

Training Log 08: Pack Riding Basics

I figure it's a good time to talk about the rationale and the ins and outs of riding in a pack. Certainly, one of the most enjoyable aspects of road cycling is the sensation of being in a smoothly working pack of riders zipping down the road seemingly effortlessly. Living in Niagara and riding with the St. Catharines Cycling Club, we have lots of great group rides every week, ranging from moderate cruising rides to big hammer rides.

First off, besides camaraderie, why bother riding in a group? The answer is simple physics. Because road cycling is done so at relatively high speeds and the bike's skinny tires result in minimal rolling resistance from the road itself (compared to riding a mountain bike and its wide tires on or off-road), the greatest impediment is air resistance. Pushing those molecules of air aside requires a LOT of energy, and the faster you are riding, the more molecules you're slamming into.

Ever feel the difference in effort between riding at 20 km/h versus 40 km/h? The speed doubles, but the power required to overcome the added air resistance increases four-fold or more. And that's in still air. Add in a headwind and things get painful very quick! So the end result is that the rider at the very front of the group is spending about 30% more energy than the rider(s) behind. That's why the main race contenders spend the bulk of the race riding behind their teammates, staying as rested as possible and only hitting the front to make decisive attacks. For the pros, this can be the case even in the major mountain stages, because they're riding so darned fast that aerodynamics still play a major role.

So the primary reason for riding in a pack is efficiency – you save a ton of energy and can ride farther/faster than you can by yourself. What are some of the basic formations we'll employ, and what are some of the major rules for safe group riding?

Single Paceline

This one is best suited for small groups from 1-6 riders, and also where roads are narrow/twisting/busy. In this formation, riders ride behind each other in a single file. The lead rider stays in front for anywhere from 5 seconds to many minutes. S/he then waits until it's safe, then swings GENTLY off to one side (usually the left). Once off to the side, he then decreases his speed by a small amount (2-3 km/h if the group is going 30 km/h), drifting gradually to the back of the line. There are many small but crucial tricks to a smooth single paceline (see below).

Double Paceline

This is identical to the single paceline, but needs more riders and quieter roads because it takes up more space on the road. Rather than a single file, the riders are stretched in double file down the line. With a group of good riders, the pair will have their shoulders only about 30 cm apart. The lead pair of riders pull off to the right or left, then drift back. The major advantage of this formation is that you have somebody to talk to throughout the ride! Of course, this formation only makes sense when it's safe and also when there are at least a decent number of riders, or else you won't be getting much rest and the overall speed will be slower.

There are many other possible formations, but they are generally variations of these two basic patterns but more difficult to execute. For example, at really high speeds, riders will hit the front and then instantly pull off, so they're barely at the front at all during any individual pull. This permits each rider to go incredibly fast for very brief periods, but it is incredibly tiring and not designed for all-day rides!

Another example is the *echelon*, designed to maximize group efficiency in crosswinds (winds coming from the side). This can take up most or all of the width of the road, and is only rarely used unless the roads are safe and the riders really have excellent bike handling skill.

So with pack riding, what are some important skills and tips?

1. The closer you can stay behind another rider's rear wheel, the more benefit you will receive from drafting. Good riders will have their front wheels about 6" behind the rear wheel of the rider in front.
2. Where possible, keep your front wheel *slightly* to the left or right of the rear wheel ahead. This gives you an easier path to veer away in case of any sudden movement.
3. However, **DO NOT** overlap your front wheel with the rear wheel ahead of you! If this happens, a sudden movement by the rider in front can result in his rear wheel hitting your front wheel, which will most often cause you to crash.

To achieve the zen state of being in perfect drafting position, you have to absolutely trust the rider in front of you and the group in general! So here are some tips to achieve smooth riding:

4. If you're the lead rider, you **MUST** be smooth. No sudden hard braking or swerving. You should see all the potential obstacles (e.g. potholes, parked cars) and gradually move to avoid them well ahead of time. Thus you end up gradually snaking the entire pack around the obstacle, rather than a sudden crazy swerve. You should also point out the obstacle and call it out (e.g. there's a pothole on your right, steer the group around it, point downwards with your right hand as you pass it, and call out "hole"). Other riders on the right side can do the same down the entire line.
5. When you're following, smoothness is also critical, because any sudden movement can ricochet down the line. This makes it especially tough on the last riders, because they often have to brake hard and then accelerate over and over if the group is not smooth. This wastes a lot of energy for everybody.
6. When following, **DO NOT** fixate on the rear wheel ahead of you! You have a tendency to go where you look! Instead, focus above the shoulder of the rider in front of you, and use your peripheral vision to keep tabs on your front wheel and the rear wheel ahead. This permits you to get a good idea of the terrain and potential obstacles ahead.
7. If you're following and need to slow down a bit, many times you don't need to touch the brakes at all. You can slow down by simply coasting (stopping pedaling), sitting more upright to let air resistance slow you, or lightly use the rear brake if needed. If you're following, you should also be on the alert to these "body language" signals from the riders ahead!
8. When you take the lead, **DO NOT** accelerate! This is a natural temptation, but really breaks up the pack's smoothness. The rider behind you now has to accelerate, and it gets

worse and worse down the line. Keep an eye on your speedometer to ensure that you're going at the same speed when you hit the front.

9. When you're drifting back towards the end of the line, don't wait until you are completely behind the last rider to get back into the line. If you do, you'll often have to accelerate hard to get back into position, again wasting energy. Rather, as your front wheel is about even with the cranks of the last rider, accelerate very gently and then smoothly slot in behind the last rider. This uses a lot less energy.
10. Being at the back is the best and safest time to stand up to stretch, drink, eat, use your cellphone for an interview (just kidding on that one!).
11. In a pack with riders of different fitness levels, the most efficient mode is that the pack goes at the same speed/effort that's comfortable for everybody. The stronger riders would simply take longer turns at the front. This is much more efficient than constantly changing speeds/efforts, because it requires much more effort for everybody to accelerate over and over.

Ride strong and have fun!

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