1. Introduction

1.1 Structure Concept Report

This Structure Concept Report is part of a conceptual engineering and project development study addressing the rehabilitation or replacement of the 4th St. Bridge in Pueblo, Colorado. This study is being performed for the Colorado Department of Transportation, Region 2, by Figg Bridge Engineers, Inc. and a subconsultant team comprised of firms specializing in roadway and civil design, hydraulics and drainage, geotechnical investigation, hazardous waste, railroad coordination, surveying, and urban design.

Included in this report is a description of the project including goals and critical issues, a summary of the condition of the existing 4th St. Bridge, and a recommended scope of bridge improvements. Possible bridge layouts and associated structure types are presented for the construction of a new bridge. Each option is evaluated against a comprehensive set of evaluation criteria based on the goals and critical issues of the project. Bridge layouts and structure types that best meet these criteria are identified for further study. The preliminary design phase of the project will further evaluate these options and make a final structure selection.

1.2 Project Description

In the spring of 2000, the Colorado Department of Transportation (CDOT) Region 2 advertised for engineering services related to rehabilitation or replacement of the 4th St. (State Highway 96A) Bridge in Pueblo, Colorado. Fourth St. is a major east west route through Pueblo connecting I-25, downtown, and residential neighborhoods to the west. The 4th St. Bridge carries State Highway 96A (SH96A) across the Union Pacific and Burlington Northern Santa Fe Railroad yard (Pueblo Yard) and the Arkansas River. The Pueblo Yard is a very active railroad yard with approximately 30 tracks, including three mainline tracks. The Arkansas River in this area is relatively narrow and shallow with flow controlled by the Pueblo Reservoir.

The existing 4th St. Bridge, structure number K-18-Z, has become functionally obsolete and is showing signs of structural deterioration of both the superstructure and the substructure. Improvements will be made to enhance safety for motorists and pedestrians through structure modification or replacement. Roadway alignment modifications, right-of-way, structure replacement, intersection improvements, and roadway reconstruction may all be part of the final overall strategy.

1.3 Project Site

Figure 1.1 shows the location of the existing 4th St. Bridge. The bridge is located in Pueblo, Colorado on 4th St. (SH96A) west of I-25 and downtown Pueblo between Midtown Circle Drive and Elmhurst Place. The bridge crosses the Union Pacific (UPRR) and Burlington Northern Santa Fe (BNSF) railroad yard, the Arkansas River, and the Arkansas River Floodwall. Residential and commercial properties are located west of the bridge towards Abriendo Avenue. A handicapped fishing pier, trail system, and parking facility are also located on the west end of the bridge, along the river. East of the bridge are primarily commercial and industrial properties. Railroad and power generation facilities are nearby and the Midtown Center is just north of the bridge at the east end. Downtown Pueblo is further to the east between Elizabeth Street and I-25.

1.4 Project Goals and Critical Issues

The goals of the 4th St. Bridge Project are to improve safety for motorists, pedestrians, and bicyclists on the bridge, increase the capacity, provide a higher level of service, improve clearances to the railroad tracks, and increase load carrying capacity. Community and agency involvement in bridge, roadway, aesthetics, and urban design features is key to the success of the project.

Due to the constraints of the site, there are many critical project issues. A successful project solution includes consideration of these issues, which include the following:

- Access and Right of Way Restrictions
- UPRR and BNSF Railroad Coordination
- Environmental Assessment and Mitigation
- Historical Assessment and Mitigation
- CDOT Schedule and Budget Constraints
- Aesthetics and Urban Design
- Community and Agency Involvement
- Maintenance of Traffic During Construction
- Alignment and Profile Improvements
- Access to Midtown Center
- Arkansas River Floodwall Impacts
- Coordination with Other Pueblo Projects (I-25, Downtown Access)

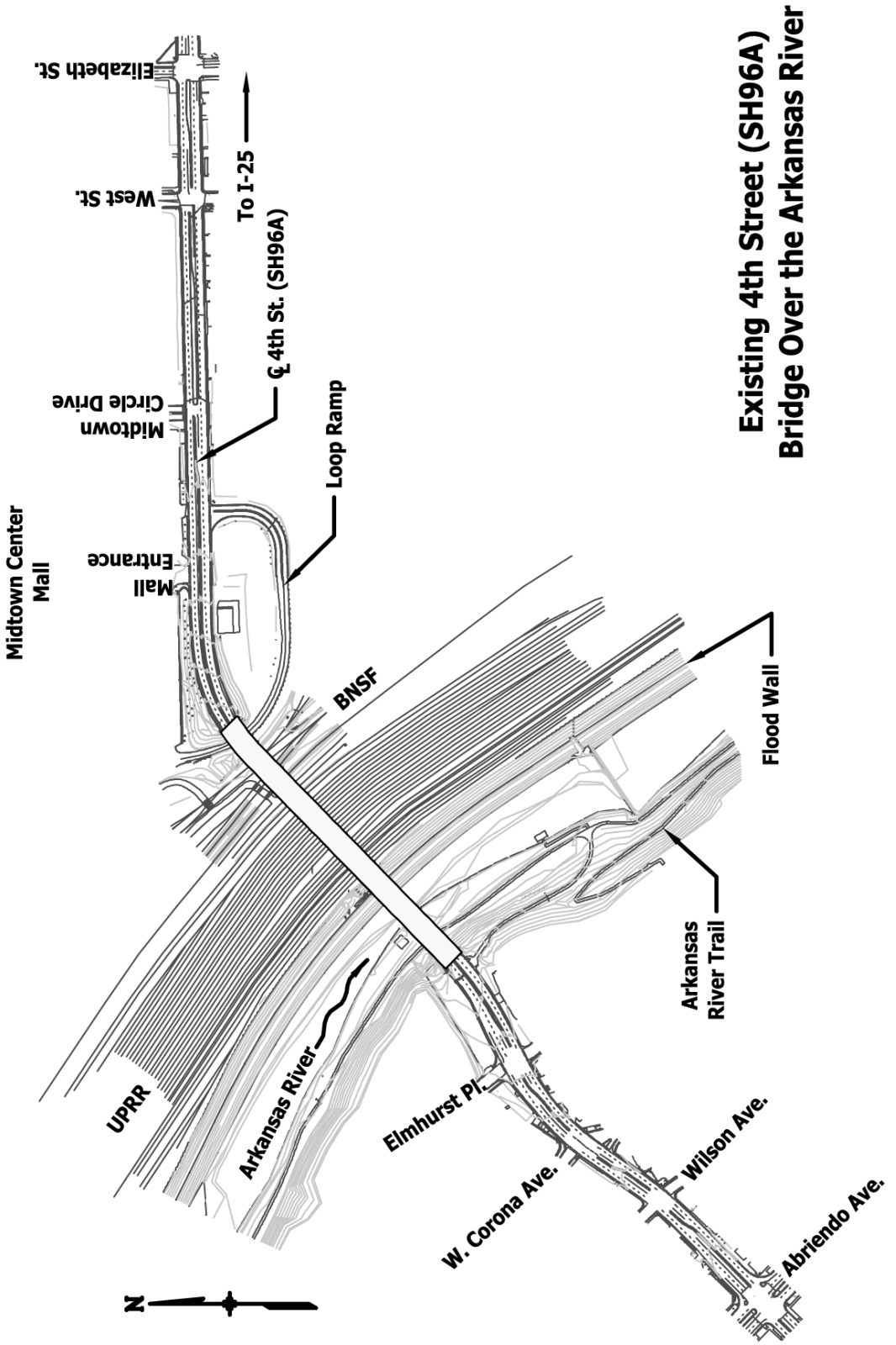

Figure 1.1 Existing Structure Site Location Map