



# On Track Vision Basics and Tips

## NNJR Track Side Classroom Series



Porsche Club of America



## ***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 Lightning, 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.*

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## WHERE TO LOOK?



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## ADAPTING TO TRACK DRIVING



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## WHEN TO LOOK?



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## HOW TO IMPROVE ON-TRACK VISION



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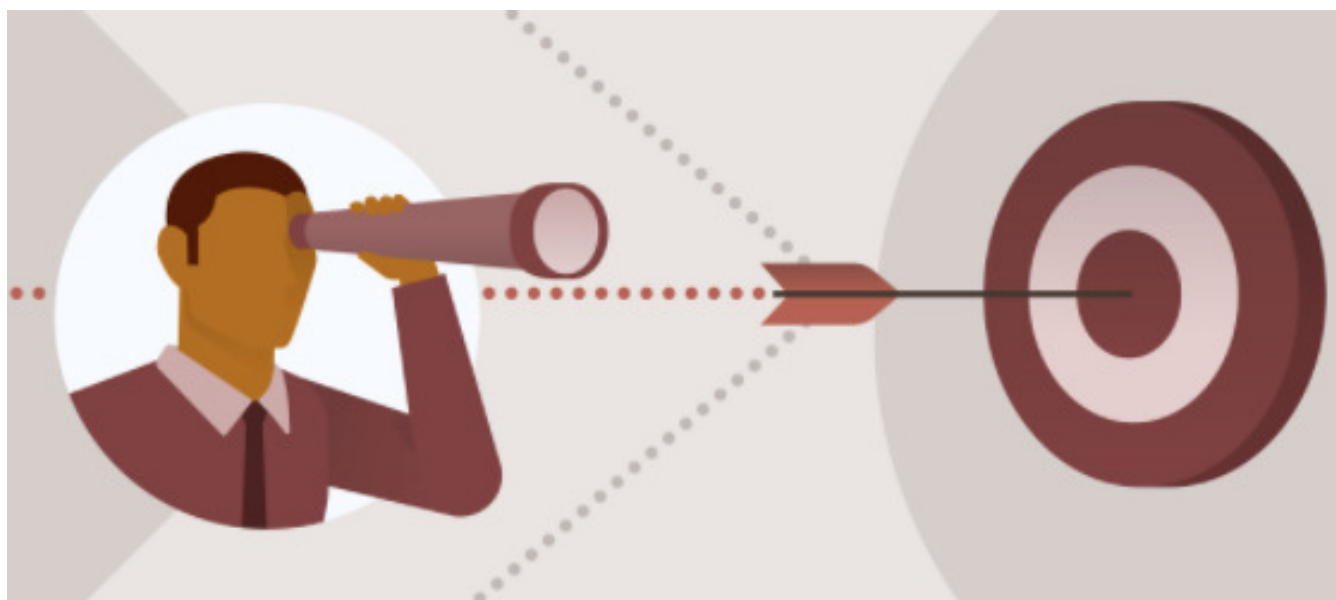
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## SUMMARY / Q&A

# ?

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# WHERE TO LOOK?



# NNJR Where to Look?



- “Classic” Advice
  - Look (far) ahead (20 sec)
  - Look where we want to go
  - Focus
    - Approaching brake zone, look at Apex or end of braking (EOB)
      - Beginning of braking (BOB) is peripheral vision
    - Approaching corner, look at turn-in point
    - Approaching turn-in, look at apex
    - Etc.
  - Use Reference Points (RPs)
    - Cones
    - Fixed items: fence, curb, tire marks, etc.

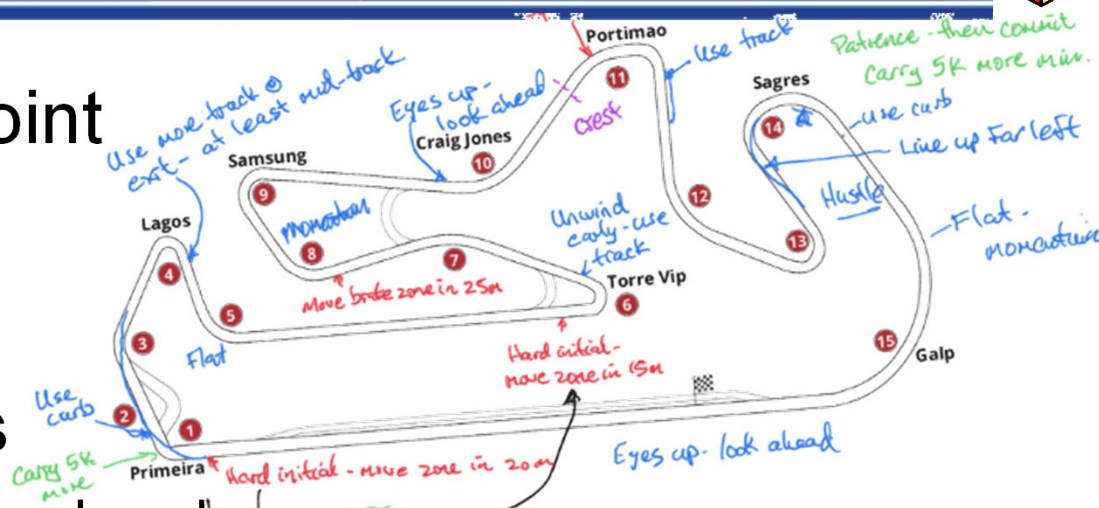




# RP's: You Can't Have Too Many



- RP = Reference Point
- Basics
  - BOB, TI, A, TO
- Essential Additions
  - Elevation, surface, color changes
  - All other unique features
- Non-Obvious Additions
  - EOB, TAP, WOT
- Want to Get Better?
  - More: complete “mental picture”

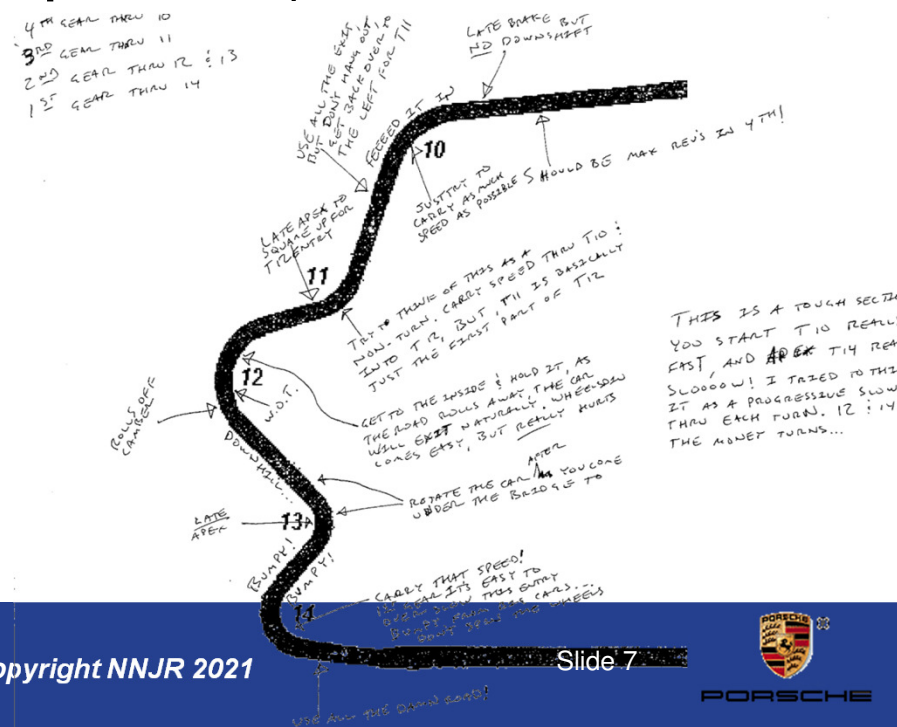




# NNJR Why RP's?



- Consistency; i.e. “Repeatability”
  - “Hit Your Marks”
  - If it doesn't look the same, it isn't the same
- Write them down (track map notes)
- Create a mental picture
  - Use for Visualization



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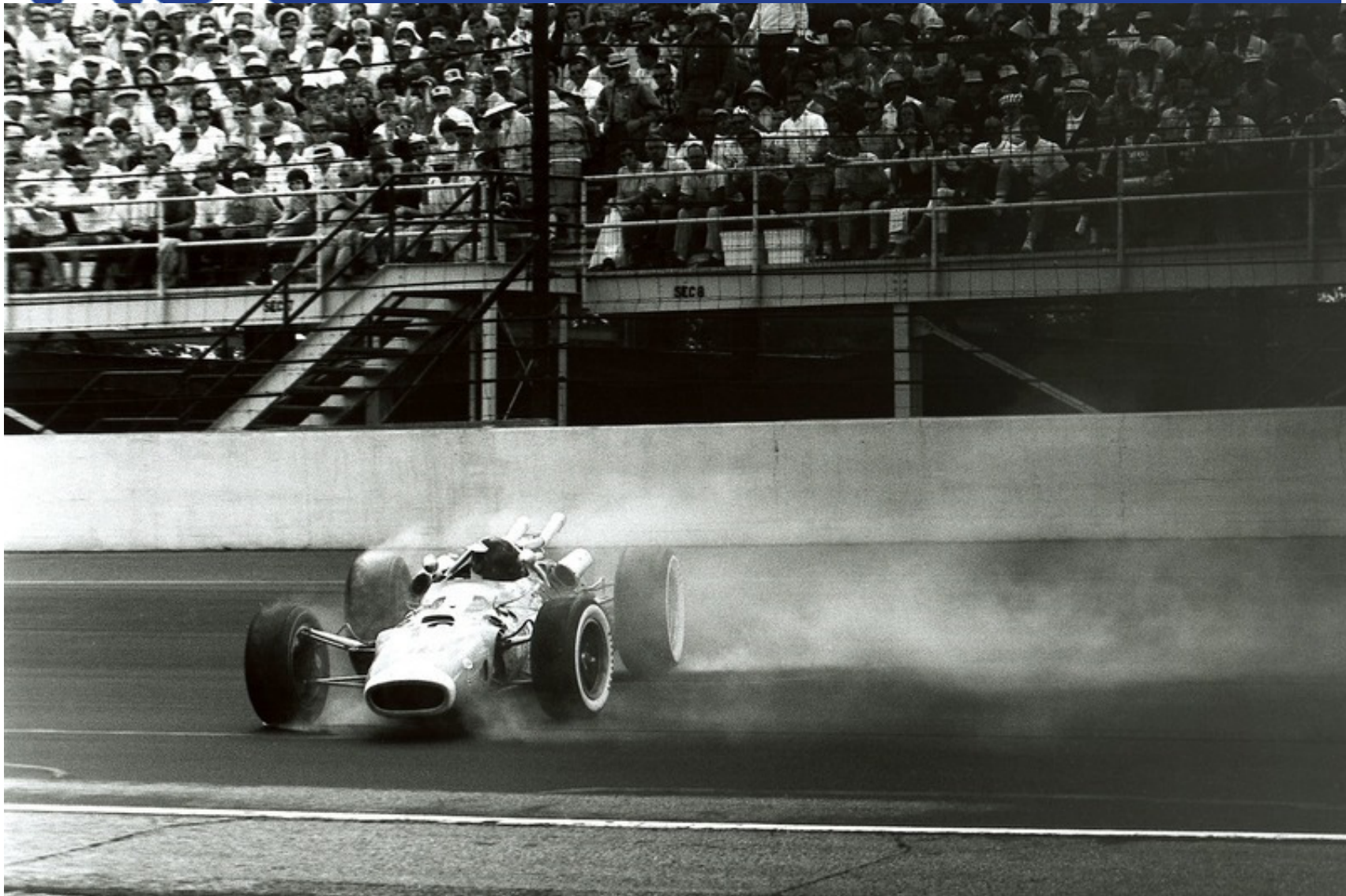
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Look Where We Want to Go!



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# ADAPTING TO TRACK DRIVING





# Adapting Vision to DE Driving\*



- Eyes take .7 sec to see, brain another .7 sec to react to something new (unexpected)
  - Means we need to look a minimum of 2 seconds ahead
- Our eyes have to be trained
  - Genetically programmed for 19 mph; not for 100+
  - Looking 30' ahead is natural
  - Human eyes/brain not designed to drive fast cars on a race track!
  - Avoid “target fixation”
    - <https://www.youtube.com/watch?v=v7xFXxwZMNA>

\* *Dennis Macchio*



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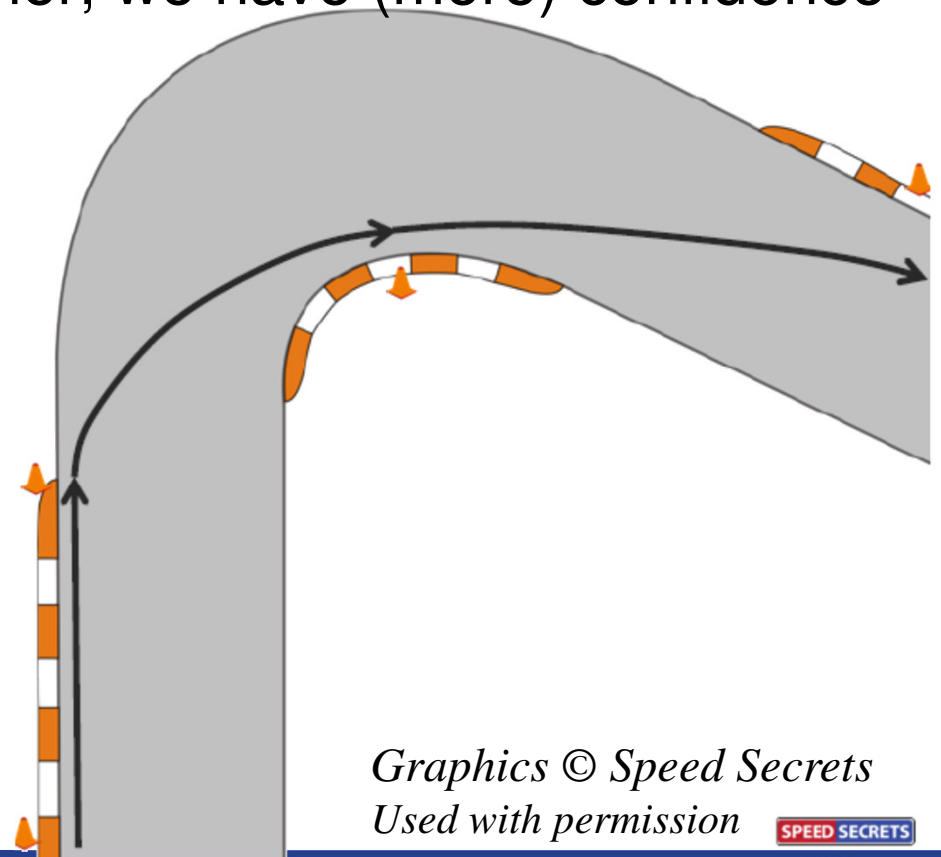
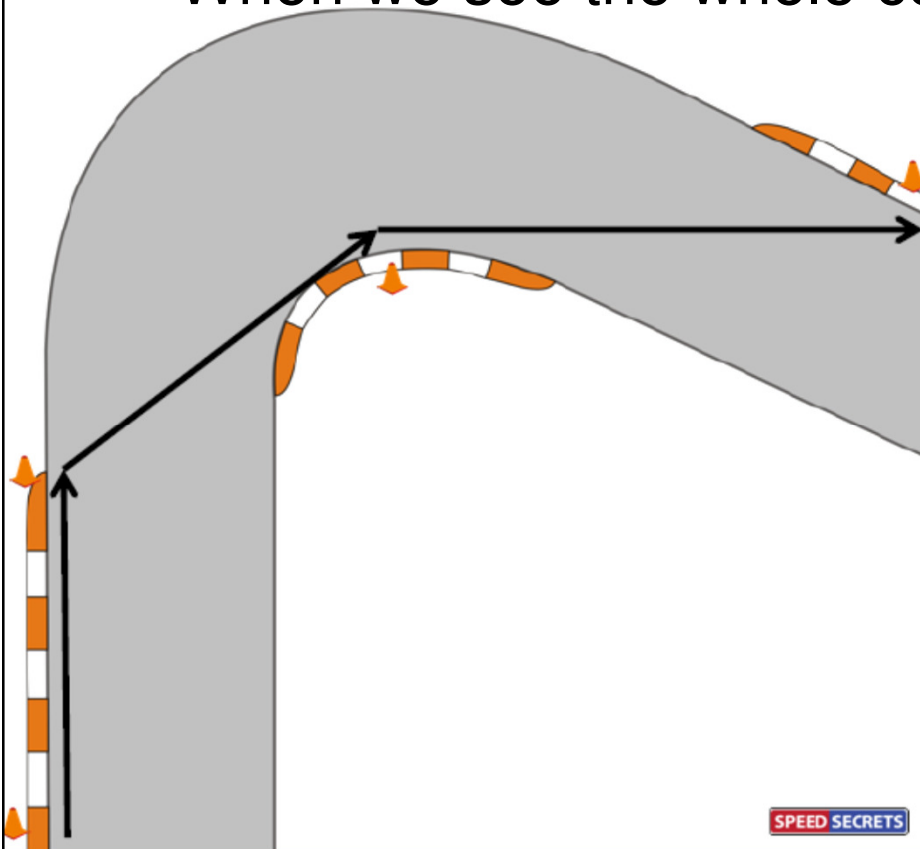


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# NNJR How We "See" a Corner



- A curve requires 3 points (basic geometry)
  - Our eyes have to "see" the whole corner
  - When we see the whole corner, we have (more) confidence



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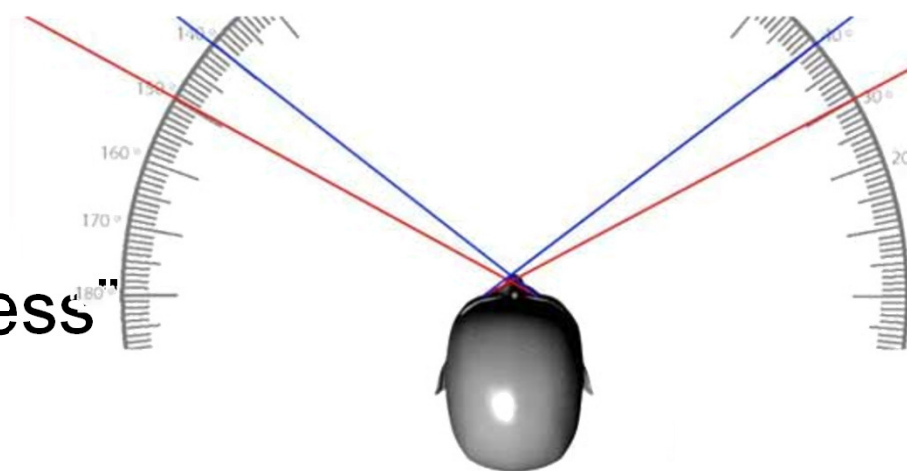


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# NNJR “Peripheral Vision”



- Focus ahead and use peripheral vision when close to RPs
- Part of depth perception
- Essential for “track awareness”
  - Mirrors
  - Cars, objects in motion



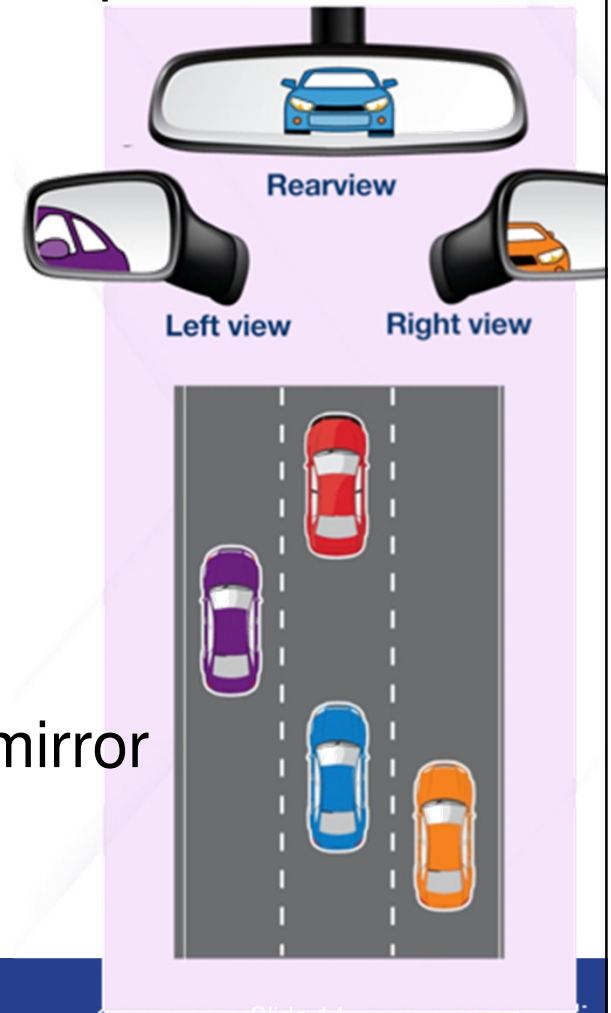
- Critical part of Situational Awareness
  - MUST be aware of cars behind
- Should never be surprised by a car in mirror
- Scan mirrors (esp. rear view)
  - On and end of straightaway
    - Are cars closer or further away?
  - Exiting a corner
    - Confirms how close the next car is



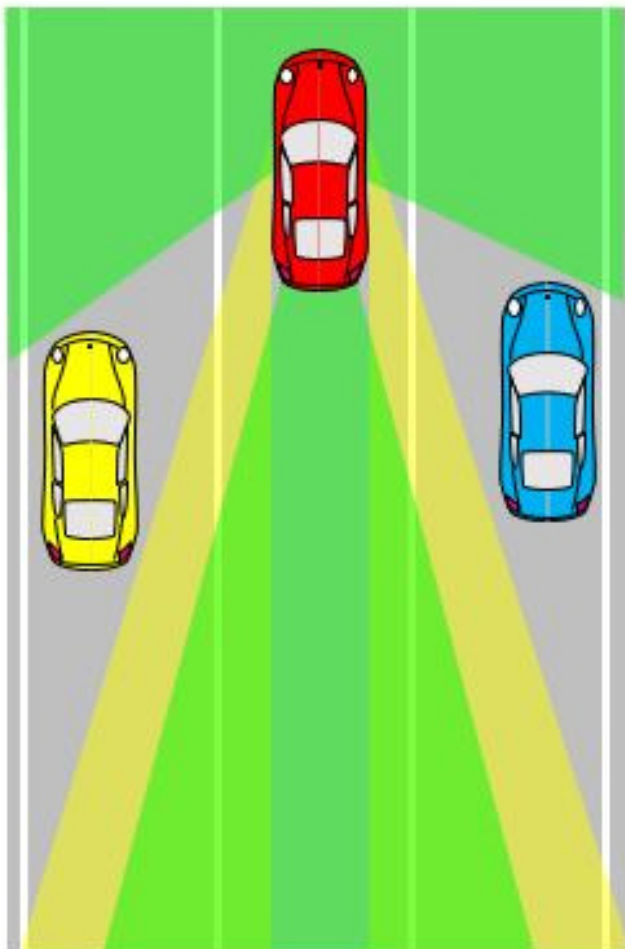
- **Start in correct seating position!**
  - Height tradeoff: up helps vision, down helps kinesthetics

## MIRRORS

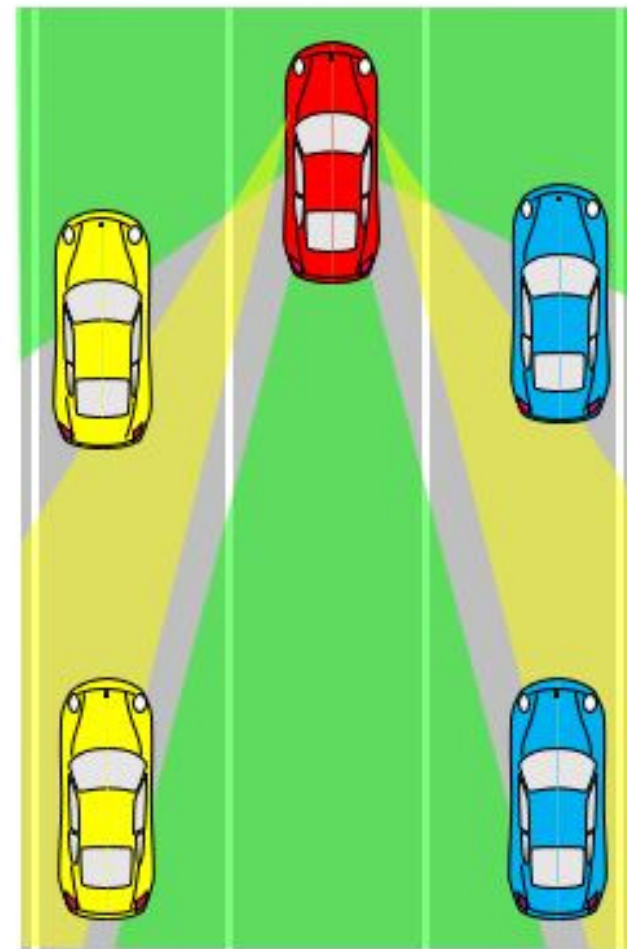
- **Rearview Mirror**
  - Adjust to see entire rear window
- **Left Mirror**
  - Rest head against driver's window
  - Adjust to barely see left rear fender
- **Right Mirror**
  - Lean right so head is under rearview mirror
  - Adjust to barely see right rear fender



Common



Better



G. Plazer, "The Geometry of Automotive Rearview Mirrors—Why Blind Zones Exist and Strategies to Overcome Them," SAE Tech. Paper 950601 (1995).

# NNJR How to “Look”?



- **Focus**
  - Central vision, 1 second or more
- **Peripheral**
  - Side/surround vision
- **Glance**
  - Central vision, 1/2 second or less
- **Mental**
  - Your “mind’s eye”

Source: Central Indiana PCA



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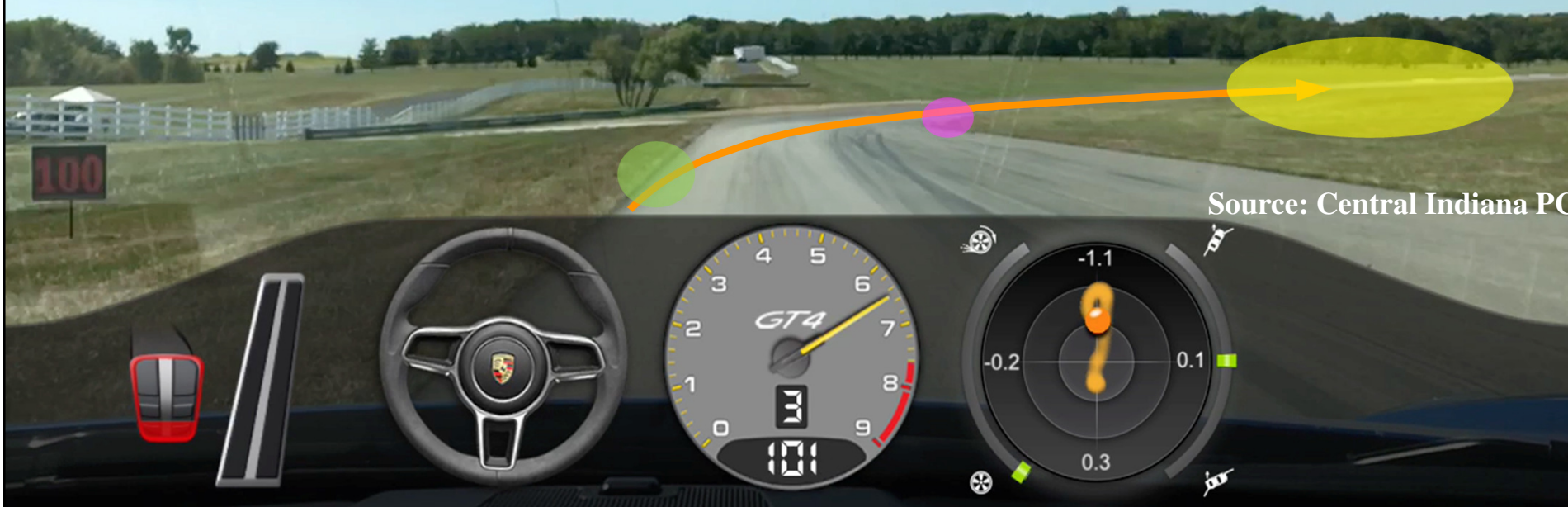
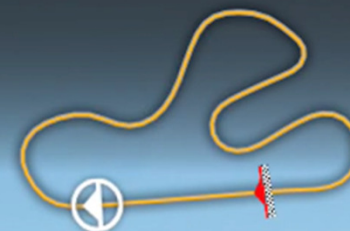
# NNJR Example



Chuck Tucker, Cayman GT4, 09/10/2017  
Putnam Park, Lap 7/15  
Sector – Sector 1

Total Time: 0:08:19.8  
Lap Time: 00:08.3

Glance  
Mental  
Focus  
Peripheral



Source: Central Indiana PC



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- Where to look (focus) when at apex
  - Track Out
  - WOT (Wide Open Throttle)
  - Down the Straight
  - Mirrors
  - Flag Station



# WHEN TO LOOK?



# NNJR When to Look:



- At Flagstations?
- At Mirrors?



# NNJR Flag Stations



- Critical for your safety and others (*duh*)
- **No excuse** for missing any flag
  - Why do drivers miss flags?
- Inexperienced drivers
  - Not enough scanning (“glance”)
  - Incomplete “mental picture”
- Experienced drivers
  - Tunnel vision: e.g. chasing a car or a laptime
  - Incomplete “mental picture”
  - “In a rut” and forget the basics



# NNJR Flag Station Turn 5



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# NNJR Flag Station Turn 5



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# NNJR Flag Station Turn 5



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# NNJR Flag Station Turn 5



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# NNJR Flag Station Turn 10



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# NNJR Flag Station Turn 10



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# Flag Station Turn 10



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- When should you look in your mirrors?
  - Entering a corner
  - Middle of a corner
  - Exiting a corner
  - Middle of straightaway
  - Entering a braking zone

# HOW TO IMPROVE ON-TRACK VISION





# How to Improve on-track Vision?



1. On the street
  - 5 seconds, 20 seconds
  - Focus vs. glance vs. peripheral
  - Adjust mirrors!
2. Visualization / Mental Imagery
  - Develop the mental picture!
3. Deliberate Practice
  - Sensory Input Sessions
4. Exercises
5. Be Aware of Negative Factors





- See Appendix for Details
- Questions?
  - Email [gilbert4@rcn.com](mailto:gilbert4@rcn.com) or
  - Ask your instructor





- In a rut / lose focus
- Pressure
- Tired
- Distracted



# SUMMARY / Q&A





- Follow classic advice
  - Look far ahead
  - Look where you want to go
  - Adjust mirrors
  - Use Reference Points
- Adapt to Track Driving
  - Reprogram for faster speeds
  - Use Focus, Glance, Peripheral and Mental Vision
- See flags early
- Check mirrors at the right time
- Pressure, distractions, etc. reduce vision...a lot

