



# TRANSPORTATION

PACIFIC SOUTHWEST CONFERENCE 2015

## OBJECTIVE

- ◆ This event gives students the opportunity to gain experience in transportation engineering. Students are expected to incorporate geometric design as well as traffic engineering to create a practical and efficient design,

## GENERAL PROMPT

A public agency has requested potential designs from multiple consulting firms, as they are proposing to develop a new rural highway in the Tucson area. Competitors are expected to design the highway including horizontal and vertical alignment, design speed, striping, signage, pavement specifications and a cost estimate.



Proposed Site

## REQUIREMENTS

All teams must follow the agency's requirements listed below in order to be considered for the bid.

## DESIGN CRITERIA

Design year: 2035  
Current ADT: 6450  
% Trucks: 11%  
Traffic growth rate: 1.5% annually  
Design Speed: 40 mph





Lane width: 12'  
Pavement Design life: 25 years  
Number of lanes: 1 lane, each direction

## ROADWAY PLAN VIEW

The plan view should indicate the centerline, edge line, medians, shoulders, sign locations and any part of the roadway including striping or signage.

## SAMPLE CALCULATIONS

Each variable found for the design of the highway should be explained with a detailed sample calculation, as well the formulas used to find these variables. The manual from which these formulas were referenced should also be cited. Hauling cost shall not be taken into account when determining cut and fill amounts.

## CUT AND FILL

The design should maximize the use of on-site materials to minimize transporting rock and soil. Please calculate the volume of soil that will be cut and used for fill in other locations along the highway. Submit a table showing cut and fill locations with volume calculations for soil used for each section.

## COST ESTIMATE

A cost estimate for the construction should be created. Estimate the variables associated with the construction and submit a detailed summary with the final cost.

## SUBMISSIONS

All documents should be submitted before March 2<sup>nd</sup>, 2015. They should contain the following:

- Plan view of proposed roadway
- A cost estimate for construction
- Detailed sample calculations for variables used
- A written summary for the proposed design
- A cut and fill table





These should be incorporated into a report. All bids should be submitted to pswc.2015@gmail.com by March 2nd. The email subject should be Transportation Bid\_(School name)

## WRITTEN REPORT

A summary of the design should be written, explaining the following:

- Benefit of the design
- How the design meets the specifications by the public agency
- Functionality of the roadway

This report should be included with the documents stated above. The written portion should not exceed more than 10 pages.

## POSTER SESSION

All schools should prepare a poster summarizing their highway design for Thursday, April 9<sup>th</sup> from 2-4pm. The posters will be displayed so that other participants can view your work. Each poster should contain school name, member names, drawings of the completed roadway, cost estimates, sample calculations, and any other additional details. There will be no presentation for this poster.

## JUDGING

Judging will be based on each school's submissions. The criteria are as follows:

Roadway Plan View	15
Sample Calculations	10
Written Summary	20
Cost Estimate	20
Cut and Fill Calculation/Diagram	15
Report Formatting	10
Poster Session	10
<b>Total Points</b>	<b>100</b>

Each submission will be judged with the point scale shown above. The team with the highest number of points will win the competition.

