July 05 Sidebar 6 Velocity, monitoring, and woe

Could it be done? Back in the early days of the Iron Butt Rally, that was the big question. Motorcycles were not reliable, at least compared to what most riders expect today. If they expected to complete long road trips, riders needed to know how to adjust and repair their bikes on the side of the road. Speed limits were low. Bike mounted GPS and smart phones did not exist. Plans and routing decisions were made while pouring over paper maps. Back then, only a handful of riders were even interested in a long distance rally on a motorcycle.

Nevertheless, those few riders took on the challenge of the IBR to find out if it really could be done. As motorcycles became more capable, more riders rode further, and interest in the rally grew. Riders found new and better ways to modify their bikes to make long distance riding more comfortable and less risky. Rallymasters found new and more difficult bonuses to challenge experienced riders. The question morphed from 'Could it be done?' into 'How many bonuses could a rider collect in 11 days?' The question of speeds on public roads was ushered into the discussion in short order.

In theory, going faster allows for more bonus collection. But theory and application do not always agree. Human factors and technological limitations come into the equation and limit what is possible. In the early days, motorcycle tire technology was much less refined. It was not difficult to conclude that needing three tire changes to complete the rally (as a direct result of heat generated by excessive speed) was counterproductive. Factors such as the lack of advanced tire technology and motorcycles that needed frequent maintenance attention combined to indirectly mitigate excessive speeds. But even with such limitations, early rally design tended to favor 'riding harder not smarter'. The 'sit here, twist that' mentality was the mantra of the day through the late 1990's for many riders.

Better tire technology, more advanced motorcycles, the advent of GPS systems sized to work on motorcycles, computer based mapping programs, better roads, higher speed limits, and the burgeoning internet conspired to create a growing community of riders interested in long distance rallies.

It was inevitable that these factors would change the dynamics of the sport. If rallies were going to survive, their design would have to change. In addition, more sharing of information was occurring due to the internet, which effectively raised the profile of the rally community. Flying under the radar with a handful of riders was no longer possible.

The early 2000's saw rally architecture trend toward the 'ride smarter, not harder' side of the scale. Rally design began to incorporate ways to employ the electronic advances which were being rapidly accepted by riders looking for an edge in the competition. It was also becoming clear that rallymasters needed to develop effective methods for monitoring speed. After all, rallies are held on public roads, not racetracks.

The IBA has always maintained that riding long distances safely does not involve riding at excessive speeds. The way to ride big miles involves staying on the bike, i.e. spending less time stopped. I recently came across some interesting data from a somewhat different long distance community that demonstrates that the concept of minimizing stops is more effective than increasing speed.

Top riders in the Race Across America (RAAM) ride a bicycle 3000 miles, climbing 175,000 feet, crossing 12 states, in under 11 days. These riders are racing, not rallying, but the numbers for stopped time as related to average speed are a valid correlation.

Brian Toone is an ultra endurance bicycle rider. He is a legend in the Birmingham, Alabama bicycling community and an acquaintance of mine. He competed in the Race Across America (RAAM) in 2015 and again in 2017 (it ended just a couple of weeks ago). Brian finished in 3rd place overall solo rider this year and 1st place solo American. He has been posting some stats from his rides that I found interesting.

Paraphrased from Brian:

Some interesting trends are emerging as I'm looking through all the data from my 3rd place finish in Race Across America.

My moving average speed dropped down to 15.2 mph in 2017 vs my 16.2 mph average in 2015.

With a 1 mph slower average this year, how was I almost 12 hours faster over a course that was 70 miles longer?

I stopped 68 less times, only 206 stops this year vs 274 stops in 2015.

Excluding sleep, my average stop duration this year was 5.6 minutes vs 8.2 minutes in 2015.

Minimizing stopped time is the key to covering distance without needing to speed. It should be obvious that there are a number of factors that make excessive speeding during a rally event a serious problem for rallymasters and riders. First and foremost, it is not legal. Riders in a rally who choose to blatantly disregard speed limits are a liability issue, especially if the Rallymaster condones it.

Excessive speed also requires more attention from the rider and the result is more stress and fatigue. Large speed differentials in traffic create higher risks for everyone. Not to mention higher fuel consumption requiring more fuel stops and reducing efficiency. However, no matter how many times the examples are posted and discussed; there are always a few riders that think excessive speed is the way to go.

There is also a fairness issue. Let’s assume that there are no rally consequences applied for speeding. Let’s say that Rider #1 accepts the considerable legal and accident risk of running, say

30 mph over the limit. Let's say Rider #2 is only comfortable running with the flow of traffic, because that minimizes the speed differential with surrounding traffic.

If Rider #1 does not get caught by law enforcement and does not experience a roadside chat that consumes all of the time he banked and more, then he may have the opportunity to collect a few more bonuses than Rider #2. Many rallymasters do not want to acquire the reputation of allowing excessive speeds due to serious the liability associated with such behavior as well as the perception of unfairness.

In recent years, a variety of methods have been attempted by various rallymasters to keep rider speeds in check, such as sealing rider's licenses in envelopes, then applying a penalty at the end of the rally if the seal is broken. Some rallymasters have sent staff to strategic locations with radar units and clocked rally riders, applying point penalties to those who were over the limit. Some rallies have set mileage caps in an effort to limit the perceived benefits of excessive speed. None of these attempts have been 100% effective.

The IBR recently began using satellite systems (the most popular is SPOT, some riders use InReach) for tracking the locations of rally riders. These are *consumer level* systems, not *professional level* systems (such as the popular Fleet Tracking system). A side-benefit of *professional level* systems is the ability to provide data every few seconds, along with complicated software that rejects GPS skips (sudden shifts in satellite data that most of us have seen when our GPS reports we achieved a max speed of 876 mph). Therefore, the professional systems can somewhat reliably report driver speed.

The problem with professional systems, of course, is expense. Not only the cost of the equipment, but also for the installation and service fees. The very high sampling rate and complicated software is costly. While the consumer level SPOT units are affordable, they do not provide the high sampling rate or complex tracking software that rejects obvious errors in the reporting data.

Despite those limitations, SPOT and InReach are very good at telling you exactly what date and time it recorded the position it thinks you were located (remember those small shifts in satellite location data can show you miles away from your actual location). But typically, they are accurate to a few feet - you just need a method to reject obviously bad data.

Using any two locations, a bit of crude math can be used to guess at speed. Yes, you will get the occasional 2956 mph error, but typically a rider's speed over a very long distance can be determined. In the case of the IBR, if we know you were at Bonus A at 8:12 am and arrived at Bonus B, 160 miles away (map miles, that we checked and know to be accurate) at 10:12 am (to keep the example simple), the rider would have been averaging 80 mph to make that happen (this assumes no traffic signals or other impediments - which would raise the actual speed slightly over that distance).

Sampling known data points between key items (in our case key bonuses) is all that is needed to determine which riders are speeding and take appropriate action - with penalties that range from losing their tracking bonus to disqualification from the event.

Like any technology, it is expected that the cost of the professional level systems will come down in price and one day may be used to automatically, and accurately, report speeding. Until that day comes, we have systems in place to figure out who is out there wicking it up. If it is determined that has happened, then the staff pulls out the hammer and ends their ride.

When the staff tells a rider that they are being penalized or disqualified from the rally due to excessive speed, there is easy-to-access data to back it up. The riders have been made aware that we are watching. The consequences of ignoring the warnings will not be pleasant.

John Harrison
IBR Scribe
Iron Butt Rally©