

## **Appendix B Technical Memoranda**

B1. Purpose and Need

B2. Traffic Resources

B3. Pedestrian, Bicycle, and Transit Uses

B4. Hydrologic Resources

B5. Cultural Resources

B6. Section 4(f) and Section 6(f)

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## **Appendix B1 Purpose and Need**



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**Subject:** Purpose and Need, Alternatives Screening Process  
**Project Name:** Arlington Avenue Bridges Project

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### 1. Project Background

The Regional Transportation Commission (RTC) of Washoe County is conducting a feasibility and alternatives analysis to determine options for the rehabilitation or replacement of the two Arlington Avenue Bridges (Project) located across the Truckee River in downtown Reno, Nevada. The Project is located between Island Avenue and W. First Street and includes the area of Wingfield Park.

The Arlington Avenue bridges have served the community of Reno and provided access to Wingfield Park for nearly a century. The park, the Truckee River, and the surrounding area have evolved over that time, and the Arlington Avenue bridges have been widened, repaired, and modified in ways that met the needs of the community at the time. However, the bridges are showing signs of wear resulting from the variety of modifications made, their age, and the repeated exposure to flood events.

In 2009, the City of Reno completed the TRAction Visioning Project which served as a component of the Truckee River Flood Management Project's (TRFMP) master plan to provide improved safety along the Truckee River Corridor. The TRAction Project was partially a result of the 1997 and 2005 flood events and focused on looking for the best solutions for improved flood protection in downtown Reno. The two Arlington Avenue Bridges were analyzed as part of the TRAction Project.

The TRAction Visioning report suggested that the Arlington Avenue Bridges be replaced so they can better meet the flood conveyance needs, but the report cautioned that the reconstruction of the structures would be complicated by the need to ensure pedestrian access. Two bridge options were considered as part of the TRAction Report; replacement with two new structures using a slightly higher deck elevation to keep flood waters in the channel; and replacement with a single structure spanning over the river and Wingfield Park allowing pedestrians to pass under the bridge. Constraints and impacts associated with these two alternatives were not developed in great detail.



This Project aims to pick up where the TRAction report ended by evaluating options to ensure continued public safety, to meet the needs of the community, and to provide additional flood conveyance for the Truckee River. At a project meeting on March 25, 2019 with Federal Highway Administration (FHWA) and Nevada Department of Transportation (NDOT) Environmental staff, RTC and Jacobs staff proposed taking a Planning and Environmental Linkages (PEL) approach to the Project to help inform decision-making, engage the public and stakeholders, and streamline the future NEPA process. FHWA and NDOT Environmental staff agreed with this approach, noting that FHWA can sign the NDOT PEL Questionnaire. At the project Technical Advisory Meeting (TAC) meeting on July 15, 2020, it was determined that FHWA would serve as the federal lead agency for the PEL.

Alternative concepts will be developed for the two Arlington Ave bridges and analyzed based on their ability to:

- meet the project's Purpose and Need,
- minimize impacts to right of way, the river, and surrounding properties,
- provide access to the park,
- achieve required flood conveyance criteria.

The alternatives will also be analyzed based on cost and the level of support received from project stakeholders. The alternative(s) that best meets the needs of the Project will be advanced for NEPA clearance and design.

## 2. Purpose and Need Statement

The purpose and need statement describe the intention of the project and states the problems. Ultimately, it sets the stage for developing and evaluating possible improvement alternatives but is not mode specific or biased toward a particular solution. Additional factors considered in evaluating potential alternatives must include input from resource agencies/local government/public, cost, and impacts to the human/natural environment.

The purpose of the project is to address the deteriorating condition of the bridge structures, provide community access to the Truckee River and Wingfield Park, and improve the hydraulic capacity of the Truckee River during flood events.

Existing transportation needs for the Arlington Avenue Bridges Project include the following:

- Responding to structural deficiencies of the existing bridges
  - Both of the existing bridges are categorized as structurally deficient by NDOT. The north bridge is also listed as scour critical because of the two piers located in the river channel. From the inspection reports, the bridges are deteriorating with exposed rebar and spalling concrete. Shear and flexural cracks are developing throughout the structural elements. While the deterioration is not critical to the bridge structure, the inspection reports recommend rehabilitation or replacement of the structure.
  - The bridges are on a one-year inspection cycle which is more frequent than the standard 2-year inspection cycle required by FHWA.
- Improving pedestrian, bicycle, transit, and traffic safety in the area of Wingfield Park
  - Wingfield Park is a high pedestrian and multi-modal user area. However, much of the existing bicycle and pedestrian infrastructure on and adjacent to the bridges is not ADA compliant. There are mid-block crosswalks as well as transit stops located in the park between the two bridges. These locations either lack lighting or are no longer compliant with current lighting codes.
  - The existing railing on the edge bridges overlooking the river is sub-standard.

- A review of the crash data indicates that, between 2014 and 2017, six crashes involving pedestrians or bicycles occurred in the Project area.
- Providing sufficient hydraulic capacity of the Truckee River during flood events
  - Following the floods of 1997 and 2005, additional analysis has occurred to the bridges across the Truckee River in Downtown Reno. Some of this analysis was completed as a part of the previously mentioned TRAction Report. New modeling completed by the Truckee River Flood Management Authority and the Carson Truckee Water Conservancy District have better defined the water surface elevation during flood events. There has been a focus to reduce the number of features that restrict or impede the flow of water. Typical features that can impede flows can include bridges, piers, walls, slopes, and debris. The existing north bridge has two piers located in the river channel requiring City of Reno maintenance staff to remove the debris from the bridge deck during flood events to ensure water passes below the bridge and in the channel.
- Respond to regional and community plans
  - Several projects in the area and along the Truckee River have resulted a patch work of improvements that create disjointed and inconsistent network of amenities. The City of Reno has approved the *Downtown Action Plan* and is reviewing and finalizing general design criteria and specifications for downtown streetscapes aimed at providing a framework for consistent downtown improvement strategies. Arlington Avenue is within these downtown plan areas and does not currently conform to some of the proposed strategies.
  - The TRAction Report called for the replacement of the existing Arlington Bridges because they did not meet the flood design criteria used as part of that report. The Report called for the installation of a single 450-foot long bridge spanning the park, but it also noted that this concept would result in significant vehicular and pedestrian access changes to the park.
  - The City of Reno has completed an update to the city's Master Plan called *ReImagine Reno-Planning for the Future*. The bridges and Wingfield Park are located within the Riverwalk District and along the Truckee River Greenway Corridor. Greenway corridors are intended to protect the natural features of the area and allow pedestrians, bicyclists, and other recreational users to access a variety of public spaces. The master plan identifies the Truckee River as the most important greenway corridor in the City and calls for design elements to accommodate access along the river for community events and festivals throughout the year.
  - The Truckee River Flood Management Authority, whose goal is to create a more flood resilient community, has developed a project plan aimed at reducing damage resulting from floods. One of the components of the Flood Management Authority's Plan is called the 'Downtown Reach'. Several individual projects have been identified for the Downtown Reach that are related to the protection of the bridges and the replacement/construction of floodwalls upstream and downstream of the project area.

### 3. Alternatives Screening and Selection Process

The alternatives screening and bridge type selection process and the evaluation criteria are established early in the project to ensure that alternatives are assessed objectively against a common set of evaluation criteria. The alternatives are to be evaluated on the following: ability to meet project purpose and need, ability to avoid and minimize impacts to the natural and built environment, construction

feasibility and cost, and input from the TAC and Stakeholder Working Group (SWG), the Reno City Council, and the Public.

### 3.1 Selection Process

The alternatives evaluation involves a two-step screening process. Step 1 screening focuses on bridge and structure type concepts, and Step 2 screening focuses on aesthetic treatments. Each alternative at each screening level will be conceptually designed for consideration by the TAC and SWG.

Rating or scoring of alternatives during Step 1 would use a numeric scoring process, with alternatives ranked from 1 (least favorable) to 10 (most favorable) then averaged for the screening criteria that are scored. Screening during Step 2 will rely on stakeholder and community input based on access, visual impacts, style, cost and constructability. The TAC is comprised of technically-qualified agency representatives while the SWG is comprised of agency representatives and adjacent property owners. The TAC and SWG are tasked with providing the bulk of the input and will guide the screening process by establishing evaluation criteria, reviewing engineering and technical results, and making recommendations regarding specific alternatives. The Reno City Council has the opportunity to provide input on the process through its liaison to the SWG and through periodic council meetings presenting the results of the analysis.

### 3.2 Step 1 Alternatives Screening

Step 1 alternatives screening will evaluate concepts based on criteria developed from the project's Purpose and Need as well as from TAC/SWG member involvement and public input. Criteria were initially established that reflected a desire to ensure engineering feasibility, limit right-of-way impacts, minimize environmental, cultural, and community impacts, provide access to Wingfield Park and the Truckee River, and ensure long-term maintainable solutions for proposed improvements. Step 1 criteria will be finalized following public and stakeholder review, so the criteria listed are considered potential at this point.

This level of screening is designed to analyze bridge type concepts and does not look at the aesthetic details of potential alternatives. This is basically the form of the bridge. Step 1 alternatives screening analyzes a few major structure type concepts such as:

- rehabilitation versus replacement,
- one bridge versus two bridges,
- above deck structures vs. below deck structures.

Potential Step 1 alternatives screening criteria include:

1. Visual Impacts: How the alternative's size and scale impact the viewshed of the Truckee River, Wingfield Park, and the surrounding properties.
2. Style: How the alternative's structural style relates to the existing improvements or regional plans.
3. Physical Impacts: Does the alternative require any right-of-way acquisition or alter other existing infrastructure?
4. Environmental Impacts: Does the alternative impact cultural, biological, hazardous materials, or other sensitive resources?
5. Access: How the alternative may change or affect access to Wingfield Park, surrounding properties, or the Truckee River.
6. Hydraulics: How the alternative affects flow conveyance of the Truckee River
7. Maintenance: Does the alternative require additional long-term maintenance requirements and cost.
8. Cost: The alternative's relative costs based on order-of-magnitude estimates using engineering judgement.

9. Constructability and Construction impacts: This criterion looks at the relative difficulty of constructing the alternative including duration, maintenance of traffic may, access to the park and river, and complexity of design are among the items evaluated.

After Step 1, the remaining bridge-type alternatives will be used in the analysis of different aesthetic concepts.

### 3.3 Step 2 Alternatives Screening

The Step 2 alternatives screening process evaluates bridge aesthetics and conceptual aesthetic themes to be used for the project. Potential aesthetic themes, or finishes, may include:

- Matching the Downtown Streetscape Master Plan concepts,
- Matching the Virginia Street Bridge theme,
- Creating a 'family of bridges' themes (i.e. establishing a standard for future bridge replacements),  
or
- Creating a new theme for the Wingfield Park area.

The analysis will consider existing and newly adopted features for sidewalk and pavement treatments, railing types, lighting figures, street furniture, and color.

The criteria to be used will be finalized by the Stakeholder Working Group. It is anticipated that many of the criteria elements will be the same or similar to those used at Step 1.

Potential Step 2 alternatives criteria include:

1. Visual Impacts: How the alternative's appearance blends with existing features, proposed themes, and surrounding properties.
2. Style: How the alternative's style relates to the existing improvements and regional plans.
3. Constructability: This criterion looks at the relative difficulty of constructing the alternative including material type, availability of materials, and long-term maintenance and sustainability.

### 3.4 Conclusion of the Alternatives Process

After the Step 2 alternatives screening has been completed, RTC will present the results of both the Step 1 and Step 2 processes to the Reno City Council. The Reno City Council will have the opportunity to review the analysis and provide additional recommendations on the potential elimination or inclusion of bridge type and aesthetic package alternatives to be presented to the public. Once input from the Reno City Council is received, the RTC will hold a public meeting to present remaining options that have been evaluated and their respective results of the alternatives screening process. This public meeting provides the public with an opportunity for input on the bridge types and aesthetic themes. Once the public meeting and subsequent comment period is complete, all analysis and input will be compiled and presented again to the Reno City Council for selection of the final bridge type and aesthetic package that will be carried forward into NEPA and design.

### 3.5 Alternative Screening Summary

The results of the screening process, and all associated alternatives considered and decisions made, will be documented as part of the Project's final report. The resulting alternative(s) that best meets the needs of the Project will be advanced for NEPA clearance and design.