

# What is Autocross?

- A CONTROLLED environment
- Controlled driving through a course marked with traffic cones in a controlled environment
- Timed “one car” event
- It’s about having fun and improving driving skills for the street
- Everyone is a volunteer: you drive and you “work”
- Everyone is responsible for SAFETY at all times
- Porsche events are a social gathering



## Credits:

- Most slides from Justin Chen
- Photos courtesy of Richard Viard



# Vehicle Dynamics

- Car is connected to the ground by approximately two pieces of paper worth of contact area
- Tires only have so much grip to give in any direction: “Friction Circle”
- Tires get more grip with more weight
- Weight balance changes when car accelerates, slows, or turns

## Understeer

- Front tires lose grip
- **Causes:**
  - Too much brake
  - Too much steering wheel
  - Accelerating in a sweeper (lightens front end and increases speed)
- **Solutions:**
  - Less braking
  - Less steering wheel
  - Wait (speed decreases)



## Oversteer

- Rear tires lose grip
- **Causes:**
  - Way too much gas
  - Braking and turning (trail braking)
  - Lifting in a sweeper (lightens rear end)
- **Solutions:**
  - Counter steer (steer into the skid)
  - Maintain throttle
  - Look where you want to go

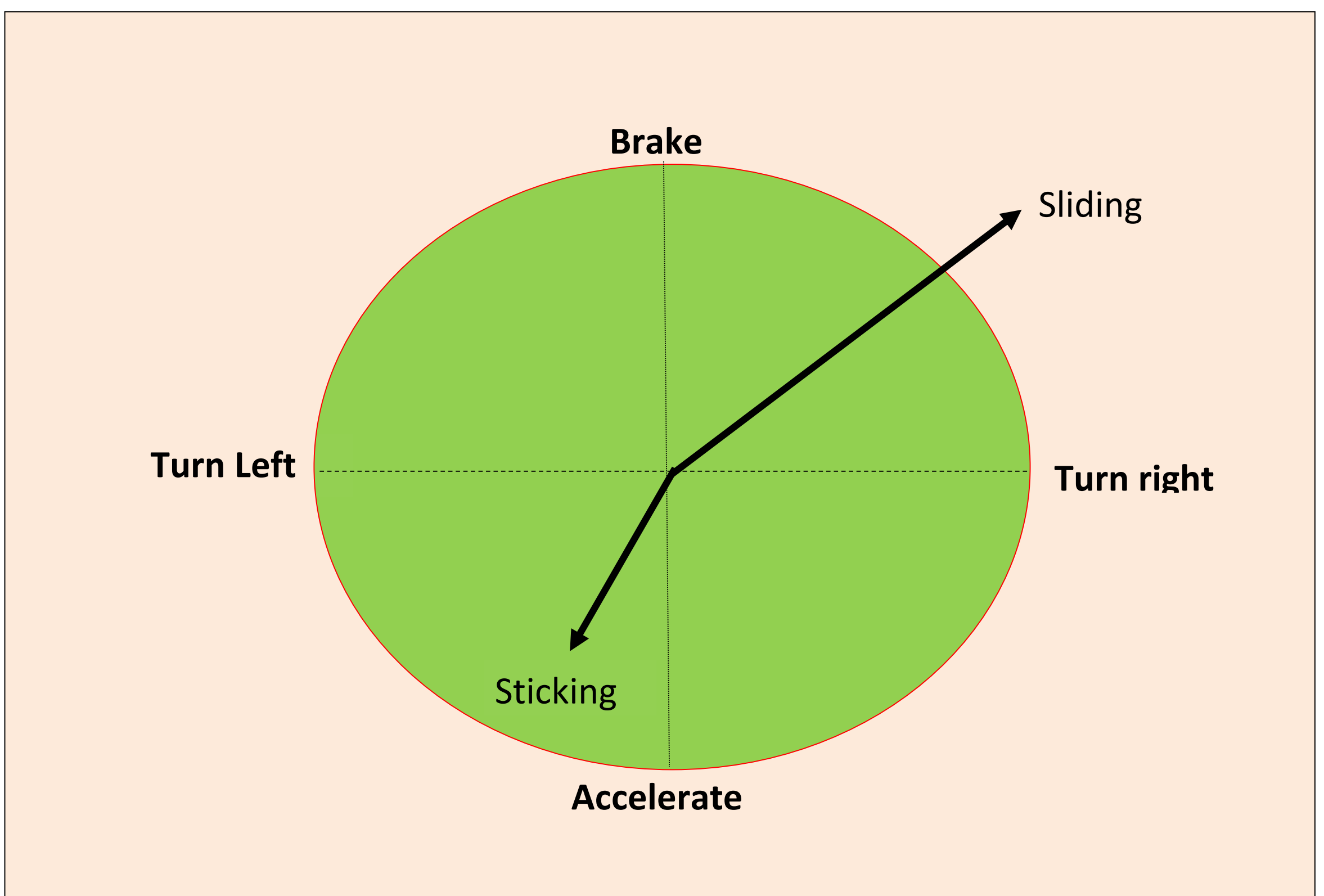


# Friction Circle

- Friction is required to accelerate, brake, or turn
- Tires and pavement provide the friction
- Tires slide when asked to do more than possible
- Sliding tires have less friction
- Tires have more friction within their ideal temperature range
- Friction works in any direction

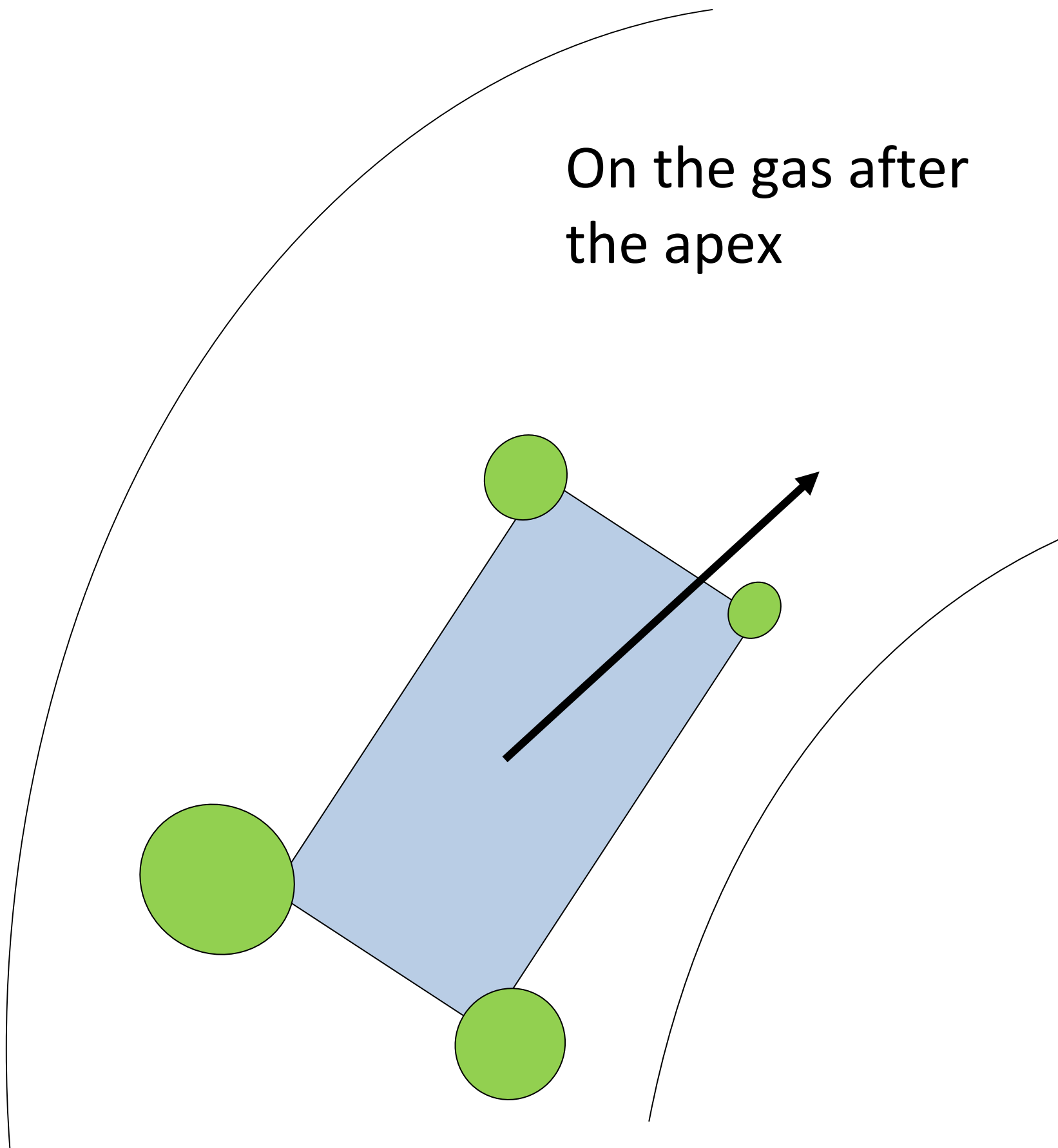
## But there's a budget

- Exceed budget – car slides and loss of control
- Don't use budget – could have gone faster



# Friction Circle again

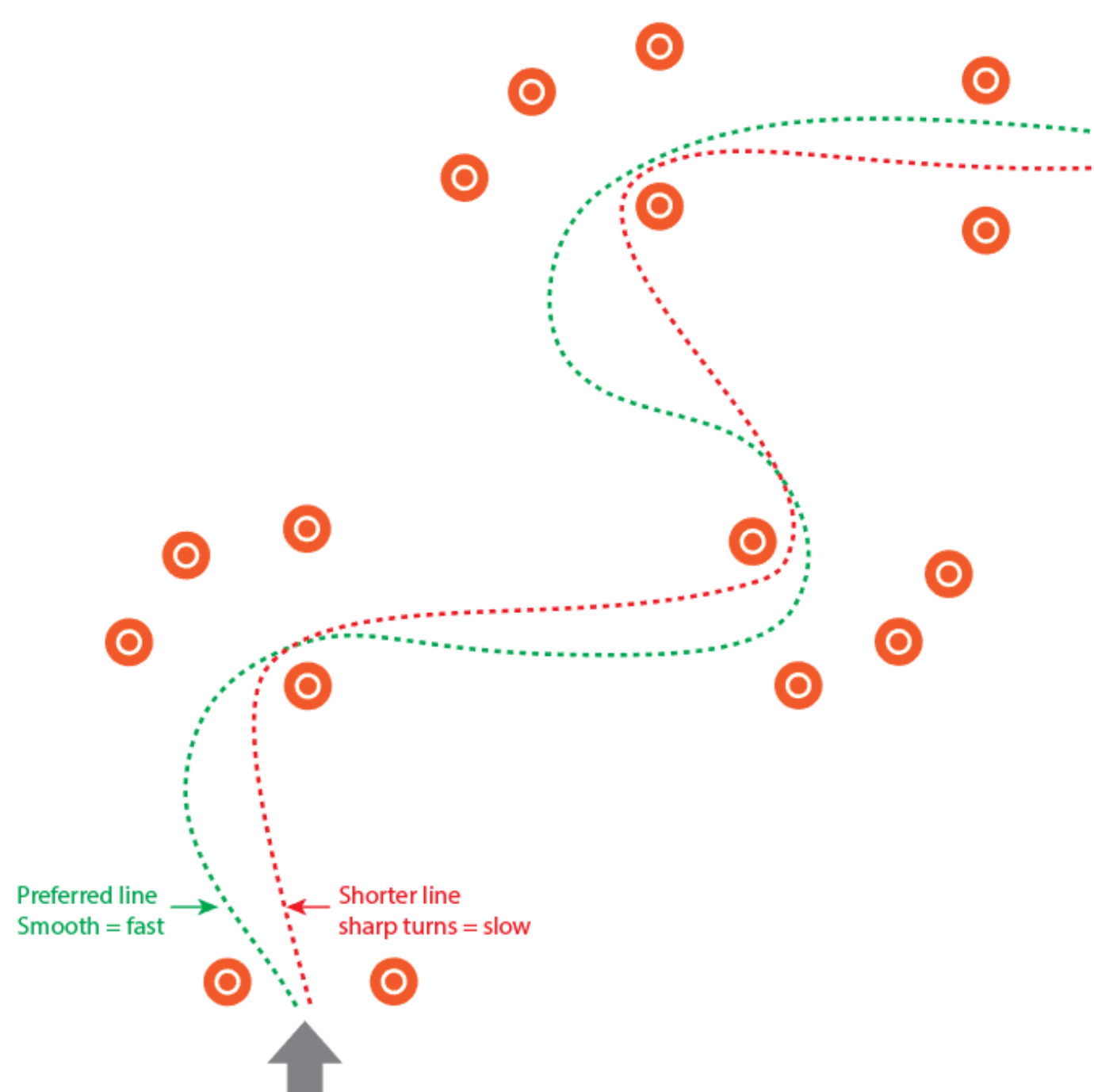
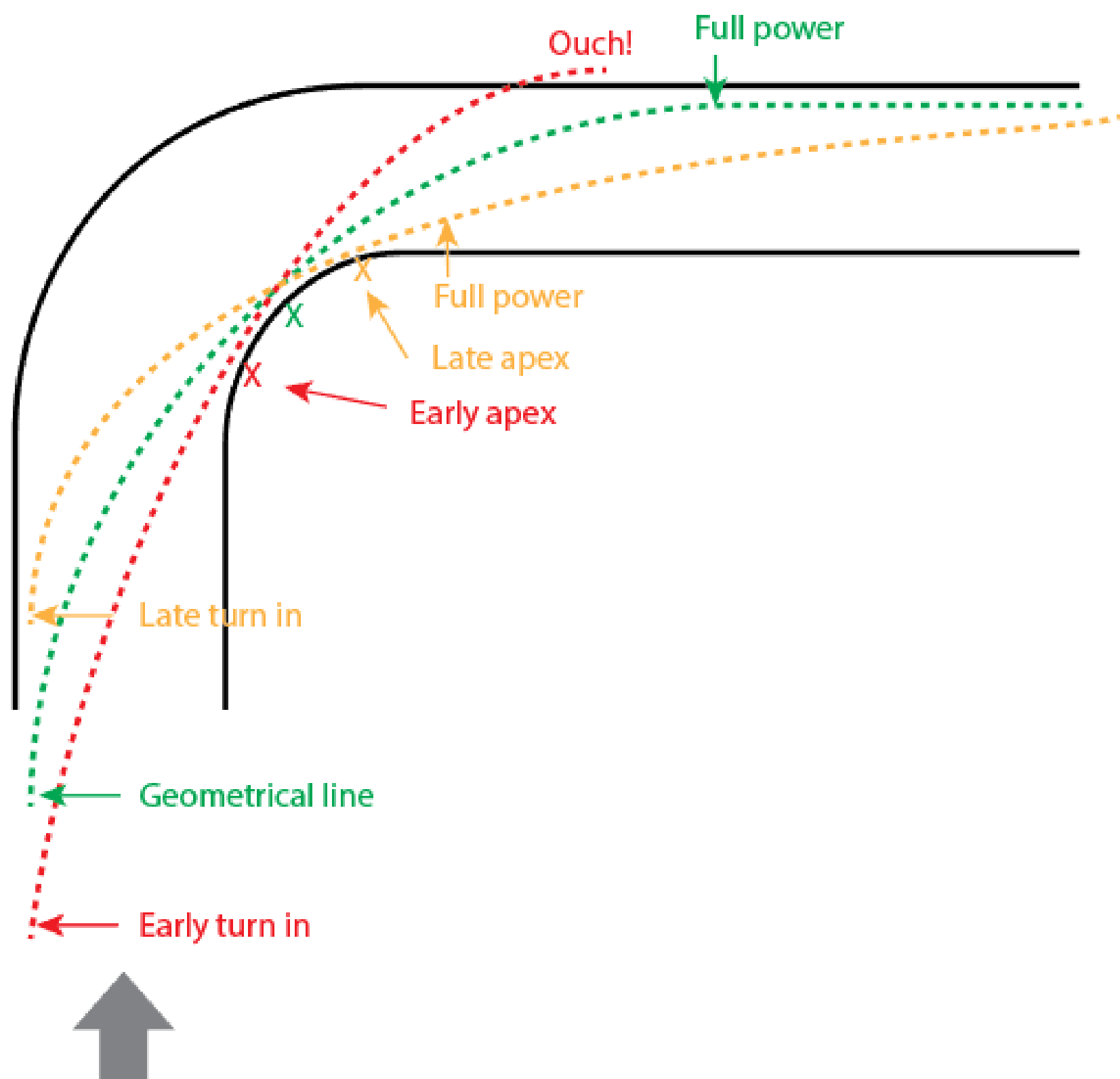
- The car has 4 tires – know them all
- Tires get more grip with more weight
- Shift weight: Gas & Brake & Steering
- The size of the friction circle changes with...





# The Racing Line

- Late Apex = Fastest & Safest
- Exit speed into straightway crucial
- Depends on what comes next
- “hey it’s more like chess than macho”



# Tips for Driving

- Be smooth in all your inputs so you don't ask too much of your tires, jerky inputs can overload tires
- Find the limit but don't exceed it
- Listen to tires and feel through the steering wheel for the limit of grip

## Proper Seating Position

- Hands at 9 and 3 if the steering wheel was a clock
- Don't let go of the wheel, cross arms if necessary
- Seat bottom close enough to get the clutch to the floor with a bend in the knee
- Seat back close enough so that top of steering wheel is at the wrist, relatively upright





# If you Spin

- Brake and clutch to the floor, “both feet in”
- Don’t be a hero! Trying to save a lost cause will just extend your spin area and can be dangerous
- Once stopped, get going ASAP



Both Feet In!

- If headed for grass point go straight



# Looking Ahead

- Look ahead to the next element and scan the upcoming course
- The car will go where you look, this is important for car control
- When you walk the course try to build it in your head, or just remember the “gotchas”
- Remember the places where you can go fast, and where you need to be slow
- Look ahead
- LOOK AHEAD





# Reading an Autocross Course

- Almost everything in autocross is “slow in fast out”
- Get pointed in the right direction early, being late is bad
- Cones might not be corner apexes or turn-in points
- Shorter distance and larger turning radius is generally the goal
- A big part of autocross is figuring out the fastest line, which may not be the same for every car



A Sea of Cones (Just a slalom)

Photo courtesy of Matt Angle



# Cone Basics

- Bases of cones are outlined with a chalk box
- Knocking a standing cone over is a penalty
- Knocking a standing cone outside its box is a penalty
- Moving a cone within its box without knocking it over is not a penalty
- Lay down or pointer cones do not count for penalties
- Not following the course results in an “Off Course” or “DNF” call





# Worker Responsibilities

- If a cone is knocked out of the box or moved at all: run your butt off, put the cone back in the box, run your butt back off course
- Keep an eye on the next car coming! That's the one that's going to hit you
- If it's not safe to replace the cone don't run out!
- Call in cone penalties or "off course", with car number, and corner number
- Look at the cones, not the cars





# Red Flag Situations

- If you see anything unsafe
  - One car catching up to another
  - Animals or people in the way
  - Car parts falling off or car on fire
- Red flag! Wave it in a big figure 8 and call it in on the radio
- If you're driving and you see a red flag, come to a controlled stop. Then proceed when instructed to by the course worker

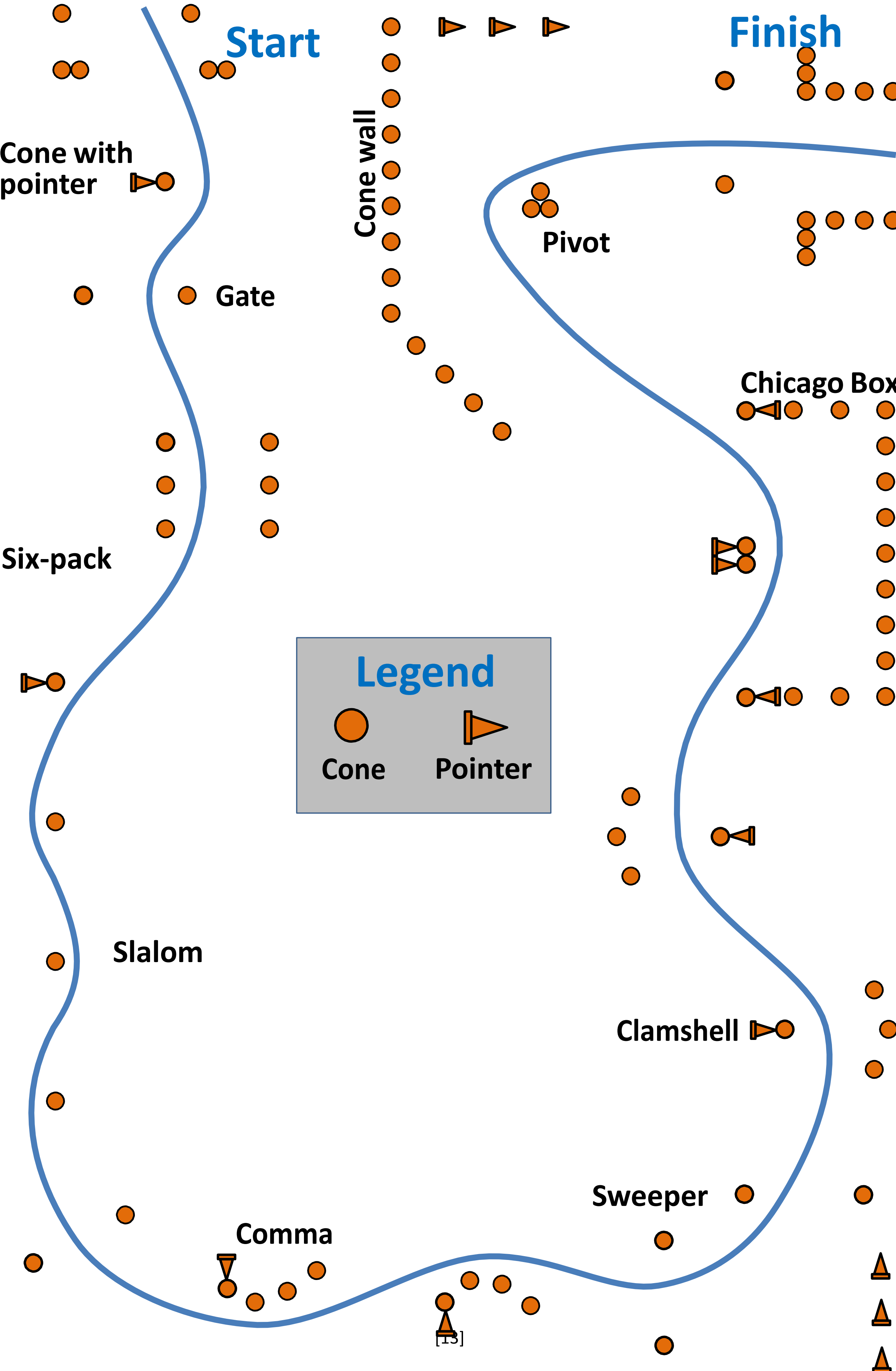


## Red Flag Situation

Photo courtesy of Krystian Macek



# Autocross Course Elements





# Summary

- Don't get run over and fix cones when working the course
- Look at the next element you're driving to
- Smooth inputs when driving
- Both feet in if you spin
- Listen to your instructor
- Have fun!

