

# Streetwise Cycling



## A GUIDE TO SAFE BICYCLING IN NORTH CAROLINA



**Division of  
Bicycle &  
Pedestrian  
Transportation**

NC Department of Transportation  
Division of Bicycle & Pedestrian Transportation  
401 Oberlin Road, Suite 250  
Raleigh, NC 27699  
Phone: (919) 807-0777  
Fax: (919) 807-0768  
Web: [www.ncdot.org/transit/bicycle](http://www.ncdot.org/transit/bicycle)

Traffic skills to help you get where you're going  
Emergency moves that can save your life  
Equipment that can make your cycling safer



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The purpose of the Streetwise Cycling guide is to explain the rights and duties of bicyclists, as vehicle operators on North Carolina's roads. Additional information on traffic riding, handling skills, and equipment is included to encourage more proficient riding.



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### Disclaimer

Every attempt has been made to provide complete and thorough information on the North Carolina laws pertaining to bicycles. NCDOT cannot be held responsible for any exclusions, omissions nor deletions of relevant laws. If you have questions or concerns regarding North Carolina law pertaining to bicycles, you may wish to consult an attorney.

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## North Carolina is for Bicycling



Start with a climate that offers good cycling year-round. Add an excellent network of roads, both urban and rural. Throw in the special bicycle maps, facilities and street improvements provided by state and local governments. Then, round out the formula with an active population of bicyclists—commuters, tourists, racers, mountain bicyclists fitness riders, and around-town cyclists—and it's easy to see why "North Carolina is for Bicycling."

From the mountains to the sea, bicycling opportunities are unlimited. If you tour, there are thousands of miles of lightly-traveled roads waiting to be explored. To make it easier for you to find your way, the Division of Bicycle and Pedestrian Transportation has selected and mapped a system of "Bicycling Highways." Nine routes cover the state, with a route guide for each, which details information on terrain, road condition, available services and points of interest. Maps of local bicycle routes have also been produced. More are in the works. Check the last page of this booklet for a list of publications and resources, and their web links.

As for events, each year there are hundreds of tours, races, festivals, bi- and

triathlons and outings of all kinds. So many, in fact, that the Division of Bicycle and Pedestrian Transportation publishes a yearly online calendar to help you keep track. Sponsored by the fifty-or-so bicycle clubs and organizations as well as various community groups, these events draw thousands of participants—from novice riders to internationally-ranked racers.

Governments, too, have begun to address bicyclists' needs. In some places, special signs, bicycle lanes, greenway paths and bicycle parking facilities have been in place for years. More recently, money from the federal government to the Department of Transportation has made providing additional bicycle improvements easier. Across the state, efforts are underway to increase cyclists' safety on the road.

Ultimately, however, your safety is in your own hands. Statistics show that 75% of all bicycle/motor vehicle accidents are the fault of the bicyclist. Learn and obey the traffic laws and practice the safe riding techniques outlined in this booklet. A skilled cyclist, riding responsibly, can enjoy bicycling in North Carolina for years to come.

## You're the Driver of a Vehicle



*As the driver of a vehicle, you've got some important rights and duties. The most important right is to safely use the roads to get where you're going. The most important duty*

*is to ride cooperatively and obey the laws. Riding a bike on the road isn't a game. Cyclists who ignore their duties endanger their right—and the rights of others—to use the roads.*

The following highlighted statutes that apply to the operation of a bicycle are excepted from the *Motor Vehicle Laws of North Carolina*.

### *What the Law says:* *Bicycles are Vehicles*

"Vehicle: Every device in, upon, or by which any person or property is or may be transported or drawn upon a highway, excepting devices moved by human power or used exclusively upon fixed rails or tracks; provided, that for the purposes of this Chapter bicycles shall be deemed vehicles and every rider of a bicycle upon a highway shall be subject to the provisions of this Chapter applicable to the driver of a vehicle except those which by their nature can have no application." §20-4.01 (49).

### **Cyclists must stop at stop signs and red lights**

Just like any other drivers, you must stop at stop signs and yield to cross traffic. By the way, "cross traffic" includes any pedestrians crossing the street in the crosswalk.

Red lights also mean stop. And, unless you're turning right, you must wait for the green light. If you find a signal that doesn't change for you, that means it's not responsive to bikes. Contact the local traffic engineers and suggest they install signals that detect bikes. For more information, contact the Division of Bicycle and Pedestrian Transportation.

### *What the Law says: Stop Signs and Stop Lights*

"When a stop sign has been erected or installed at an intersection, it shall be unlawful for the driver of any vehicle to fail to stop in obedience thereto and yield the right-of-way to vehicles operating on the designated main-traveled or through highway..." §20-158 (b) (1).

"When a steady or strobe beam stoplight is emitting a red light controlling traffic passing through an intersection, an approaching vehicle facing the red light shall come to a stop and shall not enter the intersection. After coming to a complete stop and unless prohibited by an appropriate sign, that approaching vehicle may make a right turn.

b. Any vehicle that turns right under this subdivision shall yield the right-of-way to... Other traffic and pedestrians using the intersection..." §20-158 (b) (2) (a).

Keep in mind that ignoring stop signs and red lights leads to about one of every ten car-bike crashes. It's also one of the biggest complaints motorists have against bicyclists.

### **Cyclists must go with the flow of traffic**

Legally, you must ride on the right with traffic, not against it. There's a lot of confusion about this. Some people believe the law says just the opposite, but pedestrians are the only ones who should travel *against* traffic (and that's on roads without sidewalks see §20-174(d) of the Motor Vehicle Laws of North Carolina). Riding against traffic has never been legal in the U.S. and—if we're lucky—never will be.

### *What the Law says:* *Which Side of the Road*

"Upon all highways of sufficient width a vehicle shall be driven upon the right half of the highway..." § 20-146 (a).

Nationwide, nearly 1/4 of all car/bike crashes are caused by wrong way riders. They believe that it's safer to ride facing traffic because they can "see the cars coming." It's not safer. Motorists don't look for cross traffic on the wrong side on the road.

### **Cyclists must use lights and reflectors at night**

The law requires at least some sort of headlight and a red rear reflector or tail-light. That's not much and you should consider getting more.

In the United States, nearly half of all cycling deaths involve a cyclist riding at night without lights. In the late 1970's, night-time accidents led to only about 30% of the crashes, so the picture is getting worse, not better. Some researchers say only 3% of all cycling happens after dark, proving just how deadly night-time riding is without the proper equipment.

### *What the Law says: Lights*

"Lamps on Bicycles: Every bicycle shall be equipped with a lighted lamp on the front thereof, visible under normal atmospheric conditions from a distance of at least 300 feet in front of such bicycle, and shall also be equipped with a reflex mirror or lamp on the rear, exhibiting a red light visible under like conditions from a distance of at least 200 feet to the rear of such bicycle, when used at night." §20-129 (e).

### **Slow moving vehicles must keep to the right side**

If you are going slower than the speed limit, you must ride in the right through lane *or* as close to the curb as *practicable*. However, you can move to the left to make a left turn or pass another vehicle going the same direction. What does *practicable* mean?



### *What the Law says:* **Slow Moving Vehicles**

“Upon all highways any vehicle proceeding at less than the legal maximum speed limit shall be driven in the right-hand lane then available for thru traffic, or as close as practicable to the right-hand curb or edge of the highway, except when overtaking and passing another vehicle proceeding in the same direction or when preparing for a left turn.” §20-146 (b).

There is no hard and fast definition. In one situation, it might mean two feet; in another, eight feet. Just how close “practicable” is depends on the road, the surface, the traffic, the speed of the rider, and other factors. For example, you can ride far enough to the left to avoid a roadside hazard (like a drain grate, a parked car door, right turning cars or debris).

### **Cars must pass bikers safely**

Motorists must give bicycles enough space when they pass. According to the law, they must allow at least two feet of clearance and not move back to the right until it's safe. At the same time, bicyclists

### *What the Law says:* **Passing and Being Passed**

“(a) The driver of any such vehicle overtaking another vehicle proceeding in the same direction shall pass at least two feet to the left thereof, and shall not again drive to the right side of the highway until safely clear of such overtaken vehicle...”

“(b) Except when overtaking and passing on the right is permitted, the driver of an overtaken vehicle shall give way to the right in favor of the overtaking vehicle while being lawfully overtaken on audible signal and shall not increase the speed of his vehicle until completely passed by the overtaking vehicle.” §20-149.

being passed can't speed up while being passed. And, if the passing motorist honks a horn, the bicyclist must give way to the right.

On two-lane roads, drivers can't legally pass on the crest of a grade or on a curve where they can't see what's coming for 500 feet; nor can they pass where passing is prohibited by signs or markings.

### *What the Law says:* **Making Turns**

“(a) Right Turns. Both the approach for a right turn and a right turn shall be made as close as practicable to the right-hand curb or edge of the roadway.

“(b) Left Turns. The driver of a vehicle intending to turn left at any intersection shall approach the intersection in the extreme left-hand lane lawfully available to traffic moving in the direction of travel of that vehicle, and, after entering the intersection, the left turn shall be made so as to leave the intersection in a lane lawfully available to traffic moving in the direction upon the roadway being entered.” § 20-153.

### **Bikes make turns like any other vehicles**

Bicyclists, like other vehicle drivers, should make turns in predictable ways. To make a right turn, move over towards the right edge and signal. To make a left turn, look back, signal, merge towards the left when safe (into a left turn lane, if one is available) and make your turn. This is the standard method.

You can also, if you like, pull to the curb and make your turn like a pedestrian, walking across each street. Which approach you use depends on how skilled you are, the road and the traffic situation.

### *What the Law says:* **Signaling Turns**

“(a) The driver of any vehicle upon a highway or public vehicular area before starting, stopping or turning from a direct line shall first see that such movement can be made in safety...and whenever the operation of any other vehicle may be affected by such movement, shall give a signal as required in this section, plainly visible to the driver of such other vehicle, of the intention to make such movement...”

“(b)...Whenever the signal is given the driver shall indicate his intention to start, stop, or turn by extending the hand and arm from and beyond the left side of the vehicle as hereinafter set forth.

“Left turn—hand and arm horizontal, forefinger pointing.

“Right turn—hand and arm pointed upward.

“Stop—hand and arm pointed downward...” § 20-154 (a) and (b).

### **Cyclists must signal turns with their left hands**

Signaling turns is an important part of sharing the road. It lets others know what you want to do. It's required any time your move could affect another driver.

On the other hand, simply giving a signal doesn't give you the right to turn in front of someone. Your signal is a request, not a demand.

You make a left turn signal by holding your left arm out straight to the side. To signal a right turn, hold out your left arm with the hand pointed up. To signal a stop, hold your left arm out with the hand pointed down.

### **Reckless cycling is just as illegal as reckless driving**

If you get a ticket for “reckless driving” while bicycling, you could be in a lot of trouble. While it's a misdemeanor, the penalty is serious: up to six months in jail

and/or a fine of \$500.00. It's up to the judge to decide what your sentence will be. Is it worth the thrill of flying down the street, ignoring traffic laws and the rights of others?

At the same time, motorists who endanger bicyclists by harassing and dangerous moves could be cited for reckless driving.

### *What the Law says:* **Reckless Driving**

“(a) Any person who drives any vehicle upon a highway or any public vehicular area carelessly and heedlessly in willful or wanton disregard of the rights or safety of others shall be guilty of reckless driving.

“(b) Any person who drives any vehicle upon a highway or any public vehicular area without due caution and circumspection and at a speed or in a manner so as to endanger or be likely to endanger any person or property shall be guilty of reckless driving.

“(d) Reckless driving as defined in subsections (a) and (b) is a class 2 misdemeanor. §20-140.

### **Summary**

While there are other traffic laws that affect bicyclists, these are the laws that are most often misunderstood. In this discussion, we have tried to give both the legal language (shown in shaded area) and a brief explanation of what the laws mean.

If you want to learn more go to the North Carolina General Statutes online. The Motor Vehicle Laws of North Carolina are all essentially found in Chapter 20 of the North Carolina General Statutes. This chapter can be found at [www.ncleg.net/gascripts/statutes/statutes.toc.pl](http://www.ncleg.net/gascripts/statutes/statutes.toc.pl). The laws are subject to change, so check the web site for new laws and proposed legislation. For more information on laws affecting bicyclists, please see the Guide to North Carolina Bicycle and Pedestrian Laws, online at [www.ncdot.org/transit/bicycle/laws/resources/lawguidebook.html](http://www.ncdot.org/transit/bicycle/laws/resources/lawguidebook.html).

## Fit & Equipment



### What kind of bike is for you?

It used to be that people thought “a bike is just a bike.” But today, you’ll find many different kinds in the shops. Now more than ever, the bicycle you should get depends on what you want to do with it.

*Do you want to go on long distance tours, carrying your own luggage?* Look seriously at a heavy-duty touring bike with dropped handlebars, fairly wide aluminum rims, 21 or more speeds, fenders and racks.

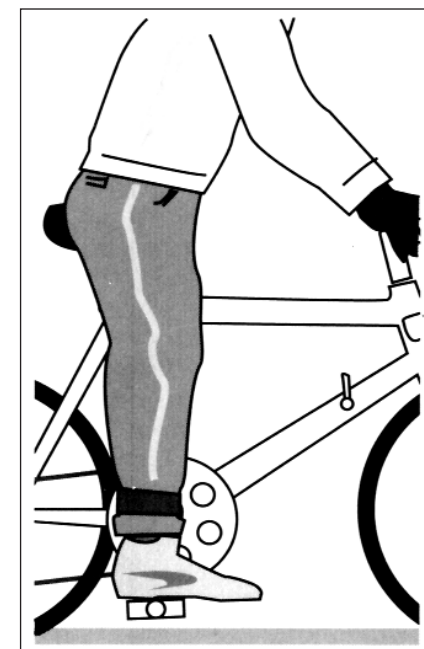
*Do you plan to do mostly fast 40 to 100-mile one-day fitness rides?* Consider a semi-racing style bike with a lightweight responsive frame, 18 to 24 speeds and 1"-wide high pressure tires.

*Will you bicycle on dirt roads and trails?* Test ride a mountain bike with 1-1/2" to 2-1/2" aluminum wheels, 15 speeds and indexed shifting for positive gear changes.

*Maybe you'll just be riding around town?* Mountain bikes and hybrid styles are popular for that purpose too. Think about the kinds of places you'll be parking your bike. Can you find secure locations? Can you bring your bike inside? If not, consider getting a “beater bike” (an old-looking clunker) for town riding.

### Sizing your bike:

Whatever bike you choose, getting one that fits right is very important for your safety and comfort. The basic test is whether you can straddle the bike flat-footed with an inch or two of clearance at the frame's top tube. Clearance for a hybrid bike should be approximately 2". For a mountain bike, you need 3" - 4" of clearance if you plan to blast down hillsides, less if you tour on back country dirt roads.



*Facing page: Bike shops have a wide assortment of bicycles to suit almost every riding style.*

*Above left: You should be able to stand over the bike with a little clearance; just how much depends on the type of bike and what you want to do with it.*

*Above right: Your leg should be straight when you put your heel on the pedal in its lowest position. When you pedal with the ball of your foot, you'll have a slight bend at the knee.*

### Adjusting to fit:

For greatest comfort and safety, you'll want to adjust your bike to fit just right. It takes a little time but is well worth it in the long run. There are many variables involved in fitting your bike precisely to your way of riding and your body. Here are some rules of thumb. Start with them and gradually modify your bike a little at a time as you learn what is and isn't comfortable.

**Saddle height:** Set the saddle so that when you put your heel on the pedal in its lowest position, your leg is just straight. Then, when you pedal with the

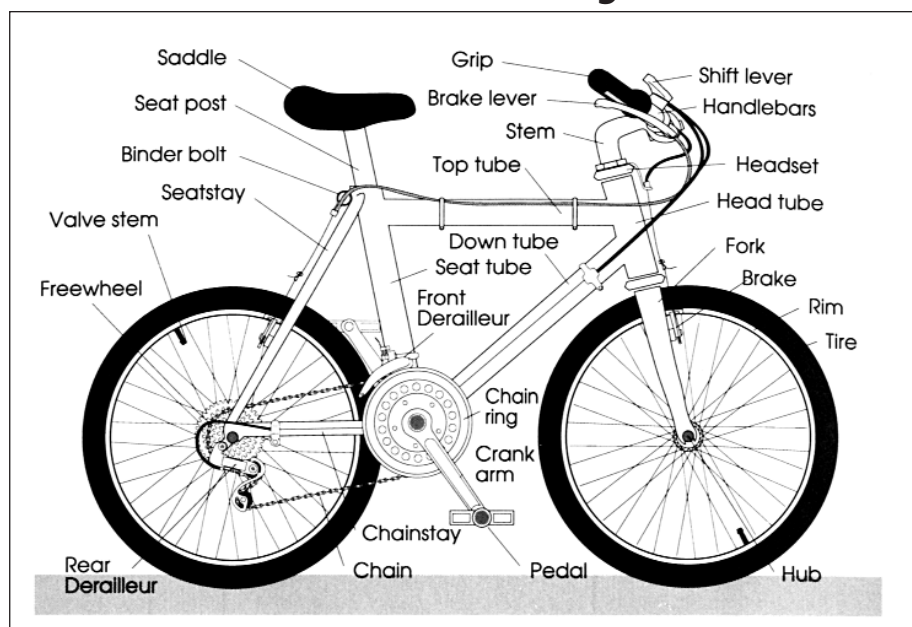
ball of your foot, you'll have a slight bend at your knee.

Many people ignore this step. They either have their saddles too high (and they wobble side-to-side as they pedal) or they have them too low (and put too much strain on their knees as they ride). With a little practice, you'll be able to spot people with their saddles set at the wrong height. Why not give them some friendly advice?

**Saddle position and tilt:** If you dropped a string from the front of your saddle, it should fall about 1-1/2" behind the center of the bottom bracket.



## Parts of the Bicycle



(The bottom bracket is where the crank arm's axle goes into the frame.) If the saddle is too far forward, your pedal motion is thrown off; if the saddle is too far back, you'll stretch out too far.

And, for most people, the top of the saddle should be roughly level. Some tilt it slightly forward or back but too much tilt isn't good.

**Handlebar height and stem length:** Generally, the top of your handlebars should be about level with the top of your saddle. To adjust the lean of your upper body, next look at the length of the handlebar stem.

A good test for bikes with dropped handlebars is to put your elbow at the front of the saddle and reach for the handlebar. You should just be able to lay the tips of your fingers across the top of the bars.

**Important:** Make sure you have at least two inches of handlebar stem and seatpost inside the frame. Look for a

mark on the side that says something like "MAX EXT" or "HIDE THIS LINE." These show you how much you need inside the frame for safety.

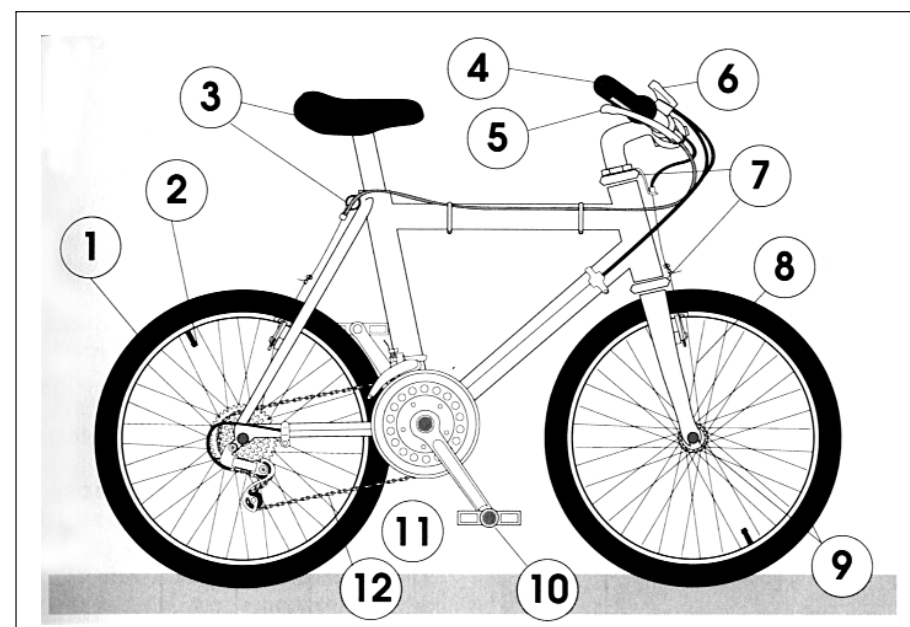
### Basic maintenance

With a few tools and some basic skills, you can do most of the routine maintenance for your bike. It's pretty easy to keep your brakes in shape, to adjust your derailleurs (gear shifters), fix a flat tire and keep the chain clean and lubricated.

And, by taking care of these simple tasks, you can extend the usable life of your bicycle and cut down on major repair costs. Try it!

To learn more, get a good bike maintenance book with clear illustrations and step-by-step instructions or check out online resources. Also contact the local recreation department or community college. They may offer bike maintenance classes.

## 13 Point Quick Check



1. Push the tires against a curb. If you can flatten them, you need more air. Inflate to the pressure shown on the tire's sidewall.
2. Make sure the tire valve stems point straight to the hubs to avoid rim cuts. Such cuts can't be patched.
3. Twist and rock the saddle. It shouldn't move in any direction.
4. Twist and rock the handlebars. They shouldn't be loose.
5. Squeeze the brakes. The levers should work smoothly and not hit the handlebars; the brake pads should hit the rims squarely.
6. Run through the gears while riding. They should shift smoothly onto all sprockets and not throw the chain.
7. Rock the fork and handlebars forward and back and turn from side to side to check for a loose or tight headset (the bearings where handlebars and fork enter the frame). They shouldn't rock or bind.
8. Squeeze pairs of spokes together. They should be tight and the wheels should be straight. Also look for broken spokes.
9. Rock the wheels from side to side. If they move, the hub bearings are loose. Next, spin the wheels. They should roll smoothly. Also keep each wheel's axle nut or quick release lever tight.
10. Rock the pedals front to back. They shouldn't move and should spin freely.
11. Rock the crank arms from side to side. There should be NO play at all.
12. Look closely at the chain. It shouldn't be either caked with grease and dirt or dry and rusty.
13. Look for any loose nuts, bolts and screws and tighten them up.

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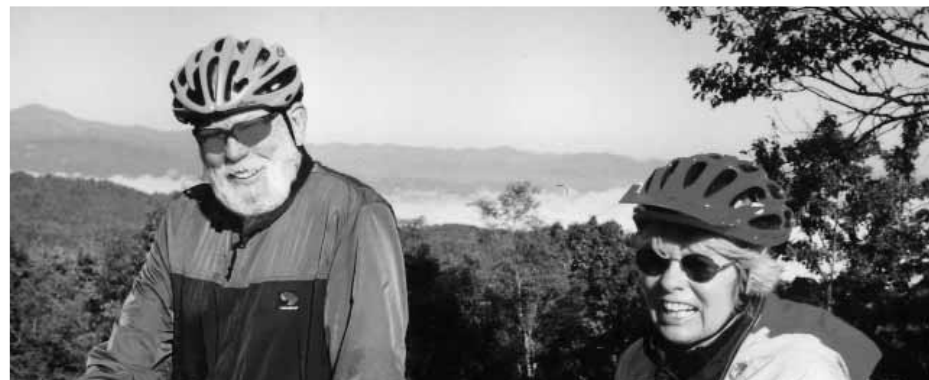
## Protecting your bike from theft

*Bicycles are stolen every day in North Carolina. Here are ten tips to help keep yours from being one of them...*



1. **Lock your bike whenever you leave it.** ...Even if you're just going into a store for a few minutes. A pro can steal your bike in seconds.
2. **Lock your bike where it can be seen.** If you lock it behind the bushes, you give the thief a chance to work in private.
3. **Most locks, chains, or cables can be broken in a few seconds.** For best protection, get a high security lock like a U-bolt shaped lock and use it. These won't stop every thief but they will stop most.
4. **Don't leave fancy accessories on your bike when you park it.** Expensive bags, tool kits, and clip-on lights are easy to steal. Take them with you.
5. **Don't leave your bike outside at odd hours.** Take it inside if you can. The best lock won't keep someone from taking your brakes, saddle, or seatpost.
6. **Lock AT LEAST your front wheel and frame to something solid.** It's better to lock both wheels if you can—especially if you have quick release hubs. Think about taking your front wheel when you lock up.
7. **If you have a quick-release seatpost bolt, take your saddle with you when you park.** That'll make the bike less attractive AND a lot harder to ride! And it'll keep your saddle from being stolen.
8. **Engrave an ID number on expensive parts.** Otherwise, if they're recovered, you'll have a hard time identifying them. The most important parts are those easiest to remove: seat post, handlebars & stem, derailleur, brakes, crank arms and wheels.
9. **Register your bike with the police.** If your police department has such a program, take advantage of it. It can help them return your bike if it's recovered. Be careful though, not to let them stamp a number into your frame. Some agencies do this and it can ruin a really good frame.
10. **Make your bike look really ugly.** If it's dirty and plain looking or has a gross paint job, it may not attract some thieves. Ugly and unique bikes are also less tempting because they are easier to identify by their owners.

## Protecting your brain in a crash



In North Carolina, children under 16 are required to wear a bicycle helmet. It's a good idea for adults, too. A bicycle helmet may be the single most important piece of equipment you can buy. Studies show that about 75% of all cycling deaths are caused by head injuries. And, each year, many more cyclists suffer permanent brain damage as a result of a crash. Don't risk it... wear a helmet every time you ride!

Helmets come in many styles and colors and there is one that is just right for you. Proper sizing is critical for your helmet to protect your head in case of a crash. Here are some important points on helmet fit.

- Make sure your helmet is the right size and doesn't rock from side to side; use the interchangeable interior pads to create a snug fit.
- The helmet should sit level on your head; you should be able to see the front edge when you look up.
- The neck strap should be snug, but not too tight; the rule of thumb is that there should be enough slack for you to easily fit your fingers between your chin and the strap.

Be sure to replace your helmet after a crash—they are designed to withstand one crash only.

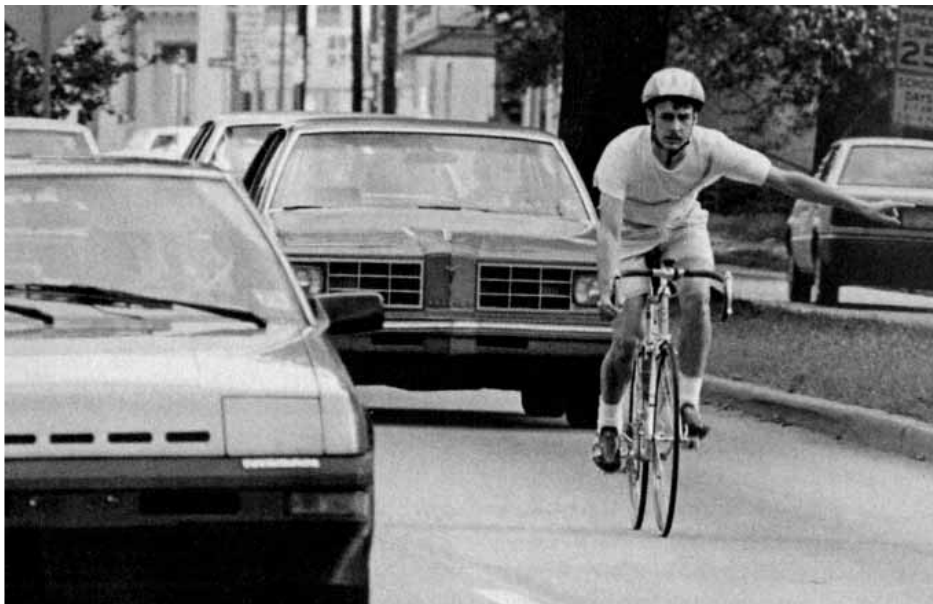
### Helmet buying tips:

- Get a helmet that meets the Consumer Product Safety Commission standard. Look for a CPSC sticker inside the helmet or on the box.
- Don't buy unless you can try it on first. It shouldn't feel tight or uncomfortable. The salesperson can fit your helmet with different sized foam pads to match the shape of your head.
- If you plan to tour, race, trail ride or commute long distances in hot weather, cooling is very important. Look for a light-colored helmet with plenty of ventilation.
- Be careful with your helmet. Toxic solvents, grease, paints or stickers may ruin the shell without your seeing the damage.

*For more information on bicycle helmets visit the Bicycle Helmet Safety Institute at [www.helmets.org](http://www.helmets.org)*



## Riding in traffic



*The following tips are for adults riding on medium speed roads. They are not intended for young children or for cyclists riding on high speed highways or expressways.*

**Riding safely in traffic takes practice and the proper attitude. Remember that you're the driver of a vehicle.**

Once you've got that attitude, the rest is relatively easy. But it still takes work. Start practicing your skills on quiet streets and gradually move up to the busy ones. Once you've mastered these cycling skills, you'll be able to ride safely on just about any road.

One of the most common mistakes that cyclists make is to take the wrong road position for conditions. Just where you should ride on the road depends on three main factors...

### 1. Your speed:

Just how fast are you going? You don't have to look at a speedometer for this test. The basic rule to follow is this:

**The closer you're going to the speed of traffic, the closer you should ride to that traffic.**

- *If you're going much slower than traffic, ride well over to the right.*
- *If you're going almost as fast as everyone else, ride near the traffic stream.*
- *If you're going as fast as everyone else, ride right in the traffic stream.*

NEVER ride fast near the curb—that's a great way to get hit by a car coming out of a side street. No one looks for fast-moving vehicles coming down the gutter!



*Above: If you're going very slowly compared to everyone else, ride well over towards the right side of the roadway.*



*Above: If you're going almost as fast as everyone else, rides near the traffic stream. This helps make you visible to others and it discourages motorists from turning in front of you.*



*Above: If you're going as fast as other traffic, ride right in traffic. This often happens during rush hour on busy roads. No one moves fast in a traffic jam.*



## 2. Your destination:

Where are you going? Turning right? Left? Going straight? The basic rule to follow is:

**Near intersections, use your road position to tell others where you're going.**

**Turning Right:** If you're going to turn right, move towards the right edge of the roadway. This will tell others what to expect.

**Going Straight:** If you're going straight, keep away from the curb. Just how far depends on your speed and the width of the road but you should be no closer than three or four feet.

This approach helps solve three common conflicts:

1. **First**, it discourages right turning motorists from pulling up next to you and then turning right around you. By riding a bit further into the roadway, you make them hesitate. As a result, most will slow down and let you go through before turning.

2. **Next**, it makes you more noticeable to drivers who are waiting at stop signs on side streets. These drivers are deadly for bicyclists and must be watched closely. They cause many car-bike crashes.

3. **Finally**, it makes you more visible to drivers coming towards you. This is important because one of the most common threats you face is being cut off by left-turning cars.

These three threats are very common complaints among adult bicyclists and with good reason. Since they tend to ride too far to the right in urban traffic, they put themselves out of the line-of-sight for most drivers.

This one simple trick—not pulling to the curb when going straight—can help you avoid between 20 and 40% of all car-bike crashes and many confrontations.

*Here's a rule of thumb: if you often get cut off, you're probably riding too close to the curb for your speed; if you often get honked at, you may be riding too far from the curb for your speed.*

Note: If you're going straight, stay out of right-turn lanes. Otherwise, you'll often find yourself in trouble when you get to the intersection. As you approach, look back for a gap in traffic and merge into the through lane when it's safe. On faster roads, rides near the right edge of the through lane.

**Turning Left:** If you're turning left, the correct position is either about four feet right of the center line or in the left turn lane (if there is one), just like for cars.



Above: If you plan to turn right, move towards the right edge of the roadway, signal your turn, look for cross traffic, obey any traffic controls and make your turn.



Above: To go straight, do NOT move towards the right curb; that fools motorists into thinking you will turn right. Instead, line up with where you want to be beyond the intersection.



Above: If you plan to turn left, the proper position is in either the left turn lane or within four feet or so of the centerline. Proper left turns require practice, skill and confidence.





*Above: Before moving left to make a left turn, look back for a good gap in traffic. If you see one coming, adjust your speed to "catch" the gap as you approach the intersection. If there isn't a gap, you can either*

**Left turns on two-lane roads:** To get to your left turn position, look back at traffic before you get to the intersection. Just how much before depends on traffic volume and speed. If it's very busy, look a block or more in advance. A good rear view mirror helps for this step. The mirror allows you to keep an eye out for any approaching gaps in traffic.

When it's clear, look over your shoulder (just to be sure), signal, and merge left to the proper left turn position. Next, pay attention to the traffic ahead of you and traffic on the cross street. Obey any traffic controls (lights or signs), yield to oncoming traffic and turn when safe.

If traffic is too fast for you, the best way is to go straight across the intersection, stop at the curb and then walk across when safe. You can't negotiate and merge with high speed traffic.

*negotiate with drivers to let you over in front of them, go a block further in hopes of getting a gap, or pull to the curb and walk across when safe. Which approach you take depends on your skill and the traffic.*

**Left turns on multi-lane roads:** Making left turns on busy multi-lane roads can be much more challenging. It's best to work up to these turns since they often involve negotiating with other drivers and precise riding between lines of traffic.

Plan your turn very early. First, negotiate and merge to the left side of the right lane. Next, negotiate and merge to the left side of the second lane. Negotiate again and merge to the left side of the second lane. As you merge over, you will have cars passing on both sides, riding straight is very important (practice this skill in a parking lot.)

Keep up this process until you get to the turn lane or proper turn position and make your turn as described in the previous section. For more details, see John Forester's classic bicycling book, *Effective Cycling* (MIT Press).



*Above: Step One: Checking for a gap in traffic. Looking back lets you see what's coming AND it lets others know you plan to do something. Eye contact with the drivers is important here.*



*Above: Step Two: Once you've found a gap, move left IF the driver behind lets you go first or you have enough time before he/she arrives. Signal and merge to your left turn position.*



*Above: Step Three: Now concentrate on traffic coming towards you and cars on the side street. Obey any traffic controls, signal and make your turn.*





Above: Ride far enough to the left to avoid curb-side hazards like opening car doors, debris, pot holes and drain grates.

### 3. The Road Condition:

Where you ride also depends on what the road itself is like. The main factors to think about are surface condition and available width.

Generally, the farther to the right you ride, the more hazards you'll face. You'll often find bad drain grates, gravel, glass, or parked cars, the doors of which could open in your face.

The best approach is to ride a straight line to the left of the hazards. Ride at least three feet away from parked cars to avoid opening doors.

Next, think about the width of the road. On a very narrow road (10-foot-wide lanes, for example), riding near the edge can encourage motorists to pass unsafely. While it won't be fun, the best approach is to ride a straight line far enough from the curb to discourage unsafe passing. The idea isn't to "hog the road" but to make sure everyone gets home safely.

On a wider road, where there is plenty of room for passing, ride just to the right of

the traffic stream. This will keep right-turning motorists from cutting you off and will make you more visible to cross traffic.

Practice these techniques on quiet streets and work up to busy arterials as you gain confidence and skill.



Above: In very narrow lanes, you may have to ride far enough from the edge to discourage unsafe passing.

## Where do you ride?

Different types of roads present different problems for bicyclists. Each one has its dangers. Many car/bike crashes happen on quiet neighborhood streets, for example. Don't let your guard down wherever you ride! Here are some things to look out for.

### Neighborhood Streets



These streets may seem "safe" but watch for things that block your view of traffic, like bushes at intersections and parked cars at driveways.

### Greenway Trails



Ride slowly on trails and yield to pedestrians. Watch out at curves or intersections. Warn people when you pass: say "passing on your left."

For more information on places you can ride and local conditions, contact your City or County Planning, Recreation, or Transportation Department or the Division of Bicycle and Pedestrian Transportation.

### Busy City Streets



Watch for turning or crossing cars, especially at intersections. Know where the turn lanes, busy driveways and tough spots are ahead of time.

### Rural Highways



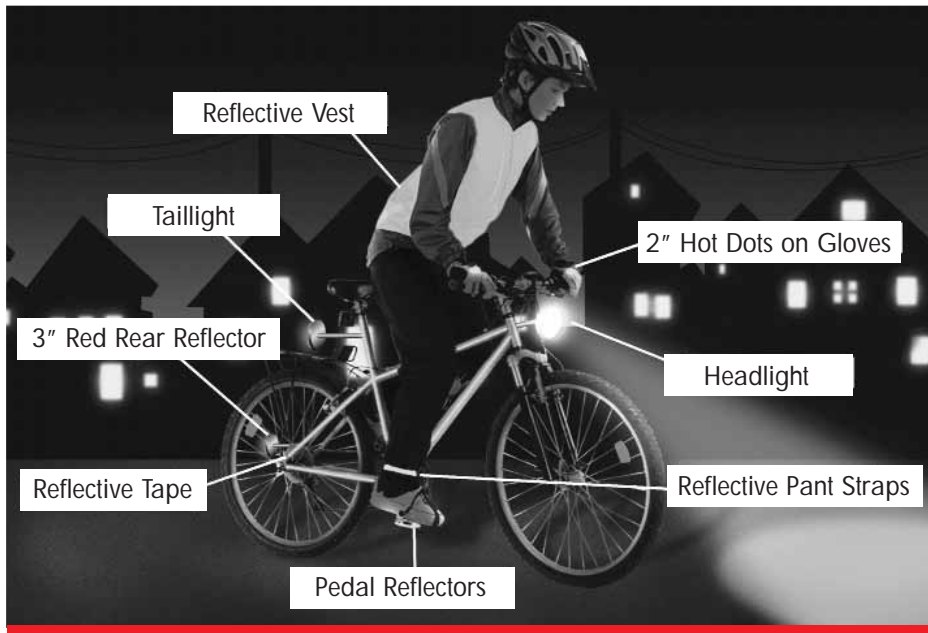
Use a mirror to keep an eye on cars coming from the rear. And watch cars coming towards you: they may pull into your lane to pass.

### Interstate Highways



North Carolina State policy prohibits all bicyclists from riding on interstate highways and limited access expressways.

## Night-time riding



*Riding at night isn't for the very young or infirm. To do it right is an art.*

### First a sobering fact:

Almost 45% of all cycling deaths happen after dark. It's a risky time to ride...Especially if you don't really know what you're doing.

### Some basic tips:

You must take special precautions before riding off into the moonlight. Use good lights and reflectors. After all, it's illegal to ride without them.

There's no excuse for riding without proper equipment—at least none that's worth your life. You may never plan to ride after dark but it'll happen some day. Get the best lights you can afford.

It's a good idea to stick to streets you know from riding during the day. You'll

know where the pot holes and gravel patches are, and be able to plan for them. Riding slower is a good idea too.

*Remember: night time seems to bring out the worst in drivers. Don't trust any of them to know what they are doing. Keep your hands on the brake levers, your eyes on everyone and be ready to take evasive action!*

### Equipment tips:

**Headlights:** A good one will let you see the road well. A mediocre one will let others see you. A poor one will do neither but comply with the law.

Headlights vary greatly in the quality of their construction, their mounting design, and the amount of light they supply. There are three basic types of headlights and most bike shops have a wide selection from which to choose.

Non-rechargeable battery powered headlights are the least expensive, initially, but if you ride at night a lot, replacement battery costs can mount up. And, they typically don't light up the road very well. Rechargeable battery headlights are a little more expensive, but save money in the long run.

Another option would be a generator light with a halogen bulb. These are less expensive than the rechargeable systems and light up the road well. Even without the halogen bulb, some generator sets are pretty bright.

If you plan to ride in winter on ice or through snow and slush, get one of the battery lights. Generators tend to slide on wet, slick tires.

**Taillights:** The best taillights come with the rechargeable battery/halogen headlamp sets. Less expensive battery powered lights work ok if supplemented with good rear reflectors. Generator taillights go out when the wheel stops so be careful when stopping in traffic.

**Reflectors:** For the bike itself, you need at least a good 3" red rear reflector and pedal reflectors (amber, usually).

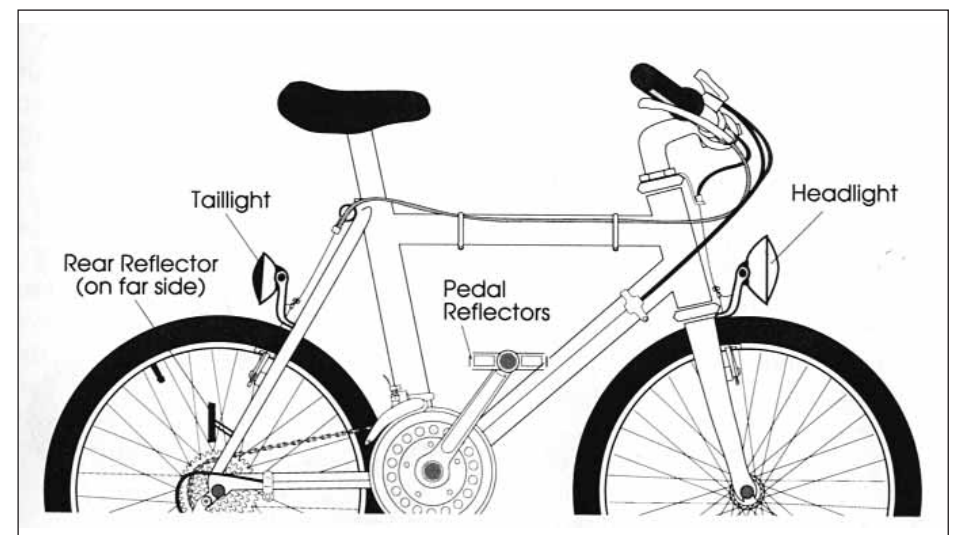
Mount the red reflector low on the frame (like on the left side where the rear wheel attaches to the frame). The lower the reflector is, the sooner it'll light up in a motorist's headlights.

*Remember:* Reflectors only work if they are pointed in the right direction AND if they are clean! Clean and check your reflectors occasionally and replace broken ones.

*Nice extras:* Add reflective tape to the frame and moving parts of your bike. The tape is cheap and durable. Use white or yellow facing the front and yellow or red facing the rear. That color scheme makes sense to other road users.

Also, reflective pant straps help. All the bike shops sell them. You might also add reflective circles to the backs of your riding gloves. These make great "blinkers" for signaling!

Some shops sell reflective vests and such. These can make a big difference, particularly if you tend to wear dark colors. Light colored clothing may help too, although reflective material is far better than white or yellow clothes.





## Basic riding skills



### Starting off:

To start off on your bike, first stand next to it and swing your leg over the frame. Then, while standing over your bicycle, bring one pedal up to a 2 o'clock position, check traffic, step onto the pedal and ride away.

Some people mount up like a cowboy. They put one foot on the pedal, push off and swing their legs over the saddle as they roll along. While this isn't a big mistake, it isn't a polished way to ride either. And, if you take off this way in traffic, you'll find yourself off balance and unprepared for emergencies while swinging yourself into the saddle.

### Scanning behind:

Looking back over your shoulder is one of the most valuable basic skills you can learn. It can tell you what's behind, in case you're thinking about making a left turn or want to move left around a parked

car. It can also tell those behind that you want to do something. It certainly gets other drivers' attention.

In fact, many times, the simple act of looking back will slow traffic down so that you can signal and merge over. And a motorist who was about to pass you and immediately turn right may think twice about such a dangerous and inconsiderate move.

Even if you have a mirror, you should learn to look back over your shoulder in important situations. Simply looking in the mirror tells others nothing about your intentions. And you might miss something important if you rely exclusively on a small mirror. Use the mirror, instead, for simply keeping an eye on traffic behind.

If you have trouble looking over your shoulder and riding straight, practice in a quiet parking lot. Pick out one of the stripes and ride along it while occasionally glancing back. Try to see things - don't just turn your head.

Hold your left shoulder steady as you look back. You may want to try pushing forward just a bit with it. Also, keep a light hold on the handlebars.

Another approach is to drop your left hand from the bars to your thigh. Then, when you look over that shoulder you won't pull back on the handlebars.



### Using the brakes:

Use your brakes smoothly and evenly. Some people are afraid of their front brakes, probably because they used it too hard once and crashed. They make the mistake of using just the rear brake, which doesn't have nearly the stopping power the front brake has. Good cycling technique means using both brakes with just the right amount of pressure.

Another use for your brakes is speed control on downhills. Don't make the mistake of hitting the brakes hard after you've gained too much speed. Instead, use the brakes lightly

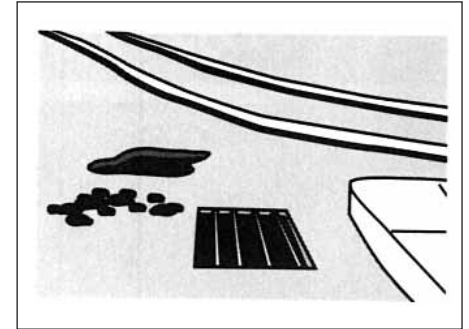


and often as you descend. Brake before you enter curves and let off as you go around.

Remember: As you ride, keep your hands on the brake levers. In case of emergency, you'll be ready to use them. Finally, never buy a bike with the extra brake levers (often called "suicide levers"). These are never as powerful or positive as the real levers and they put you in a bad position for a quick stop (see next page for more detail).

### Watching the roadway:

Far too many bicyclists crash when their wheels hit cracks, bumps, railroad tracks and drainage grates in the road. The worst



ones go in the bicycle's direction of travel. These can grab or turn your front wheel and cause a fall.

As you ride, keep your eyes constantly moving over the road surface and the traffic scene. And, when you see a hazard, look back and move around it when safe. If it's a diagonal railroad track or pavement crack, cross it as near to a right angle as you can.

### Riding in the rain:

Rain riding can be tricky. Your brakes won't work as well in the rain as on dry pavement. For this reason, allow more distance for stopping and slowing.

Watch for slippery surfaces like painted crosswalks. If you have to cross them, make sure you aren't leaning at the same time or you could lose control. Straighten up until you're past the slick spot and then make your turn.





## Advanced riding skills



*The basic emergency maneuvers are the Quick Stop, the Rock Dodge and the Instant Turn. Knowing how to do these can save your life. Practice them carefully with long pants and a helmet. It's possible to fall while you're learning.*

### **The Quick Stop:**

There will be times when you have to lose a lot of speed fast. Some people learn the hard way that you can't just slam on the brakes. That's a great way to go over the handlebars!

What happens when you brake hard? First, keep in mind that as you ride, more than half of your weight is on the rear wheel. This *weight distribution* changes when you use the brakes.

As you brake harder and lose speed, your body's weight moves from the rear wheel to the front wheel. The rear end of the bike becomes lighter and lighter until the

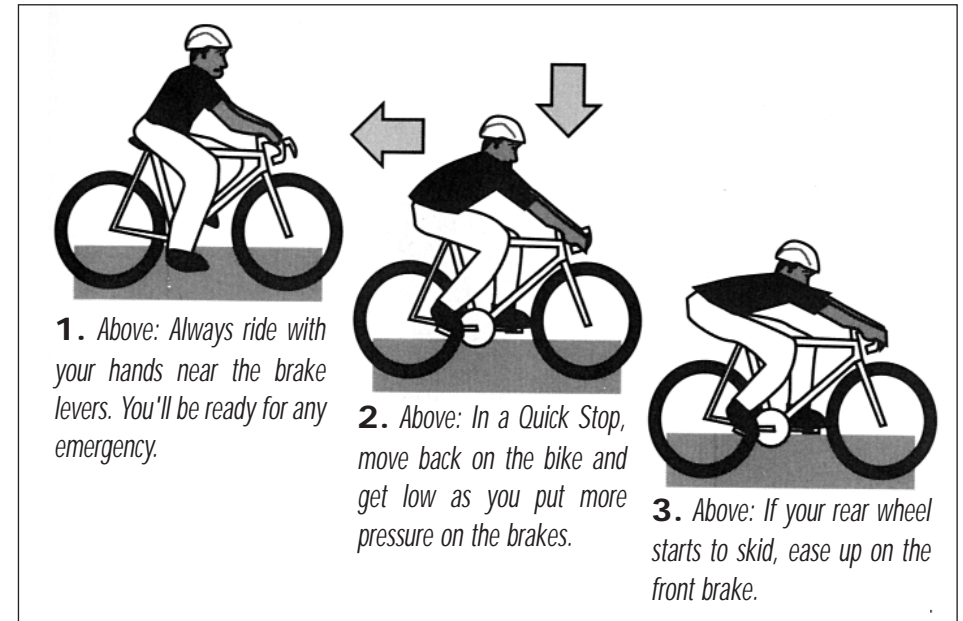
back tire starts to skid. Then it lifts off the ground. All this takes place in just a few seconds.

An expert cyclist can handle this by very quickly easing off on the front brake. But most people don't have the training. As the rear end lifts, they get scared and squeeze the brake even harder, which sends them flying.

To do a Quick Stop, move back to keep more weight on the rear wheel. You'll find this easier if you rise up off the saddle and move your whole body back, using the pedals as a platform and straightening your arms, rather than trying to scoot back on the saddle. As you move back, lower your head to lower your body.

In this position, you can squeeze the front brake two or three times as hard as the rear without flying over the handlebars. And, since your front brake is the one with the most stopping power, that's good!

## The Quick Stop



*The idea of the Quick Stop is to put more weight on your rear wheel and to lower your center of gravity, so that you won't flip over the handlebars when you hit the brakes hard.*

### **Three things to keep in mind:**

- 1.** Try Quick Stops slowly and gradually build up speed as you get the idea and gain confidence.
- 2.** Pay attention to your rear wheel. If it starts to skid, you're putting too much pressure on the front brake and the rear end is lifting. Immediately ease off a little on the front brake and the rear tire will stop skidding.
- 3.** Coming to a complete stop may not be the best idea. Often, it's better to use the Quick Stop to lose most of your speed and then to maneuver out of the way of danger. At slower speeds, you can do it more easily. Remember: don't turn while you're in the middle of braking. That could throw you into a slide.

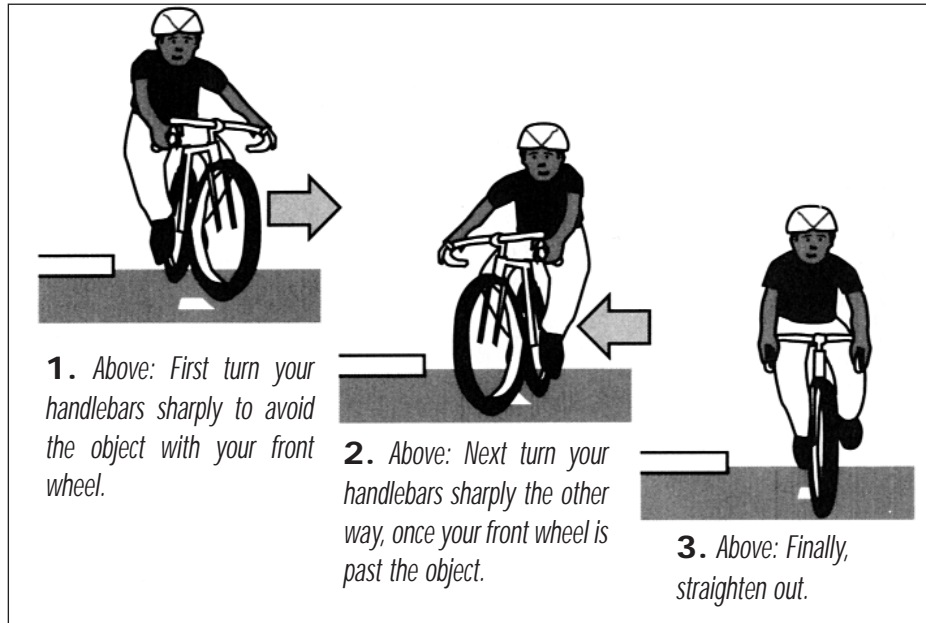
### **Equipment for safe braking:**

Fast stops depend on your skills as a cyclist but they also depend on your brakes. Keep them in good shape.

The levers should work smoothly, the cables shouldn't be rusty inside (and should be coated with lubricant), the brakes themselves should be centered around the rims and should come away cleanly from the rims when you release the levers. Brake shoes should have plenty of pad; and if a shoe has an open end, it should point toward the back of the bike.

Aluminum alloy rims and special compound brake pads are a very good combination, particularly for stopping in the rain. If you believe that "bikes don't stop in the rain," you're wrong. Good brakes stop in the rain.

## The Rock Dodge



### The Rock Dodge:

Imagine you're riding down the road and something in a store window catches your eye. You look and when you look back at the road, there's a rock three feet in front of you. Do you have to hit it and fall? Maybe not...if you know the Rock Dodge.

First, your front wheel is the important one to get around the rock. As the wheel that steers, it can be turned aside by all sorts of road hazards: rocks, cracks, curbs, and so on. The rock in our example can shove your front wheel hard to one side and down you'll go. If your back wheel hits it, you may get a flat or a bent rim but you probably won't crash.

The key to the Rock Dodge is to use the handlebars to steer the front wheel where you want it to go: around the hazard. Normally, you don't steer this way—you usually lean into turns. The first time you turn the bars, you won't like the feeling. That's why it's good to

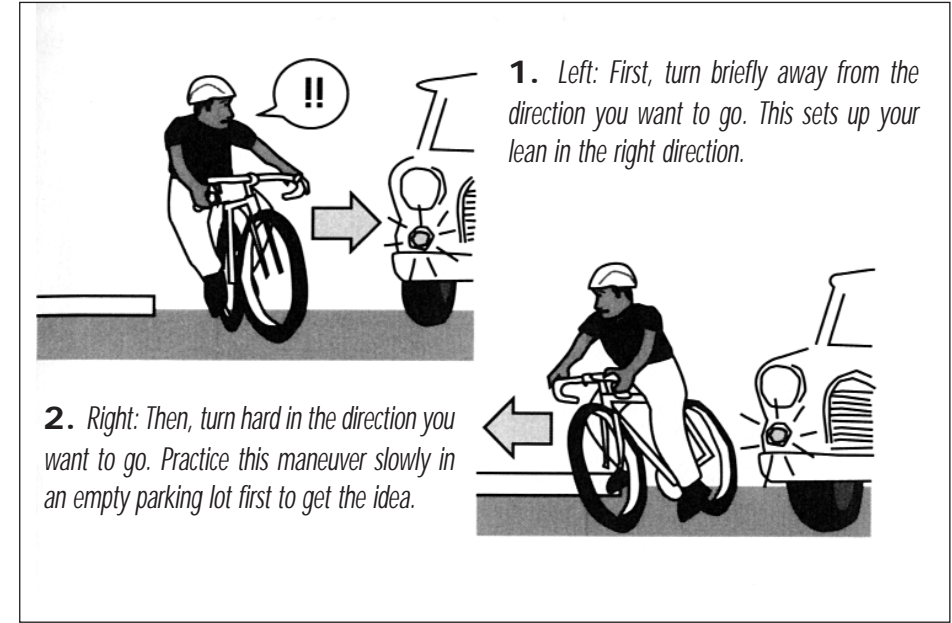
try it slowly and gradually build up speed as you learn the maneuver. Practice the Rock Dodge in a quiet and clean parking lot. Take something soft like a wet sponge, to be the "rock."

Ride straight towards it at a slow speed. At the last moment, turn your front wheel to one side to avoid hitting the "rock," then back again once you've passed it, and finally straighten out.

Try to get as close as you can before turning and try to miss it by less than a foot as you go by. Once you get the hang of the Rock Dodge, you'll simply be able to twitch the bars around obstacles. A skilled cyclist can ride through what looks to other like a mine field without hitting anything. With practice, you learn just where your wheels are.

As with the Quick Stop, you should practice this maneuver carefully. It's possible to get too wild with the handlebars and put yourself on the pavement.

## The Instant Turn



### The Instant Turn:

Occasionally, you may find yourself right next to a car that is about to turn right. While it's best to stay out of these situations (by riding defensively), here's what to do...

First, think about how a bike turns. Unlike a car, a bike doesn't go around corners when you turn the front wheel. It falls over if you do that. You turn by leaning in the direction you want to go.

But you don't just all of the sudden lean over. Instead, you gradually "fall" into your turn and then follow by steering your front wheel that way. It feels natural and it works most of the time. But it won't work when a car is coming your way. To turn fast, you need a way to lean the right way very quickly.

If you turn the front wheel the way you want to go, you'll quickly find out that won't work. It makes you lean the wrong way, setting you up to turn right

into the side of that car! But what happens if you turn your front wheel towards the car? Your bike will lean away from the car, setting up the correct turn. The trick is to turn towards the car for just a moment. Then turn hard the other way. This way, you can turn a very sharp corner with little warning.

Practice this slowly in a parking lot. Build speed as you build confidence.

### A couple of cautions:

**1.** As you make your turn, bring your inside pedal UP. You'll be leaned over so far that it could catch on the pavement.

This, by the way, is good practice for normal turns as well. Get in the habit of raising your pedal.

**2.** Don't use your brakes while turning. Use them before or after but, as in a car, if you turn and brake at the same time, you may slide out. If that starts to happen, put your inside foot down like a BMX racer.



## 5 mistakes to avoid

The following common mistakes lead to almost all car/bike accidents. It's easy to avoid these problems if you simply follow some basic rules: obey traffic laws and ride defensively.

### Cyclist ignores stop sign:



*Causes about 10% of all serious car/bike crashes. Results from many cyclists' attitude problem: "Stop signs are only for cars, they aren't for me!"*

As you ride, keep your eyes moving. Watch the traffic scene a block or more ahead; look at what's going on behind you; keep an eye on cars on side streets.

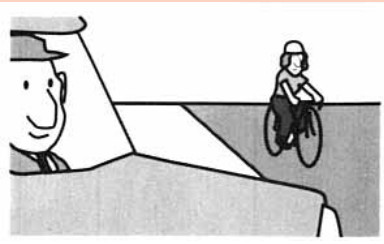
### Cyclist with no lights at night:



*Nationwide, many cyclists die because they don't use lights and reflectors at night. Almost 45% of all cycling deaths happen after dark.*

If you keep your eyes moving, you're unlikely to be surprised by someone's dumb move. Finally, look for "escape routes." Think about where you would go if someone did something wrong.

### Car pulls out in front of bike:



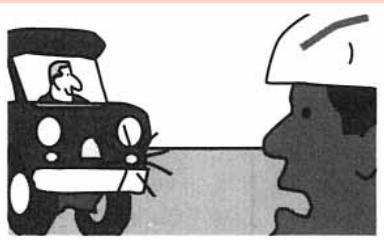
*Often caused by a driver who isn't paying attention or misjudges the bike's speed. This mistake leads to about 10% of all car/bike crashes.*

### Cyclist rides against traffic:



*Caused by riders who wrongly think it's safer because they "can see the cars coming." Too bad this mistake causes about 25% of car/bike crashes!*

### Car turns in front of bicycle:



*In some cases, the car turns left in front of an on-coming bike; in others, the car passes a bike and turns right. It causes 20% of all car/bike crashes.*

## In case of trouble...

### If you have a crash:

It's no fun being involved in a crash. Most of this booklet is directed at keeping you out of trouble. But it may happen. If you do have a crash, you will probably be in pain and may be groggy. But try to keep these tips in mind.

They are based on information originally published by the Bicycling Association of British Columbia in Canada.

**1. Identify the car:** Write down the license number as soon as you can and save your note. Also get a good description of the car and the driver if you can. The more information you can get, the better in case you have to go to court. For this reason (among others), it's handy to ride with a small notebook and pencil. Don't forget to note the date and time.

**2. Report the accident immediately:** Don't wait until you "have time." If, because of injuries, you're unable to make the call yourself, ask a witness to do it.

**3. Don't get mad at the scene:** It can keep you from taking care of important business like making notes. Also, if you are injured, don't get up (unless you need to get out of the road). Witnesses are more likely to come forward and help you if you're lying down.

**4. Get copies of any reports:** Ask for photocopies of the police report and your statement. These will help you recall details later if necessary.

**5. Prepare for your day in court:** If you end up in court, suing the motorist, read your reports again carefully. Being prepared will impress the judge and jury. Before the trial, coach your attorney on cycling subjects. The more he or she knows, the more help you will get. Also, dress conservatively but well. Wear a nice suit or dress.

**6. Be careful what you say:** In court, the attorney for the other side may try to paint you as a careless speed-crazed biker with a hot racing bike. Carefully answer questions about how fast you were going and the kind of equipment you have. Emphasize that you ride a safe bike and follow the rules of the road. If you don't know the answer to a question, say so. Making up an answer is one of the biggest mistakes you can make.

### If you are harassed:

Some motorists think it's fun to scare and endanger the lives of bicyclists. If a driver harasses you while you're riding legally, there are things you can do.



1. **Make notes:** Get the license number, a description of the car and, if possible, a good look at the people involved.
2. **Don't provoke the motorist:** Drivers who harass bicyclists could be unpredictable. If you start something, you may find yourself in more trouble than you want. It's best to keep your

temper, concentrate on observing, and live to ride another day.

3. **Call the police:** As soon as possible, report the incident to the Highway Patrol, sheriff or local police. But don't stop there. Also file a complaint with the city or county attorney's office. Your efforts may save another cyclist a lot of grief.

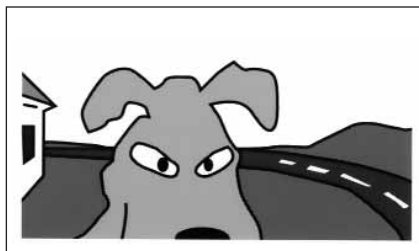
## What about dogs?

No cycling guide would be complete without a discussion of dogs. All too often, "Man's Best Friend" becomes a cyclist's worst enemy. Typically, the dog sees you as a threat to his/her territory and gives chase. Often, however, the chase ends when you get to what the dog sees as the property line. Here are some tips for dealing with a dog that comes after you:

- If the dog has bothered you in the past and continues to be a problem, let the authorities know. Call Animal Control. They should cite the owner for letting the dog run loose.
- In a surprise encounter, there are many different approaches: some people yell "NO;" some speak

quietly; some dismount and walk, holding their bikes as shields; some squirt water or a spray solution; some throw rocks; some even try to outrun the dog—not usually the best idea since it helps teach the dog to chase bikes.

The approach you use depends on the situation, the dog (Pit Bull vs. friendly mutt, for example) and how comfortable you are with strange dogs. Whatever you do, don't show fear.



## Share the road



*Our streets and highways are becoming more crowded every day. Therefore, it is necessary that motorists and bicyclists know and practice*

*the rules of the road. You should always be aware of the traffic around you and be prepared for emergency situations.*

Bicycle ridership is increasing in North Carolina. More and more people are biking for transportation, recreation and health. At the same time, urban traffic has become more congested and once-quiet country roads now carry high volumes of commuter traffic generated by rapid development in rural areas. As a result, conflicts between bicyclists and motorists have increased. That's why it's important for both bicyclists and motorists to learn how to "Share the Road".

North Carolina law defines a bicycle as a vehicle, thus granting bicycle riders the same rights and duties as the drivers of other vehicles. These rights and duties are addressed in more detail earlier in this publication and also in A Guide to North Carolina Bicycle and Pedestrian Laws,

which is online at [www.ncdot.org/transit/bicycle/laws/resources/BikePedLawsGuidebook-Part-1.pdf](http://www.ncdot.org/transit/bicycle/laws/resources/BikePedLawsGuidebook-Part-1.pdf).

In general, for bicyclists, sharing the road means:

- Riding on the right-hand side of the road, in the same direction as other traffic
- Obeying all traffic signs and signals
- Properly signaling all movements, while making sure that such movements can be made safely
- Yielding to other drivers and pedestrians, as appropriate, at intersections, alleys and traffic circles
- Moving to the right to allow lawfully operated overtaking vehicles to safely pass, and not increasing your speed until completely passed

It is important to obey all traffic laws and ride in a predictable manner to increase motorists' cooperation and create a positive perception of bicyclists as road users. Too often, bicyclists do not behave as prudent vehicle operators, thus angering motorists and contributing to the image of bicyclists as "scoff-laws".

On the other hand, most motorists are not aware that bicyclists have a right to be on the road and that they should "Share the Road". In extreme cases, motorists have been known to intentionally harass bicyclists by trying to run them off the road, throwing things at them or committing other unlawful acts.

Since a bicycle is defined as a vehicle, motorists are required to take the actions described below when encountering bicyclists on the roadway. The reference numbers for the statutes are noted in brackets and the full text can be referenced online at [www.ncleg.net/gascripts/statutes/statutestoc.pl](http://www.ncleg.net/gascripts/statutes/statutestoc.pl).

Relevant to sharing the road, the North Carolina motor vehicle laws require motorists to:

- Signal movements when starting, stopping or turning, taking care that such a movement can be made safely; and, giving a clearly audible signal whenever the operation of any other vehicle may be affected [20-154]

- Yield the right-of-way, as required, at an intersection, alley or traffic circle [GS 20-155] and [20-156]
- Leave a minimum of two feet of clearance when passing a bicyclist on the left and not move back to the right until safely past the overtaken bicycle [GS 20-149]
- Not pass on the crest of a hill or at a curve in the road where the driver cannot see at least 500 feet ahead [GS 20-150]

Drivers are urged to watch for cyclists on the road and take the following precautions.

1. Wait until the cyclist has cleared the intersection before making a turn to the right or left. The most common error for an automobile driver is to make a left turn directly into the path of an oncoming cyclist without seeing him until it is too late to stop. Don't make a right turn in front of a bicyclist you have just passed. He or she may be forced to stop quickly and could lose control of the bicycle, causing a crash.
2. When passing a cyclist, slow down and make sure the rider is aware of your presence. Leave plenty of room between the rider and your vehicle. If there is no room to pass because traffic is approaching, wait until it has gone by, and then pass.

3. Be careful in trying to judge the speed of a bicycle. A bicycle may be traveling faster than you think. Automobile drivers sometimes cut in front of a bicyclist too soon because they have not judged their speed properly.
4. Be alert for the cyclist who suddenly swerves or turns in front of you with little or no warning. Cyclists sometimes wait until the last second to move to the center of the roadway to make a left turn.
5. At night, do not assume that cyclists will always have lights and reflectors. Be alert for them. When meeting an oncoming cyclist, always dim your lights.



*The "Share the Road" yellow/green warning sign, has been erected along certain roads to alert motorists to the possible presence of bicyclists.*

## For more information...



Division of  
Bicycle &  
Pedestrian  
Transportation



***If you'd like to learn more about bicycling in North Carolina, please contact us:***

*Division of Bicycle and Pedestrian Transportation  
North Carolina Department of Transportation  
1552 Mail Service Center  
Raleigh, NC 27699  
(919) 807-0777  
[www.ncdot.org/transit/bicycle](http://www.ncdot.org/transit/bicycle)*

- Safety brochures, posters and information: [www.ncdot.org/transit/bicycle/safety/safety\\_materials.html](http://www.ncdot.org/transit/bicycle/safety/safety_materials.html)
- Touring guide and maps of Bicycling Highways routes: [www.ncdot.org/transit/bicycle/maps/maps\\_intro.html](http://www.ncdot.org/transit/bicycle/maps/maps_intro.html)
- Local bicycle touring maps: [www.ncdot.org/transit/bicycle/maps/maps\\_regional.html](http://www.ncdot.org/transit/bicycle/maps/maps_regional.html)
- Calendar of Bicycle Events: [www.ncdot.org/transit/bicycle/events/events\\_calendar.html](http://www.ncdot.org/transit/bicycle/events/events_calendar.html)
- Listing of bike clubs and organizations: [www.ncdot.org/transit/bicycle/maps/maps\\_clubs.html](http://www.ncdot.org/transit/bicycle/maps/maps_clubs.html)
- Statewide bicycle shop listing: [www.ncdot.org/transit/bicycle/maps/maps\\_shops.html](http://www.ncdot.org/transit/bicycle/maps/maps_shops.html)
- North Carolina bicycle laws: [www.ncdot.org/transit/bicycle/laws/laws\\_bikelaws.html](http://www.ncdot.org/transit/bicycle/laws/laws_bikelaws.html)