

# Plan Line Study for the SouthEast Connector Project Summary

## INTRODUCTION AND BACKGROUND

A roadway connection between the south Truckee Meadows along the eastern part of the Truckee Meadows to connect with the City of Sparks has long been considered. A number of studies have been performed over the years to evaluate such a roadway. In 2004, the Regional Transportation Commission (RTC) retained Stantec Consulting Inc. (Stantec) to conduct a corridor study with three (3) alternative corridors for the roadway connection, referred to as the SouthEast Connector. In January 2007, the RTC Board of Commissioners identified the Valley Corridor as the preferred SouthEast Connector Corridor and authorized completion of an alignment study within this corridor.

## PURPOSE AND OBJECTIVES

In August 2007, the RTC retained Stantec to develop a plan line study for the SouthEast Connector. The purpose of this plan line study was to develop an alignment within the constraints of the previously established Valley Corridor.

As part of this plan line study, certain issues required evaluation, including:

- What is the potential impact to existing homes and proposed development?
- What is the potential impact to flooding in this area, and to the improvements proposed by the Truckee River Flood Project?
- What is the potential impact to the wetlands in this area?
- What is the potential impact on sites of cultural/archeological interest?
- What is the potential impact to the Rosewood Lakes Golf Course?
- How much would the SouthEast Connector cost?

The chosen alignment would be based on various engineering and environmental investigations. The investigations conducted include:

- Geotechnical Feasibility Investigation;
- Wetlands Investigation;
- Cultural/Archeological Investigation;
- Traffic Study;
- Golf Course Master Planning; and
- Hydrologic and Hydraulic Investigation.

Upon completion of these investigations, alternative alignments were developed and evaluated based on the results of these studies and information. A preferred alignment was presented to the Regional Transportation Commission for their consideration upon completion of the alternatives analysis.

Technical memorandums discuss the results of the investigations performed in conjunction with the plan line study for the SouthEast Connector. The memorandums are attached to the detailed report which is provided herein. The results and conclusions contained within this Project Summary are based on the various engineering and environmental investigations.

## PLAN LINE STUDY DEVELOPMENT

Stantec, with their subconsultants, compiled information on the Valley Corridor's existing conditions encompassing soils, bedrock conditions, wetlands, archeological sites, cultural sites, utilities, home sites, and a comprehensive list of the approved/un-built projects. This information was vertically integrated into a software program to construct an existing conditions base map to perform the plan line study. The software program used was called Quantm. It is an extremely powerful application with the ability to model hundreds of roadway alignments simultaneously and graphically provide data relative to the horizontal and vertical alignments, earthwork quantities, mitigation costs, and probable construction costs.

Within Quantm, specific areas were identified, delineated, and input as locations with three levels of criteria; locations which must be avoided, locations where mitigation is required and locations subject to design constraints. Locations that must be avoided included areas such as home sites and significant sites of archeological/cultural interest. Locations that required mitigation included areas such as wetlands and other sites of archeological/cultural interest. Design constraints included roadway design geometrics, flood elevations and volumes, and existing topography, among others.

Quantm analyzed hundreds of potential alignments and provided output information on fifty (50) of the most favorable alternatives. Stantec, in concert with RTC staff, evaluated these fifty potential alignments and selected three (3) alternative alignments for further analysis and consideration.

Concurrent with the Quantm analysis, traffic and hydraulic analyses also were performed. The traffic analysis utilized information provided by the RTC traffic model to determine the required number of lanes for the SouthEast Connector at various horizon years. The hydraulic analysis utilized the existing US Army Corp of Engineers / Truckee River Flood Project hydraulic, HEC-RAS model to determine the effect of constructing the SouthEast Connector within the floodplain. This involved an extensive modeling effort to determine the effect of the roadway on flood elevations and volumes, the improvements required to mitigate the presence of the road within the floodplain, and to ensure no net increase in water surface elevation and no net loss of volume within the floodplain. Mitigation included equalization culverts along the length of the roadway to ensure that the roadway does not trap water on either side, as well as volumetric mitigation in the form of the earthwork for portions of the Steamboat Creek Restoration. Information from both of these analyses was utilized within Quantm and in more detailed analysis of the three alternative alignments. Stantec developed a matrix that evaluated the three alternative alignments in terms of the issues previously discussed. An extensive evaluation can be found in the detailed Plan Line Study for the SouthEast Connector report.

In general, all three alternative alignments avoided taking homes; avoided significant sites of archeological/cultural interest identified thus far; and resulted in no net impact to the design flood elevation. The three alignments varied with respect to distance to nearest homes, amount of wetlands impacted, impact to the Rosewood Lakes Golf Course, and cost. The opinion of probable construction costs (with 20-35% contingency) and right-of-way costs for the three alignments range from \$157 to \$207 million. These costs represent a single phase of construction with no allowance for additional cost associated with multiple construction phases and do not include design and construction administration costs.

Note that an opinion of probable construction and right-of-way cost of \$144 to \$202 million was provided early in the plan line study. Its accuracy was consistent with the level of effort and design details investigated at that time. Additional information obtained during the remainder of the plan line study revised this opinion of probable construction and right-of-way cost to \$157 to \$207 million. Total costs, including construction, right-of-way, engineering design and construction administration varied from \$191 to \$252 million.

With the issues previously identified in mind, a hybrid alignment was developed, taking into account the favorable elements of various segments of the three alternative alignments.

Applying the issues of concern to the hybrid alignment yields the following questions and answers for consideration:

- *What is the impact to existing homes and proposed development?*  
This alignment maximizes the distance to homes where possible. No homes will have to be acquired for right-of-way.
- *What is the impact to flooding in this area, and to the improvements proposed by the Truckee River Flood Project?*  
Modeling of this alignment and its associated mitigation within the Truckee Meadows USACE/TRFMP hydraulic model shows that the proposed improvements do not raise the water level or reduce the flood volume within the Critical Flood Pool during the 117 year flood event.
- *What is the impact to the wetlands in this area?*  
Of the 220.4 acres of wetlands identified within the Valley Corridor, this alignment affects 10 acres (less than 5 percent), which will be mitigated as part of the flood mitigation.
- *What is the impact on sites of cultural/archeological interest?*  
Given the best available data, this alignment avoids all significant sites of cultural/archeological interest, identified thus far.
- *What is the impact to the Rosewood Lakes Golf Course?*  
This alignment affects approximately 10 holes of the Rosewood Lakes Golf Course. Relocation and or modification of the golf course will be to the satisfaction of the City of Reno.
- *How much would the hybrid alignment cost?*  
The opinion of probable construction cost, including mitigation, contingency of 20% to 35%, and right-of-way is estimated at \$167-\$181 million. The total opinion of probable cost including design and construction administration is \$203 to \$221 million. These costs represent a single phase of construction with no allowance for additional cost associated with multiple construction phases.

In addition to addressing the primary issues previously identified, the exercise of developing this alignment has revealed possible win-win situations for the community. The Truckee River Flood Project will generate a large quantity of excess soil as part of the Truckee River benching. This material could be utilized as fill material for the SouthEast Connector, potentially resulting in significant cost savings to both projects. In addition, the SouthEast Connector will impact portions of the Steamboat Creek. Realignment of the Steamboat Creek, accomplished in conjunction with the restoration project, could drastically improve the riparian nature of the creek, reduce pollutants, increase wetlands, as well as generate even more fill material to construct the SouthEast Connector.

## **RESULTS AND RECOMMENDATIONS**

An extensive alignment alternatives analysis, conducted as part of the Plan Line Study for the SouthEast Connector has resulted in a preferred alignment which has endeavored to strike a balance, maximizing distances to existing homes, minimizing impacts to wetlands and sites of archeological/cultural interest, and creating no adverse impact to design flood elevations. The opinion

of probable construction cost (including golf course, mitigation, and contingency) and right-of-way cost is \$167 to \$181 million. Total opinion of probable cost including design and construction administration is \$203 to \$221 million. In addition, this project may create win-win situations with regard to the Truckee River Flood Project and the restoration of Steamboat Creek. The hybrid alignment as presented herein is recommended as the preferred alignment for the SouthEast Connector within the Valley Corridor.

