

# Lime Rock “Trackside” Classroom

*Why Drive This Line?*



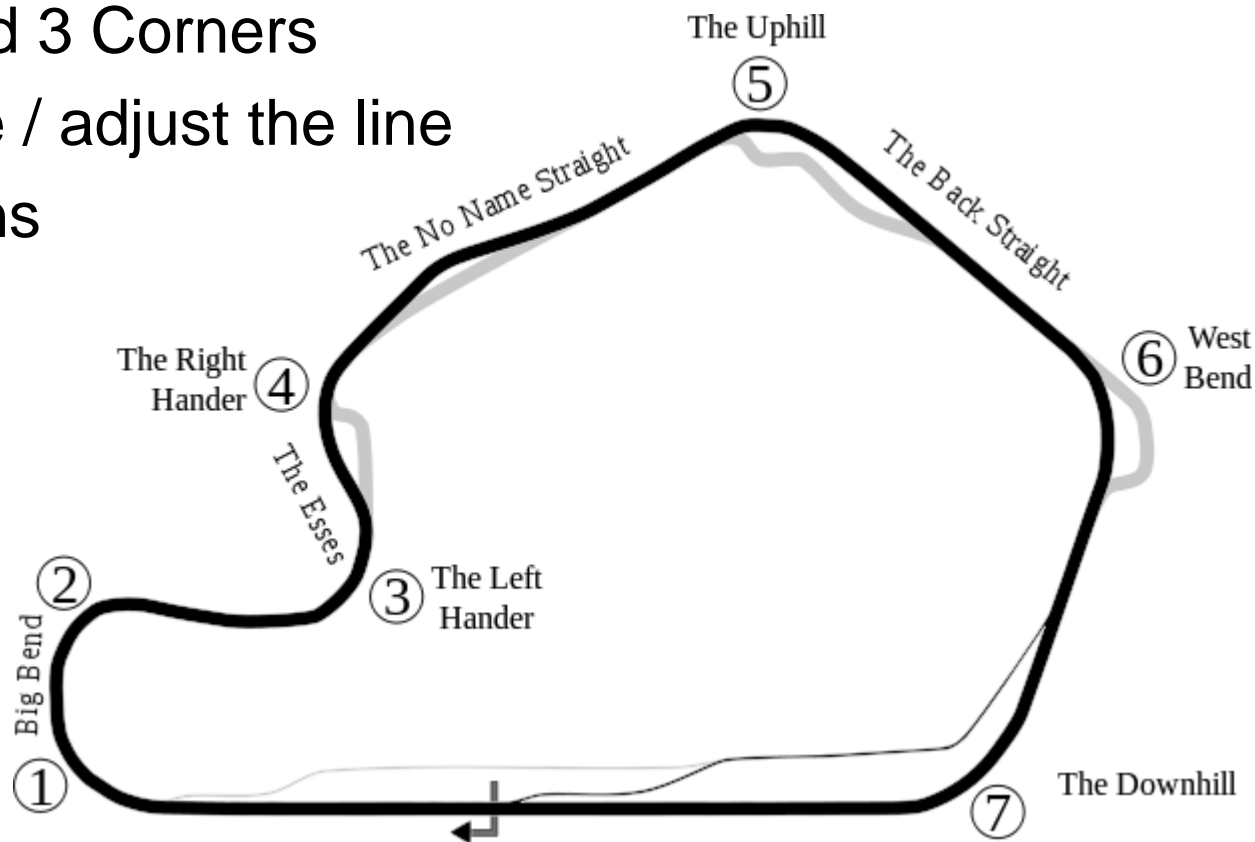
## ***Disclaimer***

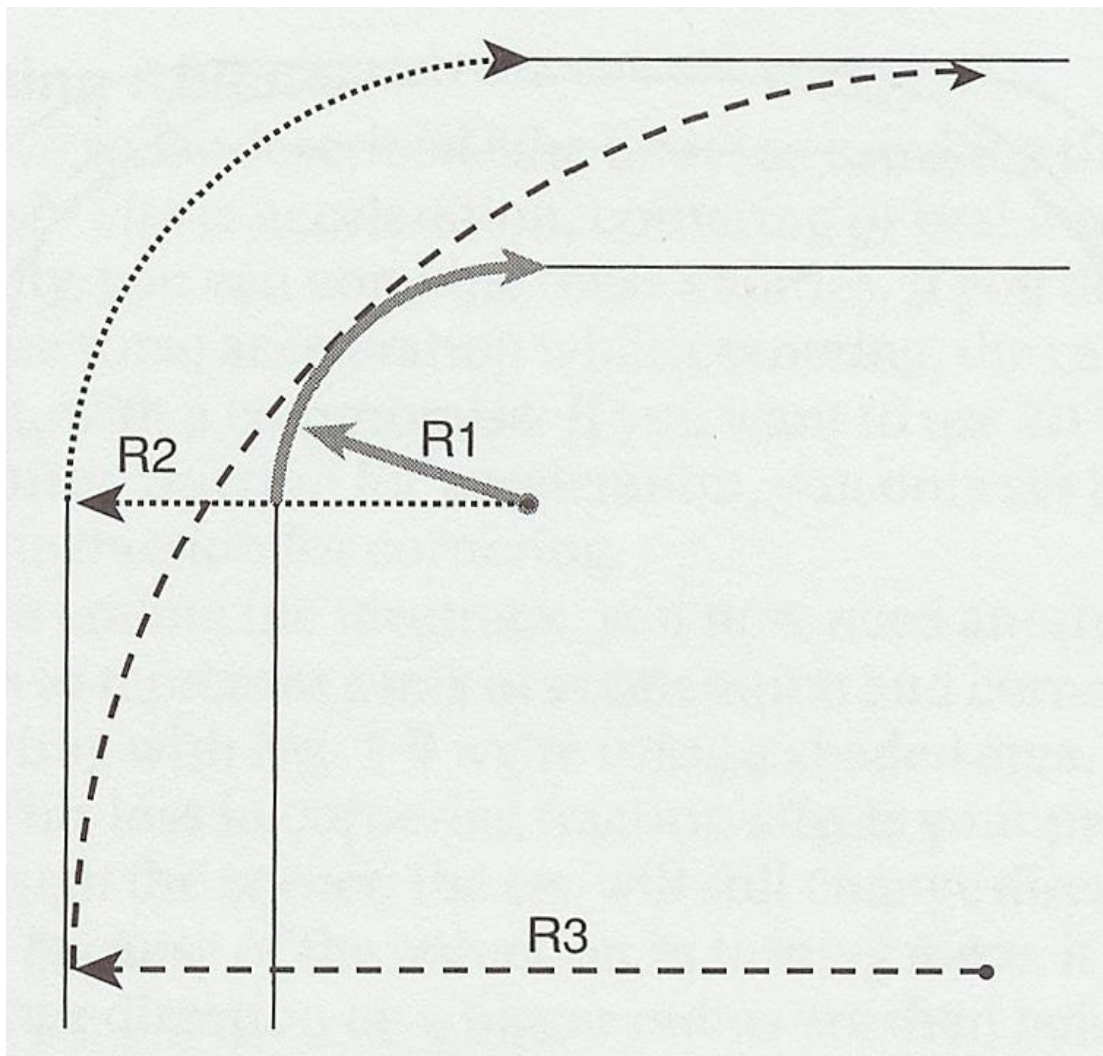
*The techniques shown here have been compiled from experienced sources believed to be reliable and to represent the best current opinions on driving on track. But they are advisory only. Driving at speed at Lime Rock, or any other track, requires skill, judgment and experience. These techniques assume the reader has high performance driving knowledge and applies them as applicable to their level of driving experience.*

*High-performance driving can be very dangerous, carries inherent risks and may result in injury or death. NNJR and PCA make no warranty, guarantee or representations as to the absolute correctness or sufficiency of any representation contained herein. Nor can it be assumed that all acceptable safety measures are contained herein or that other or additional measures may not be required under particular or exceptional conditions or circumstances.*

- The Line
  - Classic Late Apex
  - Type 1, 2 and 3 Corners
  - How to refine / adjust the line
  - Line variations

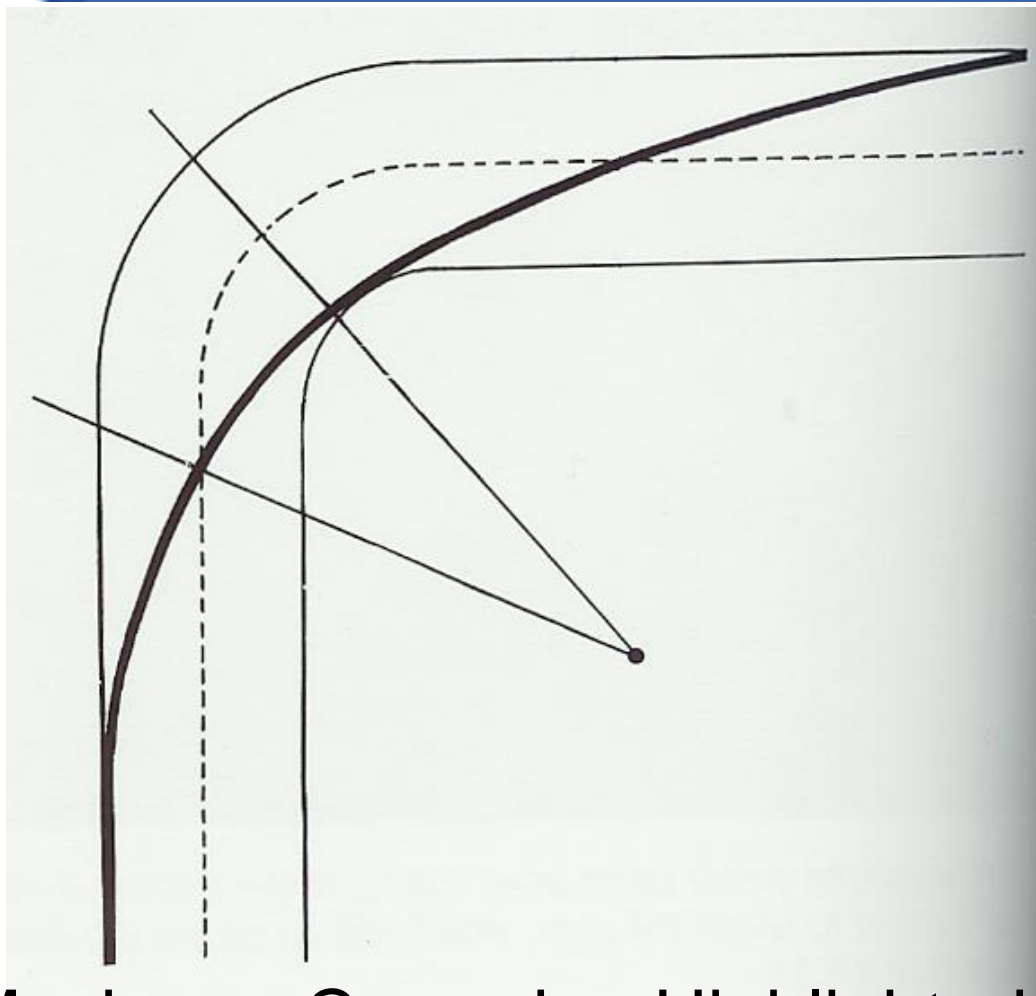
- Lime Rock





\* David Murry

# NNJR The Classic Late Apex



- Maximum Cornering Highlighted

Aryton Senna: *Principles of Race Driving*



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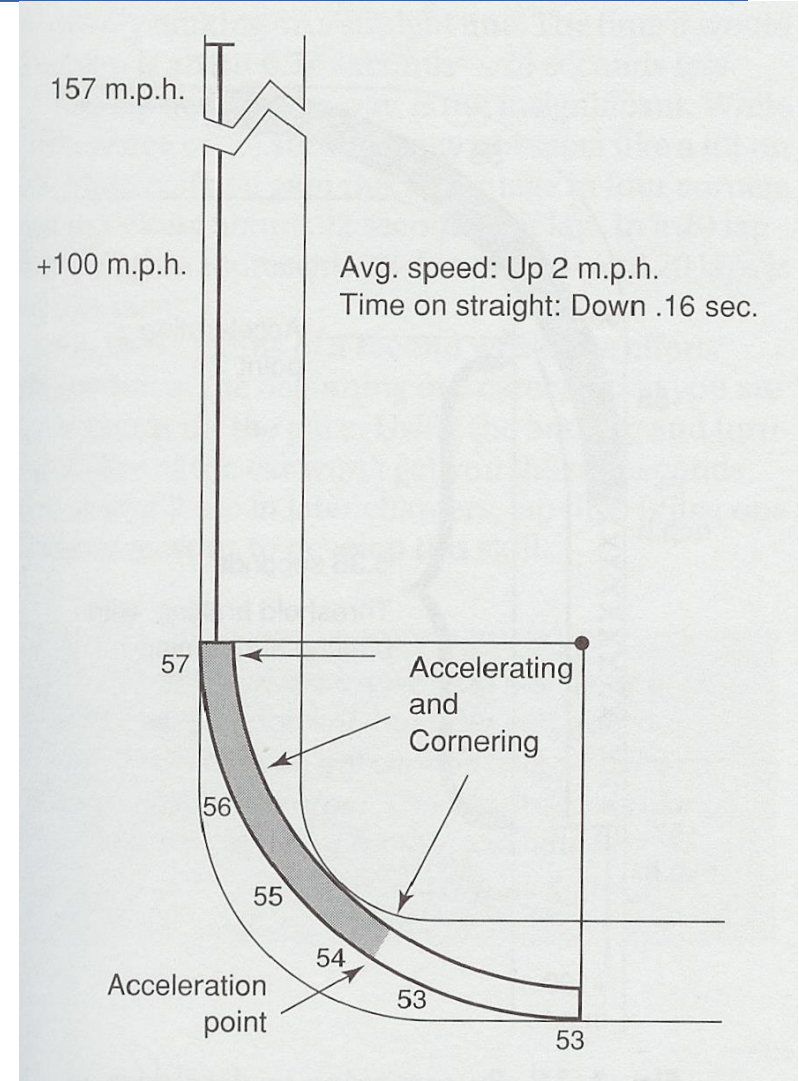
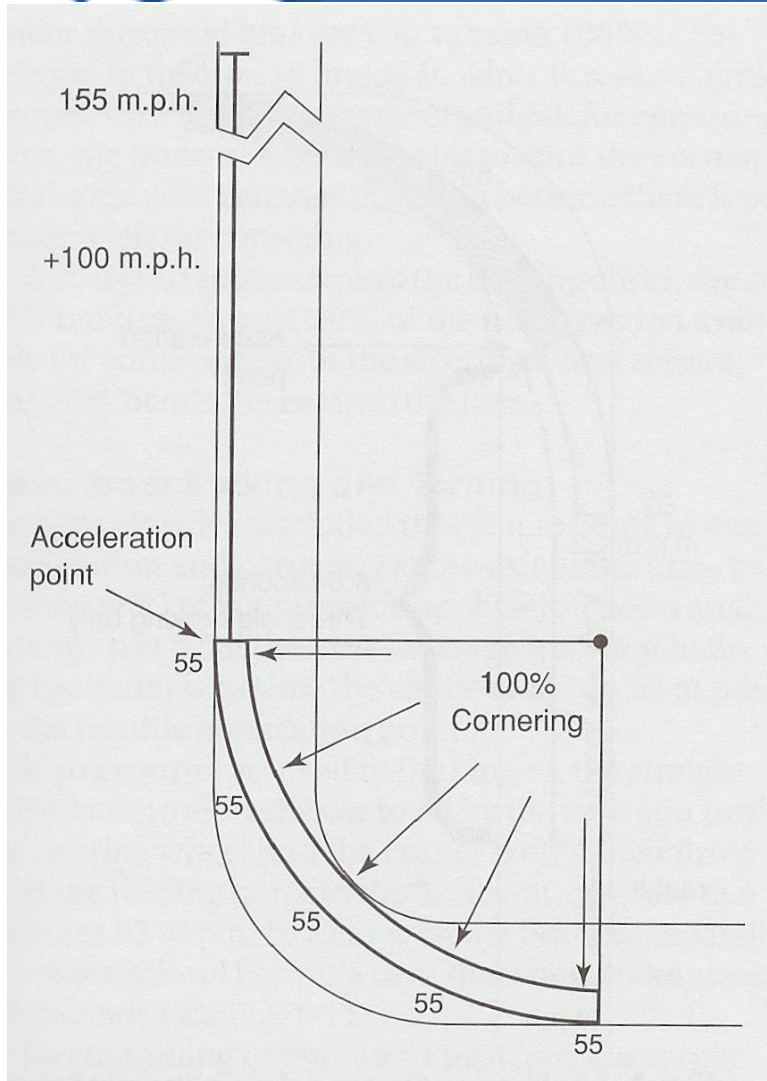
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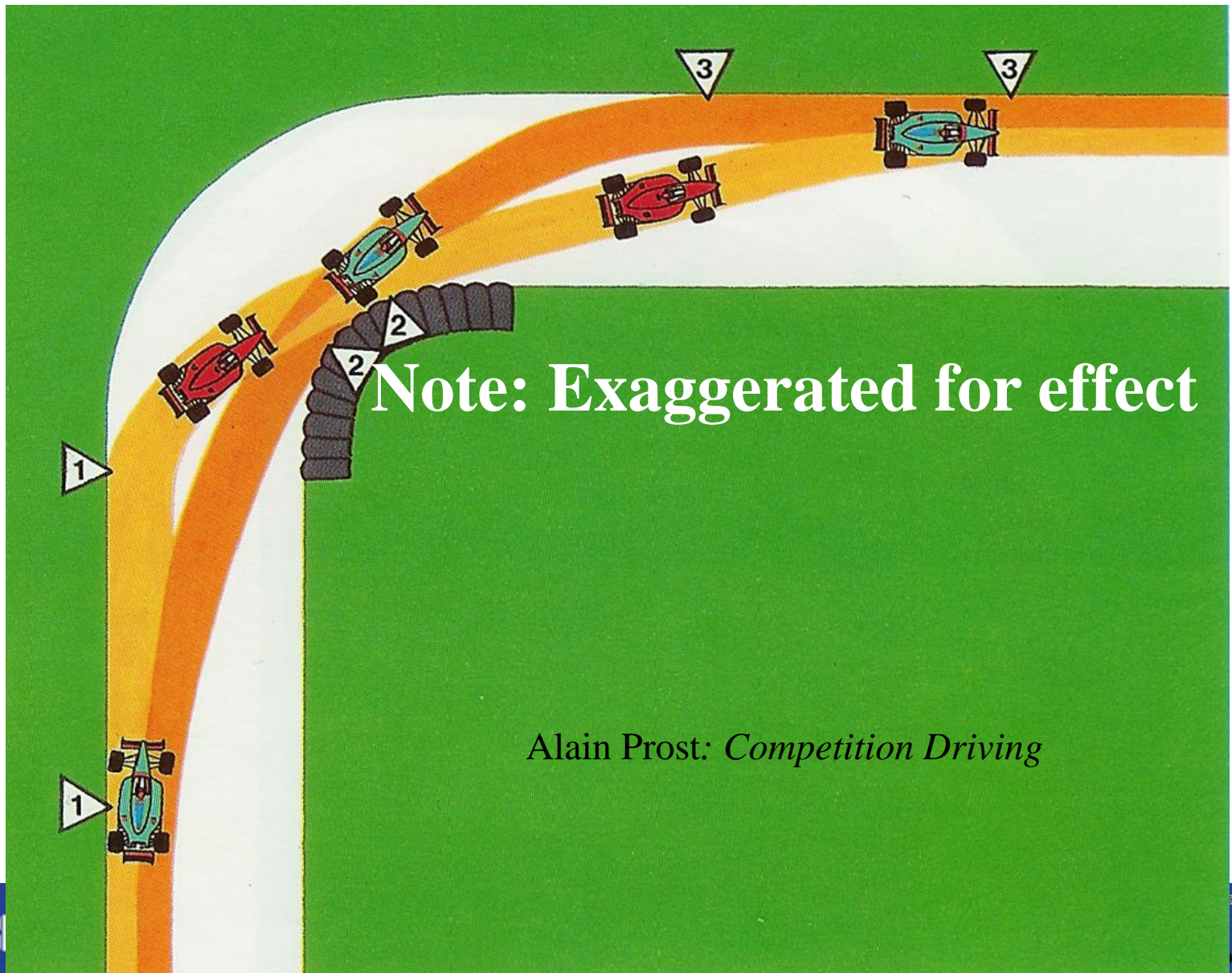
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## Why a Late Apex Line? It's All About the Exit Speed



Carl Lopez: *Going Faster!*





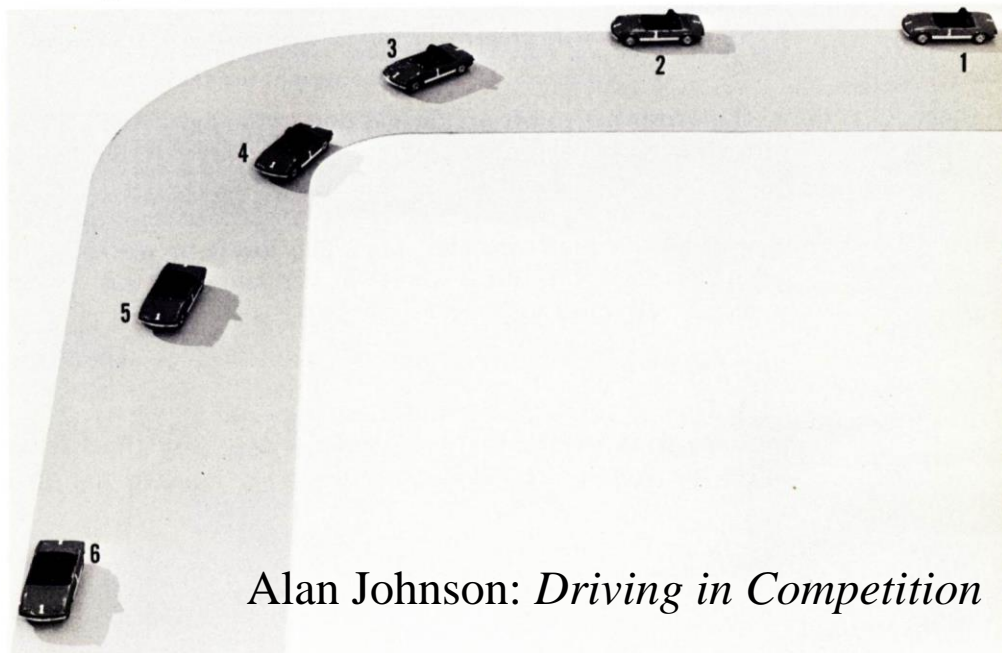
# NNJR Types of Corners



- Type I, II, III
  - Type I = Most Important; leads onto straight; Late Apex
  - Type II = Next; ends a straight, no straight after
  - Type III = Least; between corners
- Fast vs. slow
- Long vs. short

*Type I Turn. A Type I turn is one that leads onto a straightaway. In this type of turn you brake early, get on the throttle just as early as possible, make a late apex and accelerate onto the following straight at maximum rate of speed. In the illustration below, it is put together like this:*

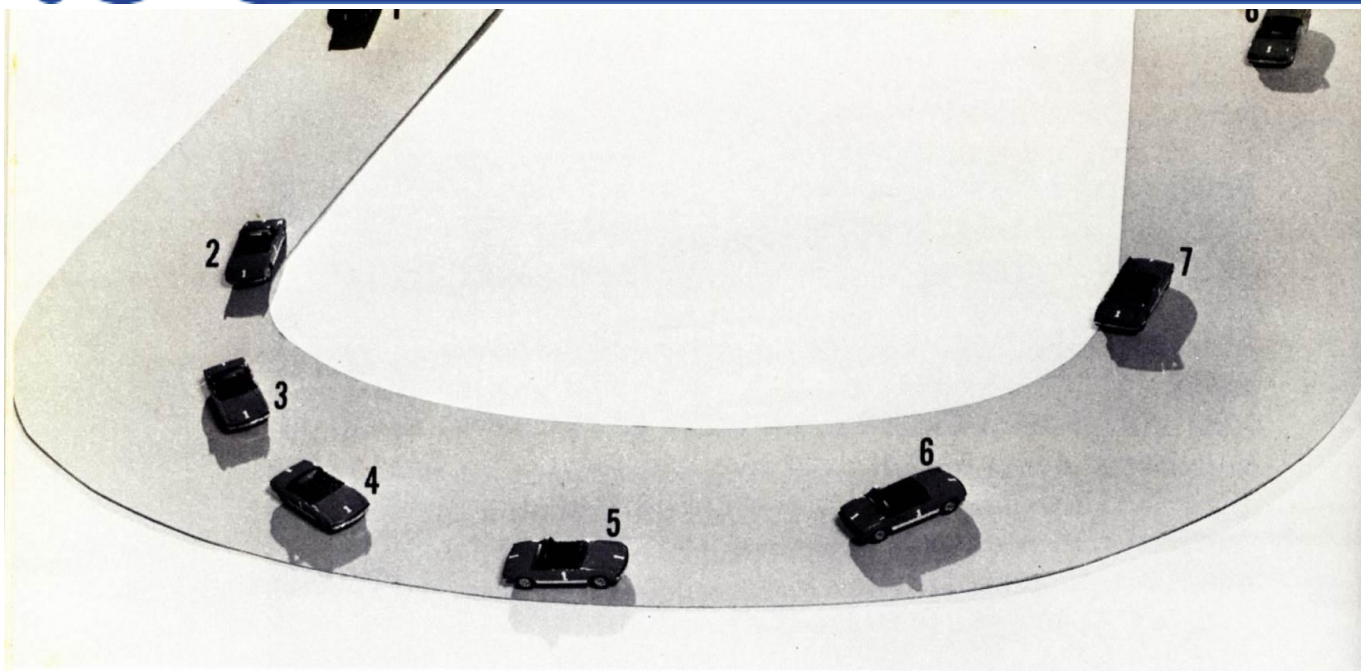
1. Maximum braking.
2. Braking almost complete, downshifted to lowest gear that will be used in accelerating out of turn.
3. Balancing point. Transition from braking to accelerating. This is a critical point. If you accelerate too early, you will have to let off to keep from running out of road on exit from turn. If you wait too long to begin acceleration, you will not be able to make entrance onto straight at maximum speed.
4. Late apex. Should be at or very nearly at full throttle.
5. Full throttle, accelerating at maximum rate.
6. Full throttle, clear of turn, using all of the road to make a smooth arc on to straightaway.



Alan Johnson: *Driving in Competition*





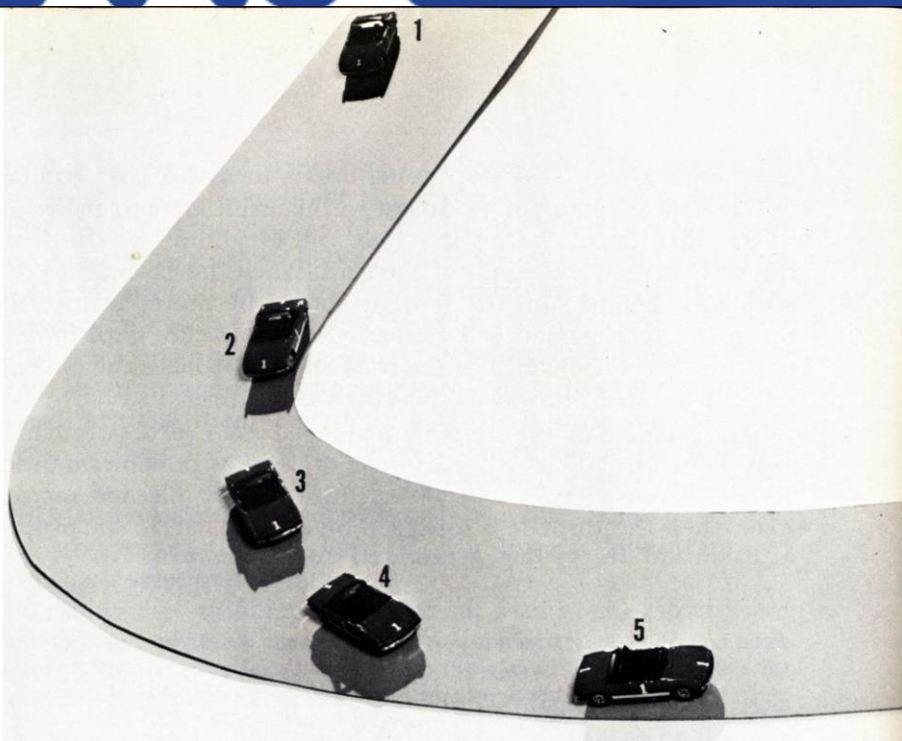


*Compound turn that is a typical example of a Type II turn that leads to a Type I turn. Here you brake late coming into the Type II turn, then balance car and get set early for maximum-speed acceleration on to straight that follows.*

- 1. Delay braking just as late as possible.*
- 2. Early apex.*
- 3. Lighter braking as car begins to turn.*
- 4. Balancing point. Transition to light throttle to "set" car.*
- 5. Apply enough throttle to set up for exit.*
- 6. Acceleration.*
- 7. Late apex. Now under full throttle.*
- 8. Exit turn, using all of road onto straightaway at maximum rate of acceleration.*

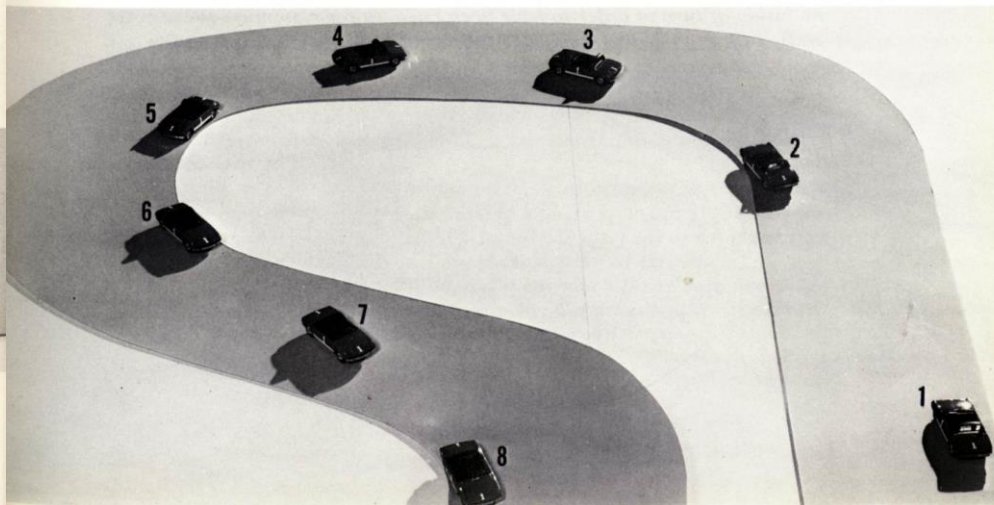
## Big Bend!

Alan Johnson: *Driving in Competition*



Compound turn with examples of Type II (coming off straight), Type III (turn between turns) and Type I (leading onto straight) turns.

1. Delay braking just as late as possible.
2. Early apex, slightly less braking as car begins to turn.
3. Balancing point, using very slight amount of throttle to "set" car.
4. Hold light throttle, follow smooth radius, not trying to go too fast.
5. Still light throttle, being especially careful to stay to inside of course and not increase acceleration too soon as this will carry you to outside of course and spoil exit.
6. Balancing point. Car should be lined up for exit and beginning to accelerate.
7. Hard acceleration, very nearly full throttle.
8. Late apex, full throttle, enter straight at maximum acceleration and use all of road getting onto straight at fastest possible speed.

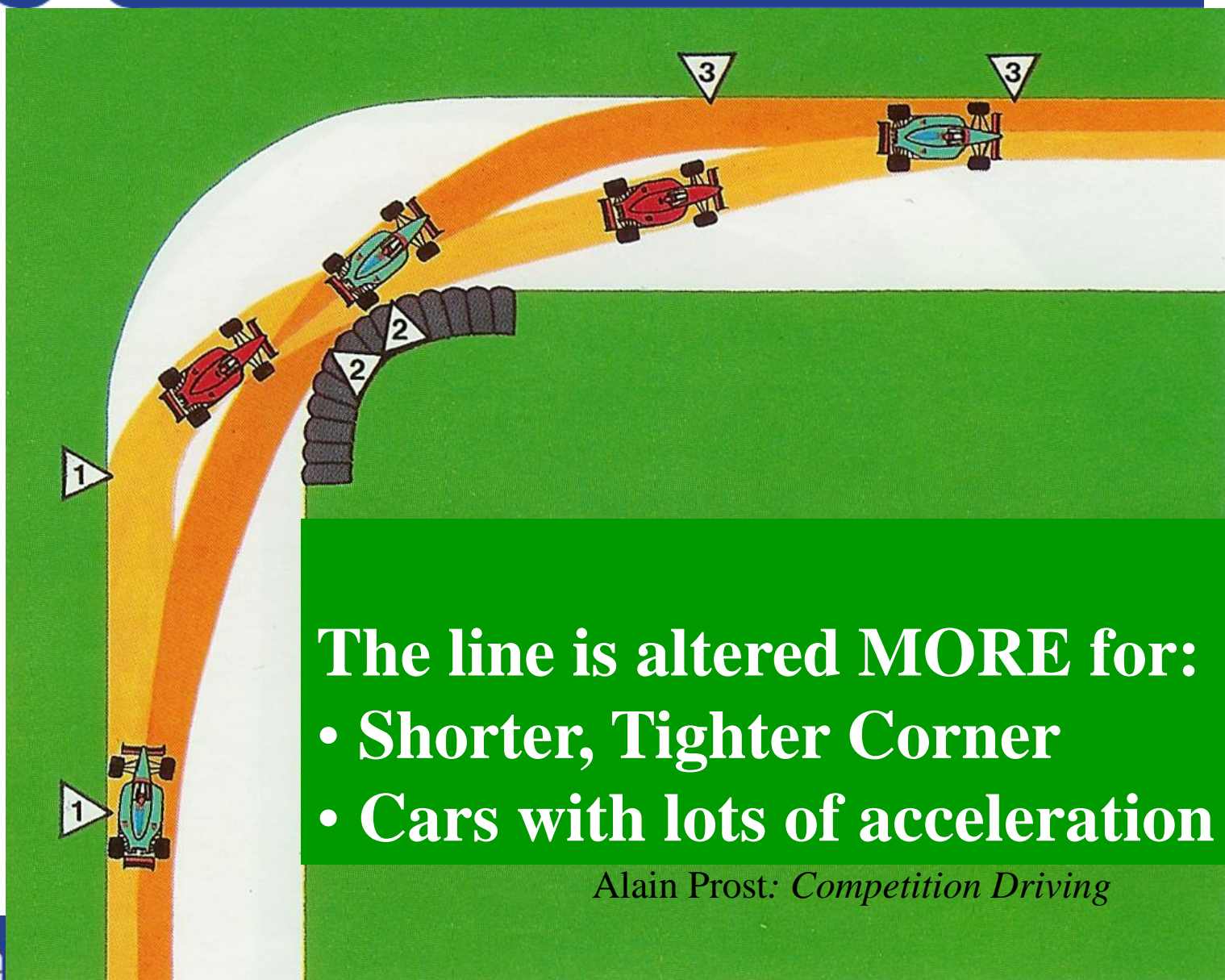


**Type II Turn.** A Type II turn is one that comes at the end of a straightaway. In order to get maximum benefit from straightaway speed, brake as late as possible, take an early apex, continue braking into turn and position the car for whatever comes next on the course.

1. Delay braking just as late as possible, using fixed reference point to begin braking.
2. Early apex, braking slightly less in this area as you begin to steer the car into the turn.
3. Lighter braking (and possibly sliding) as you widen the radius of the turn.
4. Balancing point. Transition to very light throttle to "set" car on suspension.
5. Sufficient throttle to properly line up for next portion of the course.

Alan Johnson: *Driving in Competition*

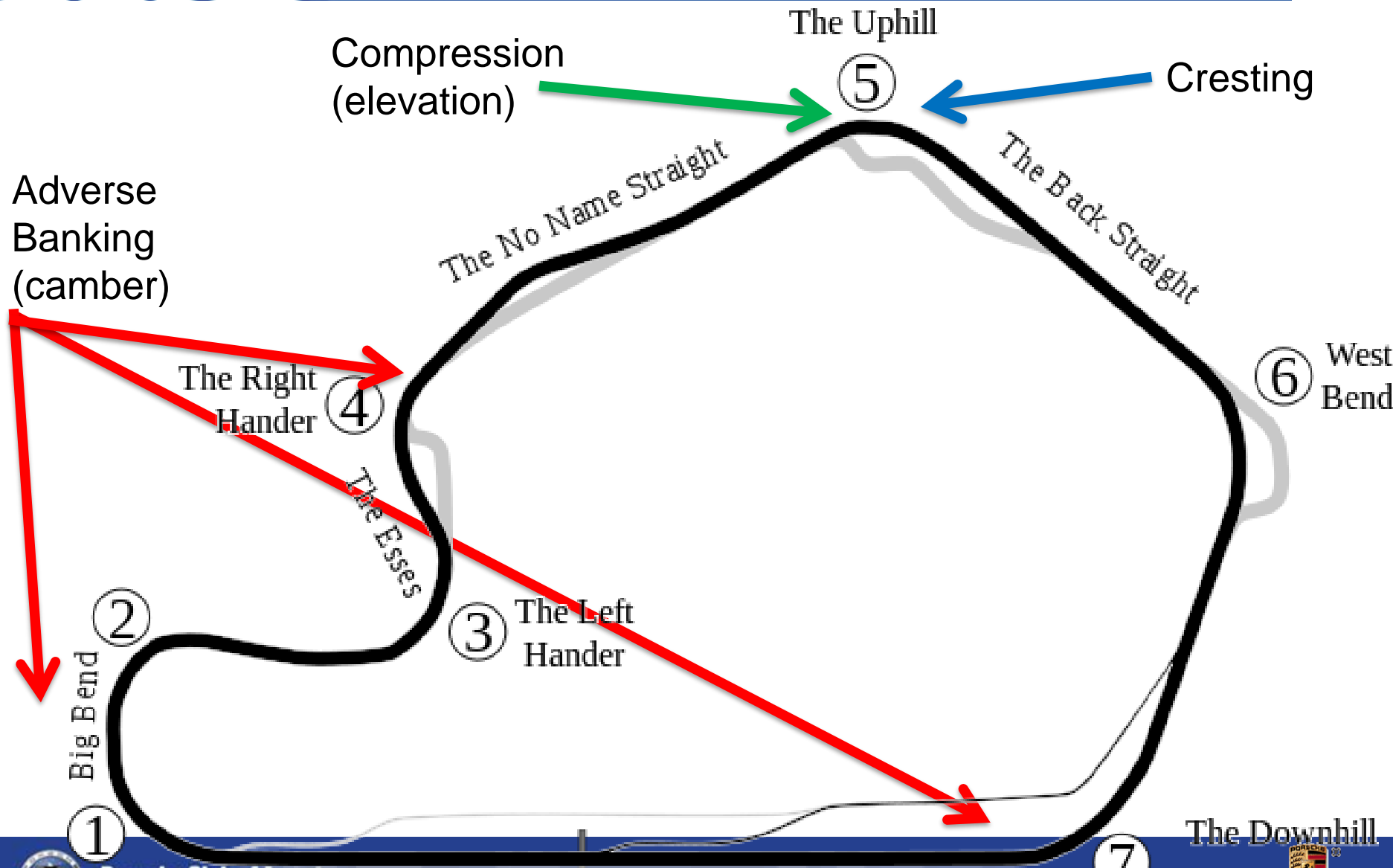




The line is altered **MORE** for:

- Shorter, Tighter Corner
- Cars with lots of acceleration

Alain Prost: *Competition Driving*

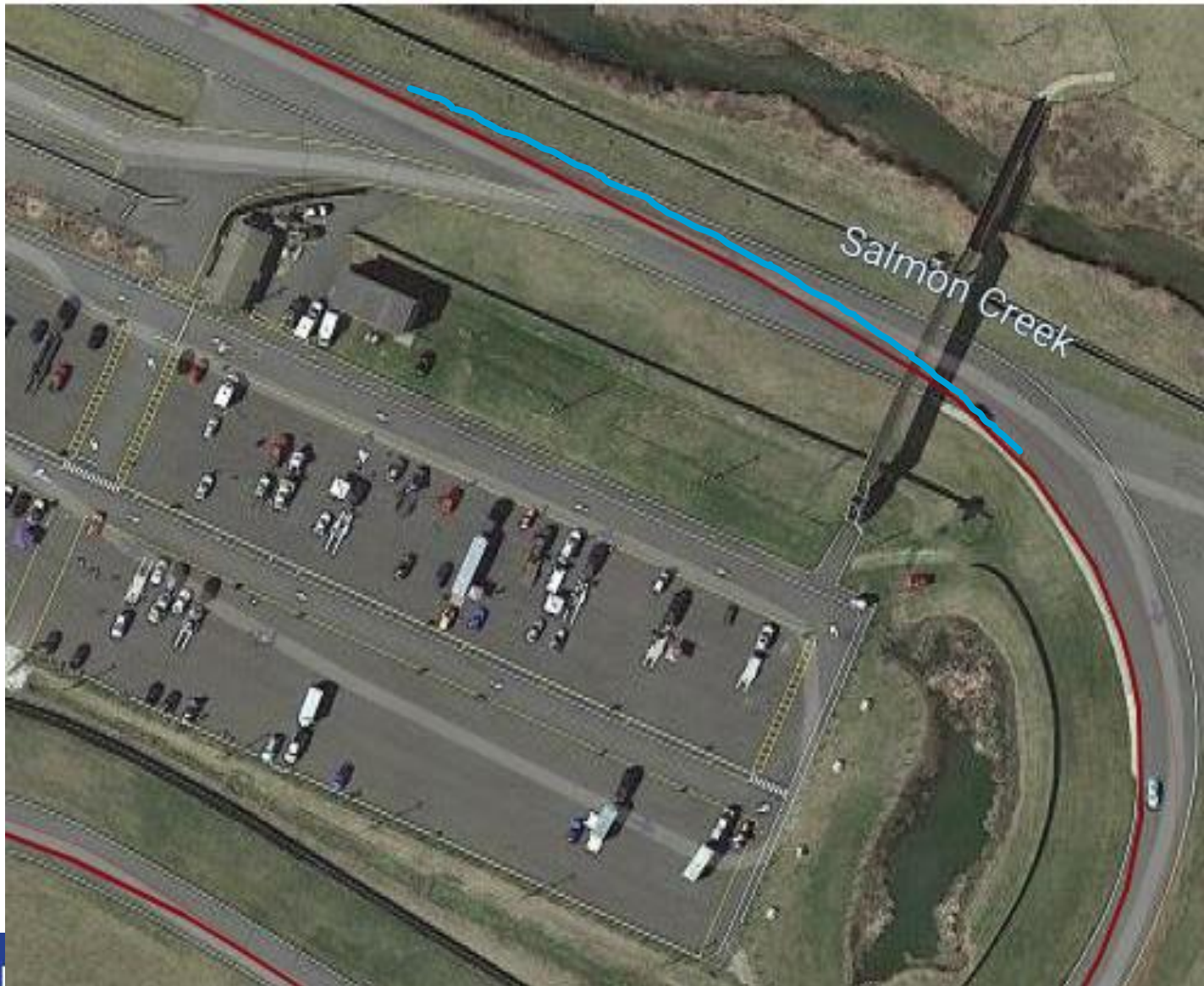






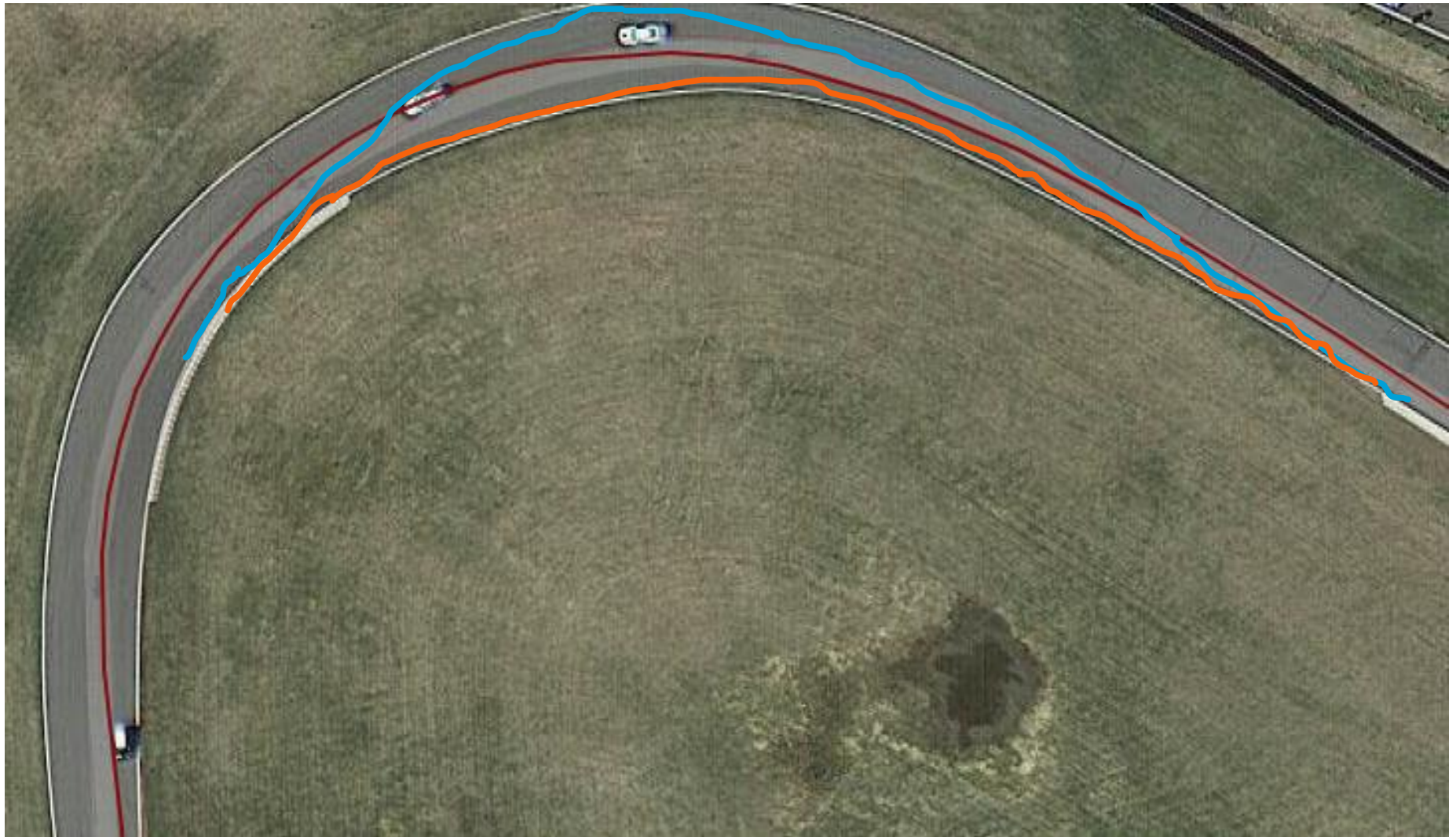
- Approach to Big Bend
  - Diagonal vs. Later Turn In
- Turn 3
  - How far right to enter?
- Uphill
  - “Normal” vs. much later turn in (to use hill)







# NNJR Turn 3



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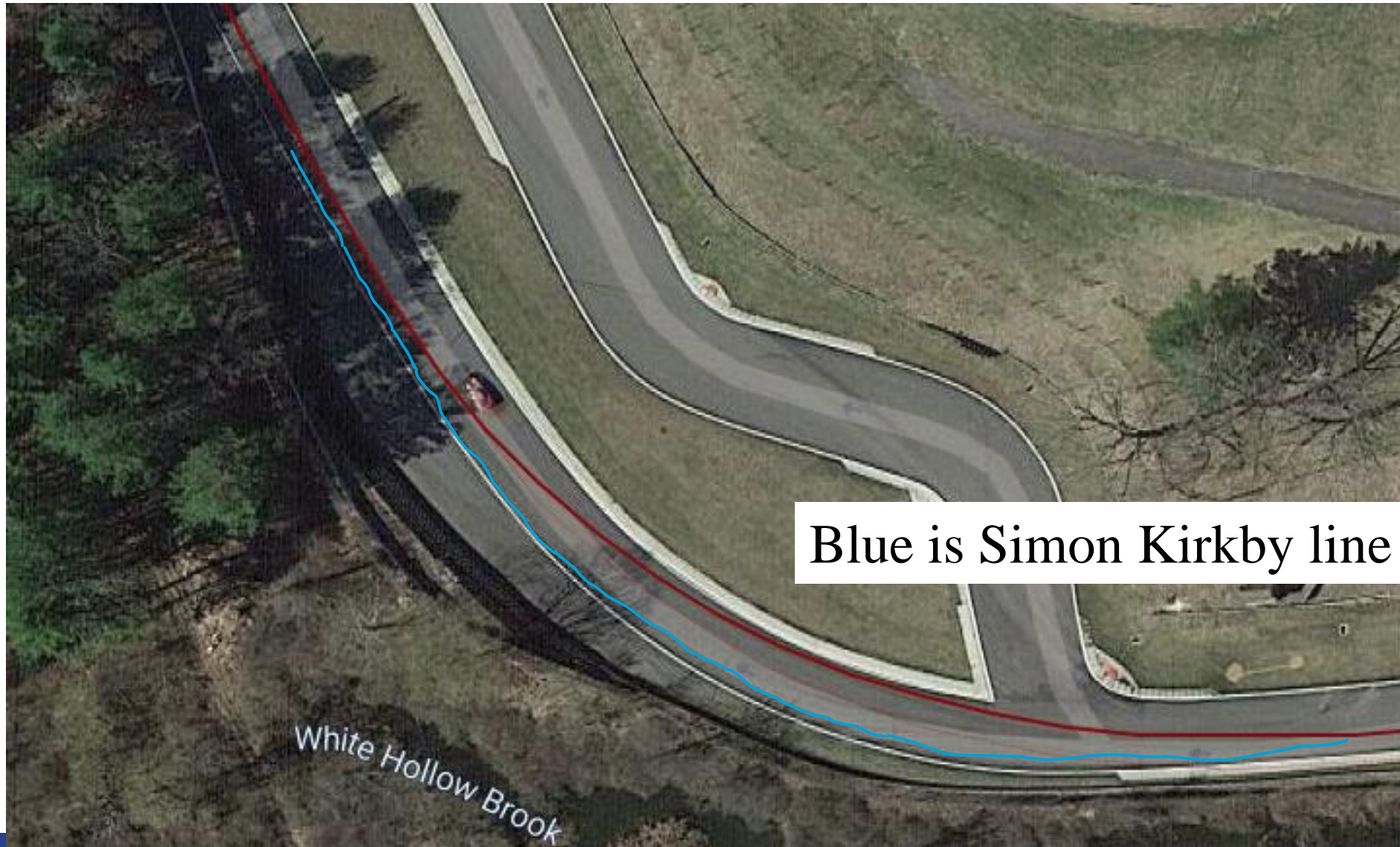
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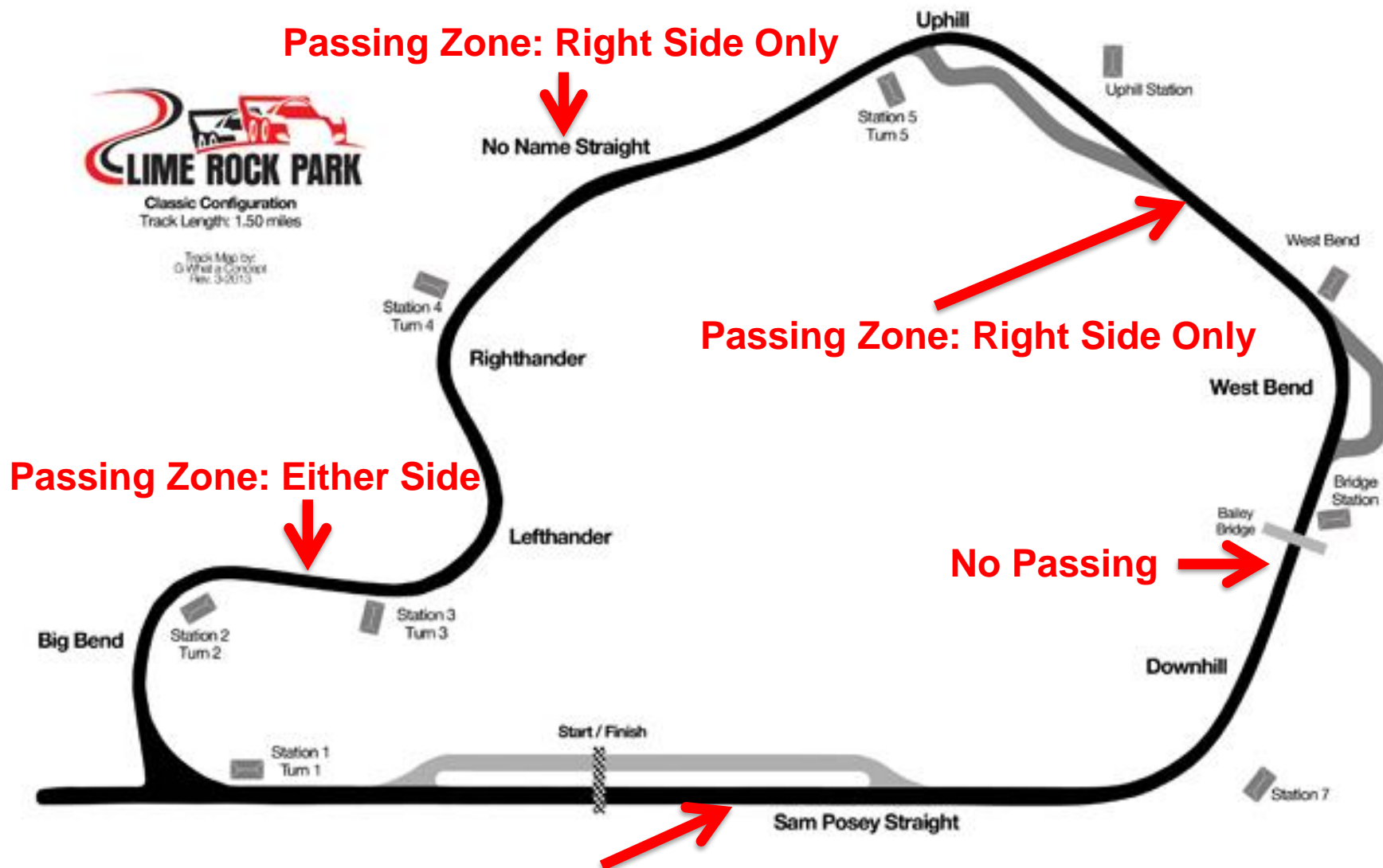




- Approach “the line” as a learning challenge
  - Why this apex? Turn in?
- Priorities
  1. Corner exit (index)
  2. Corner entry
  3. Mid corner transitions
  4. Braking
- Make adjustments and observe their effect
- Keep it safe!
  - Emphasize learning, not speed

## LIME ROCK TURN BY TURN

# NNJR Lime Rock



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**Passing Zone: Right Side Only**

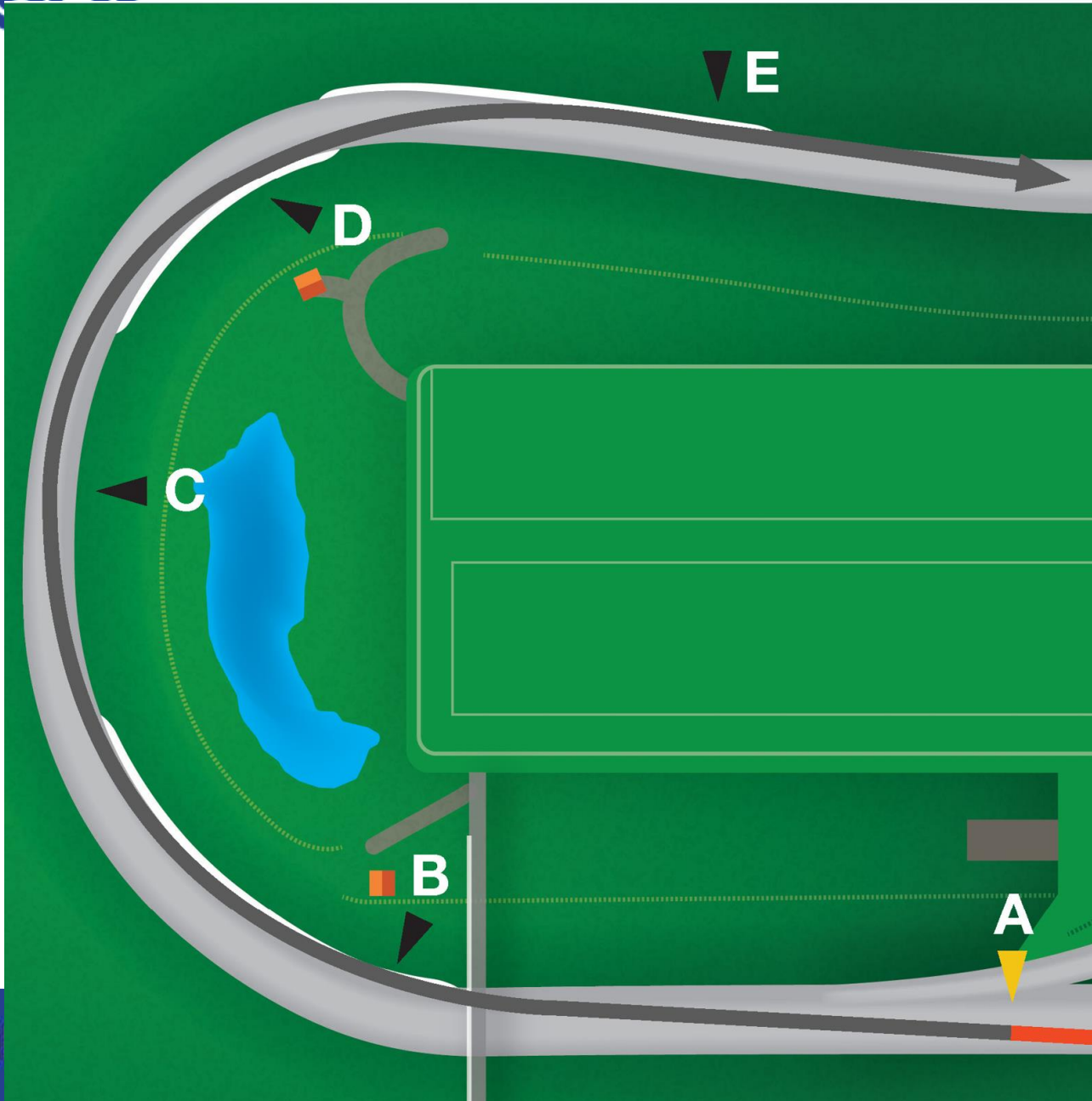
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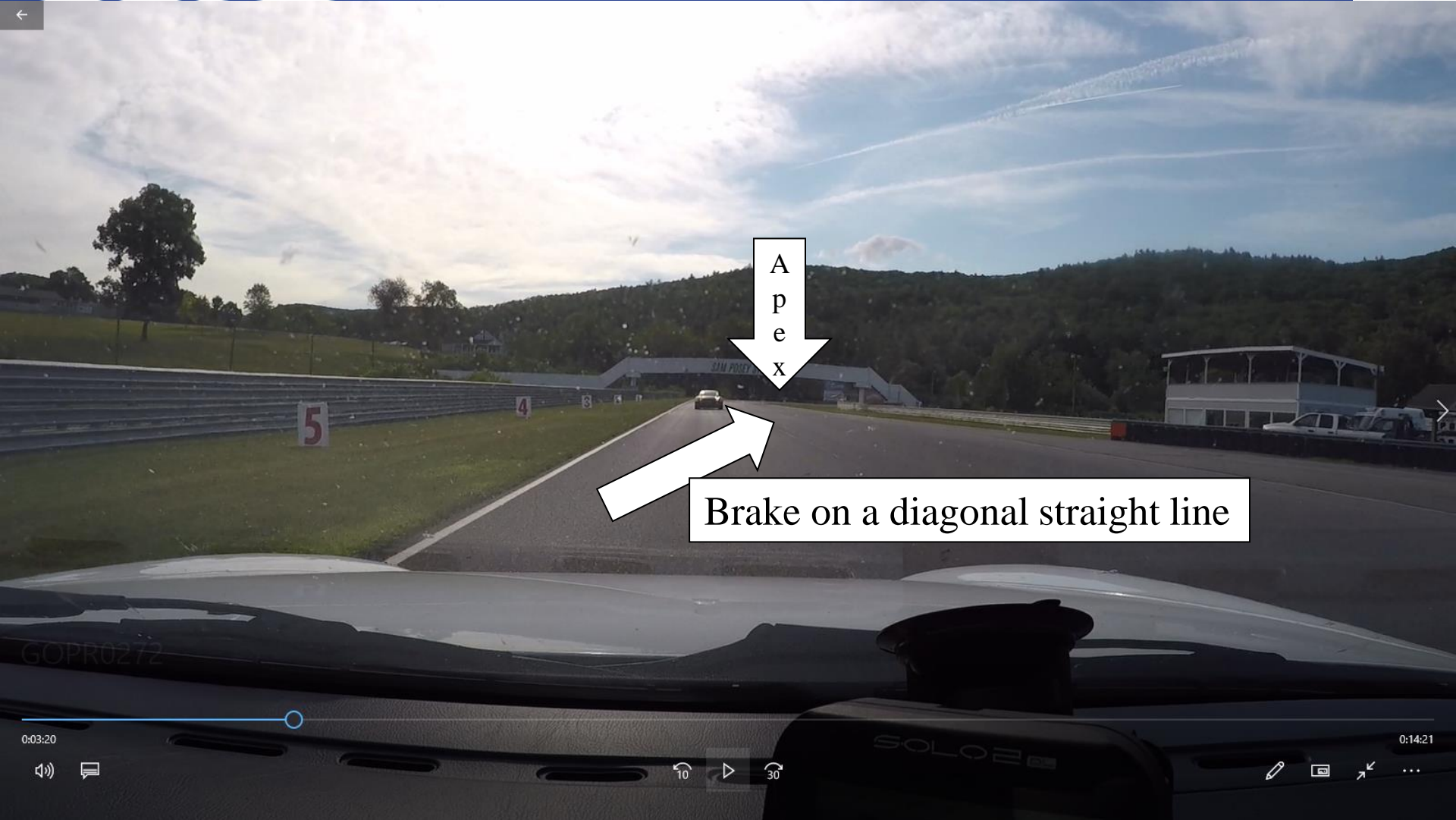


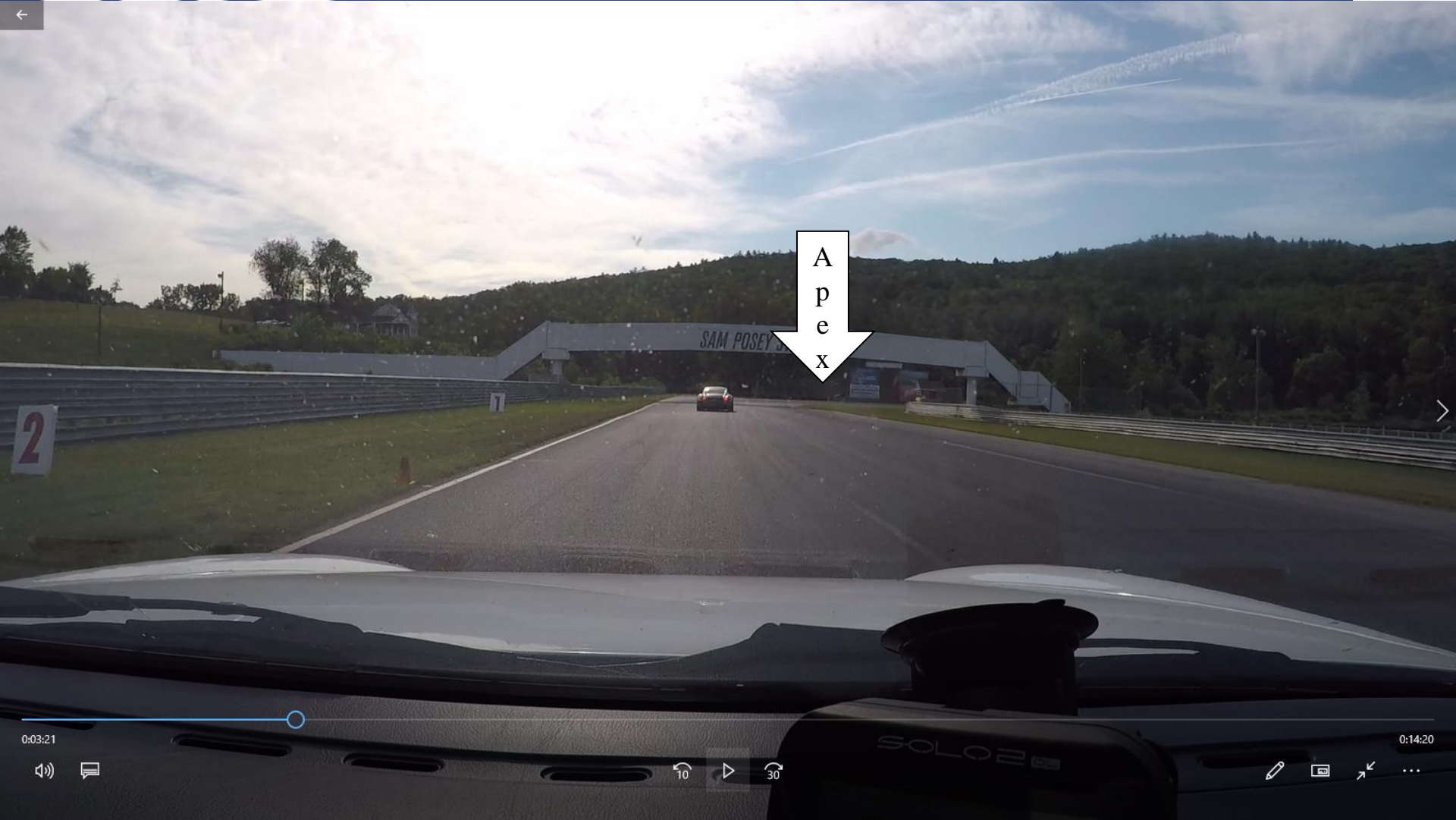
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## Big Bend: Turns 1 and 2











# NNJR Trail off Brakes at/after Apex



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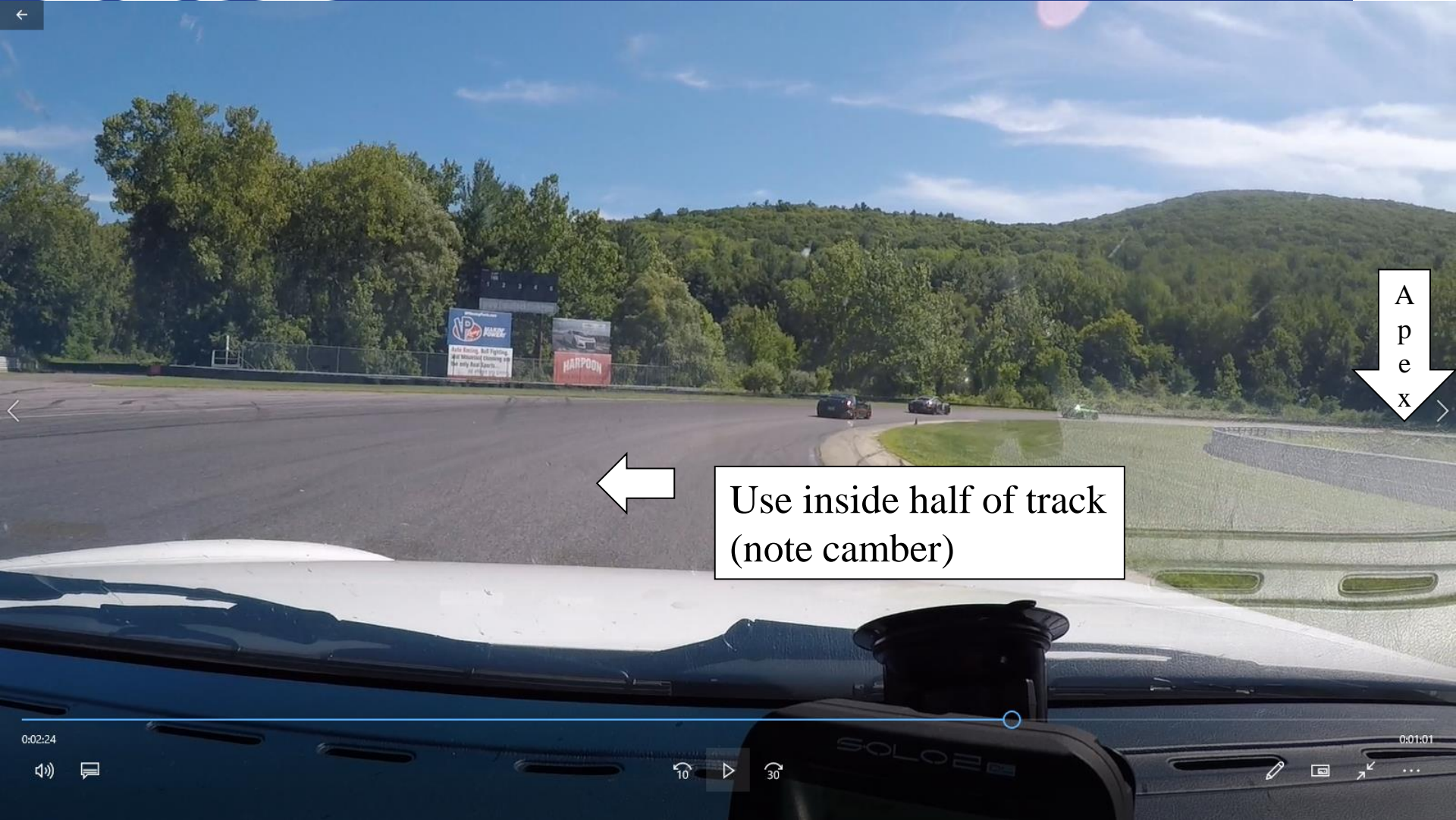
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# NNJR No Place to be Early!



Track  
Out

Apex



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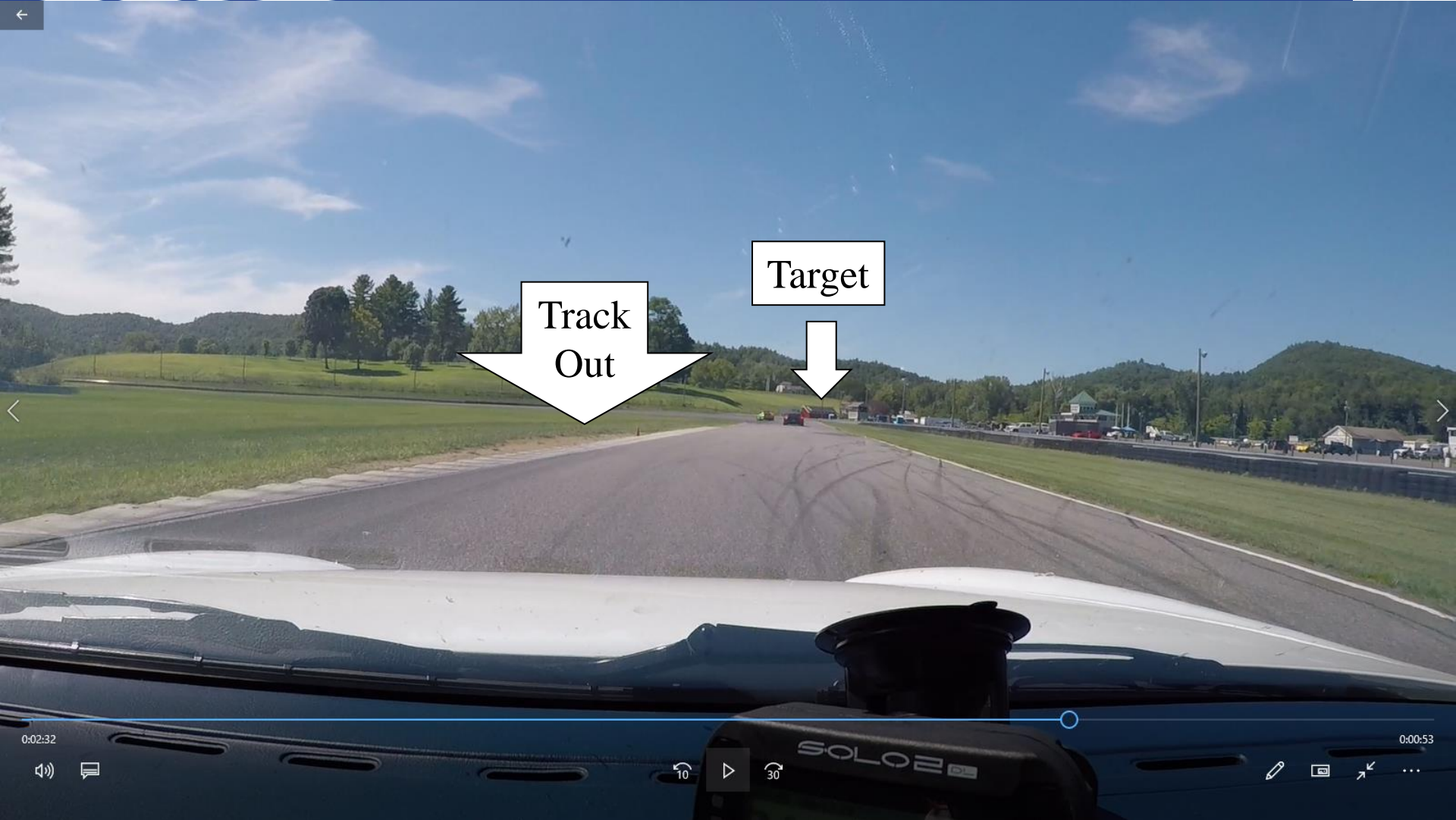
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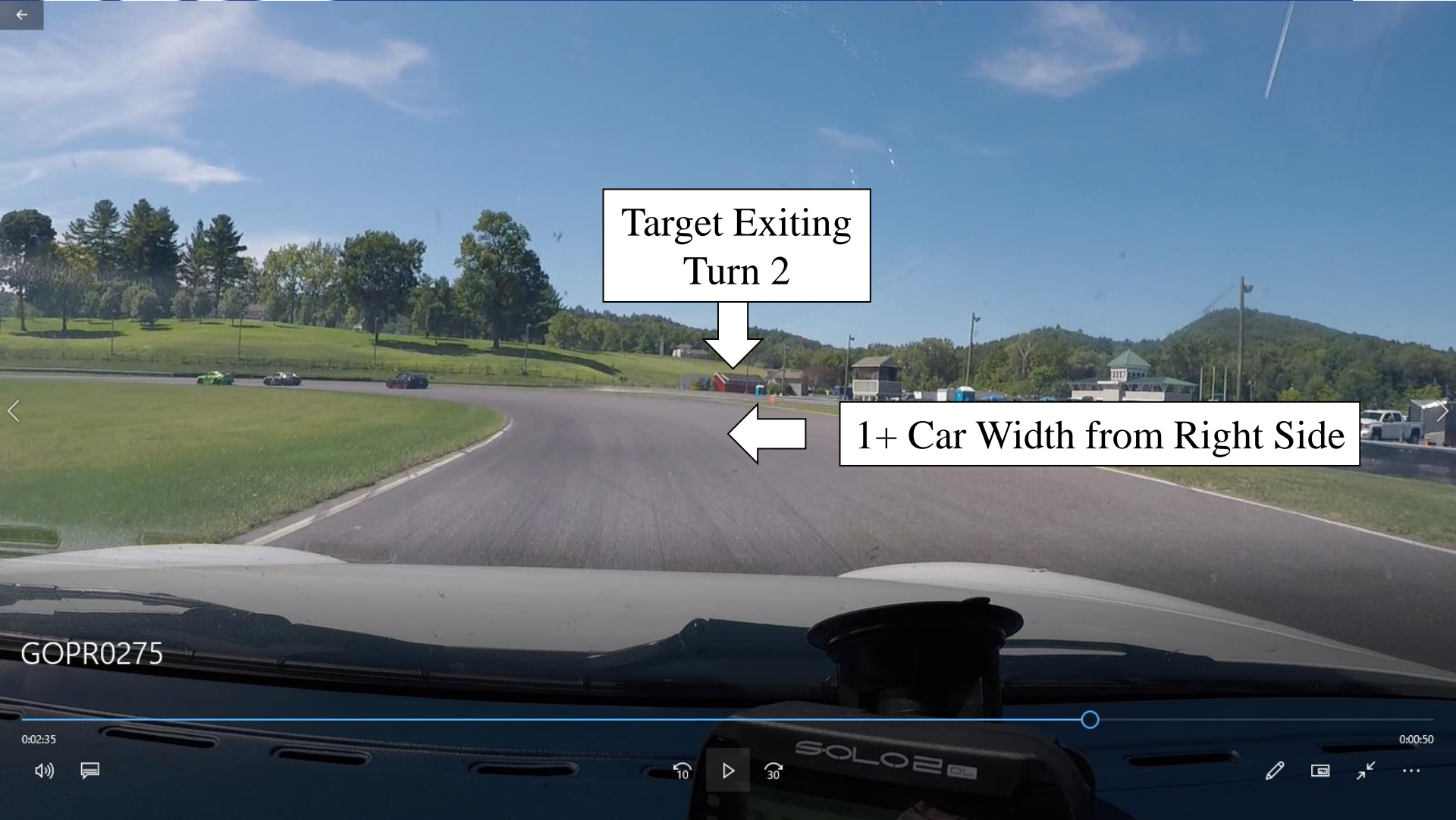
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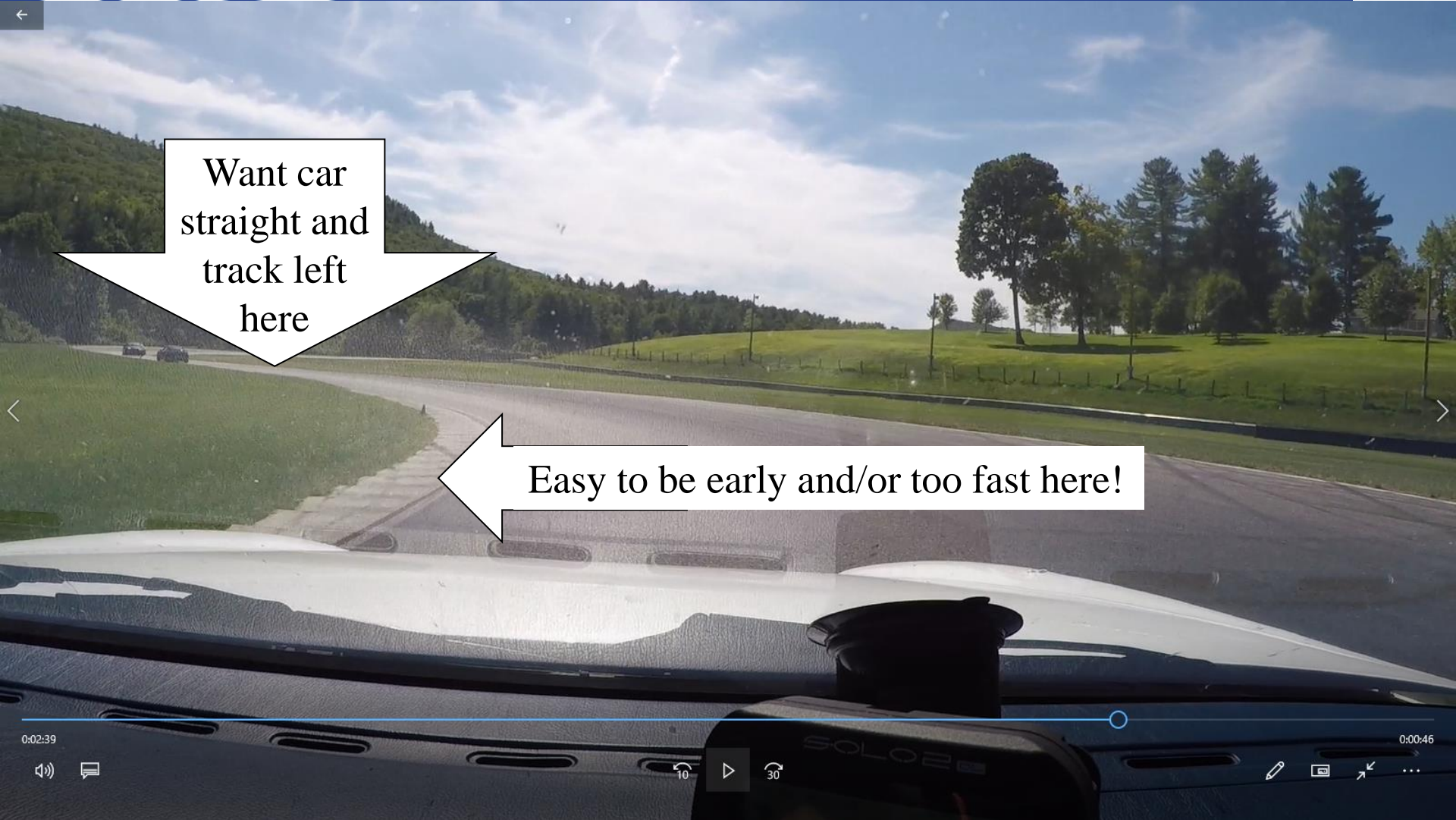
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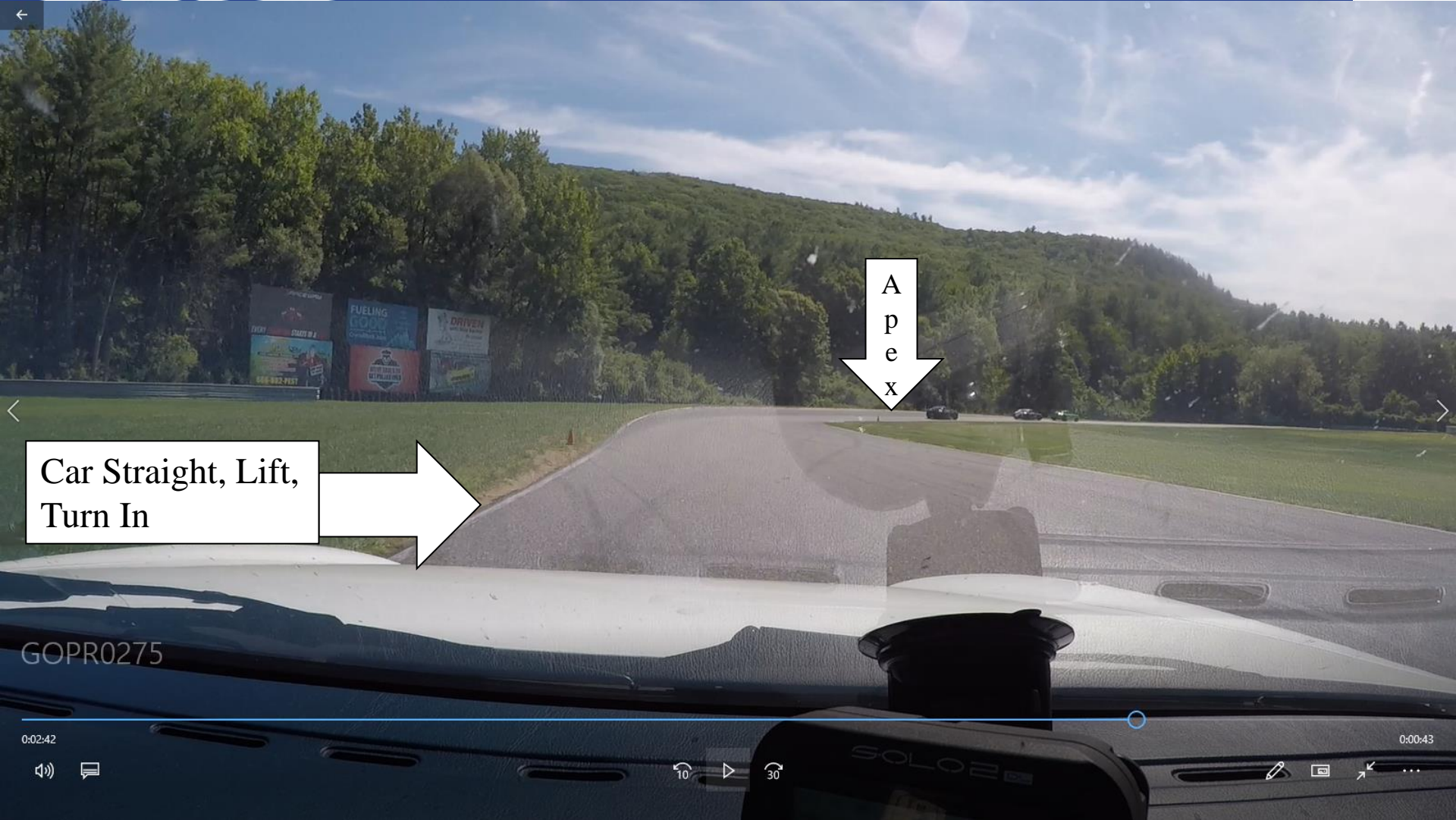








# NNJR Set Up Right Hander (Turn 4)



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# NNJR Off Brakes Right After Turn-In



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# NNJR Uphill: Tight on the Apex Turn In More into Hill



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# NNJR Straight Over the Hill



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# Stay Track Left Until Turn-In



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# NNJR Look thru Apex to Track Out



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# NNJR Apex Zone (at the Road)



# NNJR Track Left Under Bridge



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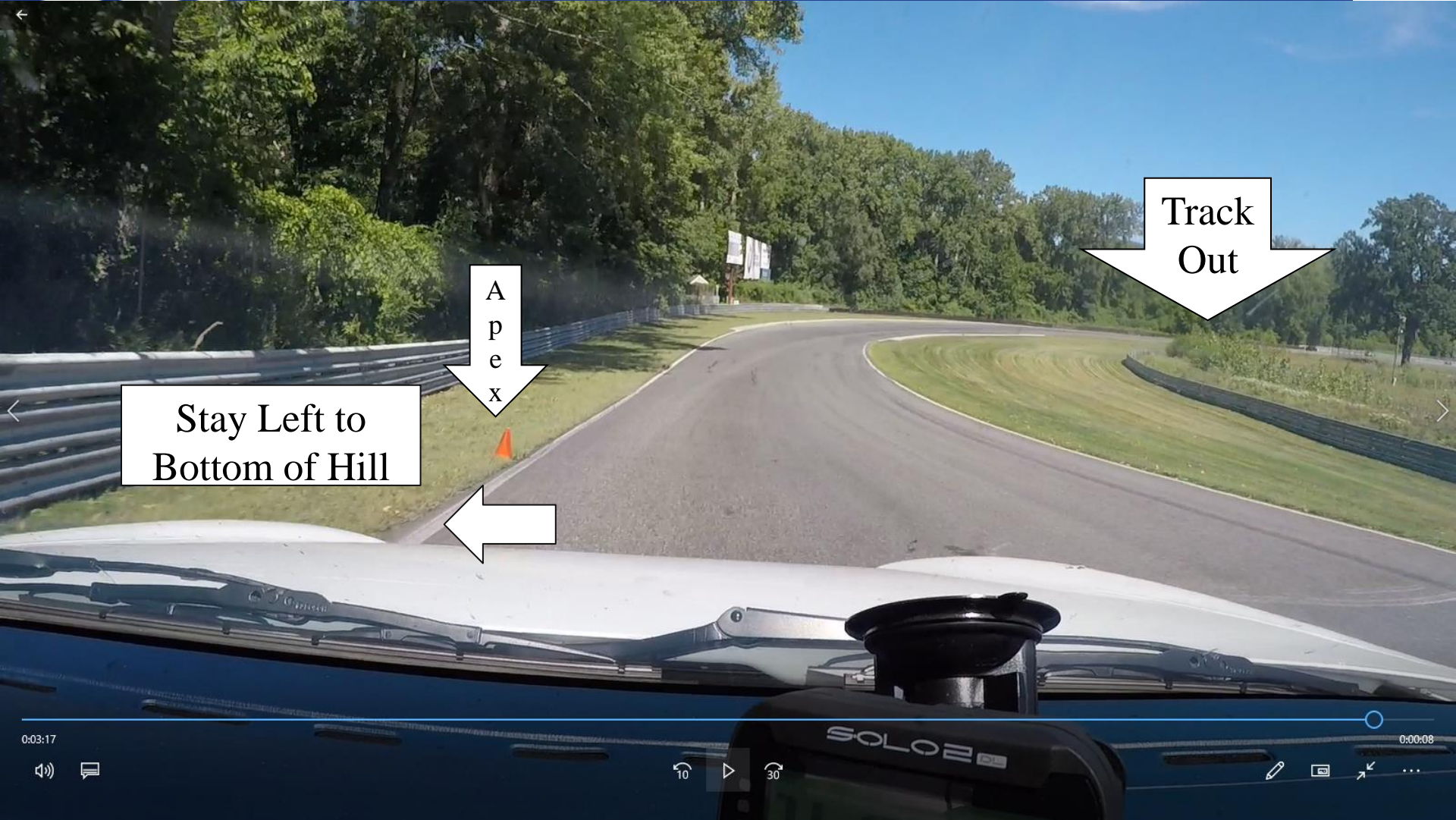
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# NNJR Tight on Apex, Look Ahead



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- Trail Brake into Big Bend and Left Hander
- Minimal trail brake for other corners
  - Brake early and lightly for Uphill, West Bend, Downhill
- Watch the adverse camber!
  - Exiting NoName, exiting Downhill, Turn 2
- Find good Reference Points that don't move!

