

NNJR “Trackside Classroom”

Driving at the Limit

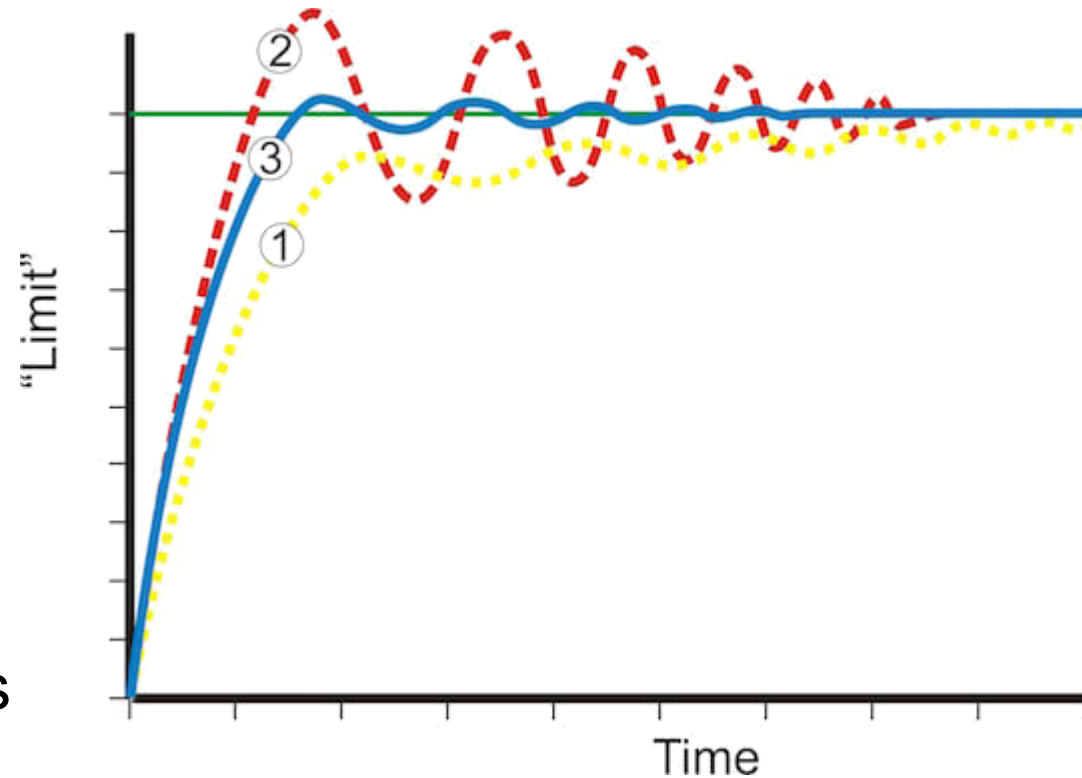


Disclaimer

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 Watkins Glen, 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.

- What is the Limit?
 - Driver
 - Car
- How to (safely) approach the limit
 - Prerequisites
 - Techniques
 - Step by step process



- Know Yourself
- Never “push”
- Dennis Macchio
 - “Fear is real: acknowledge it”
 - “Don't ignore fear even if others can drive faster”
 - “Driving is an intellectual sport; as we get better, fear goes down”
 - “Have to sneak up to the threshold”
 - “Stop at each level until it is rote”
 - “Consistency reduces fear”
- <https://www.youtube.com/watch?v=Jc5PaiGRbQw&t=645s>





- Fundamentals

1. Technique

- Improves w/deliberate practice on and off the track

2. Physical Fitness

- When fitness drops, focus drops

3. Mental Fitness

- Distractions, lack of confidence, etc. are common barriers
- Need a trigger to re-focus when attention is disrupted

Adapted from Ken Hill

- *“Understanding that motorsports is a sport...and you are an athlete”, July 2024*



NNJR To State the Obvious...



- You can't work on approaching the limit if...
 - You have limited experience
 - You are chasing car setup or modifications
 - You aren't comfortable in the car
 - You are tired
 - You are distracted
 - etc.



NNJR How to Get Closer to the Limit



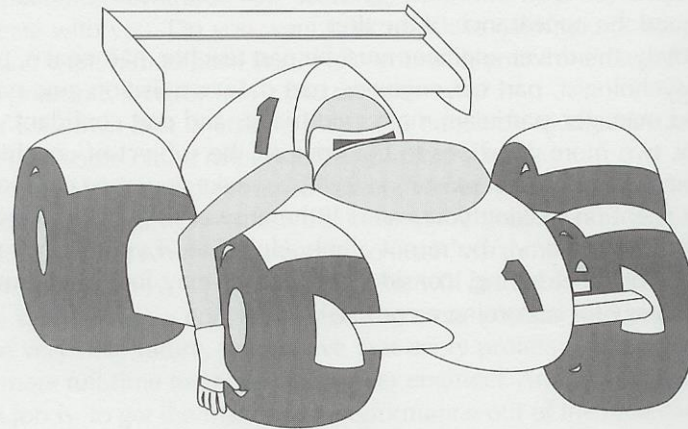
1. Write down a technique goal or goals
 - For the event, for each session
 - Pick one or more steps from slides below
 - Not a lap time!
2. Visualize success
 - Before event, at event
3. Be realistic
 - Is my driving consistent enough to build on?

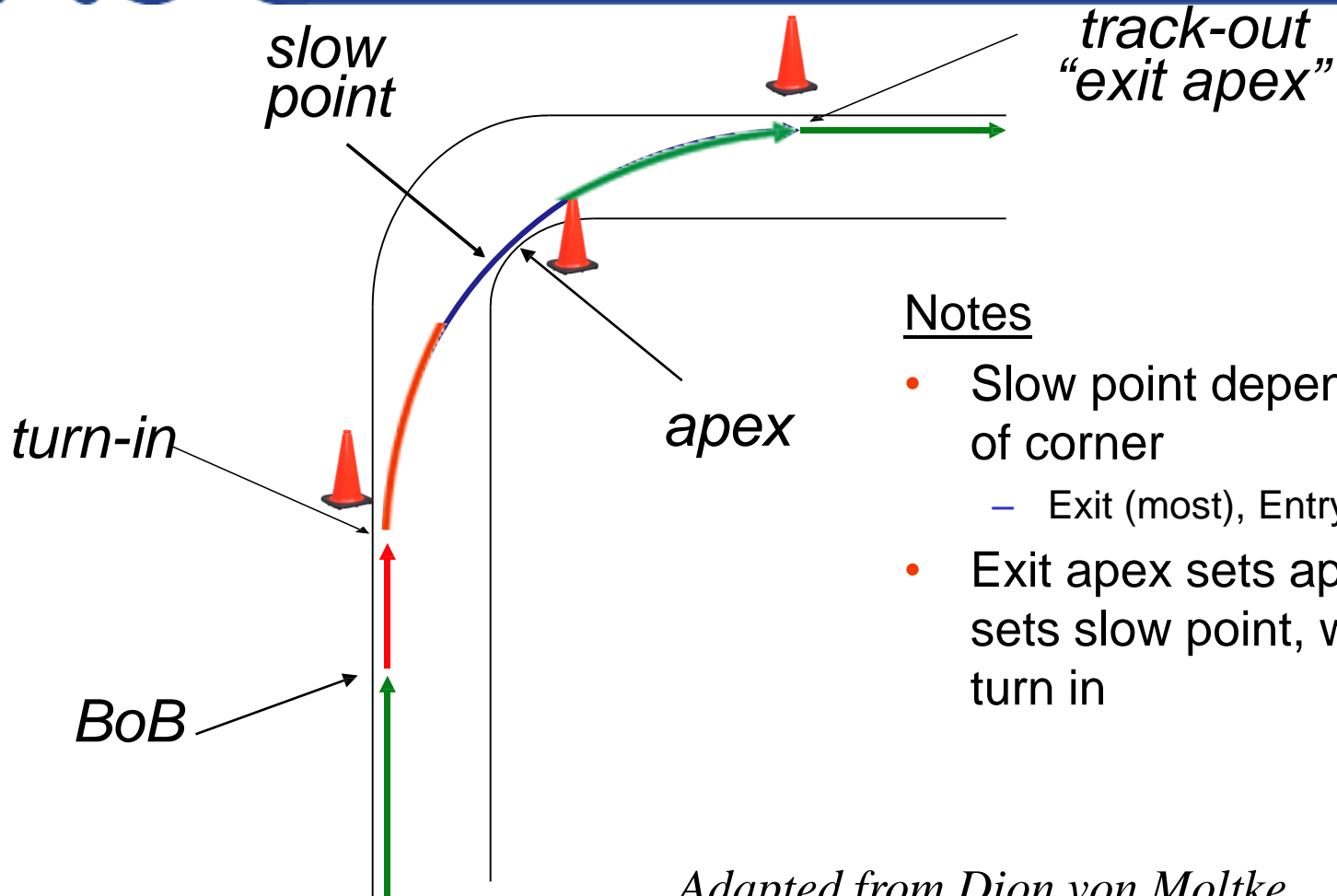


NJR Driver Prerequisites: In the Car



- Relaxed
- Focused on one thing
 - All other driving is a consistent baseline
 - Mental image of success
 - A vs B: try both, compare
- **Full sensory input**





Notes

- Slow point depends on type of corner
 - Exit (most), Entry, Balanced
- Exit apex sets apex, apex sets slow point, which sets turn in

Adapted from Dion von Moltke

- *2024 Driver and Instructor seminars*
- *“Send It: the Art & Science of Racing Cars”*

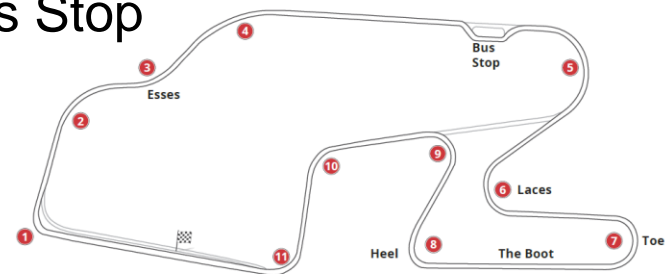
NNJR Corner Types



- Exit
 - Longer acceleration than deceleration
 - Majority of corners at most tracks
 - Slow point just before apex
- Entry
 - Deceleration longer than acceleration
 - Often followed by an exit speed corner
 - Slow point just after apex
 - e.g. Lime Rock Turn 1, Watkins Glen Bus Stop
- Balanced
 - Acceleration and deceleration equal
 - e.g. Watkins Glen Turn 10

Reminder

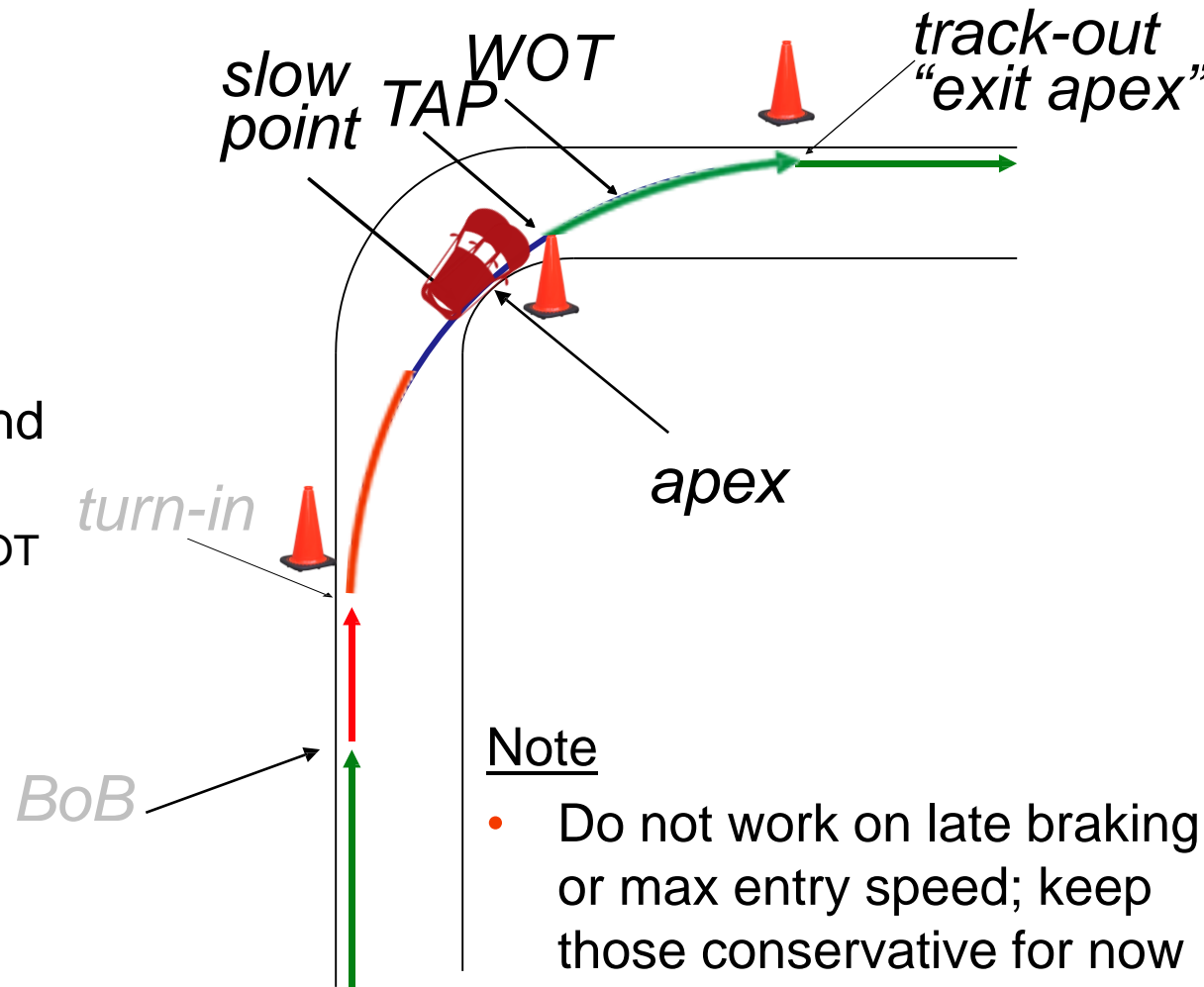
- Label corner types on track map, then mark slow point for each



NNJR How to Safely Find the Limit



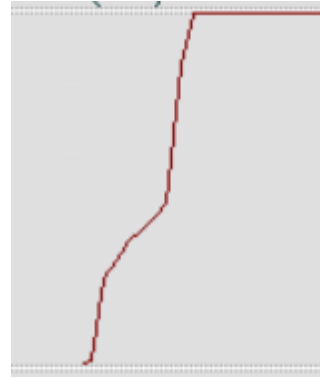
1. Pick 1 (safe) corner
2. After basic line and RP's are very consistent
3. Play with apex angle to find earliest WOT
 - Learn apex angle, TAP, WOT
 - Practice until solid
 - Need to have these nailed
 - Slow pt (min speed)
 - WOT
 - Exit apex
 - Apex
 - Angle of car at apex



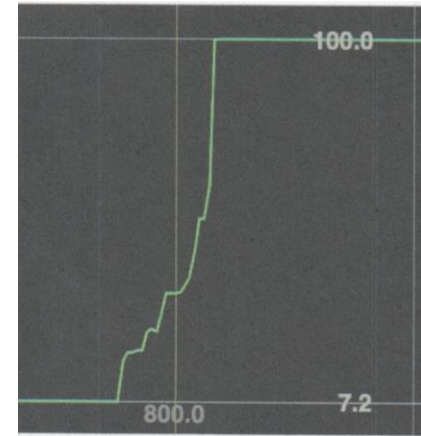
NNJR Throttle Application



- Exit speed corners
 - Exponential



- Entry speed and balanced corners
 - More linear, slower ramp up

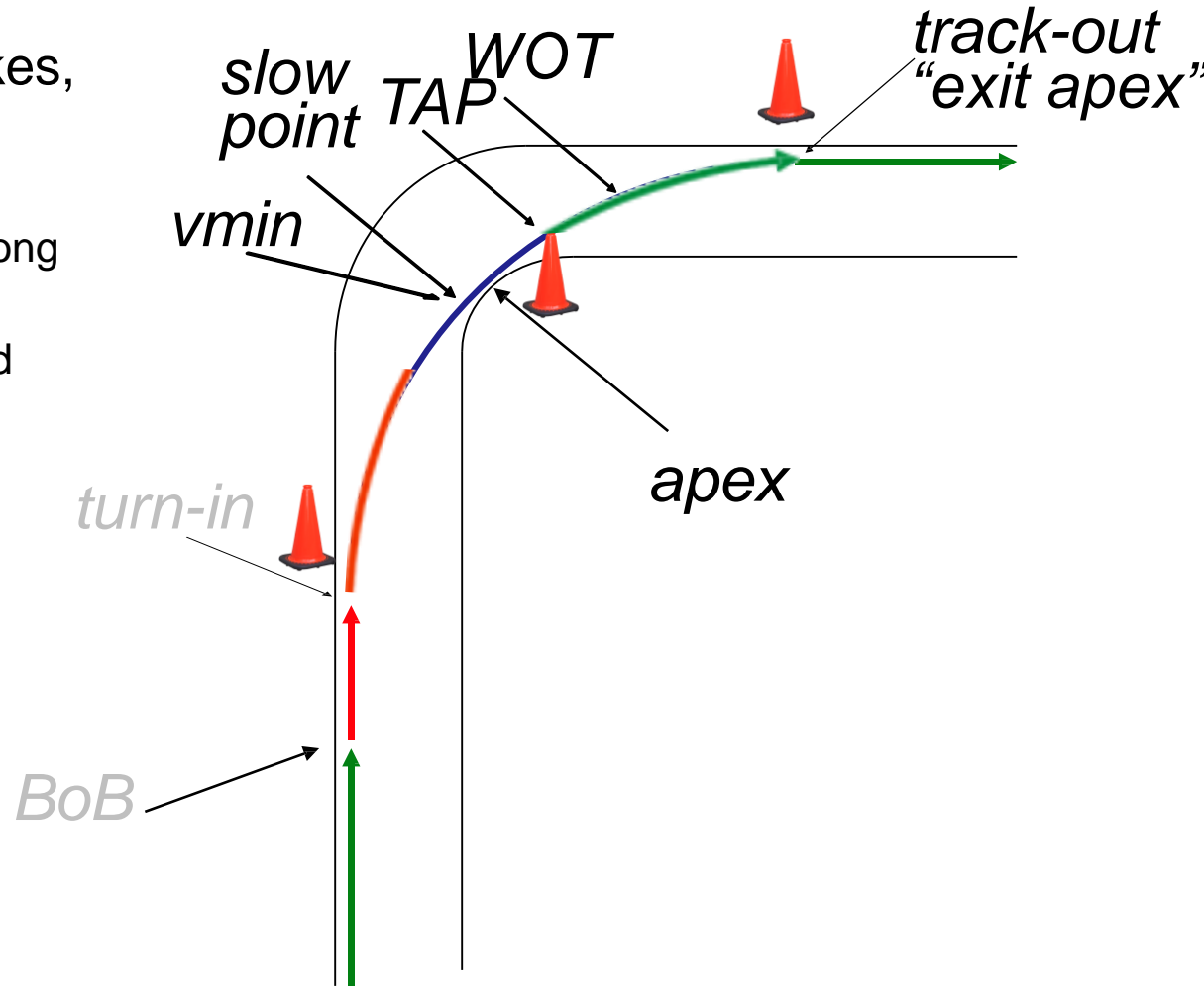


4. Find max v_{min}: relax brakes, roll speed until

- v_{min} is too late or slow pt is delayed or miss apex or wrong angle;
- then back down entry speed slightly

- Should have these nailed

- Slow pt (min speed)
- WOT
- Exit apex
- Apex
- Angle of car at apex
- V_{min}: speed at slowest pt



NNJR Summary: Driving at the Limit



- Starts with the driver
 - Physical and mental fitness required
 - Write down specific technique goals
- Pick a safe corner, use deliberate steps that minimize risk
 - Exit, entrance and balanced corners
 - Identify key Reference Points
 - Optimize WOT first
 - Braking is the last step





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- Use reference points to drive a consistent line

