

# Road America Track Notes



## Lap of Road America

### General Setting

Road America is one of the premier road racing courses in North America, if not the world. RA is nestled in the northern Kettle Moraine of Wisconsin, and the varied, hilly relief is a legacy of the glaciers' meltdown at the end of their last stand in Wisconsin. Views in the fall while driving on the track are spectacular—both colors and topography—but, don't be distracted. RA is a high-speed, high performance track, but well-driven cars with lower horsepower can make time on the twisty "backside" of the course.

### The track

The track is 4.048 miles long with fourteen (14) turns. The track surface elevation drops 160' from the start/finish line to the straight between turns 11 (Kink) and 12 (Canada Corner), and for those in low horsepower cars, it feels like you have to climb all the way up from turn 14 to the start/finish line. There is plenty of run-off room at all of the high speed corners.

The track surface is uphill from 14 to 1, downhill from 1–2–3; downhill continuing into 5; uphill from 5-6; downhill from 6-7 and 7-8; relatively flat to downhill through 9-10 (Carousel) and through the "Kink"; flat from the "Kink" to 12 (Canada Corner); uphill from 12-13; and flat from the access road on the right after turn 13 to 14.

The track has three turns that are considered “throwaways” by some because they are a) tight and require serious braking and speed reduction downhill (5 & 8), b) are blind and tight coming off a short uphill straight (6), or c) are off camber in the corner (8). However, 6 and 8 lead to significant “straights”, so they need to be negotiated well – slow in, fast out.

There are some **blazingly fast** corners if you are set up correctly – 7, The Carousel (9&10), the “Kink” (11) and 13. There are some relatively fast sweepers (14 and 1) and there is turn 12, which you enter off the fastest straight of the track. The longest straights are: 14-1, 3-5, and in lower horsepower cars, 8-12.



LEGEND					

## Local Names

Road America Straight – Turn 14 to Turn 1

Moraine Sweep – Turn 3 to Turn 5

Hurry Downs – Turn 7 to Turn 8

Carousel – Turn 9 to Turn 10

Kink – Turn 11

Bend – Used instead of the Kink during some events

Kettle Bottoms – Turn 11 to Turn 12

Canada Corner – Turn 12

Thunder Valley – Turn 12 to Turn 13

## Track Lights

There are safety light boards at a number of locations around the track. These light boards can display standing yellow, waving (flashing) yellow, red or write lights. The condition of the light will be the same as the corner worker station immediately following the light.

These lights are found in the following locations:

1. Before turn 1 on the left
2. Before turn 5 on the right
3. Before turn 6 on the right
4. Before turn 9 on the left
5. Before turn 11 on the left
6. Before turn 12 on the left
7. Before turn 14 on the left

## Number Board

Near the safety light board at turn 14 there's also a number board. This board will display the number of a car that is being black flagged. The corner worker on the right at turn 14 will also point their black flag at you if you are being called into the pits.

Black flags are used to call a driver into the pits to discuss some type of on track infraction or to bring cars into the pits if they appear to be having a mechanical problem. If you get a black flag or see your number on the board come into the pits at the entrance following turn 14. Be sure to observe the pit lane speed limit. If you ignore the black flag you'll likely see another one at the start/finish line.

## **Some Things You Might Want to Consider Bringing with You to an HPDE Event**

1. A second key for your car.
2. If you wear glasses or contacts bring a second pair of glasses or contacts. Sun glasses.
3. Helmet, Snell approved, 2010 specification or later. You may also be able to rent a helmet from Road America for the event.
4. Tools – Torque wrench, breaker bar, correct sized socket for your lug bolts or nuts, floor jack.
5. Extra set of front brake pads (do you know how to change them and have the necessary tools).
6. Tire pressure gauge (air is available at the track gas station).
7. Fluids – Oil, brake fluid, window cleaner, sun tan lotion, water to drink.
8. Paper towels for cleaning windows, checking oil.
9. Umbrella and/or rain suit.
10. A portable, fold up chair.
11. Clothes – Almost all organizations that run HPDE events will require you to wear long pants and close toe shoes. Some will also require long sleeve shirts while others will allow short sleeves. Check the information you got from the organization that is running the event.
12. School documents (did you read the information you were sent).
13. Do you know where to get gas? Do you need 93 octane? (Gas at the track is very expensive.) The nearest gas station is a BP in Elkhart Lake on County A just east of 67. They only have 91 octane. If you need 93 octane you'll need to head south on 67 to 23 east. There's a BP station on the south side of 23 (before you get to 57) that has 93 octane.

## Entering the Track

Most organizations will grid cars waiting to go on track for a session in the false grid. If you don't know where that is ask someone. The organizers should explain any gridding procedures in the driver's meeting. When you head to the track from the false grid you will drive through the pits. The pit lane speed limit for most HPDE events is usually 35 MPH.

As you get near the entrance to the track at the end of pit lane you should notice a track light. It could be green, yellow or red. If it's green the track is open and passing is allowed, if it's yellow the track is open and passing is not allowed. If it's red the track is closed and you should return to the paddock using the entrance at the end of pit lane.



Once you enter the track you must stay to the right of yellow solid line and the white dashed line painted on the track. This line is called the [blend line](#). It is extremely important that you stay to the right of the line all the way to the apex of turn one. If you don't you'll be black flagged and have to come into the pits after turn 14 and talk to the grid workers. Moving to the left and getting online right after exiting the pits is a good way to get hit by a car coming up the front straight at well over 100 MPH.

## Exiting the Track

For most HPDE events you will be exiting the track at the end of a session at turn 5. The checker flag will be shown at either the start-finish line or at turn 14. Most organization use the start-finish line but there are a few that use turn 14. After you see the checker slow down so you can get your car cooled off before exiting at turn 5. Don't slam on your brakes to slow down, just lift off the accelerator. Try to stay off the brakes as much as possible to give them a chance to cool off.

When you get to the turn 4 corner station the worker there will be holding a sign that says "Exit Next Turn". When you get to turn 5 the worker there will be holding a sign that says "Exit Here". Slow down to go around the tire barriers at the turn 5 exit, turn right at the end of the tire barriers to get back to the paddock. There's a stop sign at the main pit road, just slow down check to the right before continuing up the hill to the paddock. Do not stop on the hill, cars with really small clutches will really appreciate not having to stop on the hill behind you.

If you need to exit the track during a session you can get off at either turn 5 (like at the end of a session) or after turn 14 through the pit entrance. Get your arm out the window with a closed fist well before the exit to let drivers behind you know that you are going to exit.

In an emergency situation you can also exit the track on the access road following turn 13. If you exit onto the access road do not try to get back on track, continue on the access road and return back into the paddock.

If you exit at turn 5 **never** continue on the cut through and get back on after turn 13. This may appear tempting as a way to get back to the pits but it is very dangerous.

## Credits

Created by Larry Boyer and Mike Clemens with help from previous write-ups by Jim Furstenburg and Gregg Borland. Updated following many discussions with Duck Waddle and Shields Bergstrom.



## Paddock Parking

For most HPDE events you will be able to park in the following areas:

### Competition Paddock

### Lower West Paddock

### Main Paddock

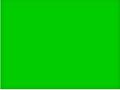
Some organizations may use the south part of the Main Paddock for car control exercises during an event. If an organization plans to use this area there will be a line of cones at about paddock space 21. Do not park to the south of the line of cones.

Some organizations may also rent the West Paddock for paddock parking during an event. However, in many cases Road America will be using this area for one of their motorcycle or teen driving classes.

In general the other highlighted paddock areas are not available to organizations for HPDE events.

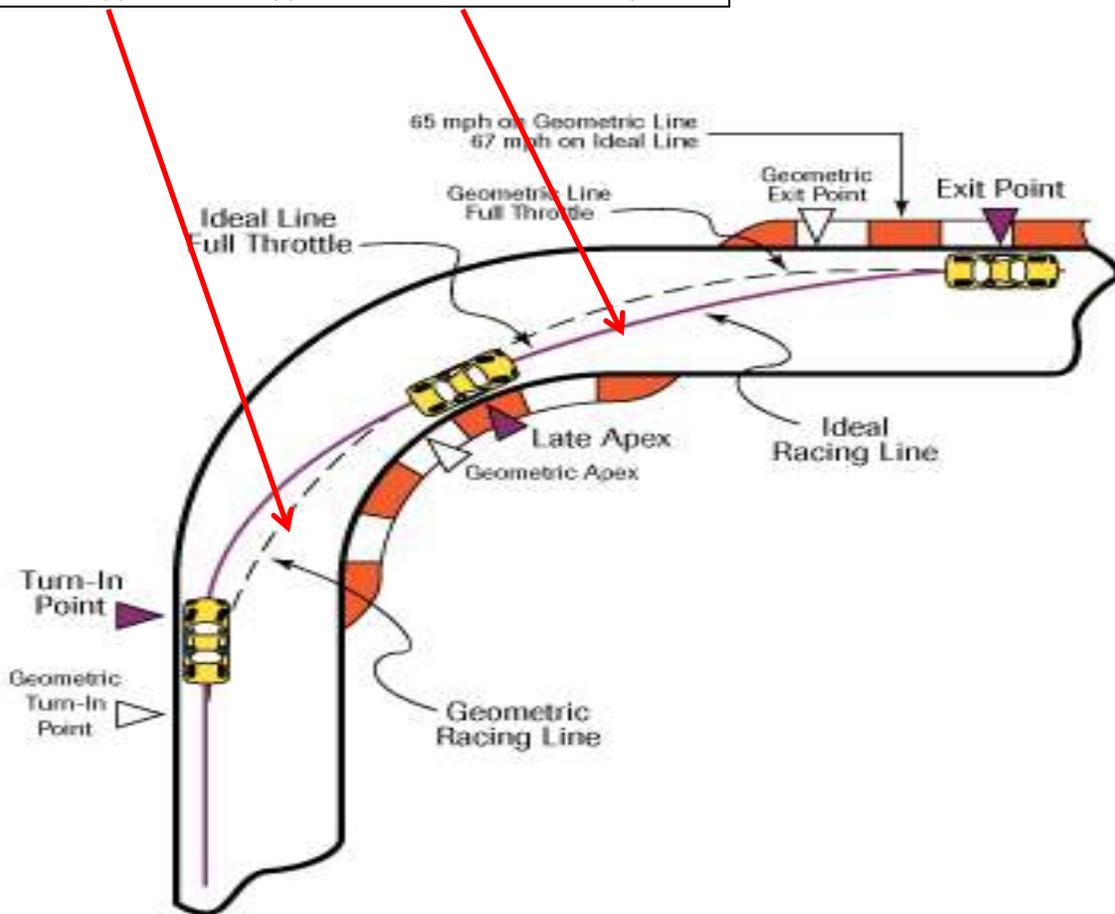
If you want to rent one of the garages in the Hagerty Tech Center contact Road America directly at 800-365-7223.

## Flags Used at Road America During HPDE Events

	<p><b>Green</b> – Displayed only at the start finish line, indicates that the track is open for passing. The absence of yellow flags at the turns indicates that passing is permitted.</p>
	<p><b>Stationary Yellow</b> – Caution, slow down. There is a potentially dangerous condition off the track. No passing until the next corner station that is not displaying a yellow flag. Violators will be black flagged.</p>
	<p><b>Waving Yellow</b> – Slow down and be prepared to stop. There is a serious condition on the track. No passing until the next corner station that is not displaying a yellow flag. Violators will be black flagged.</p>
	<p><b>Blue/Yellow Stripe</b> – Check your mirrors. A faster car is coming up behind you. Allow them to pass at the next passing zone.</p>
	<p><b>Red/Yellow Stripe</b> – The track condition has changed. There may be oil or water on the track. Also used to indicate that there is debris (car parts, glass, dirt, animals) on the track. Usually only displayed until all cars have seen the flag once or twice.</p>
	<p><b>White</b> – There is a slow moving vehicle on the track ahead. You may pass the slow moving vehicle with caution. The white flag is not used to indicate there's just one lap to go – remember this is not a race.</p>
	<p><b>White with Red Cross</b> – There is an emergency vehicle on the track ahead. You may pass with caution. The emergency vehicle could be a safety truck, ambulance, wrecker or flat bed truck.</p>
	<p><b>Black</b> – The driver receiving the black flag at corner 14 or the start/finish line must come into the pits through pit it (after turn 14) to discuss a rules infraction at the black flag station. A number board is also used at turn 14. Don't ignore this flag.</p>
	<p><b>Black (All stations)</b> – A serious incident has occurred and the track must be cleared. Proceed slowly to the pits and wait for instructions. You may exit either at turn 5 or turn 14. No passing in a black flag all situation.</p>
	<p><b>Black/Orange Circle</b> – There is something mechanically wrong with your car. Exit the track through pit in (following turn 14) and proceed to the black flag station. This flag is displayed only at turn 14.</p>
	<p><b>Red</b> – Traffic on the track must be stopped due to a serious incident. When you see this flag slow down and then stop on the side of the track (not on a hill) within sight of a corner worker station. Do not proceed until given instruction by the corner workers. Most often a black flag all will follow a red flag. No passing under a red flag.</p>

# Maximum Corner Speeds Calculated Using Mark Donohue's Formula \*

Corner Number	Inside Curve Radius	Max MPH for a 1G Car	Largest Possible Radius	Max MPH for a 1G Car
1	348	72	473	84
3	235	59	321	69
5	100	39	182	52
6	112	41	208	56
7	325	70	611	96
8	125	43	242	60
9	525	89	555	91
11	725	104	1199	134
12	170	50	275	64
13	550	91	767	107
14	200	55	277	64

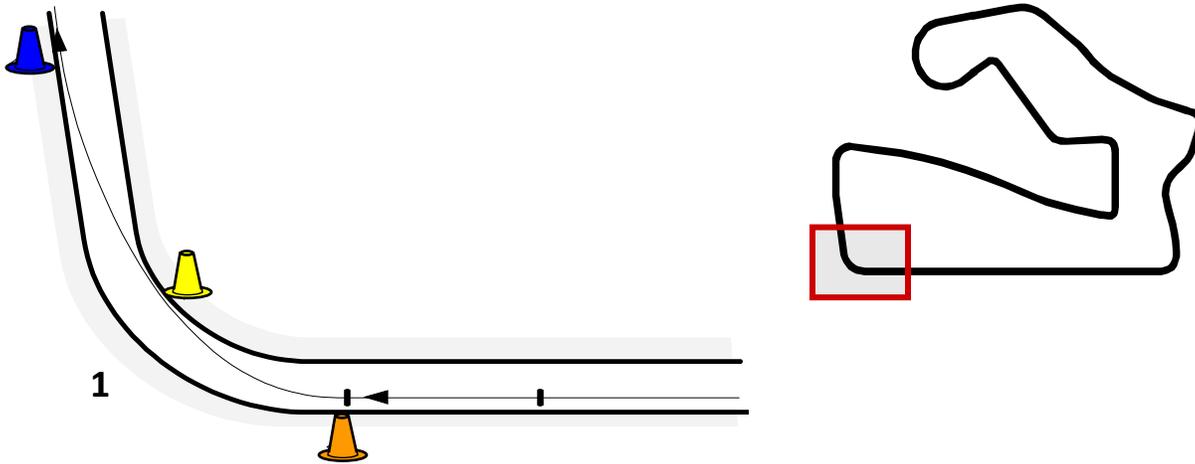


\* Maximum MPH = SQRT(15 \* Grip in Gs \* Corner Radius)

## Turn One

You've driven up this huge hill and it crests just before the braking zone in 1. A clear day gives you a view over the Kettle Moraine towards the south. The turn is much faster than it looks, but as almost all of the turns at RA, you should start out with good straight line braking somewhere after "Alpha" (the 1<sup>st</sup> corner station) and start to "bend" the car into the sweeper at the 1 marker - aiming for a late apex. There may not always be cones out for turn in, apex and track out so as a driver, you should begin to use other visual references to gain comfort on each part of the track.

For some this is a downshift from 5<sup>th</sup> or 6<sup>th</sup> to 4<sup>th</sup> gear turn with balance (not threshold) braking and no added downshifting. For others with different gearing turn 1 may require a shift to 3<sup>rd</sup> gear. Take the turn smoothly; gradually apply power after the turn in and full throttle from apex to track out.

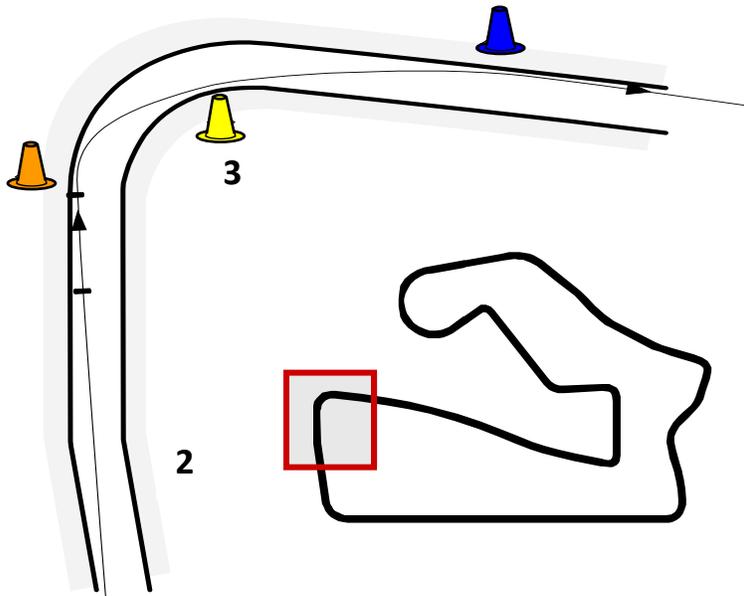


## Turns 2 to 3

Coming out of the track out of turn 1 let the car come out into the center of the track under the R on the Ariens sign. If you do this there really is no turn two. After you go under the Ariens sign aim for the copula on the top of the bathroom building in the distance on the left at the bottom of the hill.

You are going *downhill* at an angle to the left, straight into the braking zone for 3.

It's important to take this turn correctly, as it sets you up for the 2<sup>nd</sup> fastest "straight" at RA. Get your braking done smoothly and downshift and smoothly apply power from the apex to track out. Let the car come back over to right center after track out. Remember at all times, the less you turn the wheel the faster the car goes.



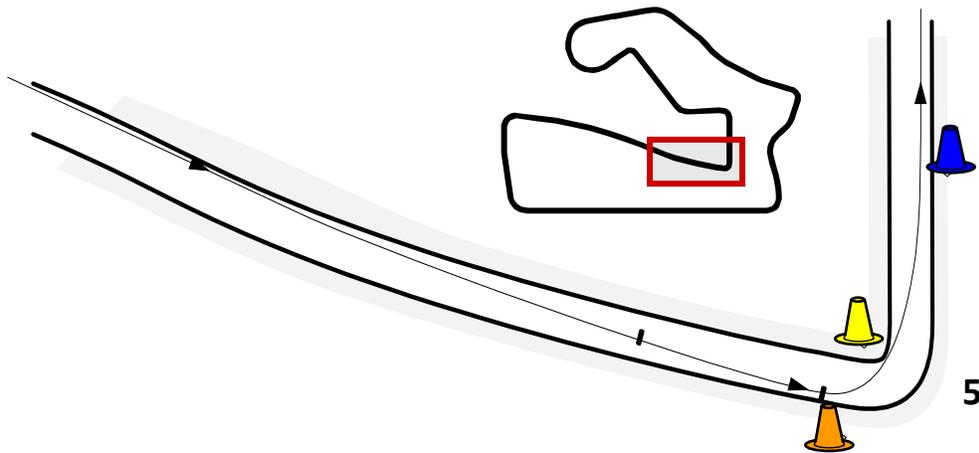
### Turn 3 to Turn Five

From turn 3 to 5 is the 2<sup>nd</sup> fastest part of RA; lots of passes that couldn't be made on the front straight can be completed safely. Check your mirrors and be polite. High horsepower cars will just walk away from you but, be very, very careful with closing speeds in the brake zone.

As you track out from turn 3 you'll be on the left side of the track. To get online for turn 5 you should aim for the word "People" in the phrase below the right side of the Sargento Truck sign on the bridge over the track. After you've gone under the bridge aim for the left side of the yellow and red Road America sign way off in the distance. Aiming at the left side of the sign will bring you back near the grass on the left side of the track and get you setup for the braking zone for turn 5.

**Coming downhill into the braking zone, you want to do all of your braking in a straight line starting left and moving diagonally towards the right-hand side of the track.** The track surface is cambered like any other road, and your car is much more stable under braking starting on the left. There is no room for error on the right.

Get the speed off and have the car under control. Keep a little brake on until turned towards the apex, and then apply power smoothly all the way to track out. In all of these braking zones (esp. downhill), leave a tire width or so space from the edge of the track for safety (tire squirm, different pad bite, etc.) Don't worry about saving speed here. Out of five you go uphill past "six flags" (the corner worker station at Corvette Bridge) and into a slow left hand corner 6.

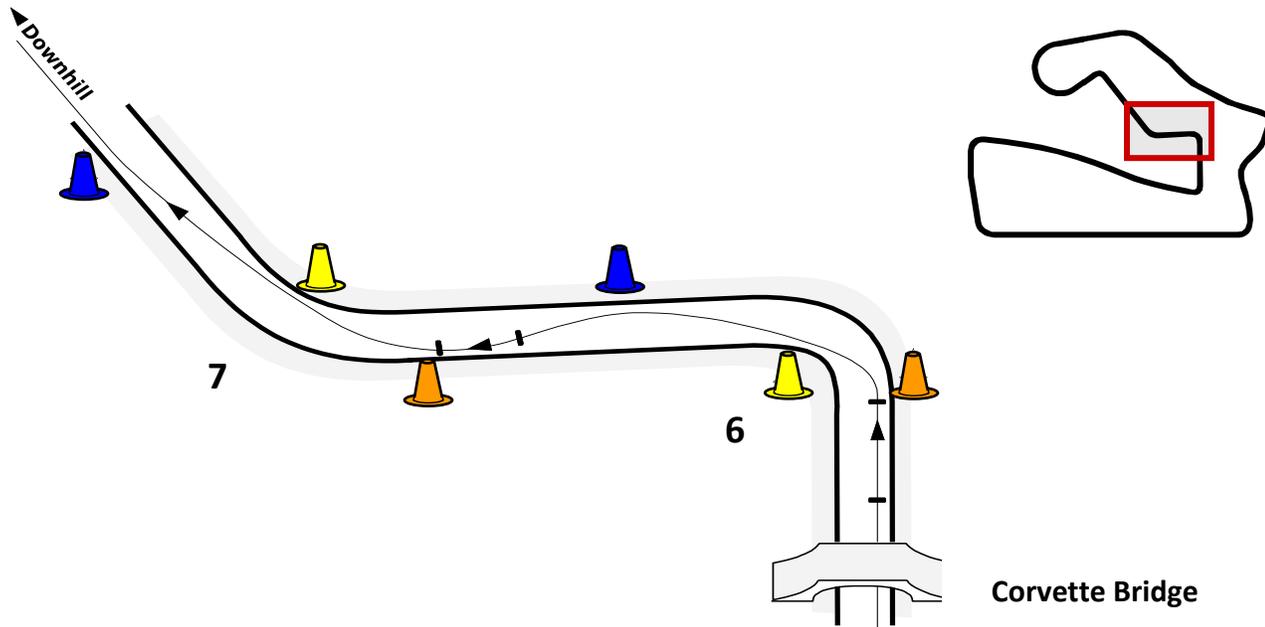


## Turn Six

From turn five you climb up a steep hill on the right hand side of the track and maybe even short shift up a gear just before the crest, or lift and begin braking. If you hammer up the hill you'll get light at the crest and then begin braking it will unbalance the car---you'll likely slide through much of the turn, especially on cool days with low grip. Turn six is a blind left-hander with your view blocked by the hill and the bridge.

As with 5, you don't gain time in 6, you need to set yourself up to do turn 7 correctly, (one of the very fastest corners). So brake *just before* the crest, settle the car and downshift if necessary.

Don't turn in early...Duck Waddle says the turn in is 57 feet past the bridge abutment (don't ask how he knows). Late apex and apply smooth throttle to track out and up shift before turn-in for turn 7. Let the car come immediately, but very smoothly, back to driver's left for the turn in for 7.



## Turn Seven

After you've come back across the track to the left out of six you could lift, brush the brakes or short shift and turn the car in smoothly, applying power until you are at full throttle. This is one of the few mid to early apex turns at RA.

At the very least "Touch" the apex curbing at seven, just so you know you've used the entire track. You may have to either short-shift up before 7 or shift to 4<sup>th</sup> at track out – then smoothly bring the car to driver's right down the short, but very fast, "Hurry Downs" straight.

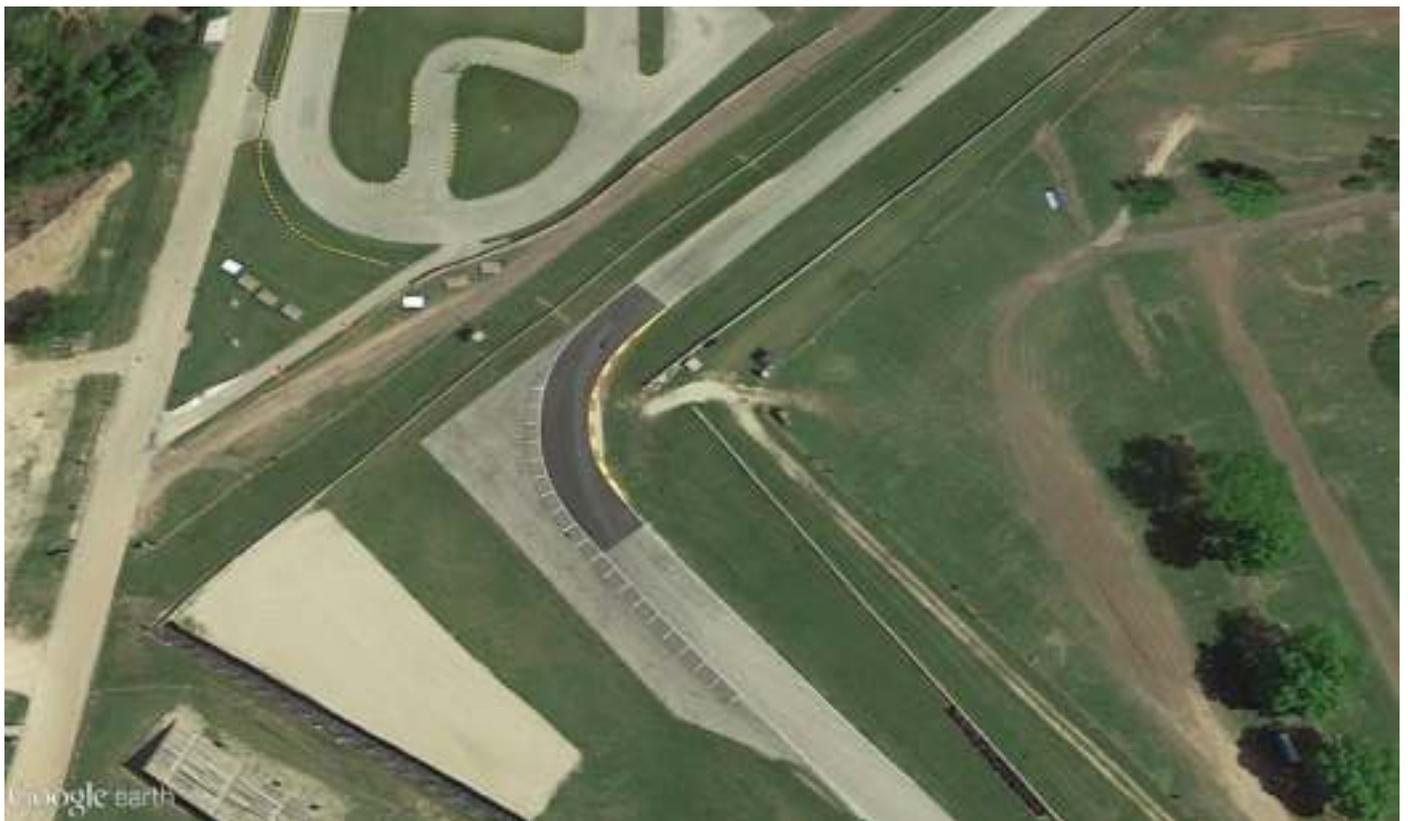
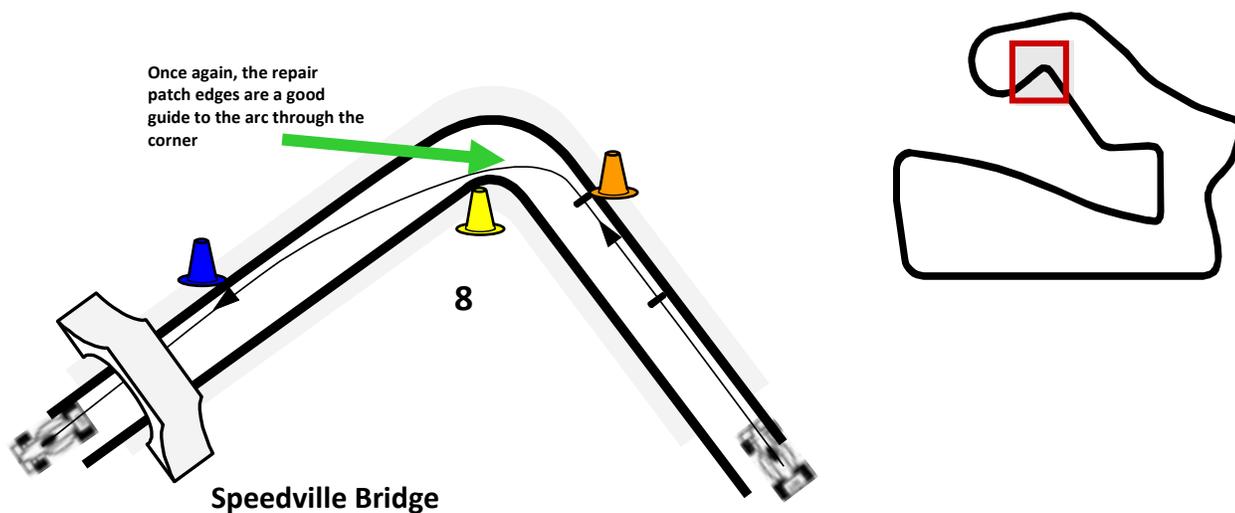


## Turn Eight

Turn 8 is another late apex, downhill, get your braking done in a straight line, turn in and apply power smoothly---like turn 5.

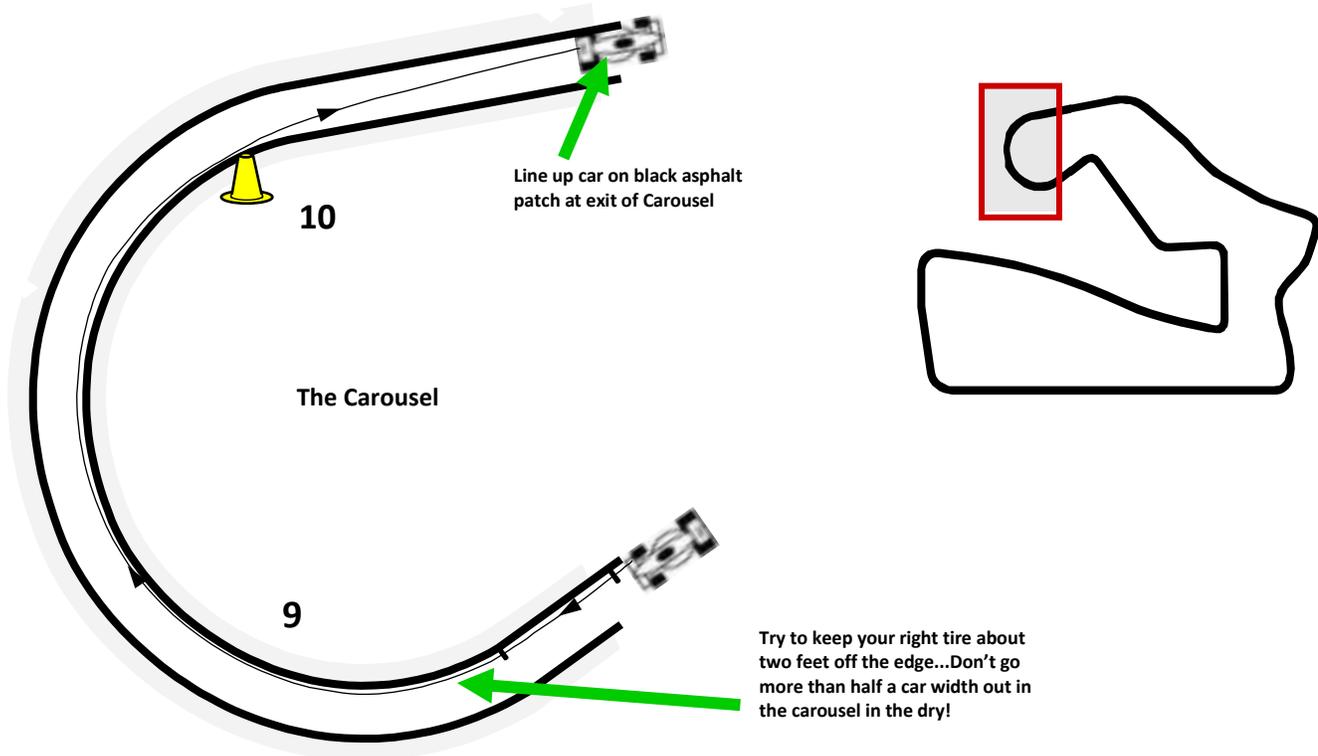
Two things are different though --- you're usually going faster than you think down "Hurry Downs", and the first part of 8 is off camber and still going downhill. Make sure to be really smooth, and keep throttle on and modulated to settle the car as you approach the apex, where you can dial in more and more power.

Once again, you won't save time by trying to charge through here. But, lower horsepower folks, this is the start of "your world". Driven correctly, the next 5 turns are the quickest part of the track. So, set yourself up very smoothly for 9 and 10 by tracking out and staying to the right as you pass under the "i" on the Speedville sign on the bridge.



## Turns Nine and Ten (The Carousel)

We recommend starting out entering the carousel with your right wheel about 1-2 feet from the right edge of the track and holding the car there....why drive further than you have too? Higher horsepower cars may want to go out further at entry and get the car to rotate as they move further into the corner. However, if you get out into the “Marbles” out there it’s harder to get back to the apex—and the apex is all the way around the corner. Keep your vision up and look for where it is and you’ll steer the car perfectly. Be very, very smooth with the throttle and steering input. There’s lots of pea gravel and runoff, but no reason to go there.

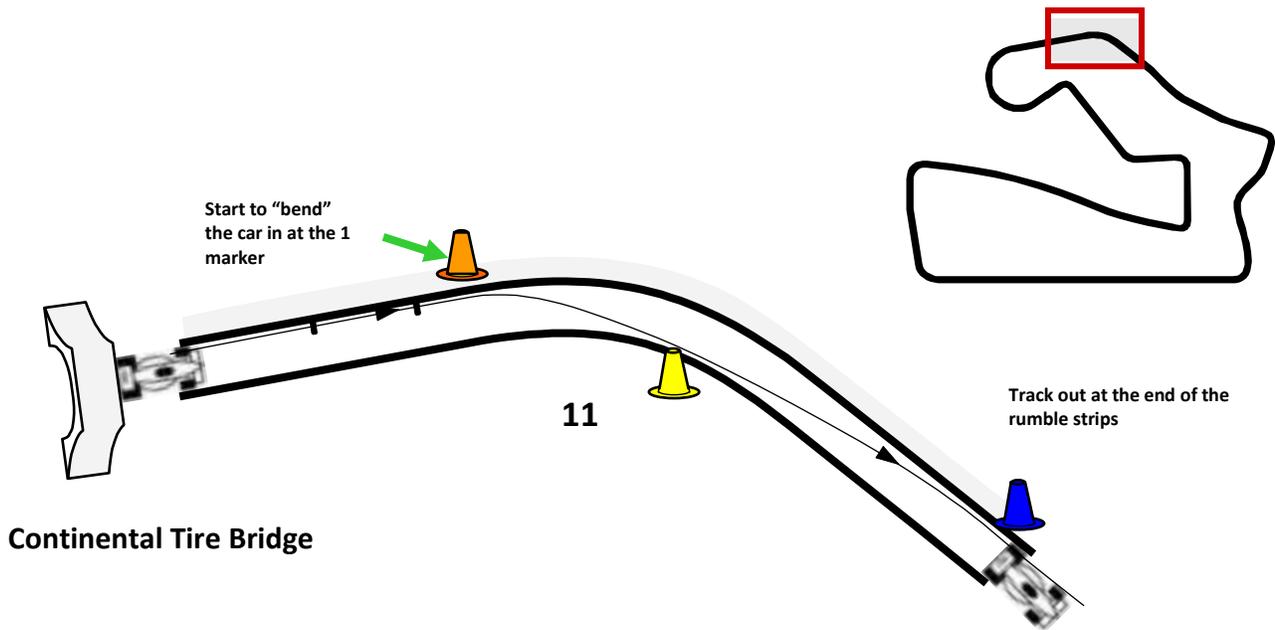


If your car is really set up, it's a hot day, and you've got slicks with plenty of grip – just drive around the inside once to feel the line---- In the wet, drive around the outside. This is a very fast corner, so make sure that all of your inputs to the car are smooth and gentle from here into the “Kink”. If you drop a wheel off at track out drive straight. Do not try to muscle the car back over.



## Turn Eleven (The Kink)

WOW! It's a legend. However, it's a fast sweeper like turn seven....there's **just no real run-off**. So, be very smooth, brush brakes or lift just prior to the turn in, and as Duck says, "bend" the car into the apex at the last brake marker. Touch the curbing for a late apex on driver's right, and let the car track all the way out – there's lots of room. Be very smooth and patient and you'll have no problems. As you exit "track out", bring the car gently towards the right and then left through Kettle Bottoms. Be very smooth and careful passing here. If it is raining, be alert and aware that water runs across the track here and many car drivers have crashed just beyond this point in their race – not at the feared "Kink". If you are too early stay early and slow the car gently. If you go off at exit, drive on the grass & go straight and very carefully - wait till the track comes back to you.



**The Bend** – Used instead of the Kink for some events.



Complete a normal exit from the Carousel passing over the black patch. Between the black patch and the Continental Tire Bridge gradually move to the right side of the track.

Line up on the right side of the track for the turn into the Bend. If you've carried lots of speed from the Carousel you'll find that fairly heavy braking is required for the turn into the Bend. Turn in speed will be around 30 mph.

The turn into the Bend is somewhat of a throwaway with the goal being to maximize the radius (and speed) for the Bend's second turn.

The rumbles on left at the turn into the Bend are almost flat so driving over them will not upset the car at all. After the turn in stay well to the left to setup for the second part of the Bend.

Again the rumbles on the right of the second turn are almost flat. The straight following the second turn leads all the way to turn 12 so try to maximize your speed exiting this turn.

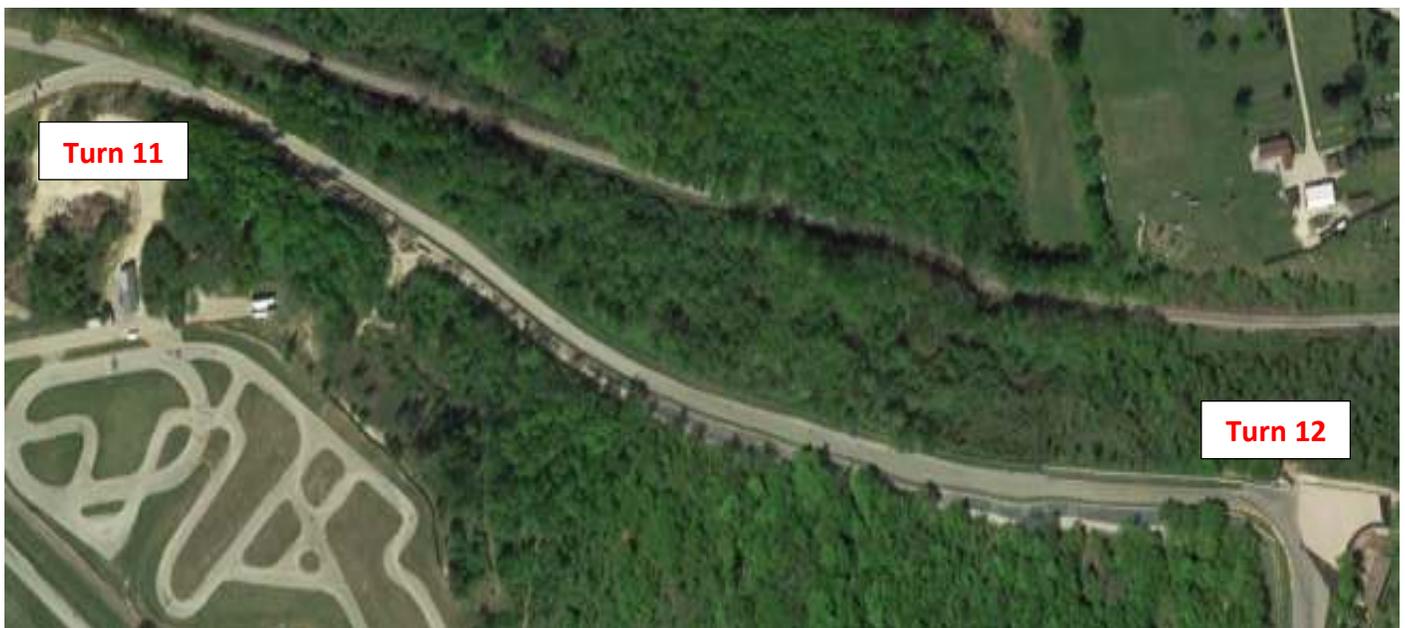
## Kettle Bottoms – Turn 11 to Turn 12

While this 0.52 mile section of the track is considered a straight, it is anything but. It must be precisely driven in order to be fast through here, or it can be uncomfortable considering the track is narrow and lined on each side with concrete walls or Armco barriers with little runoff room. Drive smoothly with slow hands on the steering wheel.

As you track out of the Kink at turn 11, drive along the rumble strip on the left side of the track, look for the corner worker station at the hole in the fence that's straight ahead in your line of sight. This is the reference for the approach to the first of the two left hand bends. Begin to drive toward the corner worker station prior to the end of the track out rumble strip.

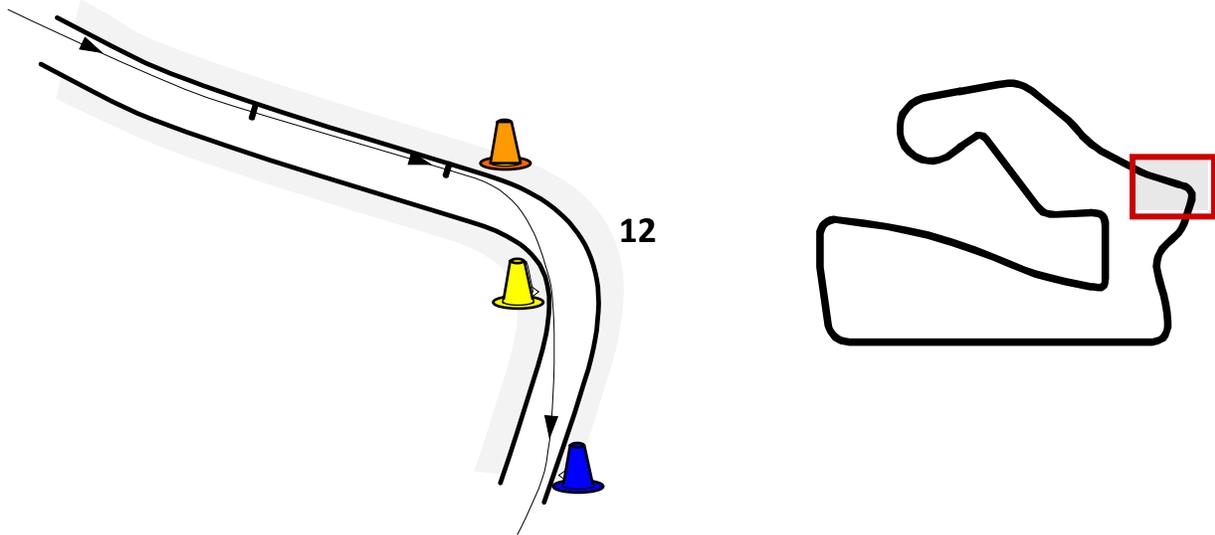
The line will now gradually cross the track on a diagonal to the right side of the track, the track moves not the car's trajectory. There is a rumble strip (unpainted concrete) on the right side about half way to the corner worker station, just touch the rumble strip. Continue going straight, then add a little steering input to return to the far left side of the track while going through the first left hand bend, and let the car track out gently to the right side of the track.

Stay on the right side to make a little straight between the two left hand bends in the track. At this point you will be picking up a lot of speed having accelerated all the way from the Kink. As you begin to see turn 12 add a little steering input again to cross the track diagonally to the left side to enter the straight line braking zone for turn 12.



## Turn Twelve (Canada Corner)

Turn twelve is probably the hardest braking you will do at Road America, (Although you may brake harder at 5 in a higher horsepower car) brake smoothly, as much as set the car up and balance, as to scrub off the speed from the fastest part of RA. Keep a safety zone on your left as the track narrows from the left into the turn, and it's a slightly bumpy surface. You may want to move over 1/2 a car width—especially if it rains. Brake smoothly, downshift and then apply power out of the turn into the apex. The throttle and the hill will help stabilize the car. Track out to the driver's left and smoothly sweep over to the right for the next left-hander. Need to absolutely make it to the apex as the apex and exit are banked and uphill. Which allows early to full throttle on exit. Stay left at track out for an extra count or two.

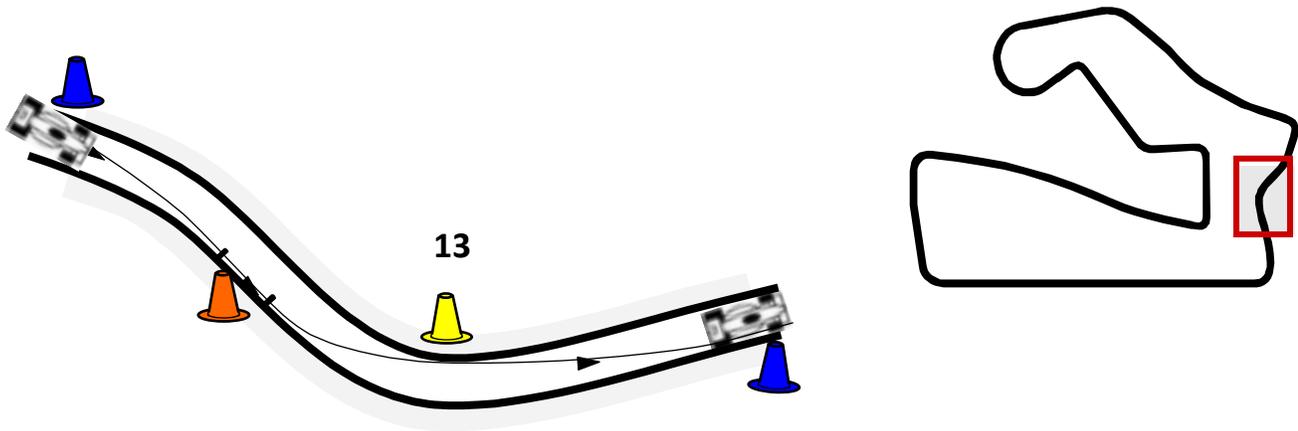


## Turn Thirteen

Going into turn 13 you continue to climb the hill from 12 and the corner begins and then takes you to apex. Track out is well past the turn on driver's right. This is a fast sweeper to the left. Start by slightly lifting off the throttle on the way to touching the rumble strips on driver's right, then "gradually" applying full power to the apex curbing and continuing flat out to track out & turn fourteen.

Unwind the wheel, don't over steer the car here.

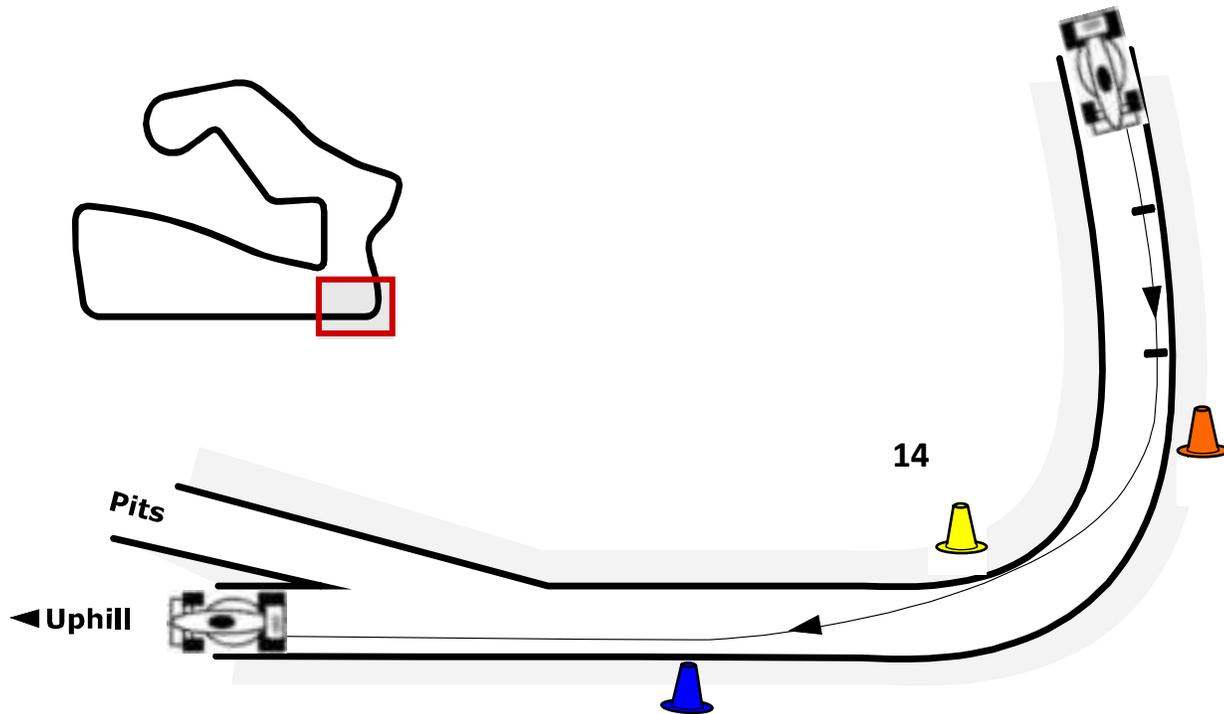
There's a little dip near the apex that can cause a spin. Use the access road on the right as a visual marker and part of extending the radius of the corner. After track out aim pretty much for the right side of the black flag light before turn 14 from the access road, straight line braking into another relatively fast sweeper. (Watch Your Mirrors).



## Turn Fourteen

Turn Fourteen is relatively fast sweeper (more than 90 degrees) that leads to the main straight and pit lane. Be very careful coming out of the turn. Watch for people with their arms up to signal they are exiting, check your gauges and watch your mirrors. If you commit to go to the pits and raise your arm do not change your mind. You can always come back out, but not if you cause an incident. Try not to use the rumble strip on the outside as you track out.

Make sure you feel up to another lap yourself. Brake in a straight line to turn in, eyes up for a late apex, and smoothly on the power up the hill. Once again, higher horsepower and torque will win the day here, so in a DE be prepared to signal, and let cars go around. It says nothing about driver skills. Don't worry, let people around – you'll have a clearer track at the end of the straight. Then you're off for another great lap.



## YouTube Videos

[Getting to the Track](#)

[Pit Exit to One](#)

[One to Three](#)

[Three to Five](#)

[Getting off at Five](#)

[Five to Six](#)

[Six to Seven](#)

[Eight to Nine](#)

[Nine to Ten](#)

[Eight to Ten](#)

[Kink to Twelve](#)

[Through the Bend](#)

[Twelve to Fourteen](#)

[Fourteen to One](#)

[Into the Pits](#)

[Full Lap at Speed](#)

