THE RIGHT LINE

Taking The Proper Line Through A Curve Is Your Key To Faster, Safer, More Efficient Riding

by BILL STERMER

Part of the joy of riding a motorcycle is in bending into a good, curvy road to play with the laws of physics. But no matter how much you like curvy roads, you may have encountered situations when you felt you were riding quite fast, pushing along quite well, only to have another rider on a "slower" or smaller machine zip right by you seemingly without effort. If you've ever experienced this, if you've ever felt you were working too hard at the turns, or felt you weren't really in control, this article has been written for you. We're going to talk about "lines," and how you can see and ride the right line through any corner.

What Is A Line?

Imagine you are riding along a curving road, following a friend on his bike. He splashes through a small puddle, and his tires momentarily leave a long double trail behind him on the pavement. Those tracks are evidence of his exact path, or "line," through the turn.

Whether your joy is touring, cruising or sport riding, there are efficient lines and less-efficient lines through turns. The efficient, or "best" line through a turn is the one that is most direct. It's the shortest line, the smoothest, and the safest. It's the one that requires the least lean, and—would you believe—the one that allows you to go through the turn, or series of turns, the fastest.

The Theory Of Lines

You learned at an early age that a straight line is the shortest distance between two points, as in Figure 1. Riding a straight road in a straight line is easy; it's when the road begins to twist and turn that you have to slow down. The most efficient line through a turn is the straightest, most direct line. In essence, the right line will straighten the road for you, which makes riding much easier. Figure 2 illustrates how to apply a relatively straight line to a curve.

When Is A Curvy Road NOT A Curvy Road?

Take a look at Figure 3. Most of us might call this a twisty section of road, as it has seven curves, or "turns," in it. Most riders would probably have to brake for turn number three, and again for turn number six, and do quite a bit of leaning in them.

Now it's time to break away from conventional thinking and become a better rider by understanding lines. We want to "straighten" this section of road by "seeing" the proper line through it. Take your finger and trace a fairly straight line through this section—without going over the centerline or off the road.

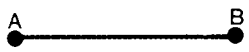
Now look at Figure 4, which illustrates an efficient line through this series of seven turns. Amazing, isn't it? The rider who takes this line won't have to brake. He hardly has to lean. He could roar through this series of turns accelerating all the way. His first step was to "see," or visualize, a line through this section of road. You should do the same. Rather than seeing turns in a section of road, visualize the most direct path *through* the turns. Visualize the line!

The Common Mistakes

We've all learned early in our riding careers about the grease strip in the middle of the lane, on which cars drop oil and grease to create a dark, slippery stripe. As a result, most motorcyclists tend to ride in one or the other wheel track in the lane, changing between them often depending upon traffic conditions. This works fine in the city, but on a curvy road this "track-think" works against efficient riding.

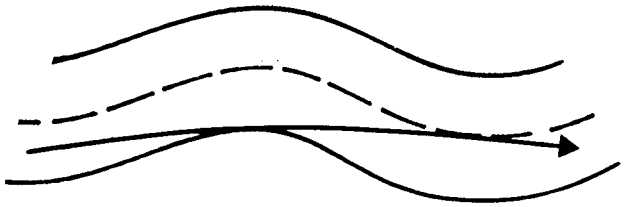
By following a rider on a winding road you can tell a great deal about his riding ability. Too many touring riders are track slaves, and tend to keep in the left or right track of the road. By doing this they allow the road to dictate to them where they will ride, and they expose themselves to potential problems. Figure 5 illustrates a couple of these.

Rider "L" in the left track likes to stay near the centerline because this allows him to see farther around blind right turns, which is fine. But on blind *lefts,* the left tire track is the wrong place to be. Not only is your vision around the turn limited, but you're actually going to be leaning your body



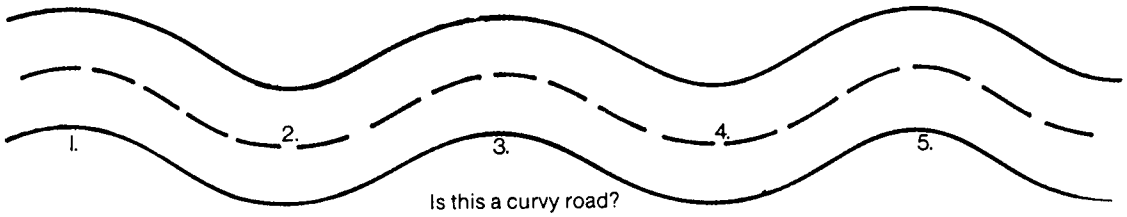
A straight line is the shortest distance between two points.

Figure 1.



A curve can be taken in a relatively straight line.

Figure 2.



Is this a curvy road?

Figure 3.

over the centerline and into the oncoming lane—and that is downright dangerous.

Rider "R" in the right-hand track feels more secure because he's hugging the inside, away from traffic on the right turns. One problem with this position is that he cannot see very far around blind right-hand curves. If the curve tightens up suddenly, or another vehicle ahead of him decides to stop, he'll have precious little warning, and little room to maneuver. Another problem is that from his inside position, he is forced to take the relatively acute angles the curves throw at him. The road is controlling him instead of him controlling the road.

Okay, I know what you're thinking now. "You're saying we shouldn't ride in the left track, and you're saying we shouldn't ride in the right track, and the center is a grease strip—so where *do* we ride?" The answer is: you ride wherever you need to within your lane to straighten the curve. In simplified terms, you hang wide in a trun until you can see it opening up, then you sweep across the apex and away. Figure 6 shows the efficient line for an open, rather than a blind, turn.

An efficient line uses the entire lane, flitting from edge to edge as the need arises. Notice the advantages of the line in Figure 6. Because it "straightens" the turn, very little lean is required. The line clips the apex, which is the tightest part of the turn, keeping the rider far away from oncoming traffic in a right-hander. This line is easier. It's safer. Because it does not require as much lean, it will be faster. And, as you can see by its sweep, it's a thing of beauty.

Apexes

The "apex" of a turn is that point at which the turn reaches its most extreme angle. Most people would say it was where the turn was sharpest. When you reach that point in a turn where you can see all the way through it, the apex is easy to spot. Up to the point of the apex the turn is tightening; beyond the apex the turn is opening, loosening. The apex is your key to reading turns.

Because the turn opens up past the apex, you can now understand that the apex is your limiting point, which also means it's your signal where to run your line. In reading a turn you need to find its three limits, which mark how far you can go in straightening the turn. They are simply: 1) the extreme outside edge of the lane entering the turn, 2) the apex on the inside of the turn, and 3) the extreme outside edge of the lane exiting the turn. In Figure 7 the limiting points are clearly marked.

To review, here is how you find your efficient line through a right-hand, open turn.

1. Ease out close to the centerline and follow it around as you sight along the right edge of the pavement.

2. The apex is the point beyond which the turn begins to open up—find it. In a right-hand turn, watch for the apex along the right edge of the road; in a left-hand turn, the apex will be on the centerline.

3. When you spot the apex, identify the imaginary line that clips its edge and continues on straight out of the turn—and aims for the correct entry spot for the next turn.

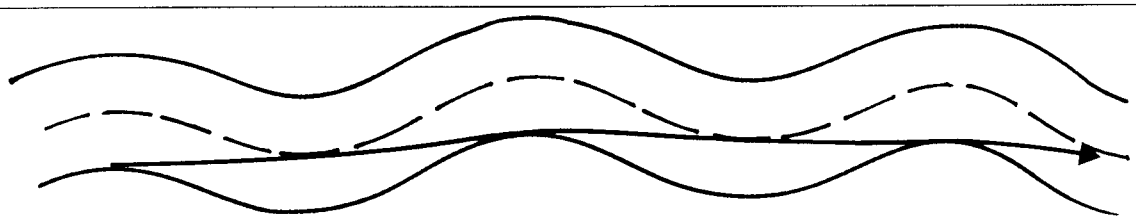
4. Take that line.

Blind Turns

Thus far, we've been talking about laboratory turns, pure lines governed by the pure beauty of physics. Unfortunately, the road is a harsh reality, and far from perfect. Roads are full of potholes, rocks, oil spots, fallen car mufflers and oncoming traffic. The faster you ride, the less you can correct your line as it moves between its limiting points, the edges of the pavement. In fact, a well-chosen, efficient line executed well uses all the lane. The slightest miscalculation and the rider is in the weeds. But we don't want that, do we! We'd much rather leave ourselves an out.

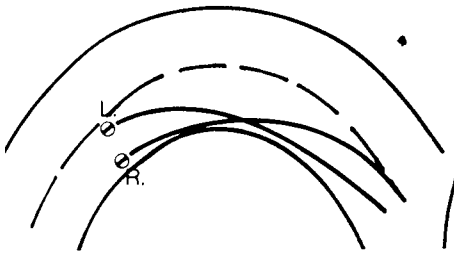
The single safest way to avoid the problem in a "blind" turn is quite simply this: *never enter a turn you can't see all the way through—a blind turn—at anything near racing speeds.* Save the acceleration for the moment you can *see* that the turn ahead is clear.

We've already talked about visualization, about "seeing" a line in a turn. Here's another visualizing exercise to try. How often have you spotted a small rock in a turn, then—despite your best intentions—you run right over it? You can't believe it. "How could I have



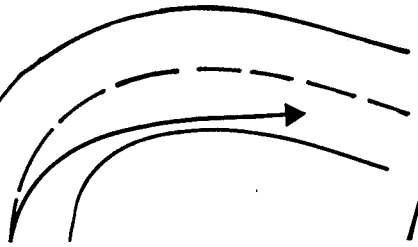
Nope, this isn't a curvy road at all, if you know the right line.

Figure 4.



Stay to the outside in a blind turn initially, as this position allows you to see farther around the turn, as with rider L."

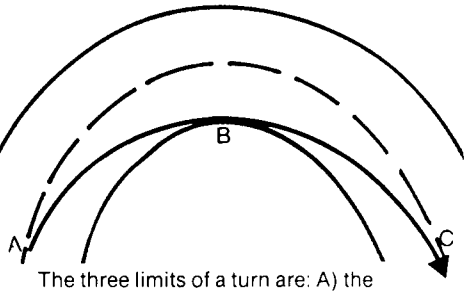
Figure 5.



In a long sweeping turn, hang wide in it until you see it opening up...

...then sweep across the apex and away!

Figure 6.



The three limits of a turn are: A) the extreme outside edge of the lane entering the turn, B) the turn's apex, and C) the extreme outside edge of the lane exiting the turn.

Figure 7.

done that?" you say. "There was an entire lane open, one tiny rock in it, I wanted to avoid the rock, but I hit it anyway! Why did I do that?"

You did that because of a phenomenon known as "Target Fixation." It means that when you see an obstacle in the road, your eyes fixate on it. Then, because you go where you look, you run over the obstacle, or "target." You can avoid this target fixation syndrome by visualization. As soon as you see a scattering of loose rocks in the road, discipline yourself to look through it, to visualize the safe pathway *through* the rocks rather than the rocks themselves. This way you change your target from the obstacle to the clear path past it, and your motorcycle will follow this path. This approach will not only help you in turns, but in emergency situations as well.

Many Lines

A common question asks, "Is there just one line through a turn, or can there be more?" The answer is that there are many lines through a turn for certain bikes in certain situations. For example, you take a different line on your bike when you're going slowly than when you're going fast. Bikes with different suspension geometries take slightly different lines.

Personal riding styles differ. Motorcycles differ. Riding a small, heavily laden 450 two-up, you might use minimal braking and a wide line in the turn to keep your speed up and compensate for the bike's lack of power. Later in the day, riding your 1000cc Hurricane solo, you might dive into the same turn hard and power out, using your bike's muscular engine.

In either case, for the bike and the situation, you will be using the quickest, straightest line through the turn under the circumstances. When all variables are relatively similar, however, the most efficient line is also the same. When good, fast riders on similar bikes hit the road, those imaginary sets of tire tracks through any given turn will generally be quite close to each other, varying only by inches.

Gear Selection

The proper form for riding through a turn is to brake before it, then lean and accelerate through it. It is this accelerative force that "supports" the rider in his lean angle through the turn. The more force you apply (the harder you accelerate), the more you can lean. If you've ever wondered how the racers can hang their bodies well off their bikes and lean far enough to scrape their knees on the pavement, it's because at these moments they are accelerating very hard on very powerful motorcycles. In order for you to get the proper accelerative force required to lean effectively in a turn, you need to be in a lower gear than you're probably accustomed to riding in.

Try this experiment. Ride down your favorite twisty road, one you may not have taken too aggressively in the past, but ride it one gear lower than normal. If you're usually in fourth gear through a certain turn, try it in third. Keep the revs up, and accelerate through the turn once you've noted the proper line. You'll be amazed at how much more precise control you have through this turn with that added accelerative "support" in the lower gear.

Smoother, Faster, Safer

Using these techniques may not have any professional racers staying awake nights worrying about you overtaking them on a racetrack, but these visualizing, turn-straightening techniques will certainly have you riding better, faster, smoother, safer, and under better control.

Oh, by the way, there is another word for the "efficient" line through a turn. It's also called the "racing" line. Why do racers use these lines? Because they're faster, smoother, safer, and require less leaning. In short, racers use these lines for the same reasons you will—because they're more efficient. Our purpose here is not to try to turn touring riders into racers—just to help them become more efficient, smoother, safer riders.

Once you become skilled in lines, you'll learn the irony that non-motorcyclists cannot comprehend. You'll learn that faster is not necessarily more dangerous. Faster, when it's the result of being on the right line, can be easier and safer—than you've ever ridden before.