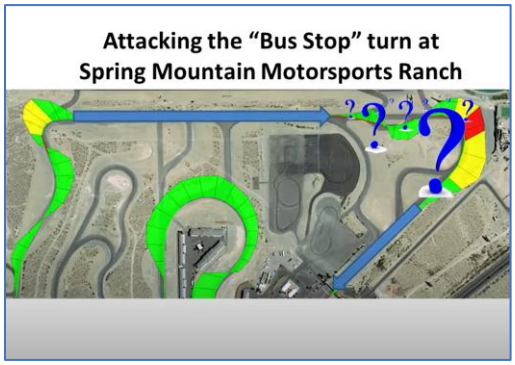
The Bus Stop Turn

I was first introduced to the Bus Stop Turn on May 6th and 7th 2016. Up until I actually drove the Mansell Course at Spring Mountain; I didn't even know it existed. The first few laps on that Saturday morning absolutely got my attention with the number of things I had to think about during the entire half minute to minute long excursion in the south eastern section of the track. It was not until the afternoon that I started to feel comfortable, having discussed it with a couple of the Instructors I had had the previous year at the Ron Fellow's Driving School. But even then, as I departed the track and the Track Days activity at noon on the Sunday, well let's say my fascination was peaked with the entire concept of Bus Stop Turns negotiation.

The days following the Track Days were occupied with the video and the data recorded during the 6 separate sessions on the track. I parsed the video and overlaid the data, countless times. Additionally, following Corvette Racing, I paid extra attention to the Daytona and Watkins Glen races; analyzing how the professionals attacked the issue. The differences between the two tracks, Daytona to the left and Watkins Glen to the right, provided a great deal of insight, as I eventually determined that, how you positioned the car, and at what speed you approached the turn probably determined the speed and comfort of the negotiation.

It was not long after those initial Track Days, that I finally composed a couple of videos that summarized my "take-aways" of what I have made famous with "The 10 Questions" and the ten different examples of other variables that come into play.

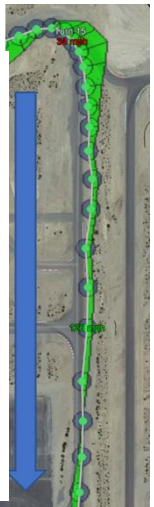


During my "Mission Across America", I did get to visit the new road course at the Corvette Museum Motor Sports Park. They too have a Bus Stop turn, however my time on that track was escorted and they didn't even venture through the Bus Stop, they took the straight away by-pass. But, later at Watkins Glen, I was allowed to pursue their Bus Stop at my comfort speed. It was during that visit to that track that I realized that the depth of the turns makes the negotiation entirely different. And I prefer the turns at Spring Mountain; as it requires more finesse, as the depth of the excursion is the secret.

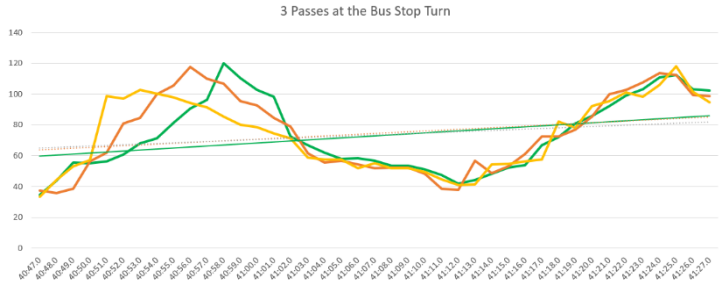
I am pleased that all of my studying and research has paid off. The May 1st 2021 adventure allowed, however briefly the opportunity to feel fully comfortable taking the Bus Stop turn at a vastly superior speed than ever before. I can indeed approach the turns at upwards to 120, and depart at speeds up to 118, and be completely at ease. I know it will be so much better on good tires, and I look forward to doing that section of track again, saving the time to perhaps do the Mansell course under 200 seconds.

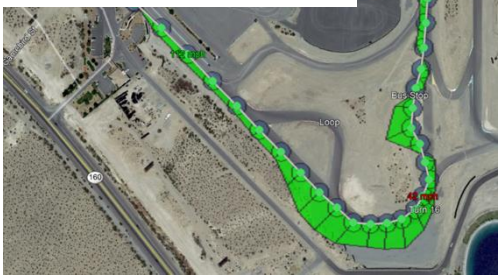
Note 1 If you're as Anal as I am and want to see the spread sheet of data of this KEY Lap. Click on the graphs on page 2 and it will take you to a link that will download the spreadsheet for you – then scroll down to see the graphs.

THE MATH OF IT.

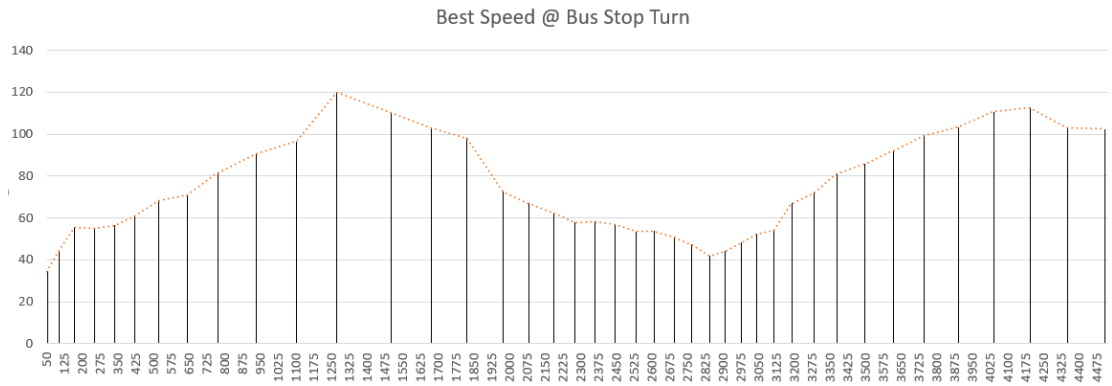


What you see here is the section of the track that is associated with the Bus Stop Turn. It is that little jog to the left at the bottom of the long straight, just before Turns 16 and 17 which create the 135 degree turn to the Michelin Straight, and the Start/Finish Line. A distance covered almost 4,500 feet long; it represents almost 1/3rd of the distance of a lap on the Mansell Course at Spring Mountain. The very long southbound straight is the longest straight away on the course. Your best speed on the track is expected here. Which is the first question of the 10, and there are three parts that you have to consider; how fast, how far, and where do you take your foot off the gas? At 120MPH you have two seconds to ponder the answers. At that speed you are covering about 153 feet per second. The graph[1] below shows my three laps using the 120MPH time scale to show the comparison. Note the green lines, that is the 120MPH lap with an increasing average.

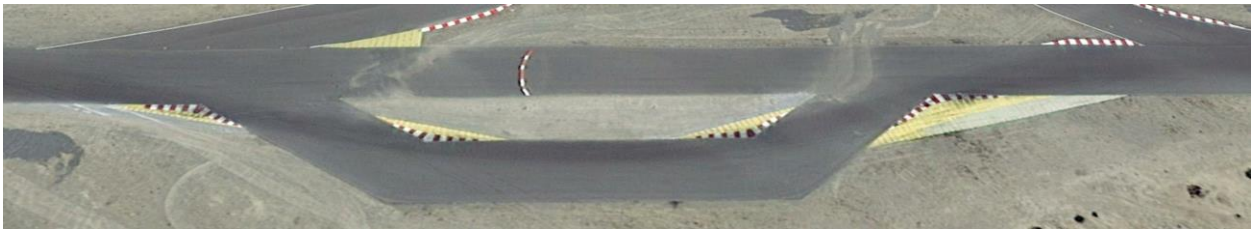




The 40 second tick marks showing the speed above does not tell the story of the green location dots on the map. A better representation is the graph[1] below that shows the 40 one second marks at speed by distance covered, starting at 50, and ending at 4,500.



The 10 questions, requiring action on your part, gas pedal, brake pedal, right turn / left turn at what angle, and where you are in relationship to the track (and other drivers) all come into play; with the most densely packed tick-marks being IN the Bus Stop Turns.



THE TIRE STORY

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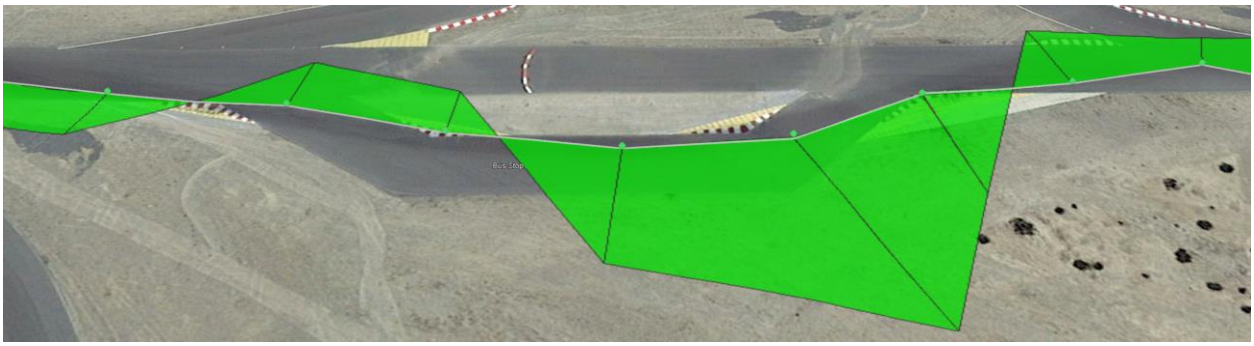
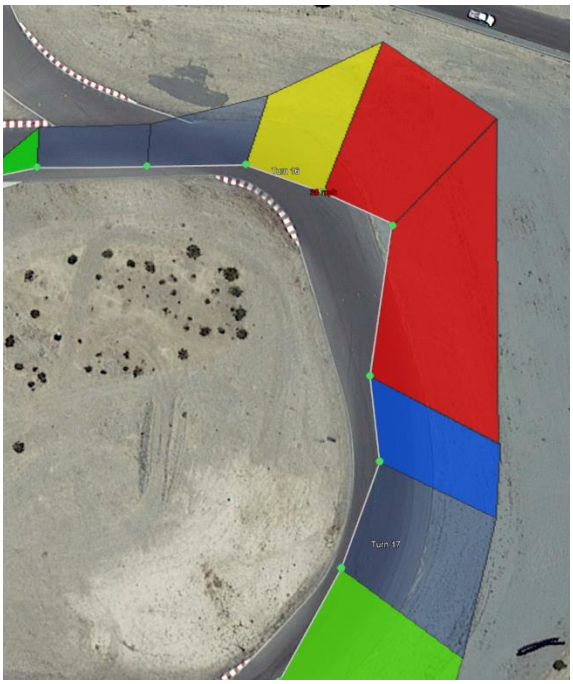
Shown here is my 118MPH pass at the Bus Stop Turn. In this picture, my position and lateral G's are shown. The positioning by GPS and the recording of lateral G's shows a successful pass at the Bus Stop turns. However, they are immediately followed by the approach apogee and then the apex of Turn 16.





The picture to the right here shows Turn 16 and the issue of the tires that caused my early retirement from the 2 days of six sessions on the track. The risks imposed by the aged tires, was the deciding factor. In the picture above the two green polygons in the upper right corner are shaded light blue, in the picture to the right. Those two regions of building lateral G's , provided me with an uncomfortable "feeling" of stability. In the Yellow marked region the rear tires were about to, and they did in the two red regions. Now it is break loose important to know that the back end of Calypso did NOT break free, nor did I leave the track as shown. However the GPS "lost it" with unexpected momentum. The traction control along with most likely the ELSD (Electronic Limited Slip Differential); kicked in and allowed me to recover stability and traction. So the approach apogee to Turn 17 did not go as desired. However, at the point where I reached the apex of Turn 17; I was "back on track" and able to execute the Michelin Straight as if nothing had happened.

At the time it was strictly a "feeling", there was no damage and no risk, Calypso's Track 2 Mode and ELSD did their thing. But the "feeling" put me ill at ease, and unsure of performance and ability to safely drive the course at speed. It was not until days afterwards, downloading the collected data that I was able to see the combination lateral/linear acceleration vectors (lower red polygon) going in opposite directions, AND the GPS complete departure from the track that let me know that I had made the right decision at the time.

Finally, I am grateful to the engineers at GM, the Corvette Engineers, that in this time of artificial intelligence and automated cars making decisions and taking action on behalf of the drivers, that THEY allow the drivers to have control and the feeling required to make the right decisions. THAT to me is the American way. Life, Liberty and the Pursuit of Happiness, coupled with the responsibility to others.

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