for Heavy Wheel Loads*. Asphalt pavements designed for Truck and/or vehicle loading shall follow the Asphalt Institute Manual, *Thickness Design - Asphalt Pavements for*

*Highways and Streets (MS-1)*” The pavement in the loading areas shall be designed for the more restrictive of the two loadings.

All asphalt pavement sections must be determined from geotechnical analysis of existing soils with sections designed for a minimum 20 year design period.

All flexible pavements shall have thickened edges where flexible pavement sections abut concrete pavements, concrete crossings, and at all other locations where flexible pavement edges will not receive edge constraint by the adjoining materials.

## 14. Pavements in Nonloading Area

### **General:**

All asphalt pavements shall be designed following procedures presented in the American Association of State Highway and Transportation Officials (AASHTO) guide or other acceptable design methodology.

All pavement sections must be determined from geotechnical analysis of existing soils with sections designed for a minimum 20 year design period.

All flexible pavements shall have thickened edges where flexible pavement sections abut concrete pavements, concrete crossings, and at all other locations where flexible pavement edges will not receive edge constraint by the adjoining materials.

### **Drive Lanes:**

All flexible pavement sections shall be designed for an HS20-44 standard AASHTO truck with an axle load of 32,000 pounds.

### **Employee Parking Lot**

All flexible pavement sections shall be designed for AASHTO standard vehicles and small trucks.

## 15. Pavement Striping, Markings and Signs

### **General:**

Pavement striping, markings and signs shall be provided to delineate and control traffic at all parking bays, roadway drive areas, “remain clear” zones, and other needs typically required and found in a transload facility.

Reflective pavement striping shall be designed to define traffic routes and lanes, as well as fire department access lanes.

Paint shall meet WSDOT specifications, traffic color yellow and white.

## 16. Security Fence and Gates

The entire transload site must be fenced with two truck entrances and gates for the rail entrances.

Security fence shall be standard 8 feet high galvanized chain link fence with 24 inch, four-strand barbed wire outriggers at 45 degrees at the perimeter of the facility including track areas.

Fencing shall include all posts, top and bottom rails, chain link fabric with ties, diagonal braces, end caps and hardware connectors required for complete installation.

Line post sizes shall be minimum 2.375" O.D., end or corner post minimum 2.875" O.D. galvanized steel pipe, gate post shall be minimum 6.625" O.D. galvanized steel pipe, fabric shall be minimum No. 9 gauge galvanized steel wire with 2" mesh design. Line post shall be spaced maximum 10' on center embedded in concrete base minimum 12" diameter and 3' deep.

All security gates shall be designed for the opening size required to accommodate inbound/outbound vehicle flow. Gates shall be slide type, motor operated with controls. Gate controls will be required on both sides of the opening and may be remote control, card reader or key pad type controllers.

Track gates shall be manual swinging gates with devices to positively hold gates in open position (all in accordance with BNSF and WUTC clearance requirements). The track gate must accommodate a modified track section and/or center panel that prohibits access under the gate.

## 17. Utilities

### **General:**

Availability of utilities to the proposed site is not known. The selected design firm will be responsible for determination of location, availability, and capacities of all utilities. The availability, location, and capacity factors will be major factors in the design of the utility systems. Based upon the information obtained by the design firm, it may be necessary to develop a list of a number of options. The Developer shall consult with the Railroad concerning the issues and options list to ascertain the Railroad's preferences. The discussion shall include engineering analysis and cost ranges for the various options.

In general, utilities which extend under a track should be located no shallower than 5.5' below the base of rail and designed for railroad loadings; a casing pipe is optional for industrial spur tracks on private property. However, due to the difficulty of maintaining utilities underneath tracks, it is recommended that utilities under high-usage industrial tracks have casings.

**Storm Sewer and Drainage System:**

The design of the storm drainage system shall be in accordance with Spokane County, and/or governing regulatory authority.

Storm water may be directed away from the facility through grading, ditch or pipe means. Graded, ditched or piped flow away from the facility must be evaluated to determine the impact upon the existing railroad and neighboring property. All drainage shall be contained on-site; no drainage shall be directed onto the Spokane County Geiger Rail Spur right-of-way or City streets.

The storm drainage system design shall consider existing site features, site access, personnel safety and all laws and codes that apply to storm water runoff and detention.

All drainage piping shall include track sections in accordance with the BNSF, *Design Guidelines for Industrial Track Projects*, Kansas City, KS, June 2005.

Refer to the “Storm water drainage, detention ponds” section of this proposal for additional site drainage information.

**Sanitary Sewer System:**

The sanitary sewer system should utilize industry accepted material and methods. Any sewer line placed under concrete shall be cast or ductile iron. The design and installation shall conform to the latest edition of the Uniform Plumbing Code or local building code, whichever is more stringent.

The maximum spacing between manholes or at grade clean outs on the site shall be 400 feet.

Reference the section on lift stations for information on sanitary pumping systems.

**Industrial Sewer and Drainage Systems:**

As a general rule, the drainage inside the confines of servicing, repair or fueling areas should be considered industrial waste. The method of collection and transport should follow standard practices. The primary waste is a petroleum product. Materials should be selected which are compatible with diesel fuel and its aromatic components. All gasketed pipe will have to have oil resistant gasket materials. Drain lines under concrete shall be cast or ductile iron. The remaining portions of the pipeline shall be a schedule 40 or SDR 26 material.

The maximum spacing between manholes and/or grade clean outs shall be 400 feet.

All inlet structure gratings shall be designed for heavy vehicular loading.

Reference the lift station and wastewater treatment sections for information on pumping stations.

The storm water that impacts the service and fueling areas is considered industrial waste. Other site storm water drainage shall be classified, as appropriate, by Spokane County (or other regulatory agency) Surface Water design criteria

### **Sewer Lift Stations**

Often it is not possible to provide a gravity drainage system. In this event a lift station is usually required. At a minimum a duplex set of pumps will be required.

If possible the detention capacity of the lift station shall provide a minimum of 15 minutes pump run time. The duplex pumps shall be sized so that one pump will handle the normal calculated inflow. The second pump will provide redundancy and assist with atypical inflow conditions. The pump shall be controlled by the pump supplier and provide alternating lead/lag, lag start, lead start, lead stop, lag stop and high level alarm.

There are several criteria to be used in the selection of the pumps for the lift stations.

- Storm water pumps - these need open volutes which will tolerate suspended solids in the water.
- Industrial water pumps - the primary contaminants are petroleum and possibly soap. Pumps used to move this waste stream should be low shear or positive displacement type to reduce emulsification.

For shallow lift stations less than 10 feet deep a shaft driven pump with the motors mounted on the top of the structure are desirable if the application permits use of this type of pump. For a deeper station the most likely candidates are submersible type. If these are used the pumps must be provided with guide rails, shoes and lifting cables. The design of all the different types of lift stations shall include: personnel access through either doors or manhole lids (selection depends on physical size of lift station), pump extraction ports, ventilation, OSHA compliant access ladder/rungs and, if necessary, lighting.

#### **Note:**

Reference the electrical section for information regarding the lighting and power requirements.

#### **Potable Water:**

Piping 2-inch and larger shall C-900 PVC. Lines smaller than 2-inch shall be type K copper.

The primary supply line where it enters the property and each individual building or service area shall be provided with a reduced pressure type backflow preventer.

Installations shall conform to the local requirements.

Each facility and/ or building shall be provided with a curb valve and box.

Each building and/or facility shall be provided with a locally approved water meter.

If a municipal supply is available but it is some distance from the project site a pipeline may need to be considered. Engineering analysis and cost estimates will be required to determine the method to provide adequate potable and fire water supplies.

**Fire Protection:**

Fire protection must be provided as required by City of Airway Heights regulations and codes.

Piping shall meet City of Airway Heights requirements, but in no case shall be less than C-900 PVC with either PVC or cast iron fittings.

The design of the fire protection piping system shall accommodate a flow rate of 1500 GPM. That is two hydrants at 750 GPM each. Full flow shall be achieved with a residual pressure of 20 psig.

Fire protection water supply piping system shall be looped to provide an equalized flow and pressure as well as alternate routing in the event of a pipe failure.

Piping system shall be provided with thrust blocks at all elbows, hydrants, tees, reducers or any change in direction.

The piping system shall be provided with isolation valves at the ends and mid-point of each branch of the system.

Branches taken off the fire protection system piping system for the sprinkler systems in each building shall be provided with lockable post indicator valves.

Fire hydrants shall be dry barrel triplex type. The hydrants shall have threads which are compatible with the local fire department's needs. The hydrants shall be spaced a maximum of 600 feet apart in the yard. Hydrants near facilities shall be spaced a minimum of 50 feet from the facility. Each facility shall be provided with a minimum of two hydrants. It is recommended that these hydrants be located one on each side of the facility.

If a satisfactory water supply is not available a storage tank with a fire pump system may be required as part of the project.

## 18. Electrical

**Site Power:**

Coordinate with local utility company for service requirements.

Site power shall consist of a 15KV Class underground distribution system with the following components:

- Primary metering which may be metered overhead or in a switchgear.
- Concrete encased underground PCV conduit system.
- Flush pull boxes with load rated removable lids for ease of wire pulling and maintenance.
- Pad mount transformers at each facility and throughout the trailer parking area for secondary power applications.
- Distribution panelboards and underground PCV conduit and wire as required to distribute secondary power to all loads.
- Heavy duty support and physical protection shall be provided for all electrical components.
- All systems properly grounded and sized for possible future growth.
- Short circuit fault analysis of designed system completed to satisfy local power company requirements for connection to their power grid.
- An alternate primary feeder from the power company shall be provided for emergency back-up. Switching shall be arranged to facilitate either primary feeder as the source of power to the facility. Feeders shall be located at opposite ends of the facility.

**Site Lighting:**

All lighting shall be designed to comply with the recommended lighting levels stated in the latest edition of the BNSF, *Architectural Design Guidelines Manual, Section 6, Lighting Standards*, Kansas City, KS, May, 2006.

**Facility Power:**

All facility power distribution design shall conform to all national, state, and local codes, and shall be equal to that which is considered an industry standard.

The following are general statements to be considered during the design process.

- All building services shall be sized per NEC (National Electric Code) requirements with capacity for 30% future growth, and provided with TVSS. (Transient Voltage Surge Suppression Devices)
- Convenience outlets shall be provided in all offices, shops, work stations, etc. per NEC. Use GFI receptacles as required by the NEC. Special receptacles

with disconnects and outlets are to be sized and provided as required for facility equipment requirements.

- Grounding requirements shall be strictly adhered to, including the use of separate grounding conductors in all raceways.
- Three Phase services above 400 Amps shall be 277/480 volt, 3 phase.

**Facility Lighting:**

All facility lighting levels shall be designed to comply with the recommended values of the latest edition of the *BNSF Architectural Design Guidelines Manual, Section 6, Lighting Standards*, for its application.

## 19. Communications

**General:**

Fiber optic cable will be the means of providing communications service for the yard and facilities. Railroad communication requirements will include data lines and telephone lines and shall be received from the local fiber optic company service point and extended underground to the Gate/Administration building. Public telephone service shall be received from the local telephone company service point and extended underground to the Gate/Administration building.

An underground fiber/telephone raceway system shall be extended to all buildings and to the base of all new high mast light towers. An underground data network raceway system shall be extended to all buildings and to the base of all new high mast light towers.

Communications infrastructure requirements:

1. Telecom pull boxes and conduit must be separate from power pull boxes and conduits to meet National Electric Safety Code.
2. Telecom pull boxes need to be load bearing concrete structures 4 ft by 4 ft minimum with pulling eyes installed. Square lids are preferred. Structure must be able to withstand truck traffic in the facility.
3. Spacing between the pull boxes throughout the yard is to be 500 ft. maximum.
4. Two (2) 4 inch conduits, one with three (3) 1 1/4 inch inner ducts installed, need to be run between all facilities requiring telecom services.
5. All conduits are to be buried a minimum of 36 to 48 inches in depth.
6. All conduits and inner ducts are to be provided with pulling tapes.

7. Conduits and inner ducts are to be plugged until used.

## 20. Resources

### Design Guides/Drawings

1. BNSF, *Design Guidelines for Industrial Track Projects*, Kansas City, KS, June 2005)
2. BNSF, *Architectural Design Guidelines Manual, Section 6, Lighting Standards*, Kansas City, KS, May, 2006.

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## **Appendix D**

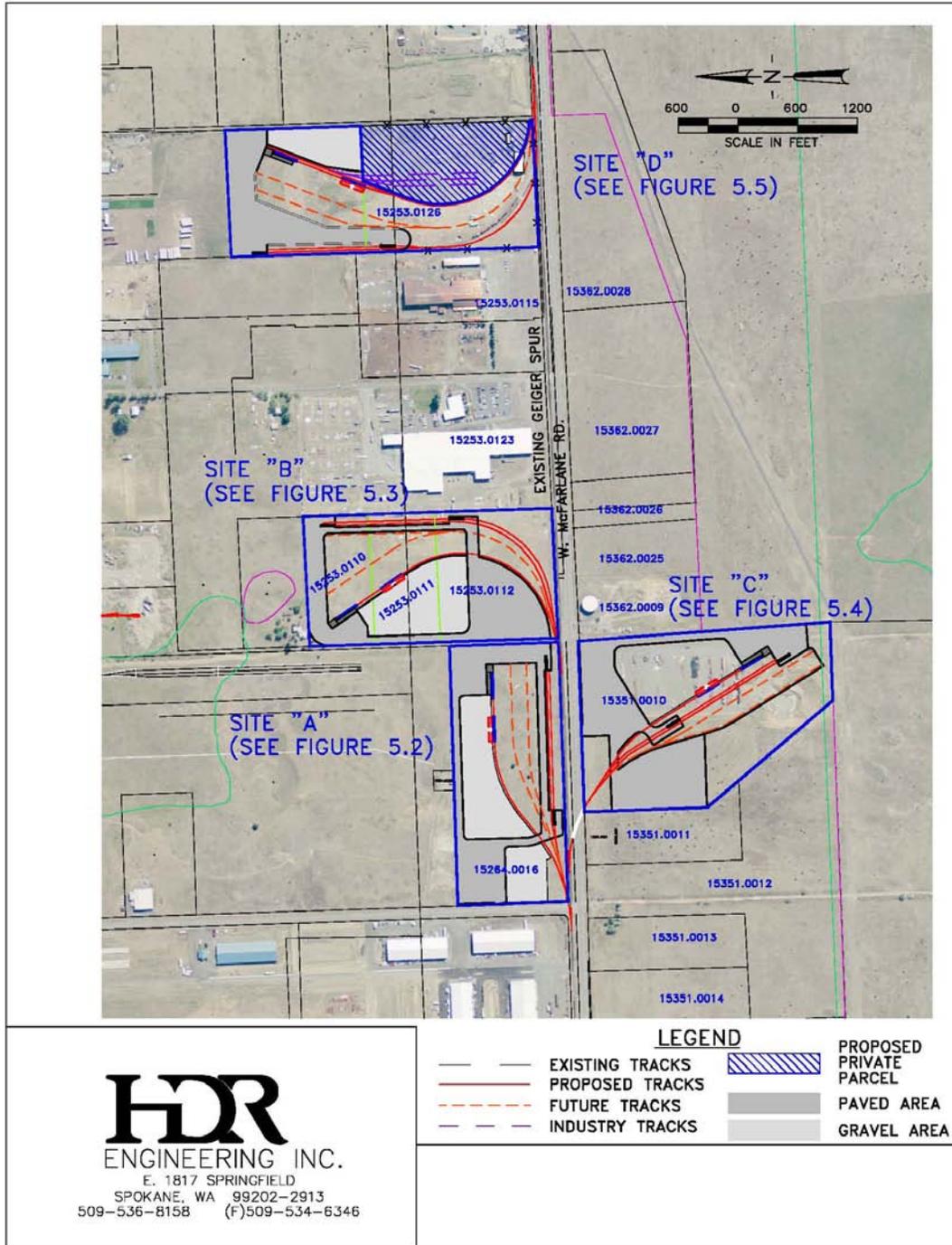
### **Location of Parcels in Relation to Geiger Spur**

**Geiger Spur  
Transload Facility Study**

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# Appendix D Location of Parcels in Relation to Geiger Spur



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**Appendix E**

**Foundation for  
Conceptual Construction Costs**



# Appendix E Foundation for Conceptual Construction Costs

Geiger Transload Study		6/20/07								
Page 1										
Item #	Description	Unit	Option A Qty	Item Total	Option B Qty	Item Total	Option C Qty	Item Total	Option D Qty	Item Total
<b>Project Items</b>										
1	Mobilization @ 3%	LS	1	\$ 57,163.23	1	\$ 57,163.23	1	\$ 57,163.23	1	\$ 57,163.23
2	Performance and Payment Bonds @ 2%	LS	1	\$ 35,122.52	1	\$ 35,122.52	1	\$ 35,122.52	1	\$ 35,122.52
3	Railroad Protective Liability Insurance	LS	0	\$ 4,500.00	0	\$ 4,500.00	0	\$ 4,500.00	0	\$ 4,500.00
4	Construction Surveying	LS	0.83	\$ 17,500.00	0.83	\$ 17,500.00	0.83	\$ 17,500.00	0.83	\$ 17,500.00
				\$ 117,500		\$ 117,500		\$ 117,500		\$ 117,500
<b>Subtotal of Project Items (Excluding Job and Bonds)</b>										
<b>Roadway - Civil Items</b>										
5	Clearing and Grubbing	AC	16.51	\$ 33,000.00	16.51	\$ 33,000.00	16.51	\$ 33,000.00	16.51	\$ 33,000.00
6	Removal of Structure and Obstruction	LS	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
7	Removing Asphalt Conc. Pavement	SY	0	\$ 9.00	0	\$ 9.00	0	\$ 9.00	0	\$ 9.00
8	Removal of Fence	LF	0	\$ 3.00	0	\$ 3.00	0	\$ 3.00	0	\$ 3.00
9	Excavation Including Haul	CY	13330	\$ 79,960.00	15180	\$ 91,080.00	17750	\$ 106,500.00	0	\$ 0
10	Unsuitable Foundation Excavation Incl Haul	CY	85	\$ 510.00	85	\$ 510.00	85	\$ 510.00	85	\$ 510.00
11	Common Borrow including Haul	CY	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
12	Embankment Compaction	CY	13330	\$ 26,660.00	15180	\$ 30,360.00	17750	\$ 35,500.00	8970	\$ 16,140.00
13	Dig and Verify	EA	0	\$ 200.00	0	\$ 200.00	0	\$ 200.00	0	\$ 200.00
14	Construction Entrance	SY	225	\$ 3,150.00	225	\$ 3,150.00	225	\$ 3,150.00	225	\$ 3,150.00
15	CMP Culv. Pipe 18 in. Diam.	LF	0	\$ 50.00	0	\$ 50.00	0	\$ 50.00	0	\$ 50.00
16	CMP Culv. Pipe 24 in. Diam. Under Railroad	LF	0	\$ 65.00	0	\$ 65.00	0	\$ 65.00	0	\$ 65.00
17	Schedule B Culv. Pipe 12 in. Diam.	EA	50	\$ 1,750.00	50	\$ 1,750.00	50	\$ 1,750.00	50	\$ 1,750.00
18	Storm Drainage Features (Allowance)	CY	5	\$ 25,000.00	5	\$ 25,000.00	5	\$ 25,000.00	5	\$ 25,000.00
19	Crushed Surfacing Base Course	CY	14021	\$ 984,546.00	14132	\$ 967,432.00	19050	\$ 485,300.00	10000	\$ 260,000.00
20	Crushed Surfacing Top Course	CY	2695	\$ 67,470.00	1884	\$ 48,844.00	2056	\$ 53,456.00	860	\$ 25,480.00
21	HMA CI 344 in. PG 64-28	TON	5620	\$ 965,300.00	6015	\$ 350,975.00	10103	\$ 656,695.00	4640	\$ 301,600.00
22	Concrete Pavement	SY	2000	\$ 60,000.00	2000	\$ 60,000.00	2000	\$ 60,000.00	2000	\$ 60,000.00
23	Seeding, Fertilizing and Mulching	AC	0.15	\$ 300.00	0.15	\$ 300.00	0.15	\$ 300.00	0.15	\$ 300.00
24	Erosion/Water Pollution Control	LS	1	\$ 5,000.00	1	\$ 5,000.00	1	\$ 5,000.00	1	\$ 5,000.00
25	Project Temporary Traffic Control	LS	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
26	Permanent Signs and Road Markings	LS	1	\$ 2,500.00	1	\$ 2,500.00	1	\$ 2,500.00	1	\$ 2,500.00
27	Furnish and Install Luminaires	EA	12	\$ 60,000.00	12	\$ 60,000.00	13	\$ 65,000.00	9	\$ 45,000.00
28	Furnish and Install Chain Link Fence	LF	3620	\$ 72,400.00	3735	\$ 74,700.00	3910	\$ 78,200.00	2500	\$ 50,000.00
29	Furnish and Install Chain Link Gates	LF	70	\$ 7,000.00	70	\$ 7,000.00	70	\$ 7,000.00	140	\$ 14,000.00
30	Provide Utilities to Property Line (Water, Sewer & Fire)	EA	1	\$ 15,000.00	1	\$ 15,000.00	1	\$ 15,000.00	1	\$ 15,000.00
31	Landscaping Allowance	EA	1	\$ 20,000.00	1	\$ 20,000.00	1	\$ 20,000.00	1	\$ 20,000.00
				\$ 1,208,866		\$ 1,211,541		\$ 1,676,266		\$ 865,530
				\$ 17,500		\$ 17,500		\$ 17,500		\$ 17,500

Geiger Transload Study											
Page 2											
6/20/07											
Item #	Description	Unit	Unit Cost	Option A Qty	Item Total	Option B Qty	Item Total	Option C Qty	Item Total	Option D Qty	Item Total
<b>Railroad Items</b>											
25	Remove Track	TF	\$ 9.00	120	\$ 1,080.00			120	\$ 1,080.00		\$ 1,080.00
26	Furnish and Install Subballast	CY	\$ 27.00	1,850	\$ 50,250.00	2415	\$ 65,205.00	1615	\$ 40,905.00	2965	\$ 80,995.00
27	Furnish and Install New Track	TF	\$ 115.00	2947	\$ 338,905.00	5230	\$ 601,450.00	3218	\$ 370,070.00	6237	\$ 717,255.00
28	Furnish and Install Sliding Bevel	EA	\$ 6,500.00	1	\$ 6,500.00	1	\$ 6,500.00	1	\$ 6,500.00	1	\$ 6,500.00
29	Furnish and Install New #9 Turnout	EA	\$ 41,000.00	3	\$ 123,000.00	4	\$ 164,000.00	3	\$ 123,000.00	7	\$ 287,000.00
30	Surfaco Line and Dress	TF	\$ 6.50	0	\$ 0.00	0	\$ 0.00	0	\$ 0.00	0	\$ 0.00
31	Furnish and Install Concrete Arrangement	PR	\$ 850.00	2	\$ 1,700.00	2	\$ 1,700.00	2	\$ 1,700.00	2	\$ 1,700.00
32	Furnish and Install Concrete Panel Crossings	TF	\$ 500.00	32	\$ 16,000.00	32	\$ 16,000.00	150	\$ 75,000.00	48	\$ 24,000.00
33	Furnish and Install Walkway Rock	TF	\$ 11.00	350	\$ 3,850.00	440	\$ 4,840.00	550	\$ 6,050.00	770	\$ 8,470.00
34	Furnish and Install Wheel Stops (Pair)	EA	\$ 900.00	2	\$ 1,800.00	3	\$ 2,700.00	3	\$ 2,700.00	6	\$ 5,400.00
35	Furnish and Install Concrete End/Side Ramp	EA	\$ 150,000.00	1	\$ 150,000.00	1	\$ 150,000.00	1	\$ 150,000.00	1	\$ 150,000.00
36	Furnish and Install Crossing Signal	EA	\$ 230,000.00	0	\$ 0.00	0	\$ 0.00	1	\$ 230,000.00	0	\$ 0.00
	<b>SUBTOTAL OF RAILROAD ITEMS</b>				<b>\$579,055</b>		<b>\$1,013,475</b>		<b>\$1,004,595</b>		<b>\$1,282,400</b>
	SUBTOTAL OF BID ITEMS (EXCLUDING MOB and P&P BOND)				\$1,906,131		\$2,272,516		\$2,700,321		\$2,764,830
	<b>SUBTOTAL OF BID ITEMS (INCLUDING MOB and BOND)</b>				<b>\$2,001,439</b>		<b>\$2,385,142</b>		<b>\$2,895,337</b>		<b>\$2,273,072</b>
<b>Additional Project Items</b>											
	Engineering and CM			12.00%	\$240,173	12.00%	\$286,337	12.00%	\$340,240	12.00%	\$272,759
	Environmental Mitigation			1.00%	\$20,014	1.00%	\$23,881	1.00%	\$28,353	1.00%	\$22,731
	<b>SUBTOTAL OF ADDITIONAL PROJECT ITEMS</b>				<b>\$260,187</b>		<b>\$310,198</b>		<b>\$365,594</b>		<b>\$295,499</b>
	Tax (8.6% of bid items and additional items)		8.60%		\$194,500		\$231,885		\$275,538		\$220,837
	<b>TOTAL (BID ITEMS, ADDITIONAL TAX)</b>				<b>\$2,456,124</b>		<b>\$2,928,225</b>		<b>\$3,475,469</b>		<b>\$2,789,468</b>
	30% Contingency				\$736,837.24		\$879,467.65		\$1,043,840.68		\$536,840.37
	<b>GRAND TOTAL</b>				<b>\$3,192,961</b>		<b>\$3,806,693</b>		<b>\$4,520,310</b>		<b>\$3,326,308</b>