Executive Summary

Portola Springs Roadway Design Project
Portola Parkway, Bucknam Way, McNally Ave
CEE 181 Team T2, May 30th 2009

Roadway Design For:

THE IRVINE COMPANY

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Planning Area 6 is located in the beautiful City of Irvine, California. It is a large piece of level and mostly undeveloped land, bounded by SR-133 to the north-west and SR-241 to the north-east that is perfect for development. Portola Parkway is the only existing arterial roadway that runs through PA6. Capital Engineering has been given the task of designing the roads in PA6 and their connections to existing roadways. Firstly, a proposed project has been designed to show the variety of roadways that a typical site plan would normally incorporate. In this proposed project, there will be three roadways designed by Capital Engineering according to the City of Irvine Standard Plans. The first roadway is Portola Parkway, a primary arterial highway. The second Bucknam Way will be a collector road, which connects to Portola Parkway. Lastly, McNally Ave a local street that connects to the collector road will also be designed.

Portola Parkway will be designed as a Primary Arterial Highway in accordance to the City of Irvine Standard Plans. This is a 4-lane highway with a raised median, as well as a bike lane in each direction. The design speed for Portola Parkway will be 55 mph. This road type was chosen because Portola Parkway will be a main roadway that connects to many collector and local streets. Due to these roads having much lower design speeds, the safest and most effective design for Portola would be a Primary Arterial Highway. An
alternative to this would be a Major Arterial Highway which is a 6-lane highway with a design speed of 60 mph. This, however, is too fast for a highway that connects to many smaller roads and would compromise the safety of the road.

The collector road Bucknam Way that connects to Portola Parkway will be designed as an industrial local street. This collector will have slightly larger lane widths than a typical local street, and it will have a design speed of 35 mph. Since this collector will have commercial areas immediately surrounding it, Capital Engineering made the decision to make the lanes larger, leaving more room for large trucks to drive through with ease. An alternative to this design would be to make this collector a smaller local street, but this wouldn’t account for the large size vehicles driving on this road due to the commercial buildings nearby and would eventually lead to much less serviceability.

The last road that will be designed is the local street, McNally Ave. The local street will have a design speed of 25 mph and will have parking available on both sides of the street. Capital Engineering designed this roadway keeping in mind that these streets will generally be surrounded by residential areas. An alternative to designing the local street this way would be to make the roadway much smaller in size, and eliminate the ability to park on the street. Designing the street this way might end up with issues with parking and would not be the best for the potential residents.
The three different roads were all designed to have a 4" thick hot mix asphalt wearing surface layer, to provide for maximum serviceability. The base layer material used was crushed stone, and is designed to be 12” thick for Portola Parkway, 14” for Bucknam Way, and 7.5” for McNally Ave. Portola Parkway needed additional support due to higher traffic volumes and more trucks, and is planned to use a 12.5” subbase of sandy gravel.

Along with the designs, some environmental documents will need to be reviewed and approved by the City of Irvine. The California Environmental Quality Act (CEQA) requires a review to show if an Environmental Impact Report (EIR) is necessary. The Environmental Checklist in the appendix of this report concludes that a complete EIR is required. All permits for grading, encroachment, pollution, utilities, building, etc. will also be prepared.

The designs done by Capital Engineering will provide for the highest level of safety and serviceability for all of the roads. All plans and approvals will be regulated by the City of Irvine. Full project build out will take approximately 34 months. The Environmental Review Process will take about 11 months to complete. Design, survey, and waiting for the City’s approval of permits will be approximately 180 days. Lastly, construction will take a contractor approximately 165 days of work to complete the project. The total cost of the project is expected to be $20.5 million dollars including contingency.