

## ISOAP Webinar Training Questions and Answers – November 20, 2024

- 1. Would the slides be emailed to us?** A PDF version of the slides will be emailed to all participants.
- 2. Is there an example prepared ISOAP memo that can be sent?** An example ISOAP report will be posted on the Caltrans ISOAP website in approximately two weeks.
- 3. We know DP-36 for ICE, is there a new DP for ISOAP?** Intersection Control Evaluation (ICE) was issued with a Traffic Operations Policy Directive (TOPD). The appropriate type of issuance document for a policy authored by multiple divisions (Traffic Operations, Safety Programs, and Design in this case) is a joint memo. There are no plans for a Director's Policy for ISOAP. ISOAP may get incorporated into manuals in the future.
- 4. Most of the time, roundabout cost is substantially higher than signal; what do you mean by comparable cost?** Because signalized intersections often require the installation of additional turn or through lanes, as well as the more extensive electrical costs, signalized intersections at times are more expensive than roundabouts. For the streamlined process, the intent of comparable is for the cost of the roundabout to be approximately the same as a traffic signal.
- 5. Regarding the cost of a roundabout is comparable to signalization, what is the acceptable ratio?** The intent is 1:1.
- 6. the BIGGEST problem I see in the process is very often it seems that the budget for the project is set before any analysis or ISOAP/ICE is completed. The roundabout option is often more expensive and ruled out for budget reasons. At locations where we don't meet signal warrants what does this leave us with?** If the roundabout is too expensive and signal warrants are not met, then various other control strategies should be considered, especially the RCUT. Also, the State of Washington is installing mini-roundabouts with an inscribed circle diameter (ICD) of 80' at I-5 ramp termini with high truck percentages. A 150' diameter roundabout is not always needed.
- 7. RAB's require right of way and can be long lead projects. Any thoughts?** Consider smaller roundabouts where possible, as they will be more affordable and will have fewer impacts.
- 8. Signal Warrant - When will the revised FHWA Warrant 7 be adopted to support the roundabout streamline process?** The updated CA MUTCD is scheduled to be released in January 2026.
- 9. Which chapter of the HSM talks about the application of HSM to roundabouts?** Since there are no Part C specific roundabout intersection crash prediction models (CPMs) in the HSM, 1<sup>st</sup> Edition, Ch. 14 – Intersections in Part D of the HSM, contains Part D CMFs to supplement the Part C CPMs. However, since the release of the HSM, 1<sup>st</sup> Edition, all Part D CMFs including the HSM Part D CMFs are contained and updated in the FHWA CMF Clearinghouse. Therefore, the

Clearinghouse is the recommended resource for all HSM Part D CMFs including roundabouts.

**10. Does the RCUT require a wide median for the U-turns?** An RCUT may be placed at a location with a narrow median. To accommodate the truck turning template at such locations, a “loon” can be placed in the outer shoulder area.

**11. I thought Caltrans is moving away from having islands in the middle of road for the safety of pedestrians. And, those islands are too small for high ped area?** Pedestrian refuge islands are a proven safety countermeasure in urban and suburban areas and should continue to be considered. At signalized crossings, they can be eliminated if sufficient pedestrian crossing time is provided.

**12. What is the minimum distance the RCUT U-turn should be placed from the intersection? I've seen something like 400', but when you have multi-lanes and high speeds, seems like it should be further. Are there design specs for this?**

Caltrans does not have a standard design for an RCUT. In general, the U-turn location should be placed 400' to 1000' from the main intersection.

Considerations are design speed, queuing, and acceleration and deceleration distances. Also, drivers entering from the minor street can wait for a gap, which allows them to immediately cross to the inside or an auxiliary lane that extends to the U-Turn opening. For additional guidance, refer to this FHWA publication:

<https://safety.fhwa.dot.gov/intersection/rltci/fhwasal4070.pdf>.

**13. Will Caltrans work with Synchro software company to add these intersection control types in their software models?** These designs can be analyzed with Synchro, though it takes some work to input the configuration. It is analyzed in SimTraffic as a network.

**14. what is the maximum speed required for (if any) roundabouts approach?** There is no maximum approach speed for roundabouts.

**15. Any information or guidelines to consider for a turbo roundabout?** A turbo roundabout should be considered wherever a multilane roundabout is being considered. Some features of a turbo roundabout, such as the concrete dividers, can also be considered for a more traditional multilane roundabout without incorporating all the features of a turbo roundabout. See Index 405.10(22) of the HDM for additional references regarding turbo roundabouts.

**16. Are the modular units for roundabouts on the approved materials list and actually approved for that use on the SHS?** The company that developed and now manufactures modular roundabout kits (VORTEX) is preparing to submit a request to the Caltrans New Products/Materials Committee for evaluation of their product. For more information, please contact Jerry Champa of HQ or Andreas Krause, the District 1 Safe System Lead.

**17. For the RCUT, are there any design guidance on how to determine how far the U-Turn area should be placed from the intersection with the side road? It looks like the vehicles coming from the side road still have to change lanes couple of times which might introduce sideswipe collisions. So, I am just wondering if there are any guidance that will help determine where to properly place the U-Turns and if we still have to consider time gaps, SSD, design speed allowable for this**

**intersection control, AADT, %Truck Traffic, etc.** The U-turn location is typically placed 400' to 1000' from the main intersection. Considerations are design speed, queuing, and acceleration and deceleration distances. FHWA has an info guide for RCUTs that has some guidance for distance from main intersection to U-turn. Here's the link to the guide:

<https://safety.fhwa.dot.gov/intersection/rltci/fhwasa14070.pdf>.

- 18. Can you mention the use cases for the peanut shaped roundabout. My understanding is they work really well for skewed and offset intersections.** A peanut-shaped or dog bone roundabout is usually considered at locations with high skews, closely spaced or offset intersections, or tight diamond interchanges. An alternative of two closely spaced roundabouts should also be evaluated to determine which configuration would perform better at the specific location. The upcoming in-person ISOAP workshop training will include a module on innovative roundabout configurations and mini-roundabouts.
- 19. Is it still up to the "engineering judgement" in determining the most suitable signing package for this diverging diamond interchange?** The MUTCD does not have specific signing details for DDI. NCHRP Report 959 Diverging Diamond Interchange Informational Guide provides guidance on signing.
- 20. RCUT probably not appropriate for 6 lane facilities?** RCUTs are typically placed on 4-lane facilities, but there is nothing that inherently restricts RCUTs only to 4-lane facilities. On a 6-lane facility with a traffic signal at only the main intersection, of particular concern would be to make sure that the traffic queue does not extend beyond the U-turn location.
- 21. Where can an agency or developer get guidance to conduct.** This question appears to have been cut off, and more information is needed to respond.
- 22. Does ISOAP consider analyzing for Rectangular Rapid Flash Beacon at pedestrian crosswalk locations with no stop control (i.e. free right turns areas)?** All pedestrian facilities at an intersection should be analyzed for ISOAP. ISOAP does not provide specific guidance regarding RRFBs or free rights, but other guidance, such as the Caltrans Complete Intersections guide or Caltrans Pedestrian Safety Countermeasures Toolbox, can be used to assess appropriate treatments at free rights.
- 23. What is included in the ISOAP documents?** Documentation for a submittal of ISOAP should include the form for the appropriate stage that is being submitted and backup material that can include exhibits showing proposed intersection geometrics, cost estimate, and summary printouts for any software that was used.
- 24. Who in HQ revises the CCA calculator for B/C? We need new rate groups for Single Lane, Hybrid and Multilane roundabout added to that calculator.** The Division of Safety Programs will be updating the Safety Index and CCA tool reflecting additional data available from the increased number of roundabouts on the State Highway System.
- 25. The ISOAP guidance states that Stage 1 is typically done before or during the Project Initiation Document (PID) phase. For instance, if an improvement to an**

**intersection is identified during a traffic investigation or local development review, then Stage 1 of ISOAP can be completed before the initiation of a project. Safety improvement projects are PIP during the traffic investigation. Should stage 1 of ISOAP be completed before the initiation project or during the K phase?** The expectation is for Stage 1 of ISOAP to be completed during development of the PID during K phase. However, it can be done in conjunction with the traffic investigation if the necessary information is readily available, if there is only one viable strategy, or if a streamlined process applies.

- 26. Safety improvement projects are PIP during the traffic investigation phase with one proposed alternative. Stage 1 of ISOAP has not been completed, the safety project will carry over to the PID phase. During the PID phase, while preparing step 1 of ISOAP, we cannot select the best alternative because the alternative has already been recommended by the traffic investigation and approved by HQ. Do we still need to prepare step 1 of ISOAP during the K phase?** Yes, if Stage 1 of ISOAP was not completed in conjunction with the traffic investigation, then it will need to be done during the PID stage. If for some reason a different recommendation is generated during ISOAP, then the Program Advisor should be consulted as it is possible to change the scope of safety projects.
- 27. Can we start Stage 2 even before PA&ED? Is the Table 1 from the ISOAP memo just a recommendation?** Yes, Stage 2 of ISOAP can be done prior to PA&ED. The table shows when the stages would typically be done. If during PA&ED new information or new potential alternatives are developed, the Stage 2 evaluation can be updated.
- 28. For a local road realignment on a State Highway in a high-volume location, the locals will need to go through permits and most likely the QMAP process requiring PID. They would like to go directly to the 2-lane roundabout option. My understanding is that they can eliminate the Signal Alternative in Phase I and move forward with the 2-lane roundabout from PID to PA&ED. Can we share the latest ISOAP document to get them on track early on?** If both a 2-lane roundabout and a traffic signal are viable control strategies during Stage 1 of ISOAP and there is sufficient information to analyze both strategies, the traffic signal can be eliminated if it can be shown that the roundabout will have clearly superior safety outcomes and if there is no constraint that would prevent the roundabout from being built. If right-of-way acquisition or environmental clearance are expected to be difficult, then it is advised to proceed to Stage 2 with both options.
- 29. Intersection type and footprint needs to be determined during the PID stage and will require Synchro, Sidra, VISSIM, etc. analysis; which is Step 2.** The detailed analysis is normally done in Stage 2 but can be done in Stage 1 if the traffic information is already available or can be made available. Absent the detailed analysis, a best guess as to the configuration is made based on rules of thumb, engineering judgment, and prior experience.
- 30. In the past HQ HSIP required use of a benefit to cost ratio calculator to determine if a roundabout was eligible for HSIP funding. Are we still using that same Excel**

**based B/C calculator? Or is there a new calculator we should use?** The Collision Cost Analysis Tool (Excel spreadsheet) calculates a B/C Ratio. All HSIP proposals (for both local and State Highway intersections) are required to use the CCA Tool. An update is getting underway. More to come after the webinar.

- 31. Safety improvement projects use crash reduction factor (CRF). Step 1 of ISOAP applies the SPICE tool, and step 2 uses the HSM. Is conducting a safety analysis using SPICE and HSM in these steps still necessary? Or there is no requirement to perform SPICE and HSM? Can we rely on the safety performance measures used in the CRF?** There is no requirement to use SPICE in Stage 1. A review of the collision history may suffice, and a comparative evaluation of the control strategies can determine which should be considered. The use of HSM is required in Stage 2 when applicable.
- 32. Be aware, some time a Fire Chief is the opponent of a roundabout concept.** For the proposed roundabout in Mendota, the Fire Chief had concerns but was made aware of the fire station in Clovis located adjacent to the roundabout at the intersection at Temperance and Alluvial Avenues. The Fire Chief had discussions with personnel at that fire station, which revealed no concerns being near a roundabout.
- 33. Please train staff how to perform the appropriate analysis for ISOAP and budget enough time and resource.** The upcoming in-person workshop will include exercises going through the stages and steps of ISOAP.
- 34. Can you define "3ST?"** 3-leg stop controlled.
- 35. Can we also use Warrant 7 about Crash Experience for this?** More context is needed to respond to this question.
- 36. Not allowing trucks to turn off of mainline in the downtown area? is that a good idea?** The specific traffic pattern for trucks should be evaluated at intersections. In general, turning movements in a downtown area should accommodate delivery trucks but not STAA trucks unless specifically needed to access an industrial area or businesses that receive such loads.
- 37. Should LOS be reported in our ISOAP analysis/memo? i saw LOS being reported in an earlier slide, but it's no longer an MOE.** While LOS is no longer the standard performance metric, it is one indicator of the performance of an intersection. In general, daily person hours of delay (DPHD), queuing, or another metric should be used. LOS was shown in the case study because that project was originally evaluated with ICE and DPHD has not yet been calculated.
- 38. I saw the LOS being reported in an earlier slide too. If it's no longer an MOE, to which values do we compare our volume/capacity ratio, queuing values that we get in order to establish a justification?** The district Traffic Operations functional unit should be consulted as to guidance in evaluating the mobility performance of intersections. The context will be important in evaluating what would be acceptable delay and queuing. For instance, in a downtown urban area, more delay and queuing may be tolerated than at a high-speed rural intersection.
- 39. Do roundabouts help prevent wrong way drivers?** The geometry of properly designed roundabouts can deter wrong-way movements. For instance, where

there is a two-way local road opposite an off-ramp, a roundabout may be a beneficial control strategy to deter wrong-way movement onto the off-ramp.

- 40. Can roundabouts have stop sign control? I thought they eliminate stop signs.** Roundabouts are to have yield control and not stop signs.
- 41. What tools do you use to evaluate transit only lanes?** For a qualitative safety analysis, the FHWA CMF Clearinghouse may have transit-related Part D CMFs that match the before and after conditions of an intersection control strategy. For operational analysis, a micro-simulation model in VISSIM can code a lane for transit-only use and outputs performance measures for transit and all vehicles at a study intersection.
- 42. Is roundabout effective at off-ramp termini (T intersection) with speeding issue and incidents where vehicles crash into object at the intersection.** A roundabout could be a highly effective control strategy at an off-ramp that has speed-related collision history. Proper geometry in the chicanes and appropriate warning devices are needed to achieve the speed reduction prior to vehicles entering the circulatory roadway.
- 43. How effective the roundabouts in high-speed highway conditions? Would it interrupt the flow of traffic?** Roundabouts are highly effective on high-speed highways. Some geometric delay is introduced, but it is typically less than the control delay introduced with a traffic signal.
- 44. Can the roundabout be proposed at the high pedestrian/bicycle volumed intersection? What is the guideline?** Yes, a roundabout can be proposed at high pedestrian/bicycle volumed intersections. As with all marked crosswalks, those at roundabouts shall be located and designed to provide *complete* traffic and design features and adequate inter-visibility. The Highway Capacity Manual (HCM) includes performance analysis methodology for pedestrians and bicycles at intersections. Sidra should be used for evaluating the operations of roundabouts. There are inputs for bicycle and pedestrian volumes, and its performance measure outputs in terms of “person” considers pedestrians, bicycles, and other mode users.
- 45. As Traffic Engineers we see the benefits of roundabout, why does the public not like them?** A few potential theories are that people do not like change in general, they may have had bad experiences at other types of circular intersections, or they feel that others cannot properly drive roundabouts.
- 46. How about double multi-lane roundabouts that connects merges into a one lane?** This scenario requires site-specific analysis with more details on traffic volumes and lane configurations. A microsimulation model in VISSIM can be used to study the operational performance including delays at each roundabout, queues between the two roundabouts, and the queue due to the merging to one lane geometry.