

Hi All,

Scott and I discussed this on the phone, but I will try to clear up any confusion for everyone else. And I apologize in advance for introducing acronyms but hopefully their meaning is pretty self-explanatory.

For Option 1.A. – the concerns I expressed at the meeting pertained to intersection geometry but before investigating that aspect of it I double-checked the traffic analysis which shows that simultaneous protected northbound and southbound left turns result in unacceptable LOS. This fact made verifying the turning templates a moot exercise and therefore I did not complete it. Also, the reason a protected NBLT works but a protected NBLT+SBLT does not work is because if we only have a protected NBLT, northbound traffic can proceed straight through the intersection at the same time – this would not be the case with a protected NBLT+SBLT. And just to be clear, when there is a protected LT phase, all opposing through traffic and pedestrians crossing the receiving lane(s) MUST be stopped.

For Option 1.B. – this issue is somewhat complex and difficult to explain in a few sentences but suffice it to say that in traffic signal timing we base the amount of green time for a given movement on the volume of cars and the movement that requires the most amount of green time is defined as the critical movement. If we base the timing on percentages the intersection would not operate efficiently and inevitably one or more approaches would begin to back up. For the NBLT and SBLT at Diamond/Bosworth, the left-turns as a percentage of all traffic on their approach are about equal, but we know that beneath those percentages are real numbers and that the NBLT has a demand of 229 cars and the SBLT demand is 137 cars. That means the NBLT has 67% more vehicles than the SBLT. In addition, in the NB direction there are 243 vehicles going straight or turning right, but in the SB direction that total is only 165, i.e., the NB demand is 47% greater. And since cars going straight and cars turning right must share a single lane (the case for both NB and SB), it only takes having that first vehicle in the queue wanting to go straight to hold up all of the potential right-turners and therefore the expectation is that the majority of the straight thru and right-turn movements will occur only when the light is green. Taking all these factors together, we can begin to understand why the intersection Level Of Service breaks down when we introduce a protected SBLT phase – it's primarily because during a protected SBLT phase, all of the NB straight thru and right turn traffic must be held back, then during the subsequent green phase we are unable to provide enough time to serve all of those vehicles, not to mention serving the demand for EB and WB, and still keep the overall signal cycle length below 120 seconds. And to further explain the subject of cycle length, here is an excerpt from Ricardo Olea's 5/15/15 memo about Diamond and Bosworth signal phasing options:

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Regarding Bruce’s other point about favoring southbound over northbound because the effects of congestion are greater in the residential/commercial area north of the intersection than they are coming off the freeway to the south, I will start by saying that when it comes to the signal timing at Diamond/Bosworth there is no magic bullet and there will be some trade-offs. I discussed this very point with Ricardo and we both agree that when taking a more macro view of traffic operations at and around Diamond/Bosworth, there is little question that causing back-ups on NB Diamond (which having a protected SBLT would do) will negatively impact traffic on Monterey as far back as the freeway on/off-ramps at Monterey/Circular, and that would have a far greater impact on a much larger number of people than the alternative.

I know I have just given you a lot of additional information so please let me know if you have further questions.

Thanks,  
Damon

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