

# BUILDING COMPETITION

How much can the design of a racetrack promote close racing? Quite a lot, actually.



Yes, there is a formula to racetrack design that promotes competition. Problem is, it isn't the whole answer, nor could it ever be, according to Tony Cotman. The former vp of operations for Champ Car and IndyCar set up NZR Consulting in 2008 and, of the current IndyCar venues, the Sao Paulo, Baltimore, Edmonton and (should it happen) Qingdao tracks are his work. Here are his thoughts...

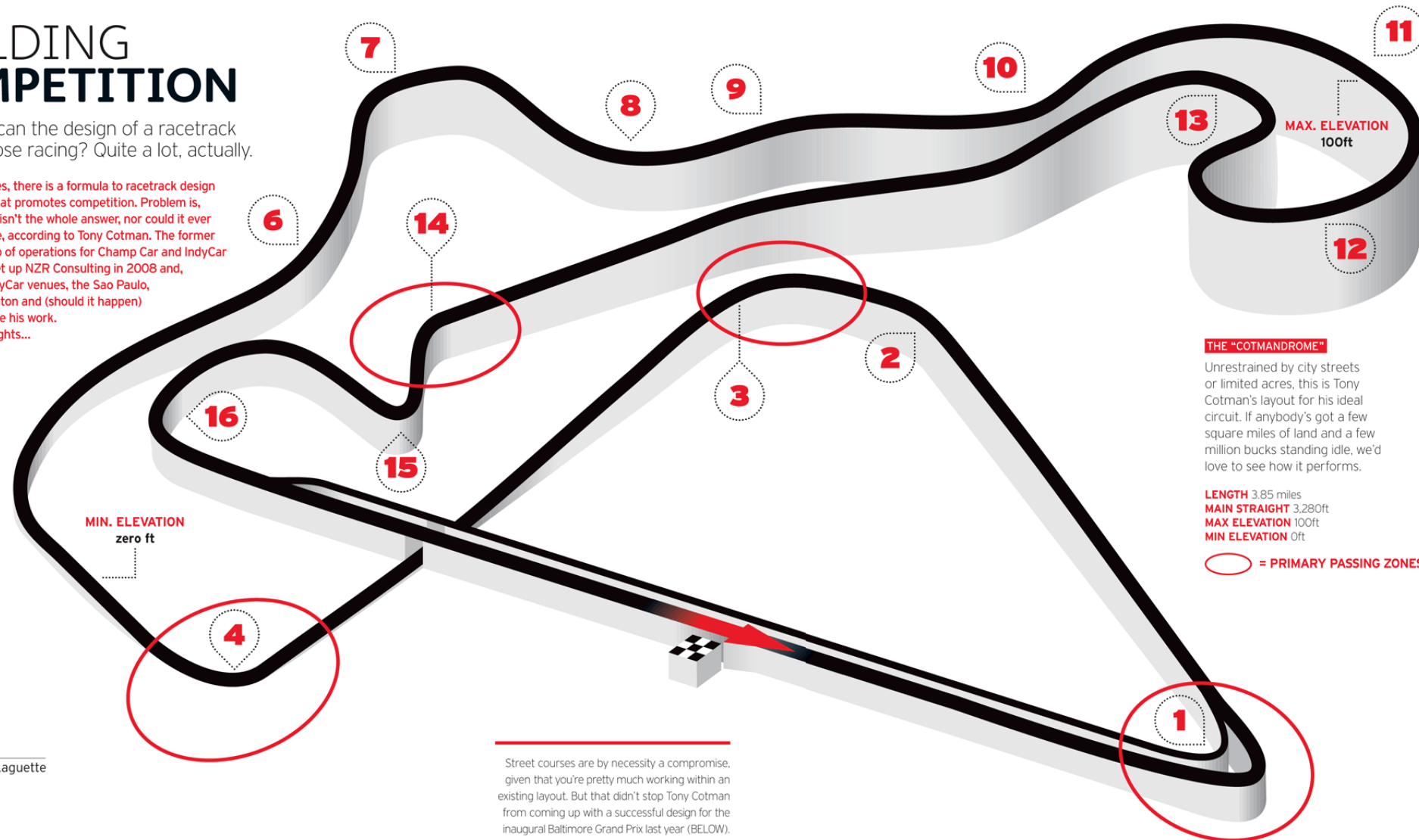
WORDS Tony Cotman  
ILLUSTRATION Paul Laguette

You could argue that the biggest influence on competition in most forms of racing is the tires. When Firestone gets the difference between its reds and blacks right, the racing in the IZOD IndyCar Series is great, and you could argue that the Pirelli tires in Formula 1 have made the racing better than any time in the last 20 years. Everyone tries to design tracks around cars or to make the racing good, but you also need the sanctioning body to have rules which allow good racing, and open development in many areas – including tires. It's not just the cars, not just the tires, and not just the tracks;

it's a combination of things.

First of all, a racetrack needs to be challenging to the drivers. But it's difficult sometimes in that a driver's perspective isn't necessarily what's good from the show's perspective. So what wins out? In my opinion, it's the show. Having said that, you aim to create a track that's the best of both worlds.

You want elevation and you want no two turns to be the same, so a combination of high-, medium- and low-speed, left and right, different radius turns, with some flat, some cambered and some off-camber.



Street courses are by necessity a compromise, given that you're pretty much working within an existing layout. But that didn't stop Tony Cotman from coming up with a successful design for the inaugural Baltimore Grand Prix last year (BELOW).



You also need the track to be a good length; anything under two miles is too short because it doesn't allow you to put any good straightaways in there. A permanent course needs to be between three and four miles. On temporary – as in, street – tracks, it's a little bit different because you're restricted by issues bigger than the race.

The idea of competition being encouraged by having a long straight followed by a tight corner isn't a myth, but it's over-emphasized, in my opinion. To me, it's about *getting onto* the straight. You don't want it too slow because then there's

hardly any discrepancy between those who are doing it best and the slower cars. The best guys might be taking it at 40mph, the worst at 37, say. That just means it's going to take an even longer straight to get a passing maneuver completed. So it's about the shape and the width of the corner leading onto the straightaway and the speed. Put that with a straight that's roughly 2,800ft long, and a wide braking zone at the end with plenty of room for error. To me, that's the formula for passing.

And then, crucially, you need the spectators in a position where they can see the majority of all that passing going on...



## THE DRIVER'S VIEW

### MULTIPLE FACTORS MAKE FOR CLOSE RACING

Takuma Sato now has experience in Formula 1 (ABOVE) and the IZOD IndyCar Series, and has clear ideas on what promotes strong competition.

I think it's important that the turn before a straight is not too aero dependent and, for that reason, long straights should have slow turns at each end to help make good passing opportunities. You also need a car that is not too sensitive when following other cars. In that respect, IndyCar is much better than F1: we have good downforce even when running close.

Track surface is another thing to consider. Different grip levels and low grip surfaces mean there are more chances of mistakes because the turns are more demanding. A wet surface is the extreme! On the other hand, a high-grip surface means you aren't depending so much on aerodynamic downforce, so it's easier to set someone up for the next braking zone.

Speaking of the brakes, I feel the carbon brakes we have this year in IndyCar have helped the racing. People say the braking zone is shorter now, but the important thing is that they give you a consistent feel from the beginning of the race to the end, so you can brake hard with confidence all the way through.

And then there are the tire compounds; having a big difference in characteristics between soft reds (BELOW) and hard blacks makes the race more interesting because drivers have a choice about when to use them. I wish we had more sets of reds so we could study the degradation pattern – we first get to run the reds in qualifying! But, still, it has been another thing to help the competition in IndyCar.

