

Michael Wallwork, Roundabout Expert

Memo

To: Dave Olson, MRC
From: Michael J. Wallwork
Date: 3/21/18
Re: Comments on Proposed Roundabout at Highway 1 and Cypress Avenue

As requested, a quick look and some basic design checks regarding the proposed roundabout at the intersection of Highway 1 and Cypress Avenue found several issues that should receive further consideration. Following the notes on the two major issues of concern some ideas are provided as possibly a guide for refining the roundabout concept. Although these comments are based on the PDF's that you sent, their use instead of using CAD files would not change the basis of these comments.

1. Overall the proposed roundabouts have an entry speed, R1, that is higher than the exit speed, R3, the reverse of recommended roundabout design practice as shown below in figures 1 and 2.

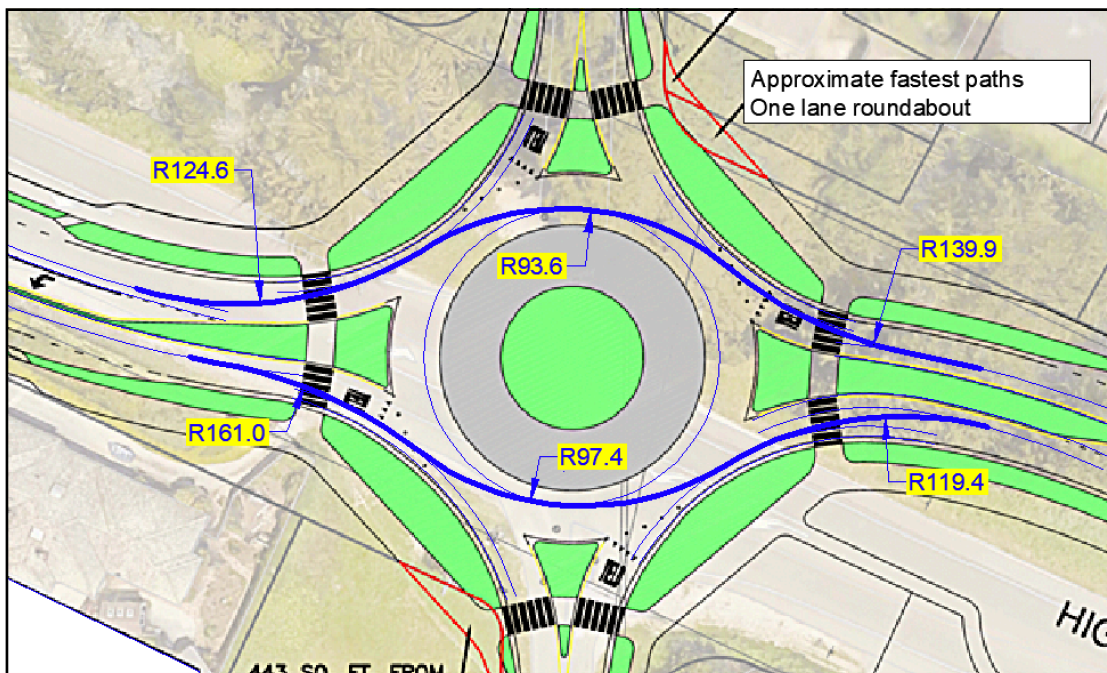


Figure 1. Likely fastest paths for the one-lane roundabout concept

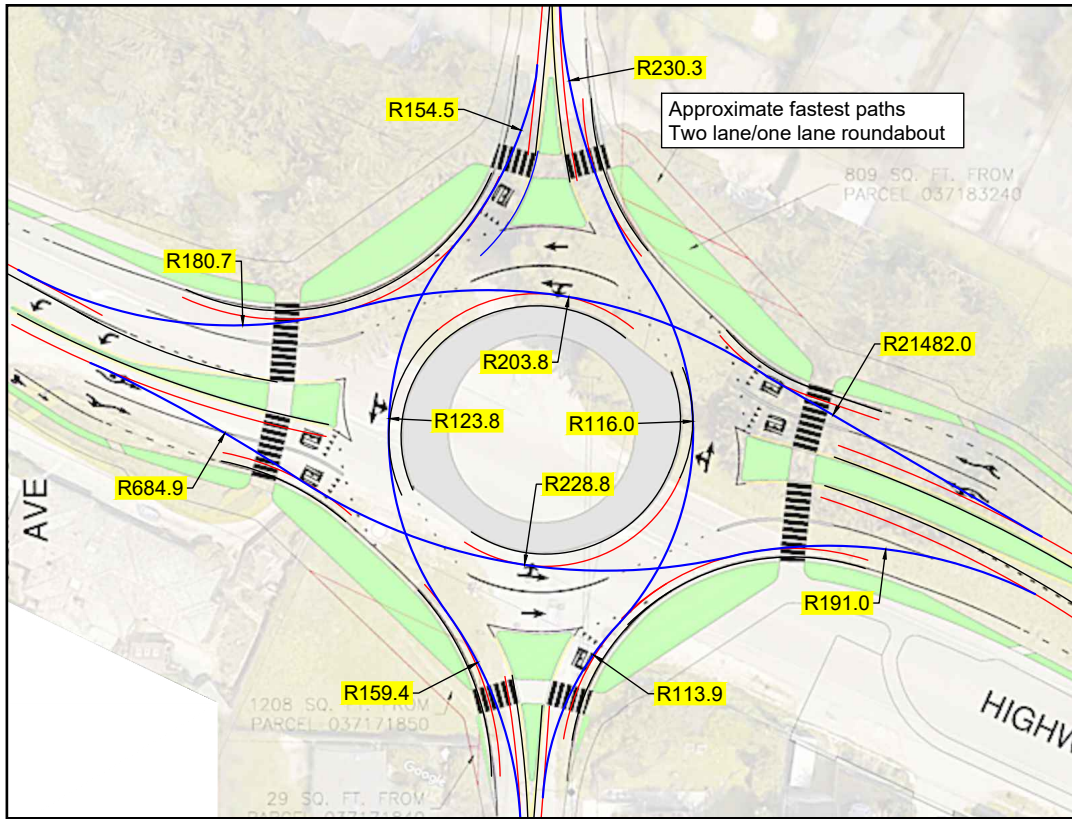


Figure 2. Likely fastest paths for the two-lane roundabout concept

The reason relationship between the entry and exit speeds is important is shown below. The roundabout below was built with a fast entry speed and a low exit speed. In the first six months of operation about 11 vehicles had hit the exit curb. A number of these vehicles mounted the curb and ran over the sidewalk.



Figure 3. A roundabout with a fast entry speed and a low-speed exit showing many hits of the exit curb.

2. A few truck templates were run using WB-50 truck as the design vehicle, a large furniture van, to test their ability to navigate the roundabout. It seems that the concept plans are quite tight with these trucks running close to the curb or, in a number of cases, are likely to turn over the curb. If a smaller design vehicle was used then the concept may be generous and could probably be narrowed. The red circles represent possible squeeze points where in some cases trucks are likely to mount the curb.

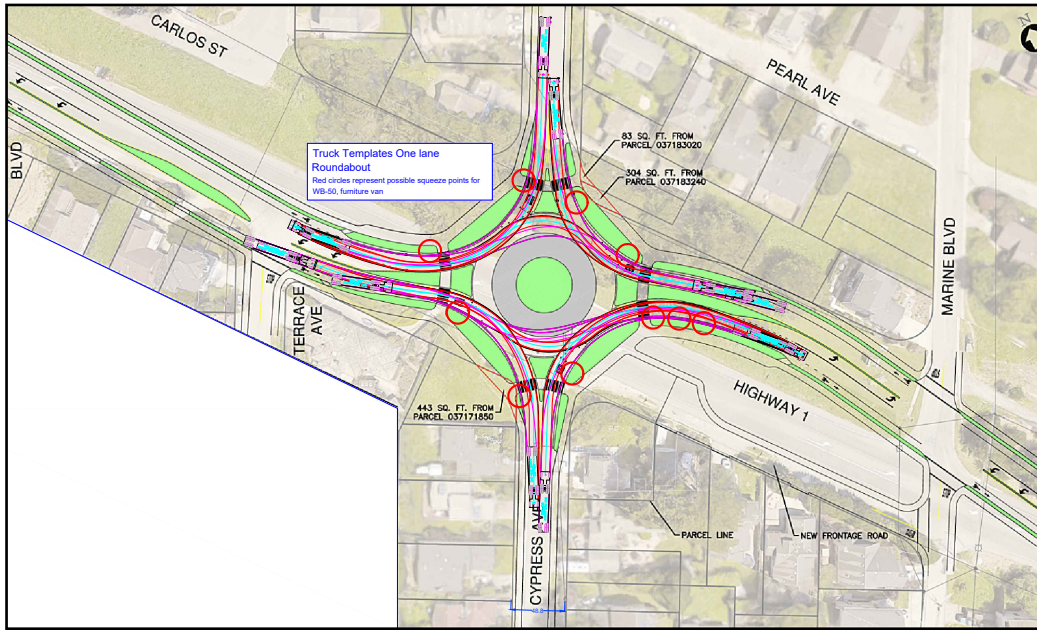


Figure 4. Likely templates for a one-lane roundabout

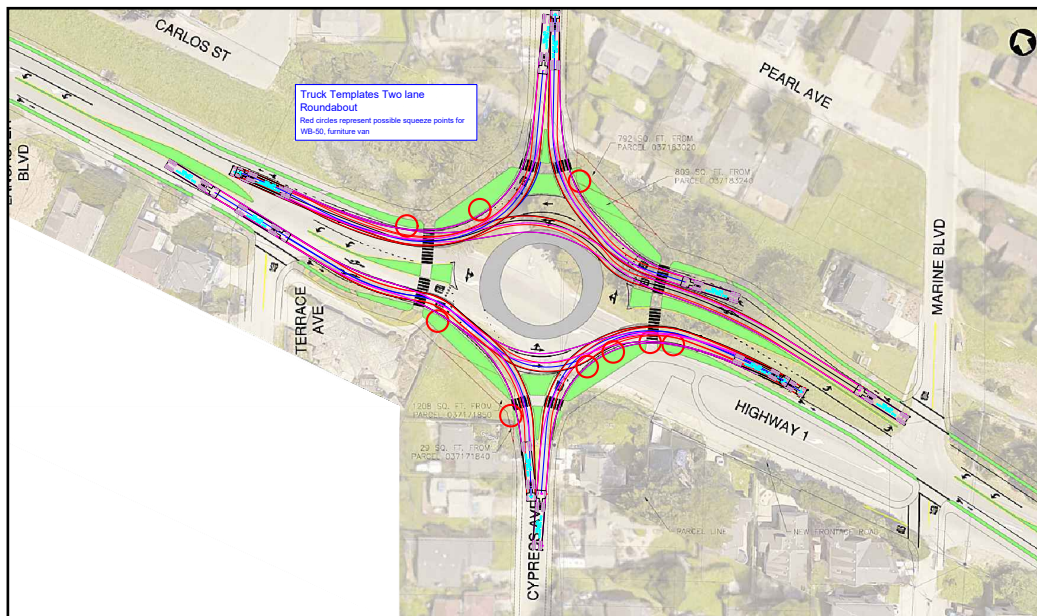


Figure 5. Likely templates for a two-lane roundabout

Suggestions for Refinement

To reverse the speed differentials a rough layout was prepared as shown below as an aid in refining the proposed layouts. This layout uses an elliptical roundabout that bends Highway 1 approaches to a greater degree while flattening the exit lanes to rebalance vehicle speeds to a slower entry speed with a similar or slightly faster exit speed. Based on the following suggestions the fastest paths are likely to be more like those shown in the second image below. Although faster, they are within NCHRP 672 recommendations for a two-lane roundabout.

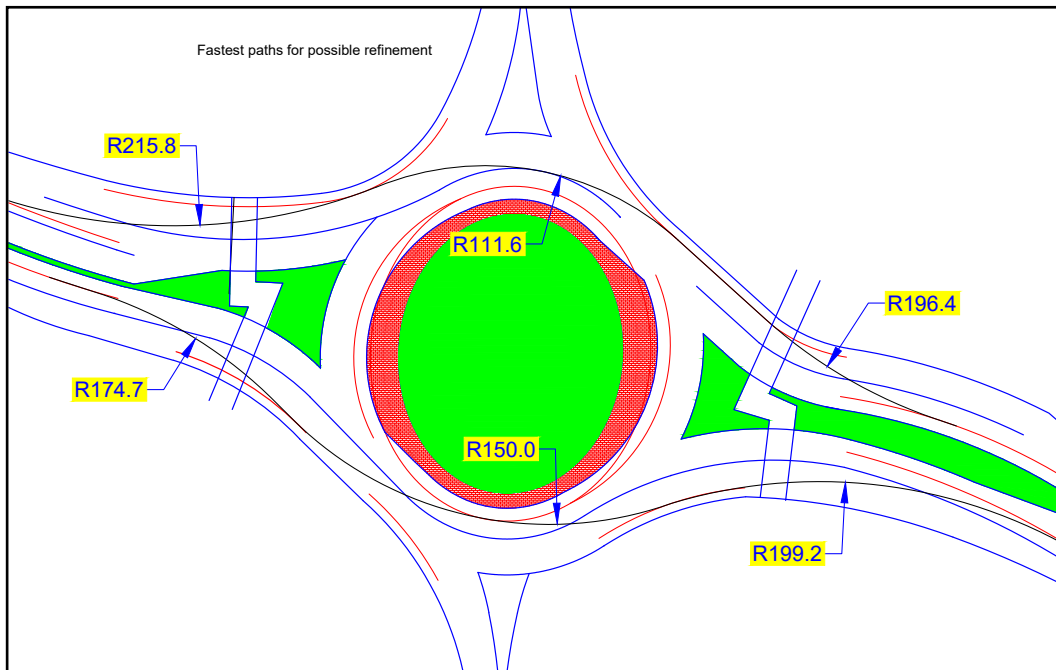
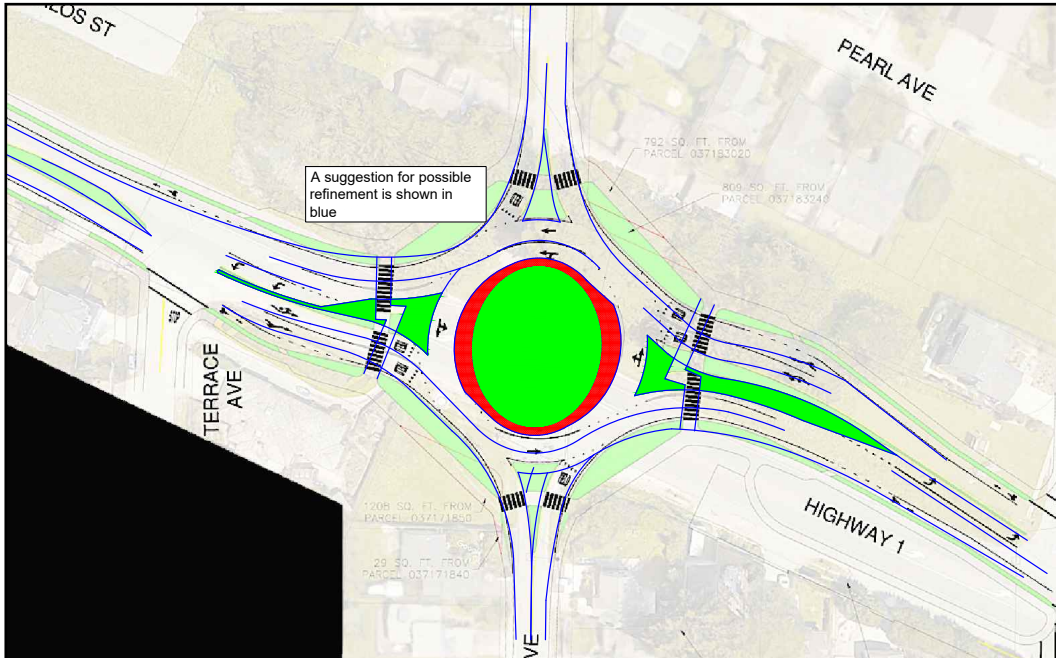


Figure 7. Likely speeds after refinement