

Beginning Autocross Clinic

By Paul Hamersly



Beginning Autocross Clinic

Target audience – Novice Autocrossers
& drivers needing a 'refresher'

Mindset –

- You are here to improve your driving skills & HAVE FUN !
- **SAFETY** is the order of the day
 - 5 MPH in the pits & staging
 - Think smart, drive smart → NO ROOM FOR SHOW OFFS
 - ***You will be asked to leave if you are a safety threat***
- As you learn, please do not concentrate on competing with others, but instead concentrate on learning and improving new skills one-at-a-time
 - As a novice, do not be concerned with the times of others
 - Try to improve yourself on each run & have FUN !
- Listen to what the instructors tell you
 - Do what they tell you
 - Clint Eastwood said, "A man has to know his limits"
 - Find them and work on decreasing them
- Don't expect too much too fast – autocrossing takes experience (seat time)
- Concentrate on only 1-2 areas of improvement each time you autocross
 - Trying to think about too many things will only frustrate you

How an Autocross Works –

- **Insurance Waiver** – sign when you arrive at the event site
 - **Required for all** – indicates personal responsibility
 - **Says you will not sue the event host**
 - Minors (under 18) require special waiver
 - Event host insurance is for liability. It protects the host and site.
- **Driver's Meeting** – MANDATORY
- **Safety is paramount**
 - Think safe, be safe
 - If you see safety violations – report them or correct them if you can
- Run & Work – normal scenario – we work while others run – we all contribute to each event
- You will drive one 'run through the course' at a time
 - Other cars may be on the course - cars will be 20-30 seconds apart
 - You may be given a 'rerun' if there are timing or course problems
 - Multiple drivers of same car –
 - Separate run groups is best
 - Otherwise, make sure you get car back to the staging area for the driver swap promptly & follow directions
- **Course Map**
 - Usually to scale and a tool to help you as you do your course walks to learn the course of the day.

How an Autocross Works – continued

- **Course Work** – you will work while another group runs
 - Be alert
 - No cell phones
 - No sitting down
 - Watch your assigned work area only –
 - Equipment & the safety/work station:
 - Red flag
 - Fire extinguisher – primarily to save the driver
 - Safety vest (usually)
 - Radio
 - Watch ONLY your section of the course
 - Watch “BEHIND” the car in your section
 - Otherwise, you will miss downed cones
 - Don’t want to give penalties to wrong drivers
 - Have your red flag ready
 - Unfurled, but with the end held in your hand ready to drop.
 - Do not keep it rolled up
 - Do not wave it around
 - Re-set down/moved cones when safe – be quick
 - NEVER turn your back to oncoming cars
 - Identify oncoming cars as they enter your area
 - Number is best
 - Color/make/year is second choice
 - Notify ‘Timing/Scoring’ of DRIVER PENALTIES in your section
 - Use assigned section number on radio calls if applicable
 - Cones
 - Down = penalty (except directional cones)
 - Up = penalty only if outside of & not touching box
 - Hand signal = hold cone in air
 - Tell ‘Timing/Scoring’
 - Total number of down cones
 - Area where you are working
 - Number or Description of Car

- **Course work** - continued

- WATCHING FOR “CONE” PENALTIES:

Cones are marked with a chalk outline “box”



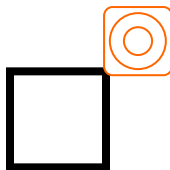
- Down cones are a 2 second penalty – report each one & reset quickly/safely



- Cones standing up, but outside the chalk box outline are “down” = penalty



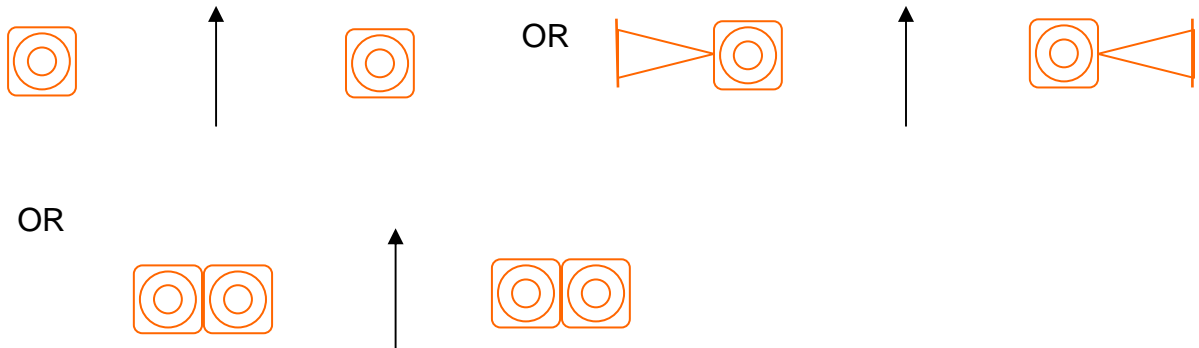
- Up cones touching the chalk box outline are “OK”



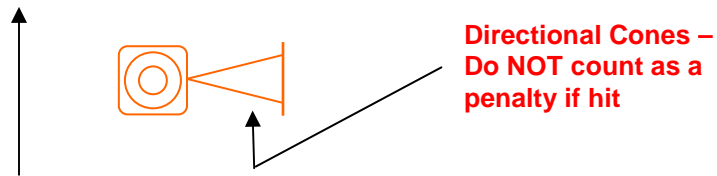
- Course deviations = DNF (No Score)
 - Missing gates
 - Bypassing slalom cones
 - Taking mandatory direction cone on wrong side
 - Bypassing section of course
 - Hand signal = crossed arms above head

- **Course work** - continued
 - **WATCHING FOR “DNF” PENALTIES:**

Gates – must drive in between the cones (single cones, doubles, or pointers)

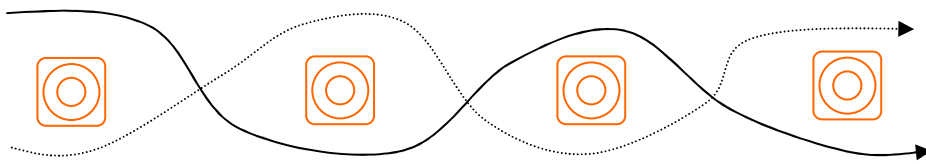


Pointers – must drive on the side away from the pointer

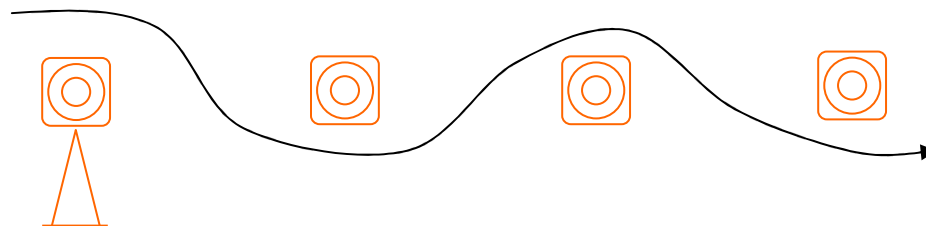


Slaloms – must “weave back & forth” – taking 2 or more on the same side is a DNF
 Direction is the driver’s choice, UNLESS there are directional cones:

Choice slalom – driver can go either way, but has to “weave” all cones



No-choice slalom – driver cannot choose entry, but has to “weave” all cones:



- **Course work** - continued
 - Communication
 - Radio
 - Identify work station
 - Report penalty or DNF & car number/description
 - Get confirmation from Timing/Scoring
 - Hand Signals
 - Down (penalty) cone – wave above your head before replacing
 - Moved cone still touching box – no penalty – wave hands criss-cross by your knees
 - Course deviation (DNF) – cross hands above your head
 - Be sure to get confirmation when you radio Timing/Scoring
 - Don't "Red Flag" unless necessary
 - Goal – keep event running smoothly
 - Err on the side of safety & caution when necessary
 - Make sure you give instructions to stopped driver
 - Stay at work station until relieved
 - IF A DRIVER STOPS for a downed cone (But not his own !)
 - Driver has a right to a clean course
 - Not an issue during practice events, fun runs, etc
 - Notify timing that a cone was down & request a rerun for this driver
 - While on the course area – **DO NOT STEP ON TIMING SYSTEM WIRING**
 - **DO NOT walk through timing lights**

Car Preparation

- Tire Pressures – depends on type of tire
 - Street Tire "Rule of thumb"
 - 36 front & 33 rear
 - Chalk on the "roll over edge" will help you decide
 - Does tire make contact all the way to the edge & wear off the part of the chalk on the traction surface?
 - Not all the way = too much pressure
 - Rolling onto the side wall = not enough pressure
 - Tire safety – don't go below "wear bars" (on street tires)
- Check all fluids
 - Leaks are bad for everyone else – don't bring them !
- Remove everything loose in the car
 - Including floor mats unless they are attached
 - Can slide under gas/brake pedals
- Keep all steering & suspension joints lubed
- Check brake pads & rotors
- Bleed brakes regularly & flush brake fluid completely once a year
 - Use quality "Hi Temp" fluid (Motul, SuperBlue, etc.)
- Check for no play in wheel bearings & steering wheel

Car Preparation - continued

- Battery securely tightened down
- Seat belts – no twists & “cinch if possible”
- No hubcaps, center caps, or trim rings
- Check for equal & proper wheel lug nut/stud torque
- Clean windows – front & rear
- Roll down side windows – recommended, but not mandatory
- Many people turn rear view mirror up – don’t look back !
- Nitrous oxide IS NOT ALLOWED at ANY sanctioned autocross event site !

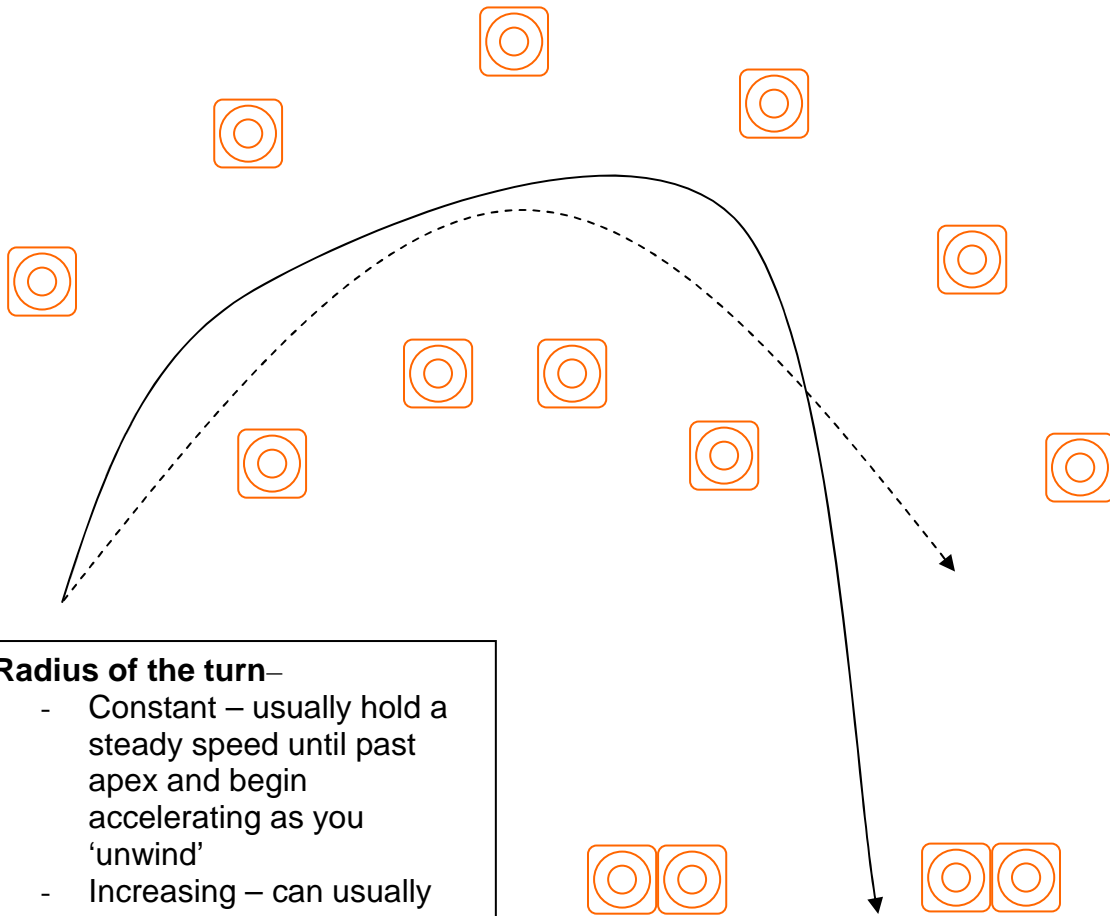
Prepare Yourself

- Arrive early !
- Concentration
 - Relaxed, but focused
 - Do not stress – you are here to have fun
- Soft shoes with closed toes - wrestling shoes work great !
- Helmet that fits (snug is right)
 - Snell 2000 or newer (less than 10 years old)
- Gloves help keep a grip on hot/sweaty days
- Sunglasses
- Sunscreen
- Hydrate – bring & drink lots of water
- Bring something for a snack – bananas are terrific
- Leave pets & kids at home
 - Unless you have someone watching them FULL TIME !
- Chairs, canopies, etc are great, but make sure they are secure in the wind
- No alcohol at the event site – EVER !

Basic Techniques and Skills –

- Goal – navigate the course SAFELY & cleanly in the shortest time
 - Each penalty cone adds 2 seconds to your run time
 - Course deviations are a DNF (Did Not Finish)
 - IF you see a down cone (not yours), stop & get a rerun (NA in practice)
 - Watch for red flags - stop & follow directions
- **Course Walk – the MOST IMPORTANT contribution to autocross success**
 - Don't socialize – let groups go ahead so you have a clear view
 - Walk with an experienced driver if possible
 - Walk “from the driver's seat”
 - Your eyes should be in the same position as when in the car
 - Sometimes stoop down to see through a “busy” area of cones to see what you will be seeing while in the seat from the same perspective
 - At each element, “LOOK AHEAD” toward the next element
 - When driving you will be looking ahead and you must “pick up” direction changes in advance
 - Your subconscious will take care of where you are !
 - Keep feeding it the view ahead !
 - DO NOT look backward on the course !
 - You won't be driving in that direction !
 - If you get toward the end of an element of section and you are not sure that you took the right line – GO BACK
 - Rewalk the section in the direction you will be driving
 - Pick the “important cones” – usually only a few on entire course
 - Disregard the “distracter” cones
 - Find the “line” you want to drive
 - Pick your brake points relative to your key cones
 - Walk several times to memorize layout & key features
 - “Drive” the course in your memory before your run
 - The shortest distance is “usually” the fastest way !
 - Let's look at the most common types of autocross course elements you will see on your course walk. Remember, you are learning where you will drive during your walk. You will be mentally driving the course solution on this walk, so pay careful attention to every element, including where the straights are (to accelerate).
 - We will go over basic turns
 - One note – the larger the turn, the faster you can be going through it.
 - On a very tight turn, it will be slow, so stay tight to the inside of the turn to travel the shortest distance.
 - On a larger radius turn where you can be going faster, choose the middle to help you carry speed to overcome the fact that you are driving a longer distance through the big turn.
 - Then we will go over slalom concepts

Turns – pick the right line for what is NEXT !



Radius of the turn–

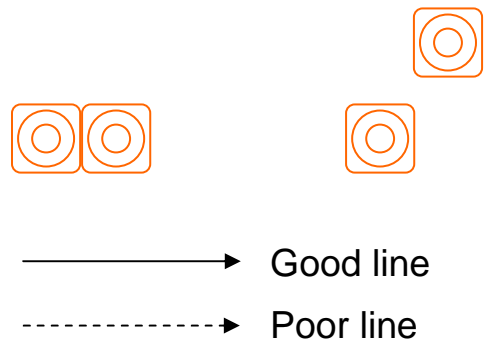
- Constant – usually hold a steady speed until past apex and begin accelerating as you 'unwind'
- Increasing – can usually accelerate a little during more of the turn
- Decreasing – avoid too much entry speed because it will close up on you

What's all this talk about "LATE APEX?"

A geometric apex is the mid-point in a turn or arc, but we're not in math class.

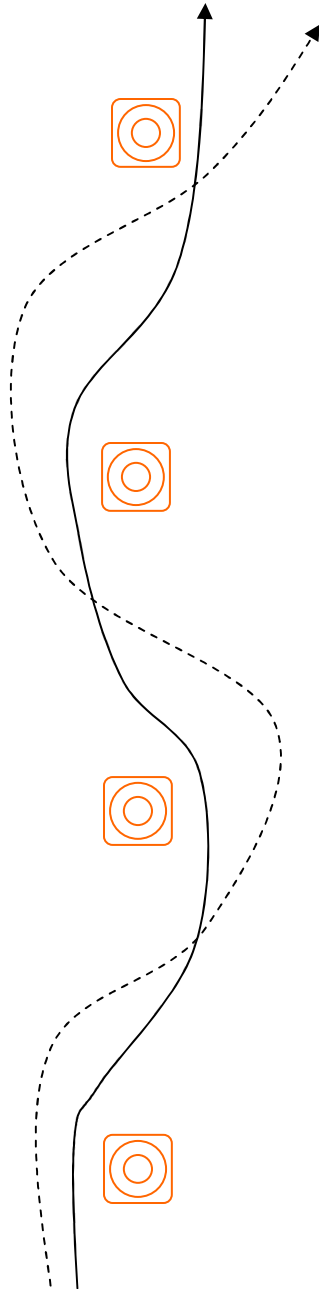
Realistically, an autocross apex is the point in the turn where you **STOP TURNING IN AND BEGIN UNWINDING THE STEERING WHEEL AND TURNING OUT!**

The solid line in this example is a late apex! A path like the dotted line is a perfect turn, but you will be way off course!



—————→ Good line
-----→ Poor line

Basic Slalom Concepts – Goal is a modified straight line with minor steering corrections, not excessive back-and-forth swings !



—————→ Good line
-----→ Poor line

Slaloms –

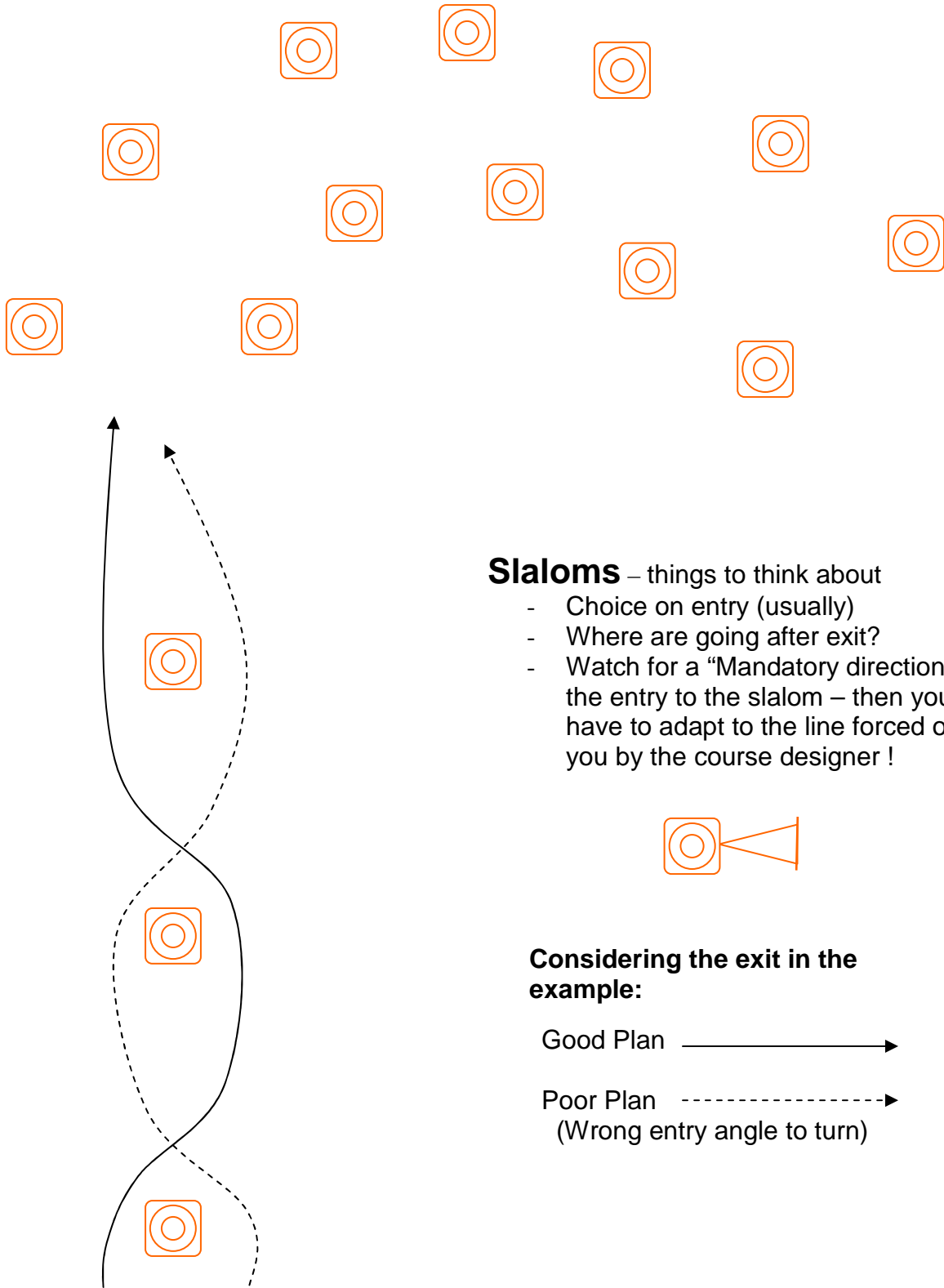
- Course walk – know distances between cones in the slalom
 - o Increasing
 - o Decreasing
 - o Random
 - o Equal
- Stay as close as possible
- “Turn in” as soon as possible w/o hitting the cone
- Break before entering to a speed that you can “carry” through the slalom
- Accelerate easily once car is stable
- Think - - - -
 - o Where are you going next?

What happens when you turn too late in a slalom?

Look at the dotted line path - You have to over-correct at each transition point ! And, all turns are more extreme.....

Finally, you will be off the desired path at the end which will have you off course for the next element of the course

Slalom Entry Choice Example



Slaloms – things to think about

- Choice on entry (usually)
- Where are going after exit?
- Watch for a “Mandatory direction” at the entry to the slalom – then you have to adapt to the line forced on you by the course designer !

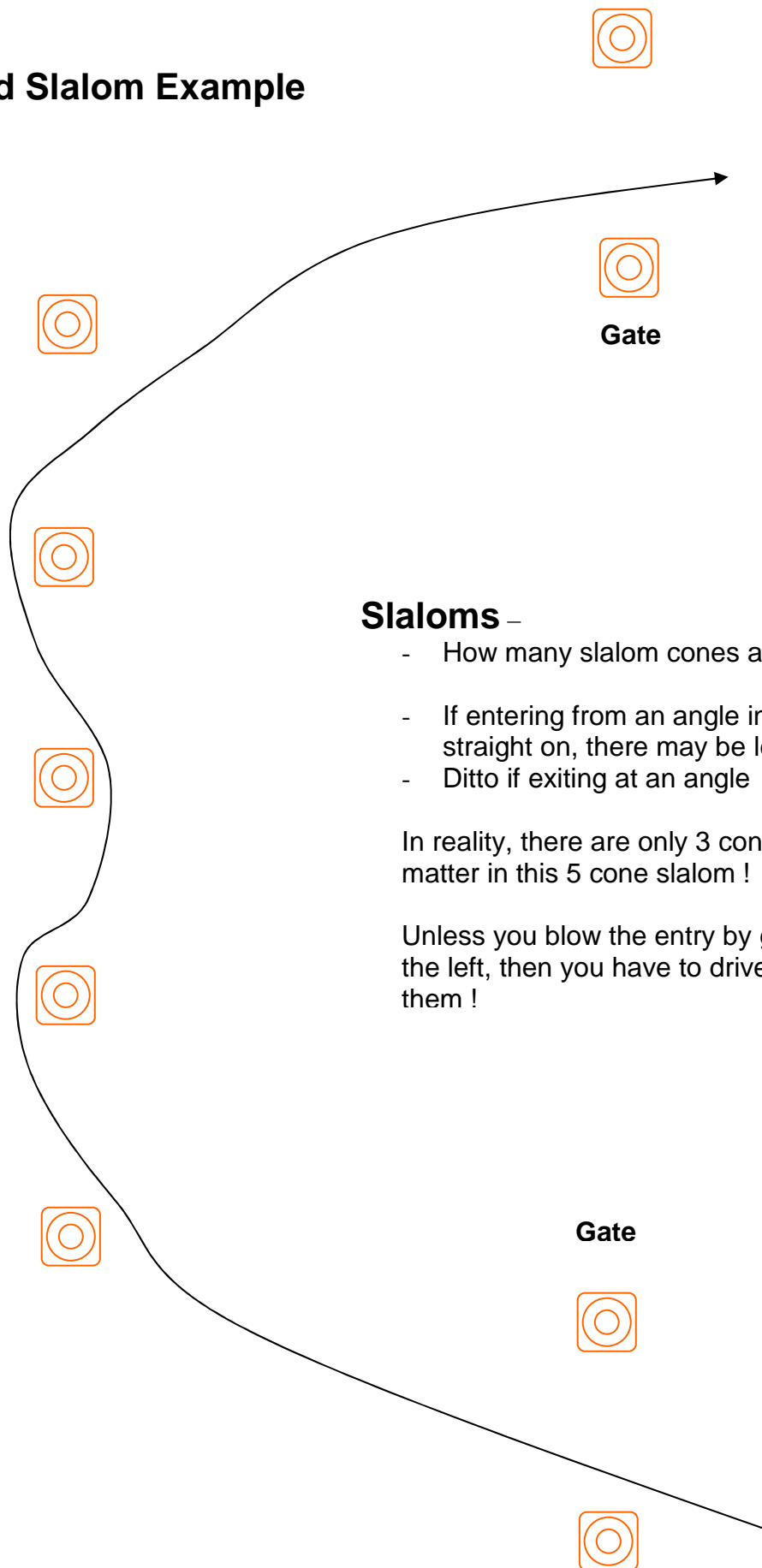


Considering the exit in the example:

Good Plan →

Poor Plan →
(Wrong entry angle to turn)

Exaggerated Slalom Example



Slaloms –

- How many slalom cones are there?
- If entering from an angle instead of straight on, there may be less.
- Ditto if exiting at an angle

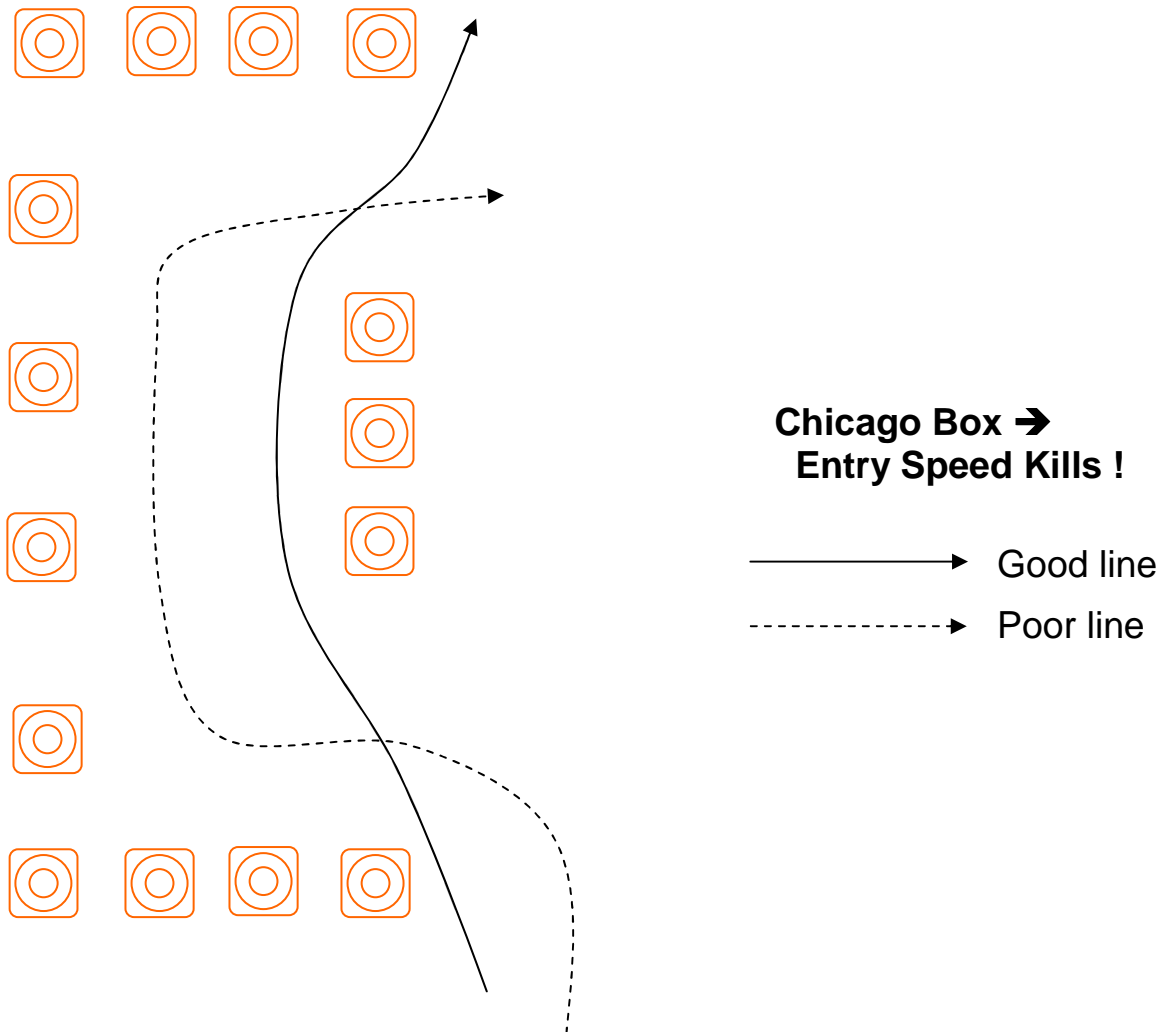
In reality, there are only 3 cones that matter in this 5 cone slalom !

Unless you blow the entry by going to the left, then you have to drive all 5 of them !

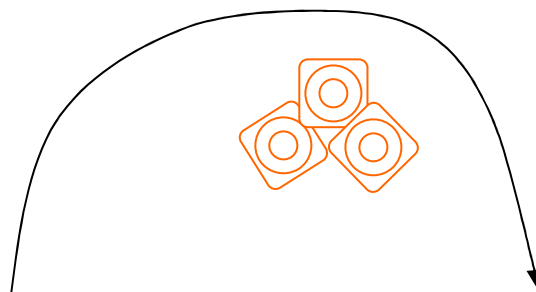
Basic Techniques and Skills – continued

Turns, slaloms, and gates are the most common autocross course elements, but there are others you will encounter.

Chicago box – drive in, through, & out

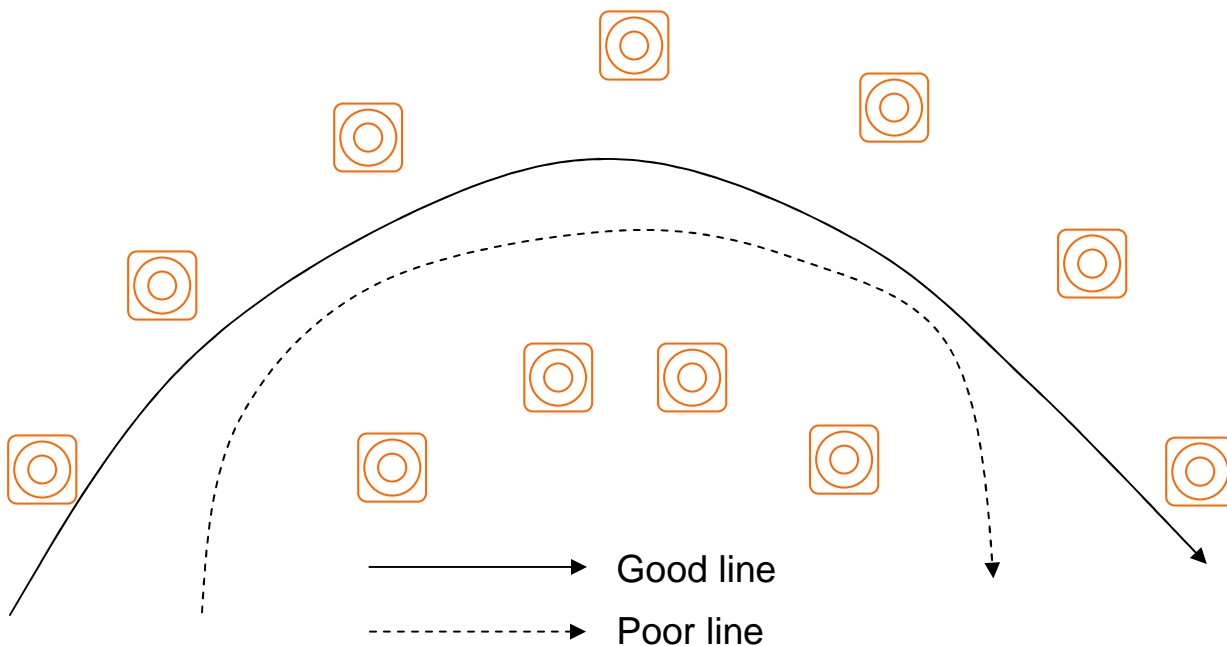


Clump – must go around – choice is yours – usually a lot of “open space before and you are “driving out to the clump & returning” Don’t drive right at it – mentally ‘picture’ the “clump” as the late apex point in a turn.



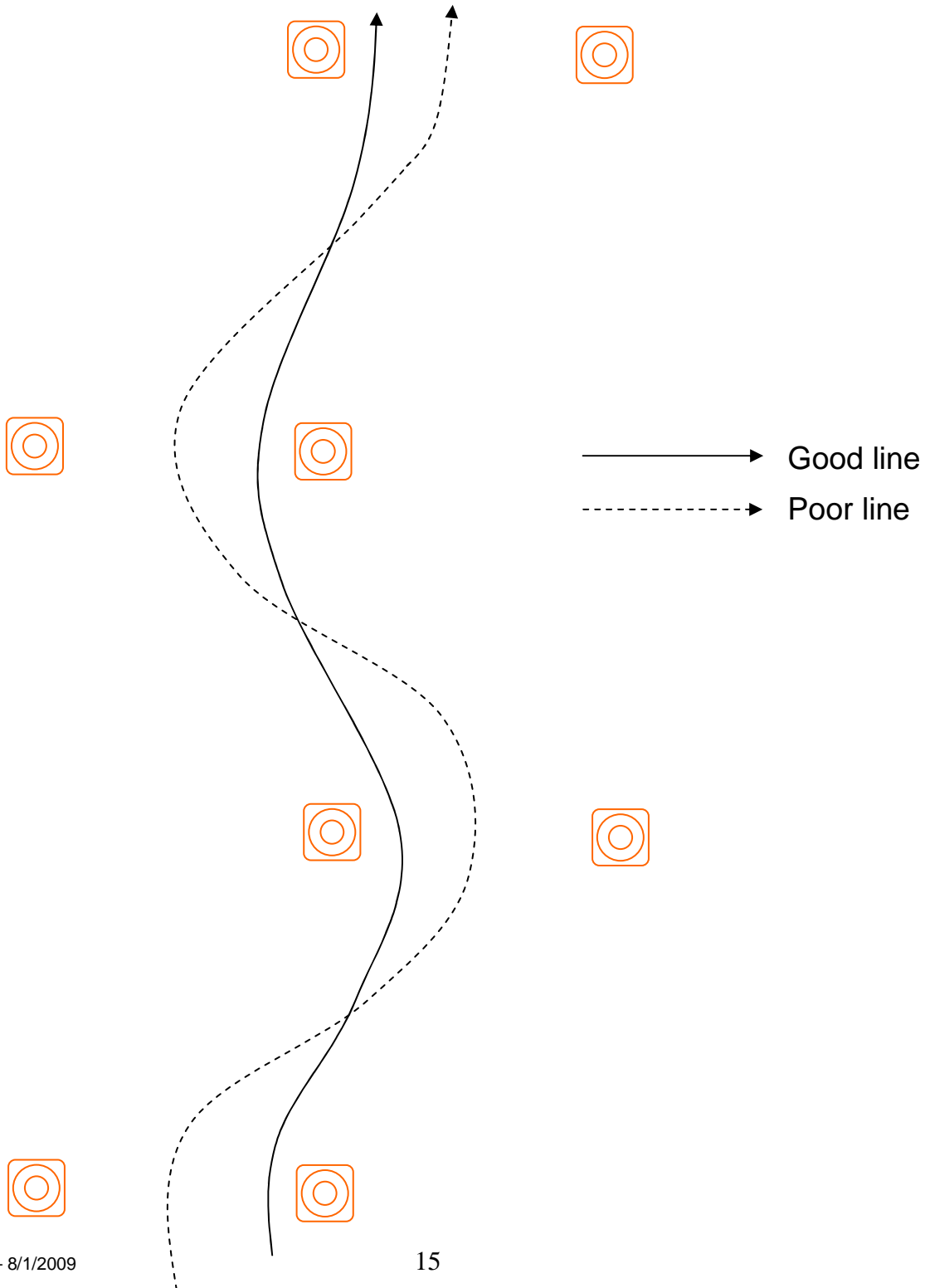
Basic Driving Techniques and Skills –

- Basic concepts to apply to the whole course while driving
 - Traction is critical to both braking & turning
 - Good tires can turn great & brake great
 - But only one at a time !
 - Brake in a straight line – slow enough, then...
 - Drive through the “feature” at a steady or slightly increasing rate – only possible if you enter at the correct speed
 - Anti-lock is your friend
 - Without anti-lock, pump quick & then brake firmly without locking up the wheels
 - Accelerate smoothly
 - Spinning tires mean you are losing time
 - Driving steady state – early in a turn
 - Do not “mash the gas” exiting a turn or other feature
 - Begin increasing acceleration rate at the turn’s apex
 - Unwind the wheel smoothly as speed increases until you are straight & at max throttle for the distance to the next feature
 - No coasting – successful autocrossing is “**all brakes**” or “**all accelerator**” This means “**use all straights,**” no matter how small, to accelerate.
 - Where possible, choose a line that reduces the angle/sharpness of turns !
 - Choose a “turn-in” point that decreases the severity of the turn if you can. Obviously, only when the preceding and subsequent elements allow for you to widen your entry & exit.
 - In the example below, the solid line is a less severe turn, so faster !
 - The dotted line is straight in and straight out, and way slower !



Basic Techniques and Skills – continued

- A series of offset gates is often encountered. Plan to drive a line to the “inside” of each gate, minimizing the distance traveled.
 - The dotted line is a “typical” Novice view of a path for a gate series.
 - Look at the solid line. This driver made the inside cones of the gate series into a slalom and reduced the distance considerably.



Basic Driving Techniques and Skills –

- Understeer (Pushing)
 - You are trying to turn & the car is trying to go straight
 - You are entering a turn too fast
 - Decrease rate of turn & brake “enough” to recover
 - Back in the pits – you can reduce understeer by:
 - Increasing pressure in front tires (1-2 lbs at a time)
 - Reducing pressure in rear tires (1-2 lbs at a time)
 - But, make sure pressure reductions do not result in rolling over onto the tire’s sidewall – too low.
- Oversteer (Loose)
 - You are trying to turn and it is turning so good the back end is trying to pass you
 - Add a little bit of acceleration
 - Back in the pits – you can reduce oversteer by:
 - Reducing pressure in front tires (1-2 lbs at a time)
 - Increasing pressure in rear tires (1-2 lbs at a time)
- IF the back end starts to “step out”
 - But you are not in a spin YET
 - Add some throttle & **DECREASE** rate of turn slightly
 - It takes very little steering reduction to regain control
 - IT WILL come naturally with experience (seat time)
 - Control, then concentrate on getting back on your course line
- IF (when) you spin (opportunity to avoid making a fool of yourself)
 - **Get off the gas completely**
 - **Brake & Clutch in**
 - **Stop it, control it, drive the rest of the course for practice**
 - You can’t make up the time
 - You won’t hurt anyone or anything if you are in control
 - You have learned one sign of “overdriving”
 - Don’t mash the gas while front wheels are turned
- Key to Success → LOOK AHEAD & DRIVE AHEAD
 - Your subconscious will take care of where you are now !
 - You already looked at this when you were further back
 - If you wait until you are there to make your move, you will be past it before your actions take affect
- First Run – while a Novice
 - Walking & memorizing gave you a “feel” for where you want to be
 - Drive first run at 75-80% to “validate” the path and the brake points you chose during your course walk
- Second & subsequent runs
 - Drive the course in memory to “see” where you can improve from the previous run while waiting
 - Increase speed & improve your line on your next runs
 - Goal → improve your time each run on the course !

Basic Driving Techniques and Skills – continued

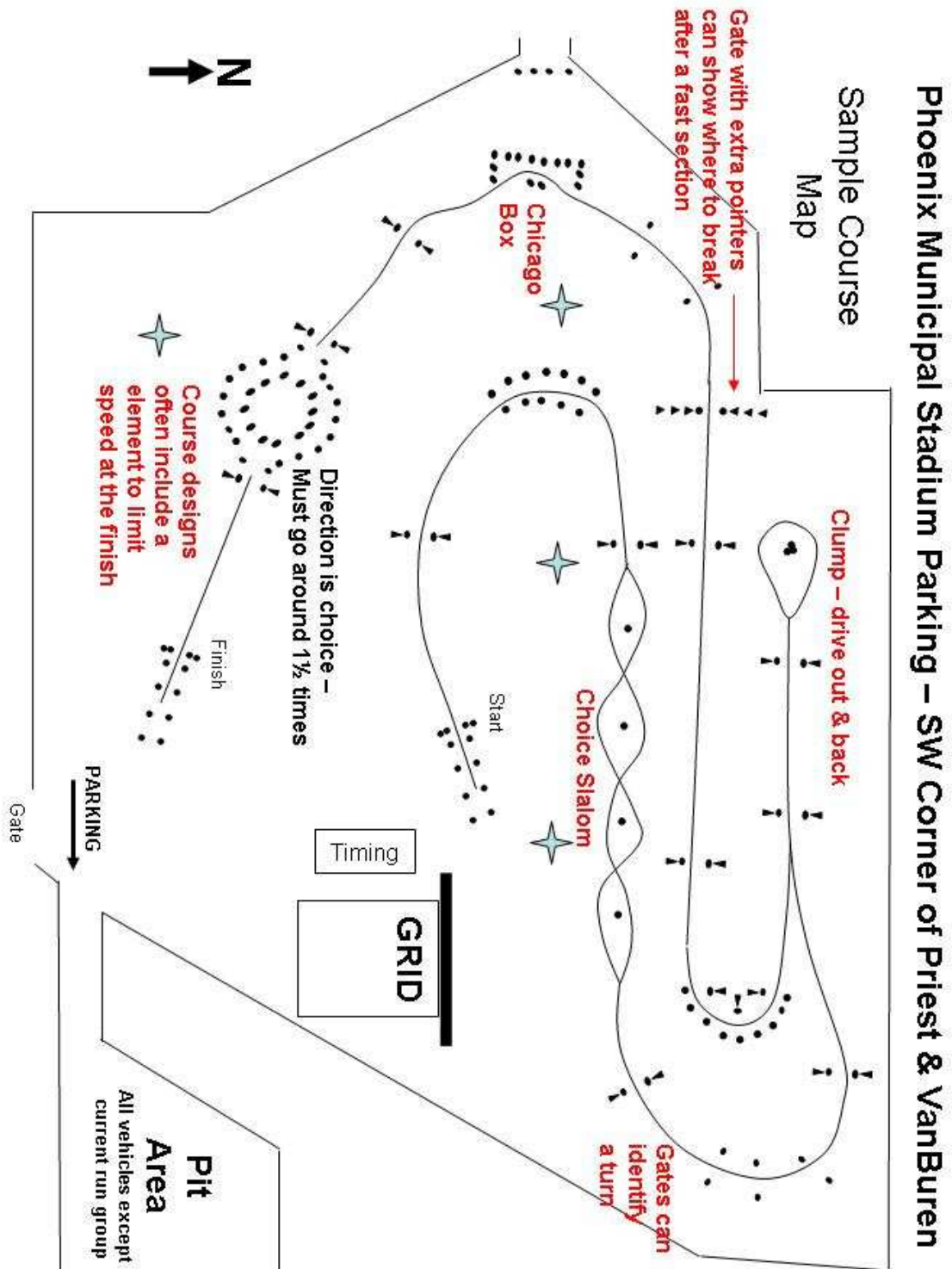
Important → Work on improving only 1-2 things at a time. Remember, you are challenging yourself against the clock – don't look at other people's times while you are learning to autocross.

- The challenge and the fun is learning & mastering a completely new course every time you autocross and knowing you drove better than the last time.
- The camaraderie of the autocross community will become more important and very evident as you compete in more events. Autocrossers compete, but they all help each other !

Very Important Novice Autocross Tips →

1. A completely stock car is best while learning
2. Street tires are best while learning
 - a. Drive on street tires until you can "CONSISTENTLY" push the car & tires to their limit before considering special autocross tires
3. Don't take passengers while learning (unless an instructor)
4. Don't worry about hitting occasional cones – if you never hit one, you are not driving a tight enough line
5. Get all the "Seat Time" you can
6. Rule of thumb – it takes several years of frequent autocrossing to become competitive in your class
 - a. Ask an experienced driver to drive your car once in a while – if they are beating you, you still have room to improve
 - b. Get coaching from people that are better drivers than you are
 - c. Don't listen to the "fast talkers," but listen to the fast drivers !
7. Car preparation is going to be more important as you gain experience
 - a. Increasing negative camber setting (versus stock) will improve steering responsiveness & turn-in capability
 - b. Tire pressure changes can affect handling greatly
 - c. Changes at one end can increase/decrease over/understeer
8. Rule of thumb – car modifications should be delayed until you can drive the car to its limits every time
 - a. Read the rule book for each sanctioning body you will be running under so you can decide which class you want to compete in, and
 - i. Pick modifications accordingly
 - b. Something you think is minor may move you to a class where you are not capable of competing without more & expensive mods
 - c. **Seat time, a good alignment, and good tires are usually far more valuable than money spent on modifications while you are learning autocross skills.**
 - d. Last thought on modifications
 - i. The best prepared and modified car in one class is a better goal than the least prepared and modified car in the next higher class !

Sample Course Map that shows major course design elements combined into a full autocross course.



Notes