

DEPARTMENT OF TRANSPORTATION

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March 26, 2021

Mr. Hasib Mohabbat
Division of Safety Programs
Caltrans
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Sacramento, CA 95814

SUBJECT: Request for CTCDC Guidance and/or Approval of Existing Signs

Dear Mr. Mohabbat:

Caltrans District 5 is requesting CTCDC guidance and/or approval regarding existing non-standard signage for large vehicles at a roundabout.

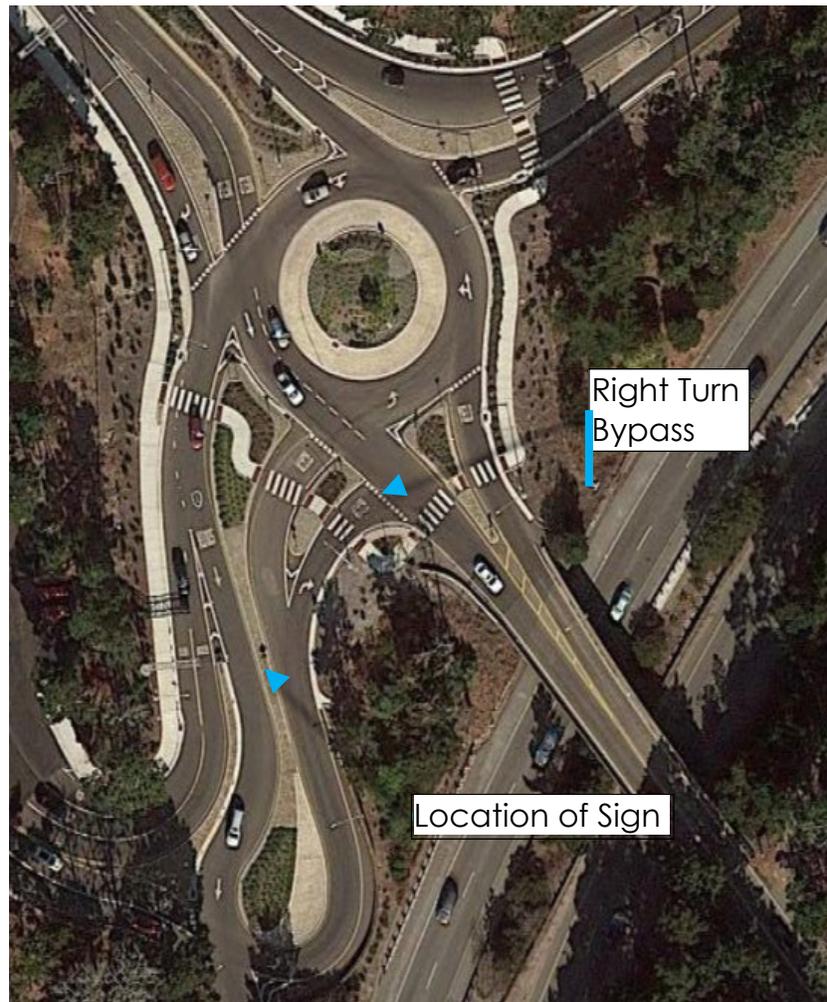
PURPOSE

The existing non-standard signage was installed at the northbound approach to the Roundabout at the junction of Routes 68 and 1 to advise the drivers of large vehicles (i.e. California Legal, STAA vehicles) as to how to make a right turn movement at the roundabout. (MON 68-L4.209)

BACKGROUND

The Holman Highway Roundabout at the junction of Route 68 and Route 1 was designed and constructed under Caltrans oversight with a minor road approach that has a through-left lane and a right turn bypass. Due to the constraints of the location, the design chose to only accommodate a 45' bus on the right turn bypass. The primary constraint at this location is the existing narrow overcrossing structure on the east leg of the intersection. There is not sufficient clearance available at this location to widen the right turn bypass to accommodate STAA vehicles and maintain pedestrian access. An aerial view of the location is shown in Figure 1.

Figure 1: Aerial showing the roundabout and the location of the non-standard sign



DISCUSSION

Due to the constrained design, larger vehicles, such as an STAA vehicle, are not accommodated and will either become stuck or off-track onto the pedestrian walkway if they attempt to use the right turn bypass. There were two instances during construction where large vehicles attempted to use the right turn bypass and became stuck blocking the roundabout.

It was always the intent of the design to accommodate larger trucks via having them use the circle of the roundabout to make a 450 degree turn to go right. During construction it was discovered that drivers would not immediately discern

that they should make what is effectively a U-turn maneuver to turn right, and nonstandard signage was developed by the design team to indicate to trucks the need to “ribbon turn” or make a 450 degree turn. Near the end of construction, the current black-on-yellow sign (Figure 2) was installed as shown in Figure 1 and is located approximately 100’ in advance of the yield line with what can in short be referred to as a “ribbon turn” message. It should be noted that during construction a similar black-on-orange construction area sign shown in Figure 3 was used.

Figure 2: Current non-standard sign at this location.



Since the signage was installed, it has been argued that because trucks no longer become stuck in the roundabout that the sign is working as intended. However, if one pays close attention to the location of the previous construction area sign next to the south crosswalk as shown in figure 3, and compares that to the location of the construction area sign that is visible at the extreme left of the Figure 4, it appears that the driver proceeded to become stuck at the roundabout despite the presence of the sign. While it could be argued that he position of the sign at that time was not far enough in advance of the roundabout to provide clear guidance, there are more indications that the current sign shown in Figure 2 might also not be working as intended despite it's better positioning.

Figure 3: Non-standard “Ribbon turn” sign used during construction that was located on the south splitter island next to the crosswalk.



Figure 4: STAA vehicle that became stuck during construction. The location of the original “ribbon turn” sign is circled in blue, at far left.



The current non-standard sign is located as shown in Figure 1, roughly 100' in advance of the roundabout. The sign was installed near the end of construction by the design team and since it was installed, no trucks have become stuck at the roundabout. However, the reality appears to be much more complicated.

Looking at the conditions that were present in Figure 5, during construction there was a deep depression behind the curb that caused the trailer's wheels to become stuck when the wheels off-tracked into the depression. Looking at Figure 4, it appears the depression was also present when that vehicle became stuck. At the end of construction the landscaping was installed which raised the final grade at the location in question and the finished surface is now at or above the height of the curb (Figure 6) thereby eliminating the obstruction that had previously caused vehicles to become stuck.

Figure 5: STAA vehicle that became stuck during construction. Note the drop-off behind the curb.



Looking at a post-construction image, (Figure 6) there has been damage caused to the curbs and the landscaping at this location due to trucks off-tracking. As can be seen in the image, the path of the trailer has off-tracked into the pedestrian areas outside of the crosswalk including the entirety of the detectable warning surface which is indicated by both the tire tracks and the damage at this location. There is also further damage to the splitter island on the eastbound exit at this location where drivers have hit the curb when presumably trying to make as wide of a turn as possible.

Figure 6: June 2019 Google Street-view image of the NB right turn bypass showing damage to the curbs and landscaping.



A. Possible Solutions

Unfortunately, the design does not accommodate large tractor-trailer type vehicles at the right turn bypass, therefore, simply removing the non-standard sign is not an option. Caltrans District 5 is not of the opinion that the existing signage is the best symbol or way of relating the message, however, this sign or something similar will be necessary going forward.

Currently, Caltrans District 5 is considering four options for this location:

- a.) Maintain the existing non-standard signage as shown in Figure 4.
- b.) Replace the existing signage with black-on-white regulatory signs (Figure 7).
- c.) Replace the existing signage with a word message sign "Trucks Use Circle for Turns."
- d.) Replace the existing signage with a word message sign "Trucks Use Left Lane" (similar to R4-5).

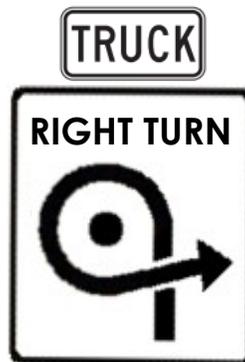
Options a and b would use a non-standard symbol that is intended to relate to drivers that they need to make a 450 degree turn to turn right. The existing signage includes a non-standard "Semi-Trucks" legend underneath to indicate that the sign is intended for large tractor-trailer trucks. It should be noted that a

request for experimentation was not pursued during design or construction, but the signage has been installed for almost 4 years.

Because there is evidence that the existing signage is not ensuring that trucks do not use the right turn bypass to make right turns, Caltrans District 5 is considering changing the signage. While we as designers know that trucks must make a 450 degree turn to go right, most drivers would not. Making a 450 degree turn is not something most drivers would think of doing on their own when they want to make a right turn at an ordinary intersection. Therefore, many unfamiliar drivers likely may not recognize that the symbol on the sign is telling them to “ribbon turn” to go right and are instead using the lane that has right turn arrow markings to make a right turn (the right turn bypass lane), not realizing until too late that they don’t fit.

To this effect, one concept under consideration would be to use the same non-standard symbol but apply the symbol to a rectangular black-on-white regulatory sign with the legend “Right Turn”. The regulatory sign would be supplemented by the M4-4 “Truck” sign as shown in Figure 7.

Figure 7: Proposed regulatory signage option



The third and fourth options are proposing to use text only to communicate how trucks should use the roundabout. These options are being suggested as an alternative to the existing symbol because there is evidence that the existing symbol is not universally understood by drivers.

SUMMARY

The existing non-standard signage located at the northbound approach to the roundabout was installed to instruct drivers of large vehicles to use the roundabout to “ribbon turn” to turn right. Due to the constraints at this location,

Mr. Hasib Mohabbat
March 26, 2020
Page 8

the right turn bypass lane does not accommodate large vehicles, however, the signage does not appear to be readily understood by all drivers. While trucks have not become stuck at the roundabout since the existing non-standard signage was installed, damage to the curbs and landscaping at this location indicate that trucks are still using the right turn bypass. Fortunately, the wheels of the trailer have off-tracked onto the landscaping and the pedestrian walkway without incident. Due to the risk posed by the truck off-tracking at this location, some type of signage is necessary from both a maintenance and safety standpoint as it is undesirable to have trucks off-track over curbs and into areas where pedestrians may be waiting at the crosswalks.

Thank you for your consideration of this request. Caltrans District 5 looks forward to receiving a response from the Committee. If you have questions or comments, please contact Jonathan Howard by email at Jonathan.Howard@dot.ca.gov or Roger Barnes at (805)-549-3473 or by email at Roger.D.Barnes@dot.ca.gov.

Sincerely,



HALLIE HOLDEN, R.C.E., T.E. on behalf of:
ROGER D. BARNES, R.C.E., T.E.
Senior Transportation Engineer
Traffic Operations Branch Chief