

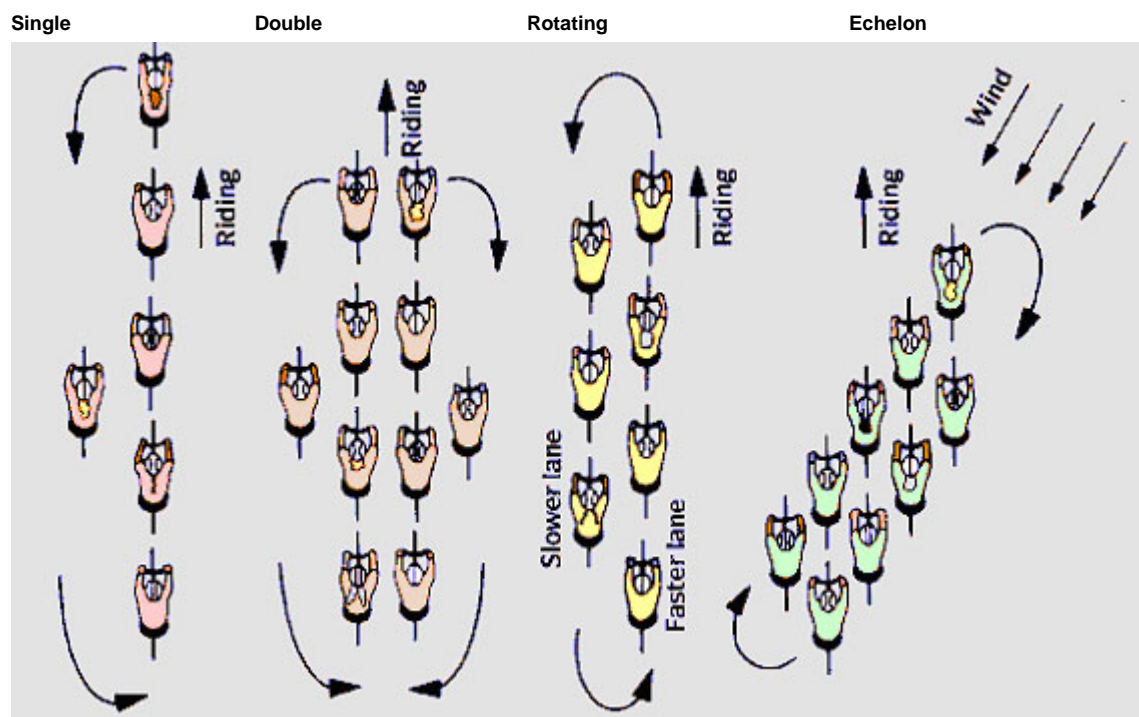
Pacelines - How to ride in a group

The essence of group riding is riding the paceline. It allows cyclists to travel faster with less effort and provides a better social experience. (It is also a foundation of racing.) Pacelines do have some inherent danger and require communication among the riders. But a good paceline is a wonderful thing.

The basic **SINGLE** paceline is simple. The riders align behind one another to take maximum advantage of the "drag" effect of the cyclists to the front. The cyclist in the front will set the group's pace, when the lead rider decides it is time to change, that rider pulls off to one side and drifts back to the end of the paceline.

The new lead cyclist increases effort **SLIGHTLY** (just increases the amount of pressure on his pedals) to *maintain* the group pace. A good paceline is smooth. A good paceline is built on trust. The riders have to be confident that the others in the group will communicate well and ride safely.

TYPES OF PACELINES



Which direction should the lead rider pull off? The single paceline picture above shows the rider pulling off to the left. But there are various reasons to pull off either direction. If there is a cross wind the lead rider will pull off whichever direction the wind is coming from. This is because the riders in the single paceline will naturally line up as shown in the "echelon" picture to hide themselves from the wind. Some believe that the rider coming off the front and going backwards should not be in the lane of car traffic and should, as a general rule, pull off to the right. Basically, whichever direction the group is using, all riders should do the same thing.

The **DOUBLE** paceline is a minor modification of the single paceline. In this setting there are just two single pacelines side by side. The riders on the front of each paceline pull off in opposite directions. As a general rule, the pacelines are far smoother if the two front riders agree and pull off simultaneously. Otherwise, one of the lines has to surge to get the front riders side by side.

A **ROTATING** paceline requires more focus and greater skills but is very satisfying to be part of. In a rotating paceline there is an advancing (faster) line of riders and a retreating (slower) line of riders.

The retreating line is on whichever side the wind is coming from. If it is a headwind a tailwind or no wind, usually the retreating line will be on the right side and the advancing line will be on the left. (The opposite of the picture above).

The key to a rotating paceline is that when the rider at the front of the advancing line clears the rider who is on the front of the retreating line, the advancing rider moves into the retreating line and softens up his pace. The rider who was behind him continues the pace of the advancing line until that rider switches over. The rider in the advancing line should NEVER surge. The idea is that you *ride to the front* and float to the back in a constant rotation. You change your speed by "soft-pedaling" as you switch to the retreating line and increasing your pedal pressure as you switch from the retreating line to the advancing line.

Smooth switches, and keeping the distance between the riders in the paceline as small as possible will keep the paceline smooth.

An **ECHELON** is a paceline ridden in a crosswind. The riders will naturally find cover at an angle as shown above. An Echelon can refer to either a single paceline or a rotating paceline. In either case, the lead rider will pull off INTO the wind.

PACE LINE RIDING – PART I

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"Pace line" riding consists of two or more riders traveling in a tight group in the draft of the rider(s) in front of you. If you are the leader of this pace line, then you are creating the draft for others.

The draft envelope behind a single bicycle is about six feet long. The closer your front wheel is to the rear wheel of the rider ahead of you, the stronger the draft. Riding in a pace line draft can save 20 to 30% of your energy output. This energy savings is what allows the pace line group to travel at higher speeds.

Concentration on what you are doing in a pace line is essential. That is, there is no time for sightseeing. Drafting behind one rider is the best way to start – someone you have ridden with before is best so that you'll already be familiar with his or her riding habits.

The Golden Rules of Pace Line Riding

1. Be predictable – Follow a straight line or the obvious racing line. Maintain a consistent direction of motion and avoid weaving.
2. Don't look back – It's what's in front that's important. The only time you should need to look back is when you are the lead rider and you are planning to fall back; in this case, you should look back briefly to ensure that there are no cars approaching; as you look back, keep your speed steady. Once you have cleared the front of the pace line, decrease your speed and get to the back quickly for a deserved rest.

3. Keep your head up – You should be able to see what is going on 120 feet up the road. Don't become fixated on the wheel of the cyclist in front of you. Look at the arms and shoulders of the rider in front of you. This gives you the best indication of a quick turn or change in direction usually associated with debris or obstacles. Keep your eyes up at all times so you can see what is happening. Regularly glance 3 to 5 riders ahead to see what lies ahead.

4. Go easy on your brakes – Use your brakes sparingly. Most crashes are caused by someone braking sharply and the rider behind touching wheels with them. If you are getting too close to the rider immediately in front of you, try "soft pedaling" instead of braking to adjust the gap. If you need to brake, do it gently. Never suddenly slow or attempt a quick stop without a hand or voice signal first – it results in pile ups!

5. Stay close to the wheel in front – With practice you will want to ride about 1 foot behind the wheel of the cyclist in front of you in order to keep the group tight and to take full advantage of the "draft". If you are brand new to riding in a pace line, you should begin by maintaining a longer distance (e.g., 3 to 4 feet) and gradually decrease the distance as your pace line skills improve. Also, stagger your front wheel about 6 inches to the left or to the right of the rear wheel of the cyclist in front of you; this wheel placement should provide extra reaction time in case the cyclist in front of you does something unpredictable (e.g., brakes suddenly or swerves). In addition, being slightly off to one side should allow you to see what is ahead. Back off when approaching a challenging rise or drop in terrain, when on a poor road surface with potholes or bumps, or when approaching curves in the road.

6. Signal to others – If you need to avoid a parked car or pothole, point it out in advance. Always provide hand signals to signal gravel, debris, other riders, cars, pedestrians, turns, and pace line rotations. Pass the appropriate hand signal down the pace line from rider to rider. Hand signals to your fellow riding partners keep everyone alert to what is ahead of your group. Sometimes, voice signals are better and faster. Voice signals are also safer at high speeds since they allow you to keep both hands on the handlebars. The last riders should advise the group of approaching traffic (e.g., by yelling out "car back"). Around curves it is also helpful for the leader to warn of traffic approaching from the front with "car up". The leader should also announce upcoming turns (e.g., "left turn").

7. Warn others of your intentions – If you need to stop or pull over indicate or shout your intentions and do it slowly. Move to the left or right and yell "slowing" or "stopping" before you brake.

8. Don't overlap wheels – Overlapping wheels with the cyclist in front of you can be a formula for disaster if he/she decides to suddenly pull out to the left or to the right in the direction of your wheel. The advantage gained by close following is not worth the risk of crashing. You should avoid overlapping wheels with the cyclist in front of you as an attempt to continually force up the riding pace.

9. Maintain a steady speed – Focus on maintaining a steady cadence and let your gears do the work. That is, no surging fast and then suddenly slowing (i.e., the bungee cord effect). This aids other cyclists as well as cars sharing the road. It's natural to slow for hills and headwinds. Keeping a consistent speed takes practice and awareness.

10. Pass on the left – Never pass on the right unless you are absolutely certain that there is plenty of room and the rider in front absolutely knows you are coming around because you yelled "coming by on your right" and you saw a visible reaction.

11. Be considerate of the riders behind you – When possible wait until you are at the back of the group before drinking from your water bottle or spitting. If you must spit or blow your nose move out of the pace line enough so no one is directly behind you.

BONUS: "Secure your luggage" – This means making sure that your water bottles, tire pump and anything else attached to your bicycle are tightly secure (i.e. able to withstand the jolt of hitting a bump or pothole and not moving). A loose water bottle flying out in the road can bring down the entire group as cyclists swerve to avoid hitting the water bottle.

PACE LINE RIDING – PART II TECHNICAL ASPECTS

Rotation frequency

1. How long do you pull the pace line before rotating to the back? The answer depends on the number of riders in the pace line and their relative strength. If you are struggling to maintain speed at the front of the pace line, then it is past the time to rotate to the back.
2. Clearly, the length of each pull will decrease with more riders. In a typical pace line of five or fewer riders, the stronger riders will be pulling for 60 to 80 pedal strokes (e.g. for about a minute or so). In larger pace lines this should decrease to a range of 30 to 60 pedal strokes. Weaker riders should be down to 15 to 40 pedal strokes.
3. When riding with stronger riders, take a shorter pull.

Riding in the front of the group

1. When on the front, keep your head up, call out the junk, and watch the lights. You are responsible for the safety of many riders. Don't let them down. Anticipate stoplight changes – it is your responsibility to get the entire group through the intersection safely. Go easy off the lights or around corners; give cyclists in the back of the group time to get going without getting whiplash!

Pace line leader and signals

1. Before the leader gets tired, he or she checks traffic behind, provides a hand signal, slowly moves to the left, and lets the next rider pull alongside to take the lead. Then the former leader eases up pedaling and drifts toward the back.
2. From a safety and efficiency point of view the next pace line leader is the rider directly behind the current leader. How does the current leader communicate to the immediate riders directly behind that he or she is pulling off? One of the best hand signals is the use of the rider's left or right elbow pointed straight out from the shoulder with the hand near the waist. This forms an arrow that will not get confused with left or right turn signals or on the road debris signals. This hand signal needs to be held for four or five seconds to give the rider directly behind the leader an opportunity to prepare for becoming the new leader. Normally, the current leader pulls off to the left of the pack. Move over gradually rather than swerving quickly to the side. As the current leader pulls off, his or her speed must remain the same before slowing to ensure the new leader an opportunity to safely take the lead of the pack. Once the retiring leader is safely over (typically to the left), he or she slows to efficiently return to the back of the pace line.
3. When giving up the lead and pulling out to the left, avoid veering out in the road more than necessary; try to stay relatively close to the pace line on your right. This way you may still get some protection from the wind.
4. As the retiring leader nears the back of the pace line, it is very useful for the end rider of the pace line to tell the retiring leader that they are approaching the end of the line (e.g., by yelling "last man").
5. Once the retiring leader gets near the end of the pace line, it is useful to get out of the saddle and bring the speed back up to the pace line speed. This out of the saddle approach serves two purposes. First, it helps the retiring leader speed up and, second, it provides an opportunity to stretch their leg muscles.

6. The new leader must maintain the same speed without sprinting, speeding up or slowing down during the first few seconds of the transition. If the new leader wants to increase the speed, then the best results are achieved with a slow increase in order to keep the pace line smooth and efficient.
7. The new leader should signal his or her retiring before fatigue or slowing becomes apparent. The best result is to retire just before slowing occurs. That way, the retiring leader still has enough energy to get back onto the end of the pace line.
8. When on the front, don't talk. You have too much responsibility.
9. On descents, keep pedaling so that everyone doesn't stack up behind you.

Hand Signals

1. Hand signals need to be held for four to six seconds so the riders behind you have a chance to react and signal the riders behind them. If you are the current lead rider of the pace line, then initiate your signal three to five seconds before reaching the location associated with its purpose. The current leader needs to plan and initiate a change in the travel path before the group encounters other riders, debris, rocks, pot holes, and the like. The leader must hold the new travel path well past the slower riders, debris, etc., until it is safe to move over to the right slowly.

General

1. If you must chit-chat in the pace line, skip the eye contact. Watch the rider in front of you and the traffic on the road.
2. When moving from a seated to a standing position, stay on the power so you do not fall back into the back behind you. When standing on the pedals, give them a couple of hard pumps as you stand up. When you raise out of the saddle, you tend to slow down before picking up your pace. When this happens, your rear wheel can accidentally hit the front wheel of the rider behind you.
3. If you find that you can't hold with the pace line that you're in, signal, then pull out of the pace line and back off. If you are smart, you can jump back at the rear and get a break too.
4. When learning to ride a pace line, you may be hanging on the back for dear life, doing all you can to stay with the group. If you are spent and can't keep up, ask for an easier speed (e.g., "please slow down" or "can we go slower?"). If you are drifting off the back, make a huge effort to get back on a wheel to take advantage of the draft.
5. If you tire, sit out as many turns as necessary at the back. Let riders coming back know that you are resting, and give them space to move in ahead of you.
6. As the speed increases, gaps may develop because riders can't hold the wheel ahead or miss the last wheel as they try to get back on the end of the pace line. Strong riders need to fill these gaps in order to preserve the flow, even if it means safely "jumping across" and moving back up the line early.
7. In general, the pace line should remain in single file when approaching and proceeding through traffic lights. If some of the group is caught at a red light, ease up to allow them to ride back up to the group. Each cyclist is responsible for verifying that the way is clear before entering the intersection.
8. If a member of the group experiences a flat or other mechanical problem, it is common courtesy for the entire group to stop to lend a helping hand.
9. Regroup after hills or other difficulties such as turns to keep everyone together.

10. For safety and as a courtesy, if the group spreads out, the last two people should adjust their speed to ride as a pair. If either should need assistance they will have a helping hand.

Eating and Drinking

1. Wait for a clear stretch of road and drift to the back so as not to get in the way.
2. Use one hand to eat (or drink) and make sure the other is covering the brake just in case. Chopping up your food into bite-sized pieces and opening wrappers before you start will save you struggling to open a packet on the move.

Dealing with the Unexpected

1. If you are riding in a pace line and experience a puncture, don't panic! Raise your arm and yell out "puncture" or "flat" and "stopping". Keep to your line, slowing down gradually by soft pedaling rather than suddenly braking. Avoid slamming on your brakes since there should be enough air left in your inner tube to avoid damaging your wheel. As soon as everyone has passed, pull over.

SUMMARY: Remember that CONCENTRATION, SMOOTH PACE, and GOOD HAND SIGNALS are critical!