# Stevenson Bridge Condition Assessment

**Firm**
Alta Vista Solutions

**Location**
Davis, CA

**Client**
Solano County

**Reference**
Nathan Newell
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**Project Completed**
2016

**Project Type**
Asset management

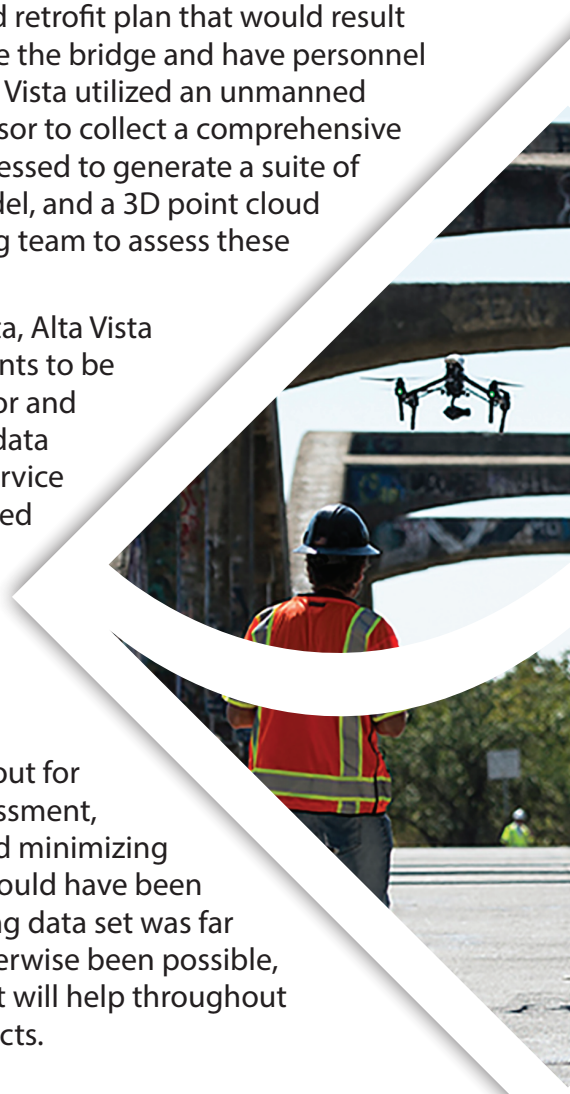
**Role**
Subconsultant

## Project Description and Scope

Solano County, in conjunction with Yolo County, Caltrans and the Federal Highway Administration (FHWA), is proposing to rehabilitate Stevenson Bridge crossing Putah Creek. Built in 1923, the bridge structure is 296 feet long and 24 feet wide with two 40-foot approach spans and two 108-foot tied arch main spans. The substructure is supported on reinforced concrete piers with curtain walls, founded on a timber pile foundation. The bridge will be retrofitted according to FHWA guidelines under the Highway Bridge Program. The rehabilitation will maintain the historical architectural features while extending the life of the structure between 50 and 75 years.

Alta Vista Solutions (Alta Vista) was responsible for assessing the soffit, transverse floor beams, hanger columns, arches and portals, pinpointing retrofit concerns, and developing a detailed retrofit plan that would result in minimal change orders. Rather than close the bridge and have personnel physically climb and assess the bridge, Alta Vista utilized an unmanned aircraft system (UAS) carrying a remote sensor to collect a comprehensive image data set. The images were then processed to generate a suite of seven orthomosaic images, a 3D mesh model, and a 3D point cloud model, which were used by the engineering team to assess these elements.

In order to ensure collection of relevant data, Alta Vista developed a detailed list of data requirements to be met, a flight plan for the UAS, and the sensor and UAS technical requirements; procured the data acquisition services from a qualified UAS service provider; and processed the images, analyzed the data, and generated a rehabilitation plan.



## Project Highlights

This project represents one of the first uses of remote sensors to gather condition assessment data. This method was carried out for approximately half the cost of manual assessment, while greatly reducing risk to personnel and minimizing traffic closure time to 10 percent of what would have been required otherwise. In addition, the resulting data set was far more comprehensive than would have otherwise been possible, and created a permanent photo record that will help throughout the duration of the retrofit and future projects.