

Types of Roads

One of the most enjoyable parts of motorcycling is running through the curves. Laying the bike over and taking a smooth line through a corner, then rolling on the throttle as you approach the exit, can be a real thrill. But graceful, coordinated turns are not made by accident. The rider must know what is in store for him as he approaches a curve in order to determine how to negotiate it.

We all know of certain curves that are very “comfortable” to ride. You lean into the turn and the bike “sticks” to the road. You come out faster than you went in, and it feels good. Then there are others that give us a bit of anxiety. As soon as you enter the curve, you know that something is not right. Perhaps you are going too fast, or you are close to your limit on lean but know you will run too wide before coming out. Or maybe you find that the road geometry has changed part way through the turn and you are out of position. You end up negotiating the curve with several “jerky” turns and are relieved to come out with both wheels on the ground.

Well, there are reasons for each of these situations and they are primarily a function of how the curve is constructed. Any curve can be negotiated with confidence if you know what to expect. In order to setup the right line and properly execute a turn, it is important to know the basic characteristics of a curve, namely camber and radius. A piece of road can have a positive camber, where the outside of the road is higher than the inside, a negative camber, where the inside of the road is higher than the outside, or the road can be flat. A single curve may have a constant radius, as in a perfect half circle, it may increase in radius, opening up at the end, or it may decrease in radius, tightening up toward the end. The radius of a turn is usually second in importance to its camber, and it is very easy to have your attention stuck to the radius so you don’t see the camber changes. Also, it is very difficult to see the banking while you’re riding on it. Surface condition and changes in elevation can also effect how you take a curve, but are not discussed here.

Positive-Camber Turn

Most everyone is comfortable riding a section of road that has some banking or positive camber (outside higher than inside). The banking has the effect of holding you up by creating a “wall” to push against your tires. Gravity is working for you, pulling you and the bike down the wall, counteracting the outward-bound cornering forces. Additionally, the banking gives you more ground clearance than does a flat section of road.

Off-Camber or Negative-Camber Turn

This type of turn is banked the wrong way; that is, it is higher on the inside than it is on the outside. A turn that begins flat or with a positive bank and ends off-camber demands the most changes and adjustments in lean angle. In order to continue around it, the bike must be leaned over farther. The effect is much the same as going from a banked to a flat surface. Gravity is now working against you, pulling you and your bike in the opposite direction of the intended turn, and the tendency of the bike to go toward the outside in an off-camber turn is dramatic.

Constant-Radius Turn

A constant-radius turn neither increases (widens) nor decreases (tightens) as you go through it. You can hold a constant speed and lean angle all the way around from entry to exit. However, if a constant-radius turn has camber changes, it can act as an increasing-radius or a decreasing-radius turn. For example, if the turn is flat on the entry and banked on the exit, it acts as an increasing-radius. If it is banked on the entry and flattens out on the exit it will have exactly the same effect on your bike as a decreasing radius.

Increasing-Radius Turn

This turn widens-its angle becomes less severe-as you go through it. An increasing-radius gives you the safest feeling because you have room at the end to make changes and corrections. You can easily recover from going into an increasing-radius turn too fast because you have plenty of room. An increasing-radius

turn can be changed dramatically by the camber of the road, just as the decreasing-radius turn can be. If it is banked going in, and flat or off-camber at the exit, it will act as a constant-radius or decreasing-radius turn, depending upon how much negative camber it has.

Decreasing-Radius Turn

This is a turn that tightens up as you go through it. The decreasing-radius turn is the most challenging of the three types. The problem with a decreasing-radius turn is that you can find yourself going too fast to exit it safely even though you were not going too fast for the first part of the turn. That is, unlike a constant-radius turn, there is not one smooth line through it that allows you to pick a single stable lean and speed. If you go into a decreasing-radius turn thinking it has a constant-radius, you will have to do one of three things: 1) Run wide at the exit, 2) Lean the bike over more at the end of the turn, or 3) Back off the gas so that one and two above don't happen.

So, what to do?

As you approach a corner, you should look to the exit. This is where you want to go, so the exit is what you need to see. You really have no idea what sort of corner it is and what's going to happen immediately after it until you can see the exit. If you are approaching a blind turn or your line of sight is restricted, it is best to assume that the portion of the turn that you cannot see has a decreasing-radius. This is potentially the safest option for any turn. Stay wide and limit your speed until you can see the exit. "Staying wide," means entering the turn as close to the outside as practical, considering roadway and traffic conditions. "Limiting your speed" means maintaining a speed that will provide time and space to successfully react to situations as they first appear in your field of view. And finally, always plan to exit a curve some distance away from its outside edge so that you have some ability to overshoot your line when the unexpected happens.

When you look through a curve, you turn your head to face the exit and the intended path after the turn. Your eyes continue to move about and scan the riding environment, but the center of your field of vision is where you will be going. This is a minor turn of the head for gradual turns. You may need to exaggerate the head turn for sharp turns to face the exit. For U-turns, it means turning your head as far as it will go. This technique not only allows you to scan more effectively, it provides "visual directional control." Your mind tends to automatically make the control inputs necessary to cause the motorcycle go where you are looking. Have you ever found yourself drifting toward the side of the road while looking at some attractive scenery? That's visual directional control. Facing the turn's exit also tends to discourage looking down, which may cause balance problems. It helps you to perceive the turn as a single coordinated maneuver rather than a series of short arcs and can result in a smoother line.

Portions of this article were taken from "A Twist of the Wrist" by Keith Code, and from The Motorcycle Safety Foundation's "Guide to Motorcycling Excellence".
