Motorists and Bicyclists:
Best Practices for Road Safety

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Contents

01 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) Best Practices for Road Safety series was created by several NCDOT Safety Task Forces composed of government and non-profit advocacy representatives. The goal of the document series is to identify best practices for all roadway users interacting with each other in different scenarios in and along North Carolina roadways.

Bicyclist-Motorist Interactions

The specific goal of the NCDOT Motorists and Bicyclists: Best Practices for Road Safety element is to address how motorists and bicyclists should interact with each other in the roadway environment. Although a description of these best practices may outline "how-to" instructions for bicyclists and motorists in different scenarios, this document does not replace instruction from the North Carolina Department of Motor Vehicles (DMV), League of American Bicyclists (LAB), CyclingSavvy, or other industry-approved driving/riding instruction. This document acts as a supplement to other available instruction materials. It does not replace or interpret any NC laws but rather outlines best practices for how motorists and bicyclists can safely share the roadway.

This Best Practices element was created over the course of 15 months by a task force composed of the following representatives with subsequent review and approval from the stakeholder groups also listed below:

NCDOT Bicycle and Pedestrian Safety Task Force

- Hanna Cockburn – NCDOT
- Steven Goodridge – BikeWalkNC
- Ed Johnson - NCDOT
- Kevin Lacy – NCDOT
- Terry Lansdell - BikeWalkNC
- Brian Mayhew - NCDOT
- Heidi Perov Perry – BikeWalkNC

Stakeholder Groups

- NCDOT
- BikeWalkNC
- Executive Committee for Highway Safety

The specific goal of this guidance is to address how motorists and bicyclists can and should safely interact with each other in the roadway environment.

Roadway Safety - Responsibility of All Roadway Users

In North Carolina, bicycles are considered vehicles, and bicyclists have the same right to be on the road as motorists, except for interstates and other fully controlled access highways. Roadway safety is the responsibility of all roadway users. No one wants to be involved in a crash or cause harm to others. However, on average, 22 North Carolina roadway fatalities occur as a result of the 951 motor vehicle-bicycle crashes each year (Thomas, Vann, & Levitt, 2018). A few simple best practices on the part of both motorists and bicyclists can go a long way to reducing the number and severity of crashes in this state. This document aims to describe how to communicate, acknowledge, and act in ways that make a safer traveling environment for everyone.

At a minimum, when executing any type of traffic maneuver, a considerate and knowledgeable roadway user should progressively do the following:

- Communicate the intended maneuver with other roadway users
- Acknowledge the reaction of other roadway users to the information that has been communicated
- Act quickly upon what has been communicated (acting as soon as it is safe and practicable to do so)

Equipping Your Vehicle for Safety

Because the purpose of this document is to address how motorists and bicyclists should interact with each other in the roadway environment, this document contains relatively little information about how roadway users should dress for comfort or choose a style of vehicle that best suits their needs. Numerous other resources can advise on choosing a vehicle/equipment for these purposes.

However, outfitting oneself for anticipated roadway environments is an essential component of safety. Just as with cars, proper night lighting for bicycles is vital for a bicyclist's safety on the roadway. Safety comes from seeing and being seen; taking a moment to think about their roadway visibility and following all lighting requirements can greatly reduce bicyclists' risk on the roadway. Similarly, checking several functions of a vehicle

Key for Motorists
Bicyclists are classified as vehicles by state law – motorists must respect bicyclists space when they are present in the roadway.

Key for Bicyclists
Bicyclists are classified as vehicles by state law – bicyclists must follow the rules of the road (stopping at stop signs, stop lights, queuing at intersections, etc.) when they are riding in the roadway.

Bicyclists at Night
Bicyclists riding at night are required to have (a) a lighted front lamp visible from 300 feet, (b) a rear red lamp or reflective clothing visible from 300 feet, and (c) a red rear reflector.

Ready to Drive

Below are some minimum safety checks to complete before starting off on a journey in your car

-Working headlights
-Working taillights
-Working windshield wipers
-Clean windshield
-Adequate brakes
-Fastened seatbelt
-Proper tire pressure

Ready to Ride

Below are some minimum safety checks to complete before starting off on a journey on your bicycle

-Working rear lights
-Working front lights
-Rear reflector
-Adequate brakes
-Properly fitting helmet
-Proper tire pressure

① STOPPING

② TURNING LEFT

③ TURNING RIGHT

02 SIGNALING

To safely execute any traffic maneuver, a considerate and knowledgeable roadway user must do the following:

- **Communicate** the intended maneuver with other roadway users
- **Acknowledge** the reaction of other roadway users to the information that has been communicated
- **Act** quickly upon what has been communicated (acting as soon as it is safe and practicable to do so)

Executing these three steps in this order best positions any roadway user to operate safely and drive defensively no matter what actions are being taken by others in the roadway. Inherent in the first step (communicate) is understanding how to appropriately communicate and understand the communications of others with regards to signaling intended traffic maneuvers. These two pages outline the three basic signals that each roadway user must be able to recognize in other vehicles and execute when signaling intended maneuvers themselves.

STOPPING

All roadway users should signal an intention to stop both through displaying an appropriate stop signal (see left and below) and by slowing down at least 100 feet prior to an intended stop. Roadway must users understand the capabilities of surrounding vehicles and begin both signaling and slowing down early enough to allow time for following vehicles to come to a stop behind them. When a roadway user sees that traffic ahead has signaled an impending stop, they should acknowledge that impending stop by also appropriately signaling an intended stop and slowing down so as to maintain adequate distance ahead all the way through the execution of the stop.

TURNING

Roadway users intending to change lanes should clearly communicate intended lateral movements well in advance of their merge. The general rule to follow when merging is to "look, signal, and look again" before departing a travel lane. Considerate and knowledgeable roadway users should also scan the roadway environment to anticipate the intended traffic movements of all roadway users ahead. This helps in identifying when others have signaled their intention to change lanes and allows each roadway user to make necessary adjustments to keep the roadway environment safe for everyone.

Appropriately signaling intentions is critical to the first step (COMMUNICATE) in safely executing traffic maneuvers

1

STOPPING

Motorists show they are stopping by applying their brakes. Bicyclists should communicate their intention to stop by holding their upper arm horizontal with their forearm and hand pointed downward 100 feet prior to their intended stop.

2

TURNING LEFT

Motorists signal a lateral shift to the left or left turn by engaging their left turn signal. Bicyclists signal a lateral shift to the left or left turn by extending their left arm with hand and arm horizontal, forefinger pointing from beyond the left side of the bicycle.

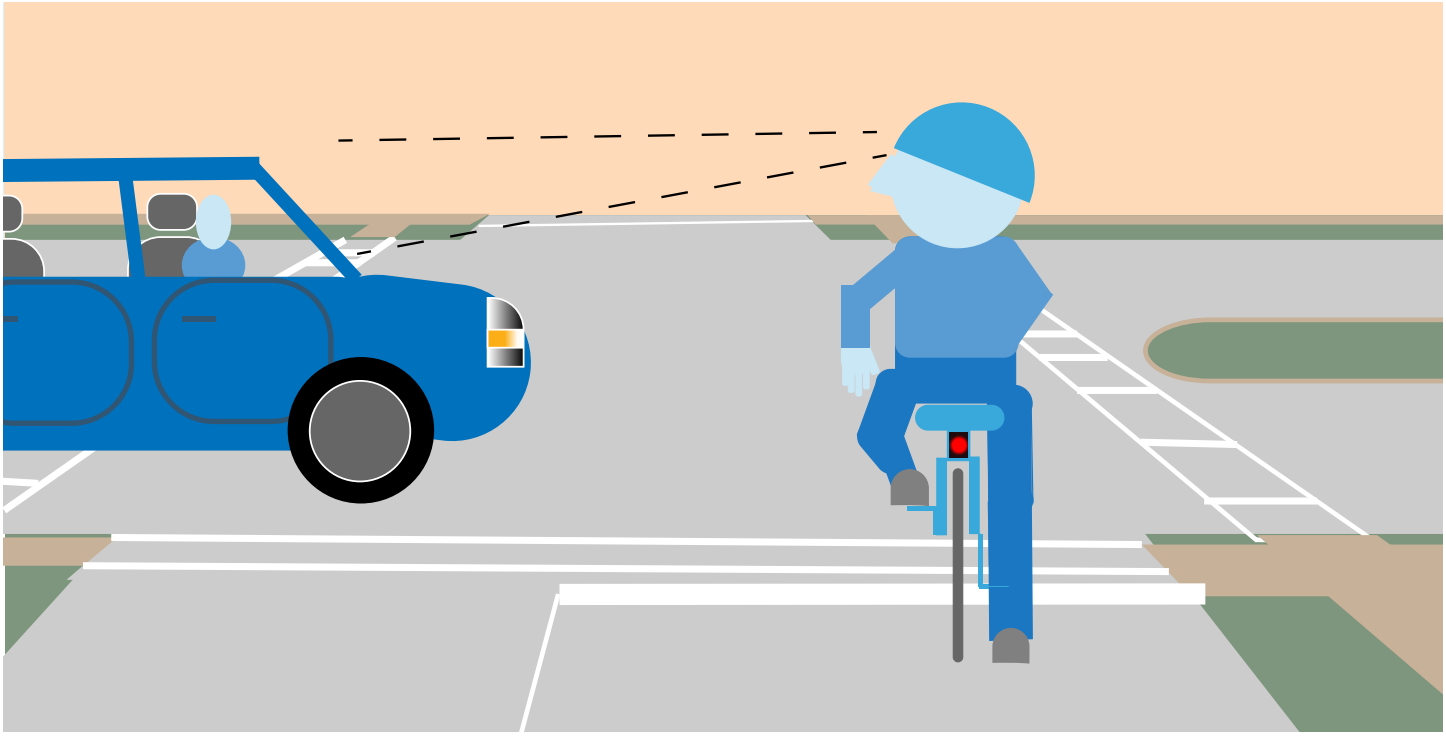
3

TURNING RIGHT

Motorists signal a lateral shift to the right or right turn by engaging their right turn signal. Bicyclists signal a lateral shift to the right or right turn by either extending their left arm with the upper arm horizontal, forearm and hand pointed upward from beyond the left side of the bicycle; or by extending their right arm horizontally with the forefinger pointing, from beyond the right side of the bicycle.

03 BEST PRACTICES

STARTING OFF



Almost 14% of bicycle crashes statewide occur during the time that either a bicyclist or a motorist is entering the roadway.[1]

1 Thomas, L., Vann, M., Levitt, D. (2018). North Carolina Bicycle Crash Types. Chapel Hill, North Carolina: UNC Highway Safety Research Center

Key for Motorists

Always look for the presence of other roadway users and slow down - especially under the following circumstances:

- **Backing out of or pulling into driveways**
- **Backing out of or pulling into parking lots**
- **Backing out of or pulling into alleyways**
- **At intersections**
- **When approaching a turn**
- **Traveling near bicycle lanes and paved shoulders**
- **Traveling near multi-use paths and**

Key for Bicyclists

Ride where other drivers look for and expect traffic. This includes establishing conspicuous lane positioning, avoiding sidewalks and riding in the same direction as other traffic. Bicyclists, as drivers of vehicles, should wait and yield to approaching traffic before entering the roadway from a non-roadway location.

Position, Yield, and Signal

COMMUNICATE

Roadway users communicate an intention to enter the roadway through positioning, yielding, and signaling to existing traffic. Prior to entering the roadway, roadway users must position themselves at the edge of the roadway and yield to existing traffic that is present and moving through the roadway. Performing a successful yield involves looking and waiting until a movement can be made safely and does not threaten other roadway users. Signs and signals may also be present to indicate the legal requirement to stop. Roadway users should always stop behind stop bars, marked crosswalks, as well as unmarked crosswalks.

Whether at a complete stop or yielding while waiting to enter the roadway, all roadway users should signal their intention to turn into the appropriate lane before proceeding (see: "Signaling").

Look for Others

ACKNOWLEDGE

Acknowledging the intentions of other roadway users when entering the roadway involves looking to identify the intended actions of others and the presence of appropriate gaps in traffic for safe entrance into the roadway. Before entering, bicyclists and motorists should scan the full width of the roadway (including sidewalks) and attempt to judge the speed of oncoming traffic. When preparing to enter a roadway, whether from a cross street, trail, or driveway, roadway users should look to survey conditions to consider how their entrance could impact oncoming traffic. Motorists and bicyclists should always be alert for others, including pedestrians, who may attempt to enter or cross the roadway at the same time. Eye contact between roadway users can be a useful tool to acknowledge the presence of all parties.

Motorists must take extra care to look for the presence of bicyclists both when entering the roadway themselves and in preparation of bicyclists' entrance into the roadway. Knowledgeable and considerate motorists recognize that narrow vehicles, such as bicycles, may be more difficult to see and may be approaching faster than expected.

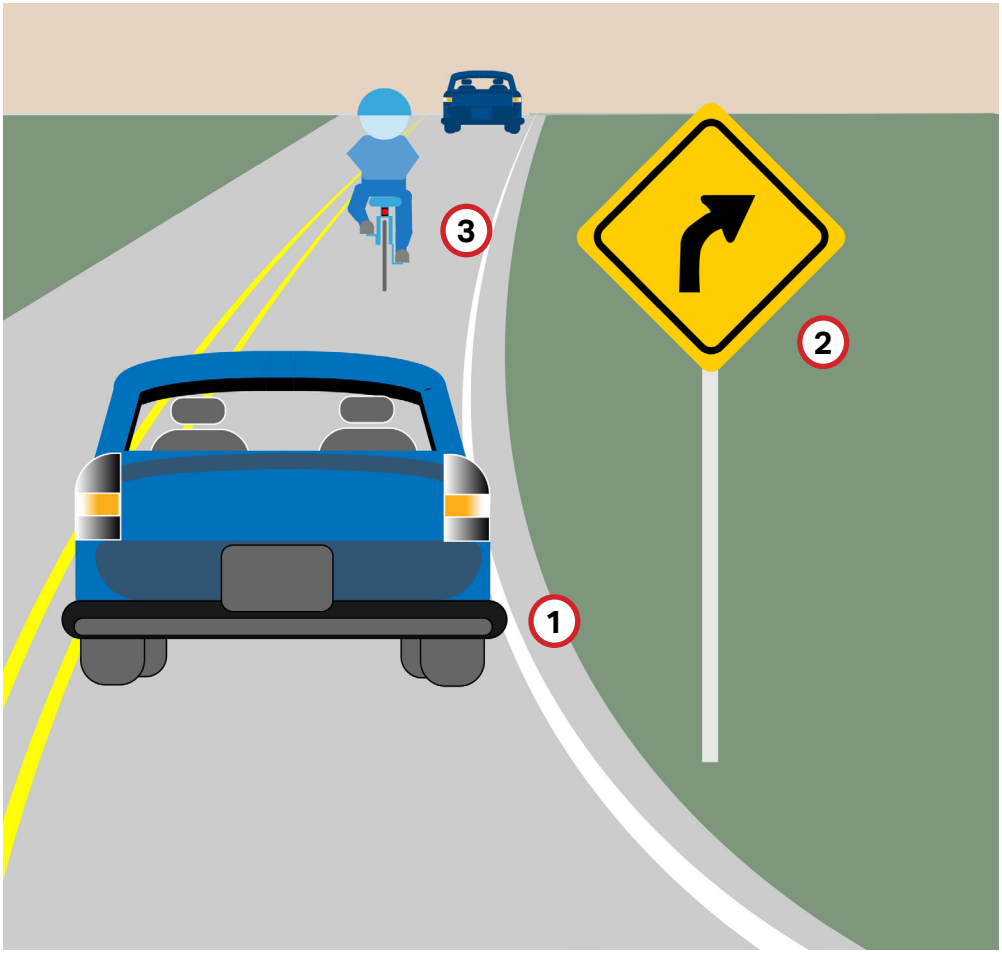
Bicyclists should look at traffic conditions to make a plan for entering the roadway. Whether starting off from a driveway, sidewalk, trail, or smaller roadway, bicyclists should only enter the roadway from an expected location. They consider whether they are merging into the main traffic lane or a bicycle lane and are aware of their personal acceleration capabilities when selecting a time to safely join traffic. When traveling along a roadway with cross streets and/or driveways, bicyclists should be alert to locations where vehicles may enter the roadway.

Enter

ACT

As soon as a safe gap in traffic appears, roadway users should act by entering the roadway as per their signal. Roadway users should proceed based on established right-of-way rather than having roadway users "waved through" in the inappropriate order. Motorists should always drive defensively, and bicyclists should always ride defensively.

TRAVELING TOGETHER IN THE ROADWAY



State law considers bicycles to be vehicles and allows for bicyclists to ride amongst other roadway users in the roadway. Bicyclists may choose to ride in bicycle lanes, on paved shoulders, or in all-purpose travel lanes. Bicyclists make their choice of where to ride based on existing and upcoming roadway conditions, a desire to avoid hazards in the roadway/ shoulder, and potential conflicts with right-turning traffic.

1. When motorists approach bicyclists in the roadway, they communicate their presence and acknowledge the presence of the bicyclists by traveling at an adequate distance behind bicyclists.

2. Motorists should adjust their speed based on sight distances considering curves in the road, hills lighting conditions or occlusion.

3. Bicyclists traveling in the roadway communicate their intentions by traveling with traffic, taking a conspicuous position within a travel lane, and maintaining a clear and predictable path within the travel lane.

Motorists and bicyclists should always drive defensively and be prepared for unforeseen movements.

To ensure the safety of other road users, every driver has a duty to limit their speed so that they can stop reliably within the distance they can see in front of them (assured clear distance ahead). This may require driving slower than the maximum posted speed limit if road or weather conditions reduce sight distance or increase braking distance.

Speed and Position Provide Reaction Time

COMMUNICATE

Safety comes from seeing and being seen. Motorists and bicyclists communicate their presence and intended path by traveling in a visible and predictable manner on the roadway.

Motorists should expect to see bicyclists in the roadway and understand that traffic operations may require bicyclists to make use of the full travel lane. When motorists approach bicyclists in the roadway, they communicate their presence and acknowledge the presence of the bicyclists by traveling at an adequate distance behind bicyclists. When following behind bicyclists, motorists should follow the same three-second guideline (see inset left) that is used to determine following distance behind other vehicles. An adequate distance ahead can be measured by counting to three between when the vehicle ahead has passed a stationary object and your vehicle has passed that same object. Knowledgeable and considerate motorists do not honk or make abrupt actions to communicate their presence to bicyclists.

Bicyclists traveling in the roadway communicate their intentions by traveling with traffic, taking a conspicuous position within a travel lane, and maintaining a clear and predictable path within the travel lane. When traveling straight, bicyclists should avoid swerving in and between travel lanes, but rather ride at a constant distance from the left lane line. Because most marked travel lanes are too narrow for a motor vehicle to overtake a bicyclist safely in the same lane, knowledgeable bicyclists will often ride far enough into a travel lane (near the center of the lane) to discourage motorists from attempting to squeeze past them in the same lane. Riding towards the center of the travel lane accomplishes multiple objectives (1) deterring unsafe same-lane passing (2) improving visibility to traffic approaching from behind, (3) improving visibility to traffic ahead that may turn or cross the bicyclist's path, (4) increasing space and time for evasive maneuvers, and (5) avoiding hazards that commonly appear on the rightmost edge of the travel lane such as accumulated debris and the sudden-opening doors of parked cars.

Prepare to Adjust

ACKNOWLEDGE

All roadway users acknowledge the presence of others in the roadway by preparing to adjust to traffic movements and conditions. By establishing an adequate following distance, roadway users provide themselves with sufficient reaction time in the case of sudden stops or unforeseen movements by others in the roadway. Motorists and bicyclists should always drive defensively and be prepared for unforeseen movements.

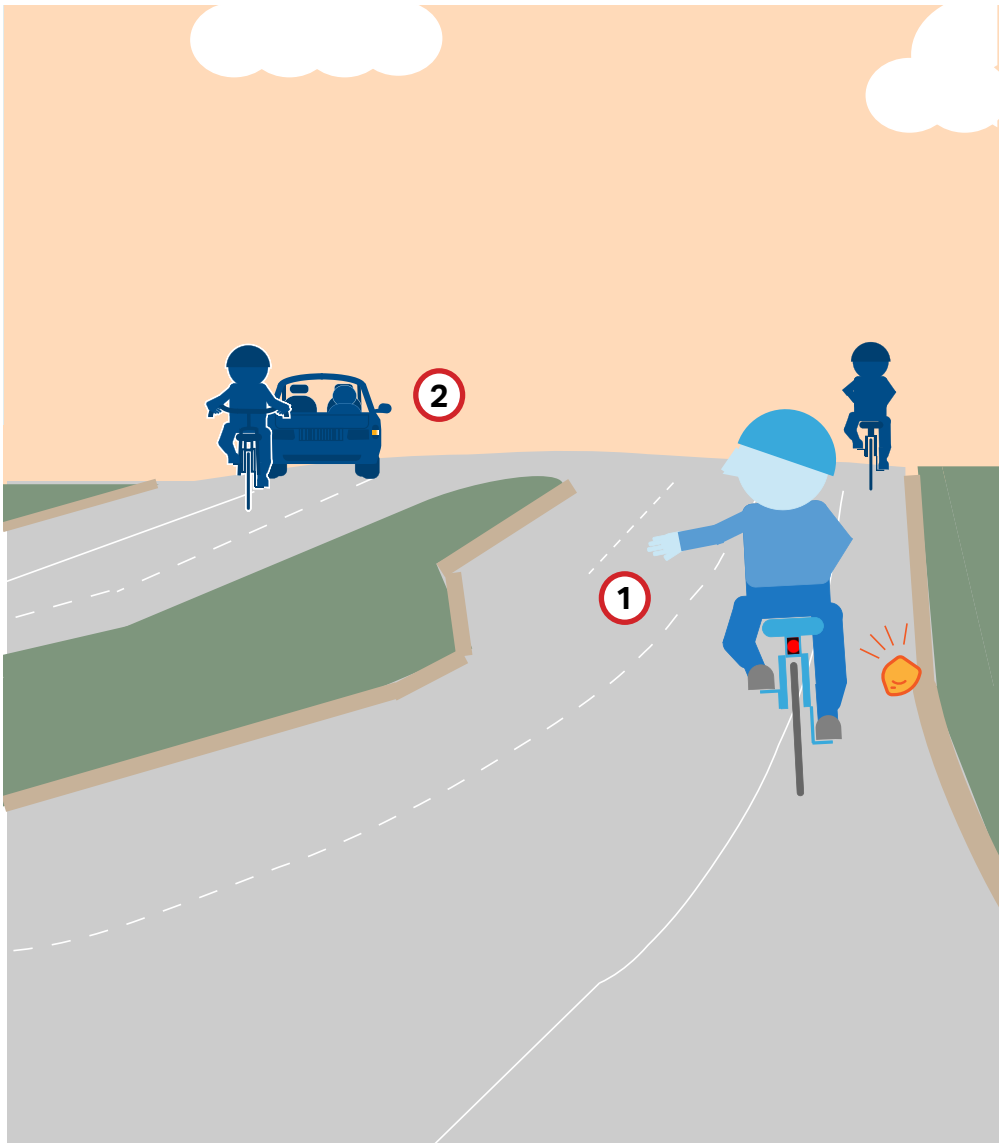
Knowledgeable and considerate roadway users also recognize when faster moving traffic is accumulating behind them and pull-over to release traffic when possible. For bicyclists, such a release requires a sufficient area of smooth pavement to allow bicyclists to decelerate and stop a safe distance away from the travel stream. Bicyclists should use their discretion when choosing where to pull over and should not risk the safety of themselves or other roadway users in order to release traffic.

Continue Travel

ACT

Knowledgeable and considerate roadway users act appropriately by always being diligent in maintaining a travel speed that allows them to make adjustments to unforeseen roadway conditions and does not put anyone at risk. Once an appropriate distance behind other traffic has been established, roadway users should maintain that distance or look for an appropriate opportunity to safely pass.

BICYCLE LANES & PAVED SHOULDERS



1 Scan roadway ahead to identify potential issues well in advance of a need to merge. Signal intended lane shifts well in advance of merging.

2 Bicyclists can and may choose to ride in the main travel lane even when bicycle lanes are present.

Bicyclists may choose to ride in bicycle lanes, on paved shoulders, or in all-purpose travel lanes when riding amongst other vehicular traffic. The choice of where to ride should be made based on anticipation of upcoming roadway conditions, a desire to avoid hazards in the roadway or shoulder, and potential conflicts with right-turning traffic.

Unexpected blockage of paved shoulders and bicycle lanes by debris, overhanging branches, or crumbling pavement can cause bicyclists to swerve or lose control, which may contribute to collisions with motorists passing at close distance.[1] Riding farther away from such hazards, including in the all-purpose travel lane, may be necessary for a bicyclist to maintain control with sufficient operating space.

1 Thomas, L., Vann, M., Levitt, D. (2018). North Carolina Bicycle Crash Types. Chapel Hill, North Carolina: UNC Highway Safety Research Center

Presence and Position

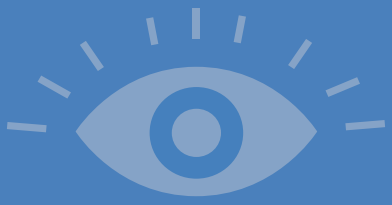
COMMUNICATE

All roadway users should scan the roadway ahead for the need to communicate with users in and near bicycle lanes/paved shoulders. Knowledgeable and considerate roadway users anticipate the potential presence of bicyclists both in bicycle lanes/on paved shoulders and in the all-purpose travel lanes.

Motorists should be aware that bicyclists may change travel lanes. To encourage roadway safety, motorists should maintain an adequate distance ahead between their vehicle and other roadway users and be alert to signals and traffic maneuvers of other roadway users. Motorists should expect that bicyclists will travel in bicycle lanes and in the roadway amongst other vehicular traffic. Motorists should be particularly careful to communicate with bicyclists when they must cross bicycle lanes to execute a turn.

Bicyclists communicate that they have chosen to travel in a bicycle lane or on a paved shoulder by committing to position their bicycle fully within the bicycle lane or paved shoulder without swerving. Should they need to merge into the all-purpose travel lane from a bicycle lane, bicyclists should clearly signal and communicate before making lateral movements.

See and Respect Other Roadway Users



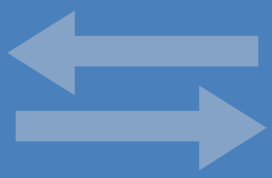
ACKNOWLEDGE

Roadway users should acknowledge the presence of others in the roadway and provide as much space to others as possible whether they are traveling in all-purpose travel lanes, in bicycle lanes, or on paved shoulders.

When passing, motorists acknowledge the presence of bicyclists in an adjacent position by always providing bicyclists with at least 4 feet of lateral space regardless of whether the bicyclist is in the all-purpose travel lane, in a bicycle lane, or on a paved shoulder. When turning, motorists must acknowledge bicycle traffic in bicycle lanes and on paved shoulders by signaling, checking their mirrors and blind spots, waiting until surrounding bicyclists are clear from the area, and merging into the bicycle lane prior to turning right. By merging into the bicycle lane prior to turning, motorists greatly reduce the risk of bicyclists moving into a motorist's path while turning.

When using bicycle lanes and paved shoulders, bicyclists acknowledge upcoming roadway conditions. Bicyclists traveling in bicycle lanes and on paved shoulders should look ahead to identify hazards and be prepared to encounter debris that may force them to merge into an all-purpose travel lane. Should they need to merge into an all-purpose travel lane, bicyclists traveling in a bicycle lane or paved shoulder should clearly signal and communicate an intention to make lateral movements in advance of their merge. Signaling lane changes should involve looking over the shoulder at oncoming traffic, using hand signals appropriately, and then looking again before completing a merge. Bicyclists choosing to ride on paved shoulders should be prepared for unforeseen hazards such as debris or crumbling pavement.

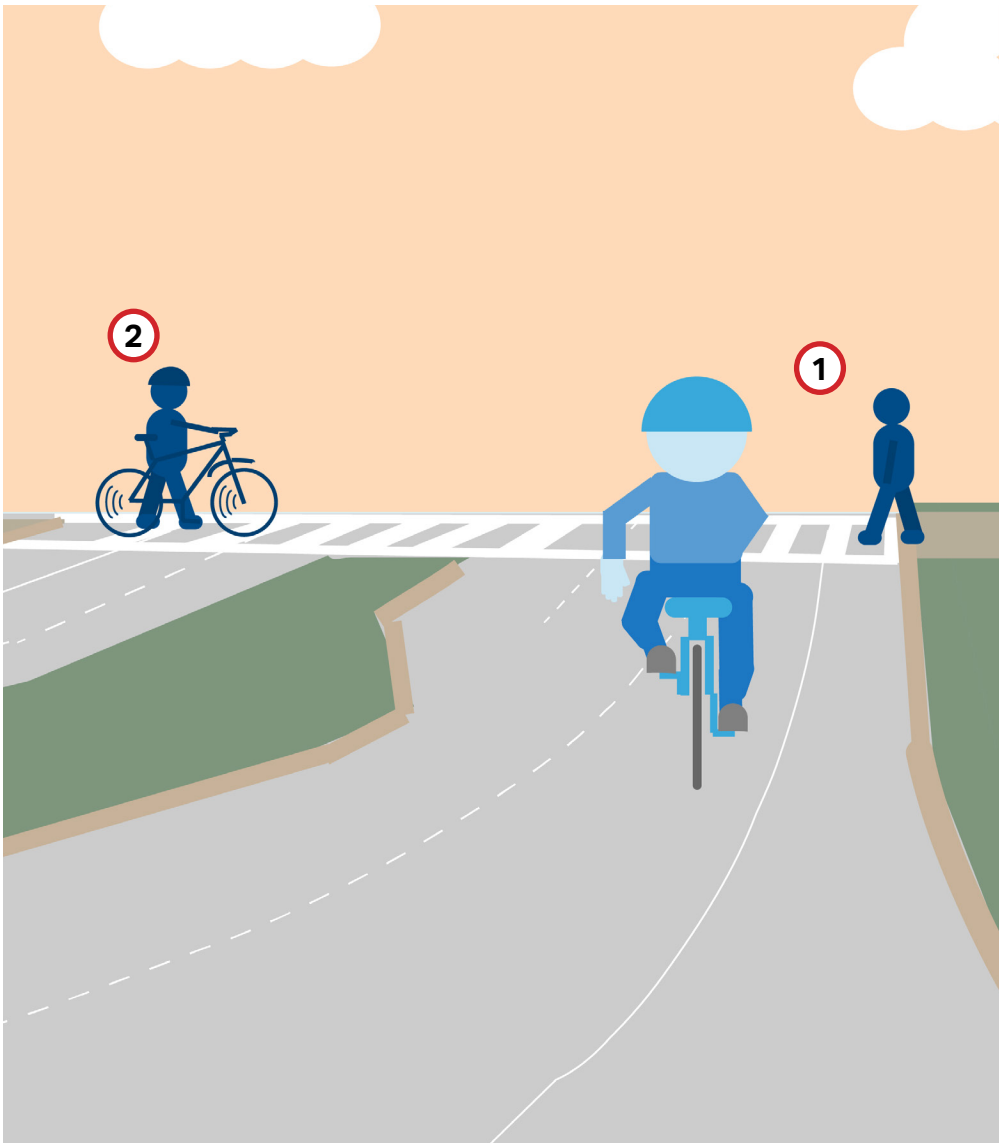
Predictability



ACT

Roadway users must make efforts to act in a highly predictable manner when traveling on the roadway and should weave unnecessarily among travel lanes. All roadway users should clearly communicate their intended roadway position and only execute planned departures from those positions after clear communication.

CROSSWALKS



1 All roadway users must yield when approaching marked or unmarked crosswalks from the main travel lane.

2 If using a crosswalk on a bicycle from a sidewalk or multi-use path, bicyclists are encouraged to dismount and cross on foot.

Bicyclists should also communicate their intention to cross by positioning their bicycle at the edge of the sidewalk/ multi-use path behind the edge of the roadway and looking at approaching cross traffic.

State law is clear that motorists, bicyclists, and all roadway users traveling in the roadway should yield to the pedestrian traffic using crosswalks (both marked and unmarked) to pass through an intersection.

Looking for cross-traffic at crosswalks = Reduced Crashes.

The 2nd most frequent bicycle crash type in the state occurs when a motorist drives out into the path of a bicyclist after stopping at a stop sign. Motorists often only look for motor vehicle cross-traffic, but bicyclists riding in the crosswalk are over four times more likely to be riding in the direction of opposing motor vehicle traffic. [1]

1 Thomas, L., Vann, M., Levitt, D. (2018). North Carolina Bicycle Crash Types. Chapel Hill, North Carolina: UNC Highway Safety Research Center

Communicate with All Users

COMMUNICATE

The best practice at crosswalks for all roadway users is to attempt to make friendly eye contact with approaching traffic to help communicate an intention as to who will stop and who will move through the crosswalk. It is important that all roadway users anticipate the crossing of pedestrians at all intersections, whether a crosswalk is marked or not (excepting interchanges which are on controlled-access facilities).

Legally, motorists and bicyclists traveling in the roadway must yield to pedestrians at crosswalks. If these roadway users see a pedestrian on or approaching the crosswalk with the clear intention of entering it, they should communicate by signaling to approaching traffic that they will be stopping and begin slowing down early enough to provide following traffic with adequate time to stop.

If using a crosswalk on a bicycle from a sidewalk or multi-use path, bicyclists should communicate their intention to cross by positioning their bicycle at the edge of the sidewalk/multi-use path behind the edge of the roadway and looking at approaching cross traffic. The best practice when using a crosswalk from a sidewalk or multi-use path is often for a bicyclist to dismount their bicycle and walk their bicycle in the crosswalk with the rest of pedestrian traffic.

Anticipate Actions of Other Roadway Users

ACKNOWLEDGE

When approaching a crosswalk, roadway users should always acknowledge surrounding activity.

When stopped in the roadway behind a crosswalk, motorists and bicyclists should wait until the crosswalk is clear before passing through the intersection. Roadway users should acknowledge the presence of sidewalk/multi-use path users at the crosswalk's edge and drive/ride defensively; preparing to stop should users enter the crosswalk unexpectedly. In areas with large amounts of pedestrian activity, considerate and knowledgeable roadway users pay extra attention to pedestrian activity so as to avoid conflict even when they have the right-of-way.

When using the crosswalk on a bicycle, bicyclists should attempt to make eye contact with potentially conflicting traffic to verify that traffic has acknowledged and is yielding to their intended movement before proceeding. Bicyclists should pay particular attention to make sure they are seen by right-turning vehicles.

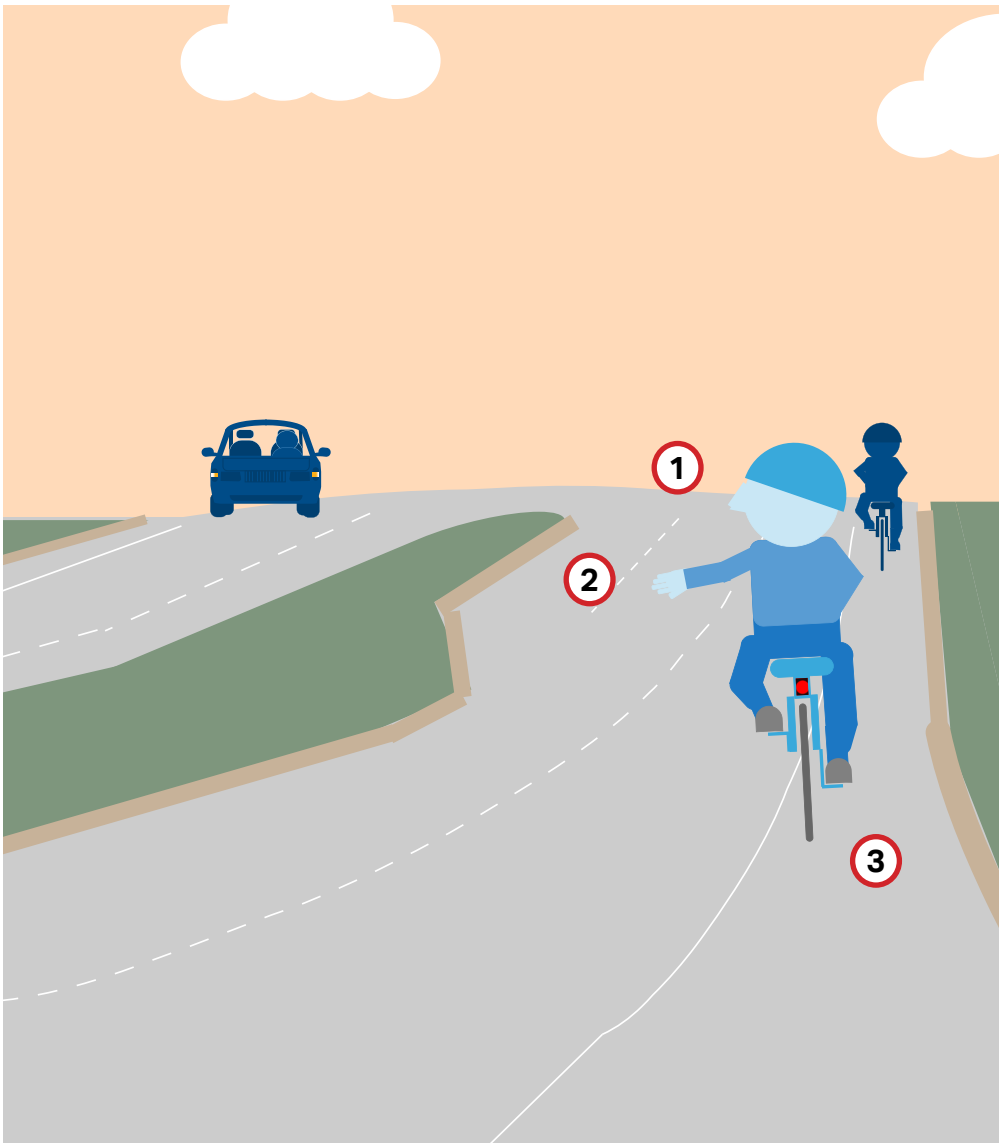
Yield and Proceed

ACT

Once the crosswalk is clear, motorists and bicyclists traveling in the roadway should resume their travel along the roadway, being particularly aware of the movements of pedestrians when turning across the crosswalk.

When using the crosswalk on a bicycle from a sidewalk or a multi-use path, bicyclists should proceed only when they are assured that potential conflicting traffic has seen their presence and is intending on yielding to the bicyclist. Bicyclists should proceed through a crosswalk only when it is safe to do so, waiting for a gap in approaching traffic and, when the crosswalk is signalized, waiting for the walk or bicycle signal.

CHANGING LANES



1. Scan roadway ahead to identify a gap in traffic that will allow enough time to merge into the adjacent travel lane.

2. Signal your intended lane shift (see “Signaling”).

3. Bicyclists should also shift the position of their bicycle in the travel lane towards the direction of the intended merge. (Here the bicyclist is merging left, so they have positioned their vehicle in the left-hand side of the travel lane)

31% of bicycle crashes statewide occur during scenarios where motorists and bicyclists are initially on parallel paths before any maneuvers that led to a crash.[1]

1 Thomas, L., Vann, M., Levitt, D. (2018). North Carolina Bicycle Crash Types. Chapel Hill, North Carolina: UNC Highway Safety Research Center

Indicate Intentions

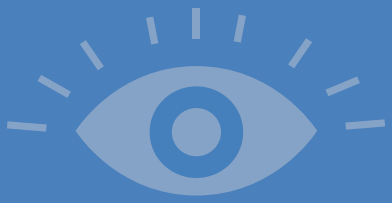
COMMUNICATE

All roadway users intending to change lanes should clearly communicate intended lateral movements well in advance of merging. Knowledgeable and considerate roadway users "look, signal, and look again" before changing lanes.

When first looking to identify an appropriate gap in traffic, motorists should look for bicyclists in surrounding lanes and communicate a desire to merge in front of bicyclists only if there is ample room in front of the bicyclist, understanding that bicyclists take a longer time to decelerate. Motorists communicate a desire to change lanes by using their turn signals well in advance of a desired merge.

By looking over their shoulder, bicyclists initiate a conversation with other roadway users that communicates a desire to safely change lanes. Like motorists, bicyclists must communicate their intention to make lateral shifts by signaling (see "Signaling")

Look



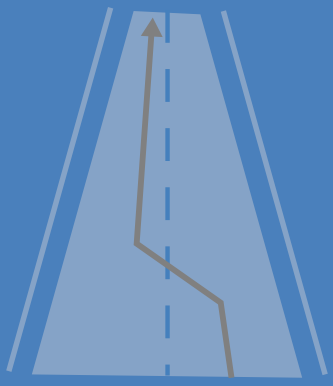
ACKNOWLEDGE

After looking for oncoming traffic and communicating their intention to change lanes, all roadway users should look behind themselves again to acknowledge and ascertain the speed of approaching traffic before executing a lane change.

Motorists must always scan the roadway environment to anticipate the intended traffic movements of all roadway users ahead, including bicyclists. This helps motorists acknowledge when others have signaled their intention to change lanes and to make necessary adjustments to speed and position to keep all roadway users safe. Bicyclists take a longer time to decelerate and stop. Motorists must be particularly careful to provide the necessary distance ahead to create a safe environment both when they intend to change lanes themselves and when allowing bicyclists to merge after signaling.

Similarly, after signaling an intention to change lanes, bicyclists must wait for a gap in traffic before merging. Clues that surrounding traffic has acknowledged a bicyclists' intention to change lanes include friendly eye contact and a slight deceleration/maintenance of speed to allow for an appropriate gap in traffic.

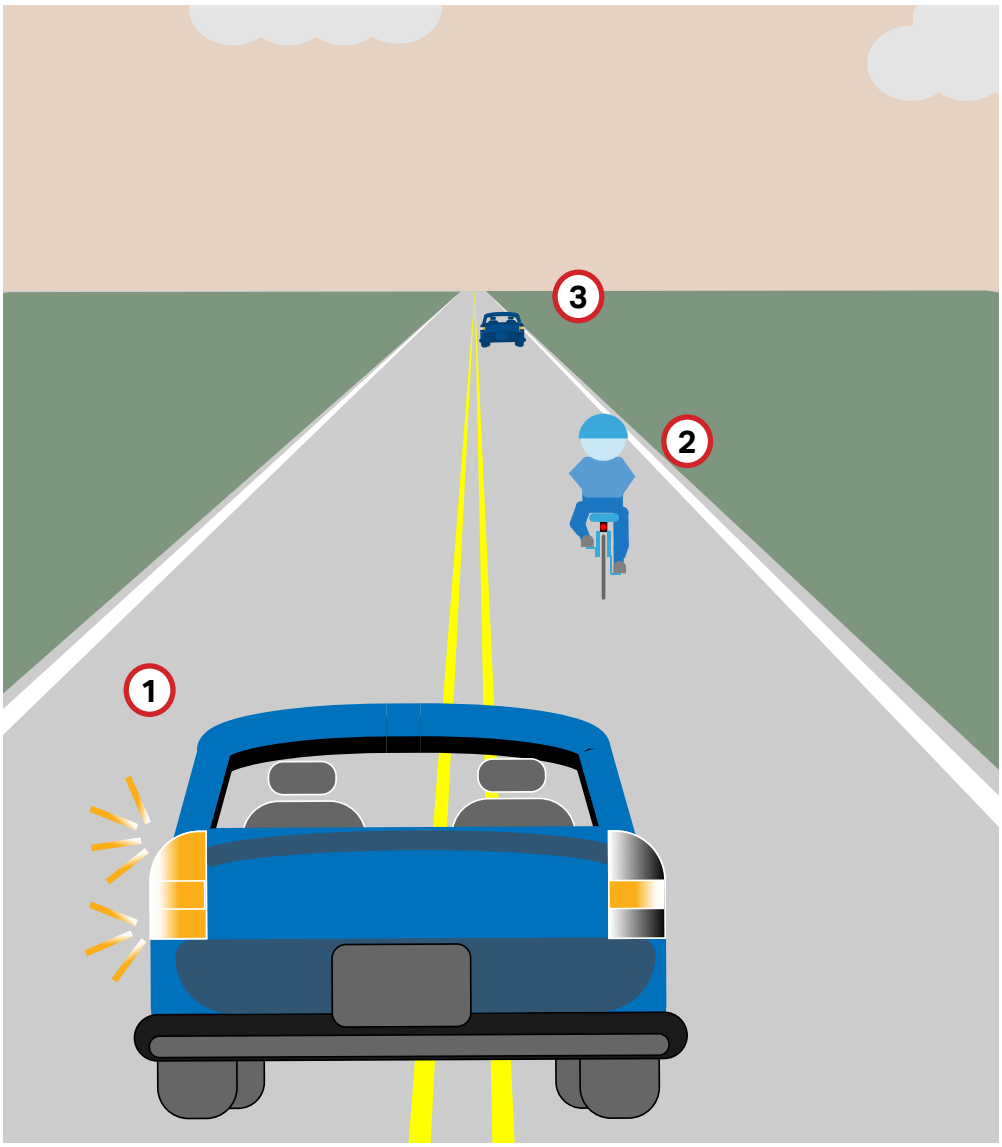
Yield and Proceed



ACT

As soon as a safe gap in traffic appears, roadway users should act by changing lanes as per their signal. All roadway users should take care to provide an adequate distance ahead for others to safely change lanes, noting that bicyclists require additional time and space to accelerate and decelerate. An adequate distance ahead can be measured by counting to three between when the vehicle ahead has passed a stationary object and when your vehicle has passed that same object.

PASSING



1. When roadway users decide to pass each other on the roadway, the best practice is to always change lanes to pass on the left.

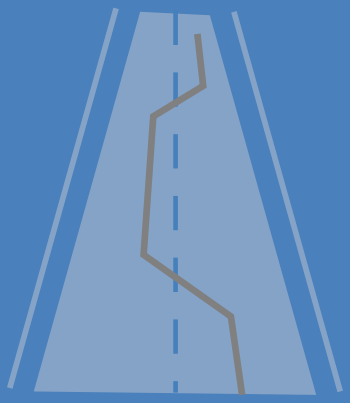
2. If passing another roadway user, change lanes well in advance of the pass. Always maintain adequate distance between vehicles.

3. Maintain an adequate distance between your vehicle and the vehicle ahead.

When wanting to overtake a bicyclist who is traveling in the same lane ahead of you, the NCDOT State Traffic Engineer recommends always fully changing lanes in order to safely pass.

Motorists can legally cross the solid yellow line(s) to pass bicyclists in a no-passing zone. To safely enter the opposite travel lane, motorists should consider roadway factors such as the speed of oncoming traffic and topography. While assessing whether it is safe to pass, motorists should slow down and wait until they are sure they can safely pass the vehicle in front of them.

Change Lanes to Pass on the Left



COMMUNICATE

To properly communicate during a passing maneuver, all roadway users should exercise patience, change lanes to pass, and provide other vehicles ample space when re-entering the travel lane following the pass.

Motorists should use their left turn signal to communicate a desire to change lanes to pass on the left of bicyclists. Motorists should not sound their horn to warn of an impending passing maneuver, as it could startle the bicyclist. It is lawful for motorists to cross the double-yellow line to pass bicyclists when the passing maneuver is safe and could not result in a collision with on-coming traffic. Bicyclists should communicate that it is safe to pass them by maintaining their lane position and not "waving" traffic to pass around them. Knowledgeable bicyclists discourage same-lane passing by positioning their bicycles towards the center of the traffic lane that they are occupying. Bicyclists being passed should maintain their lane position and practice defensive riding skills when approached by motorists from the rear.

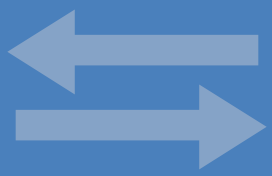
Bicyclists can clearly communicate their intention to pass other vehicles by signaling and changing lanes to pass on the left. Knowledgeable bicyclists recognize that passing on the right creates a conflict with right-turning drivers who may not see or expect bicyclists approaching in their blind spots. Bicyclists should never pass on the right unless in a separate marked travel lane, and should be especially cautious when passing on the right in a bicycle lane. Never pass on the right side of a truck or bus at an intersection, even if a bicycle lane is present.

Don't Force It

ACKNOWLEDGE

Both bicyclists and motorists should wait until roadway conditions present an opportunity to pass in which they will not place themselves or other roadway users in danger. This involves acknowledging the presence of sufficient clear space with no conflicting oncoming traffic and sufficient longitudinal space to safely change lanes while passing. Roadway users must rely on their own judgment to determine when it is safe to pass rather than making decisions based on gestures from surrounding traffic. Motorists should not pass within the same lane of traffic even if "waved through" by a bicyclist or group of bicyclists. Just as passing traffic should not rely on gestures from surrounding traffic, roadway users should not attempt to "wave through" traffic that is attempting to pass.

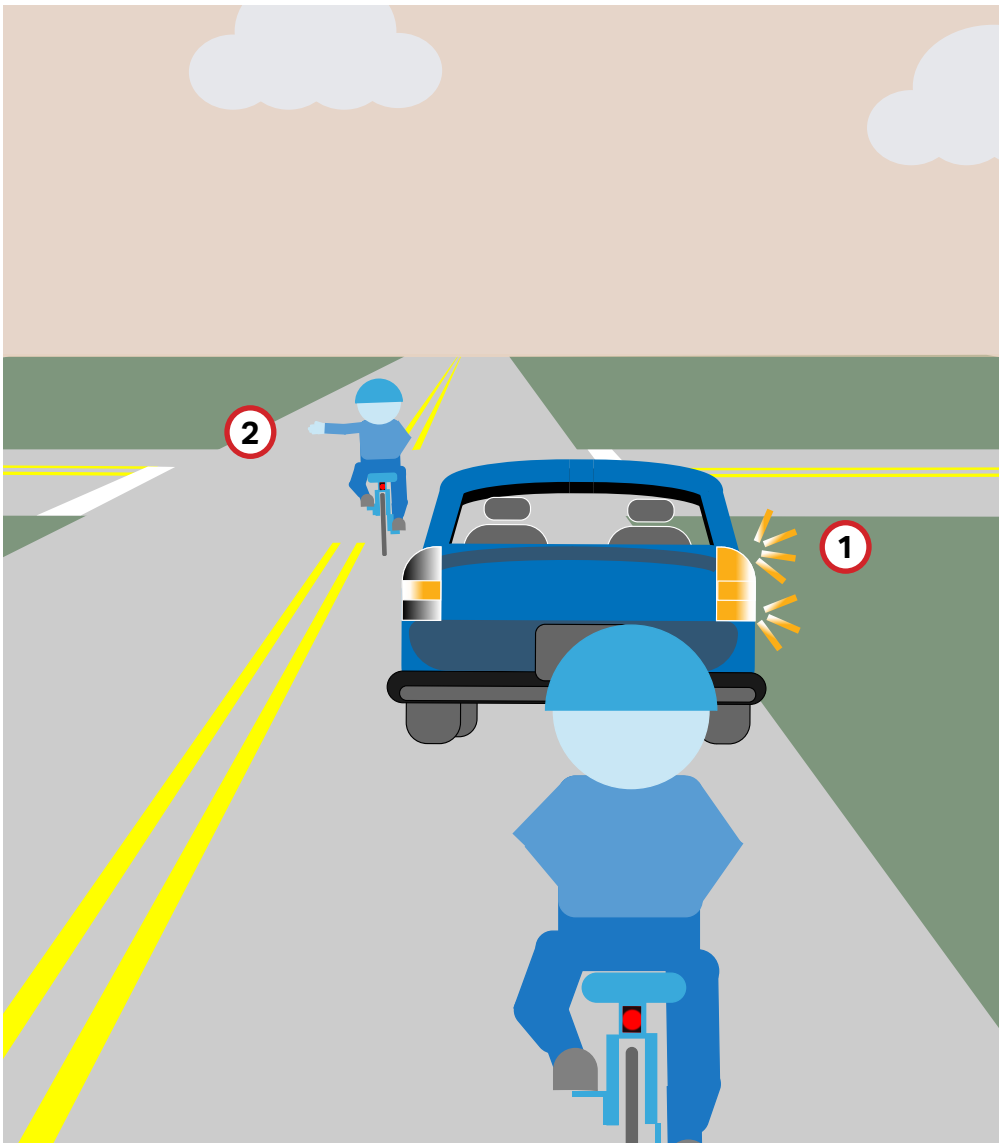
Pass with Predictability



ACT

Motorists and bicyclists should change lanes to pass on the left of other roadway users. To re-enter the lane of travel following a pass, roadway users must use their right turn signal and give adequate space to passed traffic before returning to the travel lane. Like all other vehicles being passed, bicyclists should maintain their speed and lane position as motorists execute a passing maneuver around them. It is illegal for a roadway user to swerve into another roadway user's path in an attempt to block a pass.

TURNING



1. Signal at least 100 feet in advance of a turn. (See "Signaling")

2. Wait for an appropriate gap in traffic before executing a turning movement.

Turning movements frequently contribute to bicycle crashes across the state. Motorists turning left, motorists turning right, and bicyclists turning left are all top-ten causes of bicycle crashes (ranked 3, 6, and 10 respectively). [1]

1 Thomas, L., Vann, M., Levitt, D. (2018). North Carolina Bicycle Crash Types. Chapel Hill, North Carolina: UNC Highway Safety Research Center

Turn Signals and Lane Positioning

COMMUNICATE

All roadway users communicate their intention to turn into or from the roadway by signaling and appropriately positioning their vehicles.

Motorists must use turn signals and position themselves in the appropriate turning lane for their intended direction of travel to clearly communicate their intended movement to surrounding traffic. In order to avoid conflict with bicyclists traveling in bicycle lanes, motorists who are approaching a right hand turn should merge as far right as practicable before executing a turn. This inhibits bicyclists from moving into the vehicle's blind spot prior to the turn.

Bicyclists communicate their intention to turn by both the physical placement of their bicycle within the roadway and by using appropriate hand signals at least 100 feet before a turn (see "Signaling"). When turning, bicyclists will signal and shift their vehicles to place themselves in the center of a right-turn only or a left-turn only lane, as appropriate (if present). If there are no turn lanes, bicyclists will position themselves in the lane such that they can safely navigate their intended turn and discourage following traffic from overtaking.

Look

ACKNOWLEDGE

All roadway users should wait until there is sufficient space and time to complete a turn. Roadway users should glance behind themselves prior to turning to acknowledge the movements of others in the roadway and to ensure their movement will not conflict with other roadway users. Glancing behind for other roadway users involves motorists checking their mirrors and blind spots and bicyclists checking over their shoulders.

In order to avoid conflict with bicyclists traveling in bicycle lanes, motorists who are approaching a right-hand turn should merge as far right as practicable (including into the bicycle lane) before executing a turn. This inhibits bicyclists from moving into the vehicle's blind spot just prior to the turn.

Bicyclists should look behind themselves to acknowledge the speed of and their conspicuity to approaching traffic before executing a turn. Right-turning bicyclists must be particularly cautious of approaching trucks or other large vehicles with larger blind spots.

Turn When Legal and Safe

ACT

All roadway users should quickly execute a turn after they are assured that it is legal and safe for them to do so.

Motorists should be particularly aware of bicyclists when they are making right turns, as this may involve crossing the path of bicyclists. When motorist are making right turns, they must wait until surrounding bicyclists are clear from the area to avoid a collision.

If bicyclists feel that their presence and intended turn has been perceived by surrounding traffic, they should choose and hold a line through the execution of their turn.

INTERSECTIONS

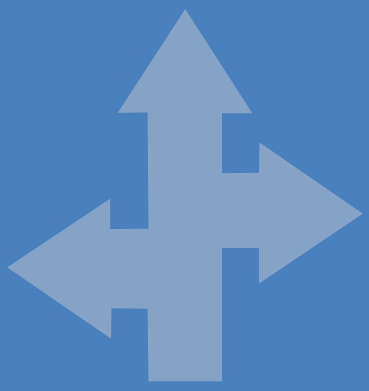
1 When approaching the intersection, use the appropriate signal to indicate your intended direction of travel (see "Signaling").

2 Position your vehicle in the right-most lane headed in your intended direction of travel. Queue your vehicle behind other vehicles in your travel lane.

About half (51%) of all bicycle crashes throughout the state occurred at or related to an intersection.[1]

1 Thomas, L., Vann, M., Levitt, D. (2018). North Carolina Bicycle Crash Types. Chapel Hill, North Carolina: UNC Highway Safety Research Center

Indicate Intended Direction



COMMUNICATE

Roadway users communicate at intersections by queuing in the appropriate order in the designated travel lane for their intended direction of travel. Appropriate queuing involves providing other vehicles with sufficient space so they do not feel crowded or threatened, regardless of vehicle type.

Motorists communicate their intentions at intersections by queuing in the appropriate directional lane and using turn signals as appropriate. Motorists should always be alert to the presence and intention of surrounding bicyclists and should not attempt to maneuver around bicyclists as they are approaching or traveling through an intersection.

Bicyclists should clearly communicate how they intend to proceed through uncontrolled intersections, traffic signals, and stop signs. This communication begins by approaching the intersection in the appropriate position for their destination. If the bicyclists' travel lane serves multiple destinations, a turning bicyclist should bias their position in that lane toward the direction of their intended movement in order to discourage other traffic from attempting to pass through the intersection or turn. When designated turn lanes are provided at an intersection, bicyclists should position themselves in the rightmost lane of traffic headed in their desired direction. Bicyclists are required to use the appropriate hand signals for turning and stopping (see "Signaling"), returning both hands to the handlebars as needed to maintain control and to brake.

Wait for a Clear Path

ACKNOWLEDGE

Motorists should acknowledge the intention of other roadway users at intersections by waiting until their planned route is clear of traffic before proceeding.

Motorists should be observant of turning traffic and traffic headed straight when they intend to turn. Bicyclists are particularly vulnerable to being overlooked by turning traffic.

Where traffic is queuing at intersections, it is best practice for bicyclists to position themselves away from the curb and in line with other traffic in first-come, first-served order. This minimizes potential conflicts with turning vehicles. If a bicyclist is unable to merge in line with the queue due to congested traffic, the bicyclist should stop where they can be seen by drivers who may reach the corner at the same time they do, e.g. beside the gap between two vehicles in the queue. [See Bicyclists Passing Motorists]

Clear the Path for Others

ACT

All roadway users should clear an intersection as quickly as possible. Defensive drivers and riders should remain alert and aware of their surroundings when traveling through traffic signals and stop signs, even when they have the right of way.

BICYCLISTS RIDING IN GROUPS

For the purpose of this document, bicyclists riding in groups or "group rides" are bicyclists that have coordinated and are intentionally traveling together. Groups of bicyclists can involve various levels of organization, ranging from highly planned rides with a distinct "ride organizer" to casual meet-ups among bicyclists. They also involve various levels of intensity, ranging from groups traveling at or above 20 miles per hour to casual rides that may travel at slower speeds and be more spread out.

Even outside of group rides, bicyclists may find themselves in close proximity to other bicyclists. While this may not be planned or expected, the general best practices for group rides are still useful. Ultimately, bicyclists should always strive to act predictably on the roadway, whether traveling individually, in an organized group, or amongst other individual bicyclists.

Key Point for Motorists:
Bicyclists riding in groups have a right to travel in the roadway. Motorists should acknowledge and interact with bicyclists riding in groups in the same manner as they would any other roadway user. When approaching bicyclists riding in groups, motorists should be prepared to exercise patience and always travel at an appropriate speed to provide an assured clear distance ahead of their vehicles, which may require slowing down below the speed limit based on the conditions in the roadway. Motorists should only pass bicyclists traveling in groups when they can safely change lanes to do so.

Key Point for Bicyclists:
Riding with a group is a great way to engage with the bicycling community and can increase a bicyclist's conspicuity while on a ride, but each individual bicyclist is ultimately responsible for his or her own safety. This means that, when on a group ride, individual bicyclists must not simply "follow the group" but continue the practices of communicating their intended movements, acknowledging other roadway users, and decisively acting only after determining that their intended movements can be safely executed.

Starting Off

Roadway users communicate an intention to enter the roadway through positioning, signaling, and yielding to existing traffic. Performing a successful yield involves looking and waiting until a movement can be made safely and does not threaten other roadway users.
Each bicyclist riding in a group should ensure that they have the time and space to safely enter the roadway individually, but should also consider the size of their group. The best practice is for the riders at the front of a group to wait until there is sufficient time for the whole group or cluster of bicyclists to enter the roadway together. All individual bicyclists riding in groups should take responsibility for their own safety and ensure their path is clear and safe rather than simply following other bicyclists in the group.

Traveling Together in Roadway

Roadway users should always follow others at a safe distance and travel at a safe speed with regards to conditions in the roadway, which may require traveling slower than the posted speed limit. Roadway users should always travel at a speed that allows them to stop within their sight distance. Motorists should approach bicyclists riding in groups cautiously and leave enough space to allow adequate time to react to unforeseen occurrences. Motorists should exercise patience and understand that bicyclists require additional time and space to execute certain maneuvers when traveling as a group.

Bicyclists riding in a group can often increase their conspicuity by riding two abreast. In some situations, however, riding single-file may be preferable due to pavement conditions or the presence of debris blocking part of the roadway. Whether riding two abreast or single-file, bicyclists riding in a group should be clear and predictable about the formation in which they intend to ride. Prior to changing their group formation, all bicyclists should ensure their movement has been clearly communicated to surrounding traffic.

Bicycle Lanes and Paved Shoulders

Bicyclists riding in a group have the right to travel in the all-purpose travel lanes, even when bicycle lanes or paved shoulders are present. Bicyclists riding in a group may choose to ride in a bicycle lane, but will often choose to forgo the use of bicycle lanes for a number of reasons, such as avoiding debris/hazards at the edge of the roadway, increasing their conspicuity to surrounding traffic, and encouraging other roadway users to change lanes to pass.

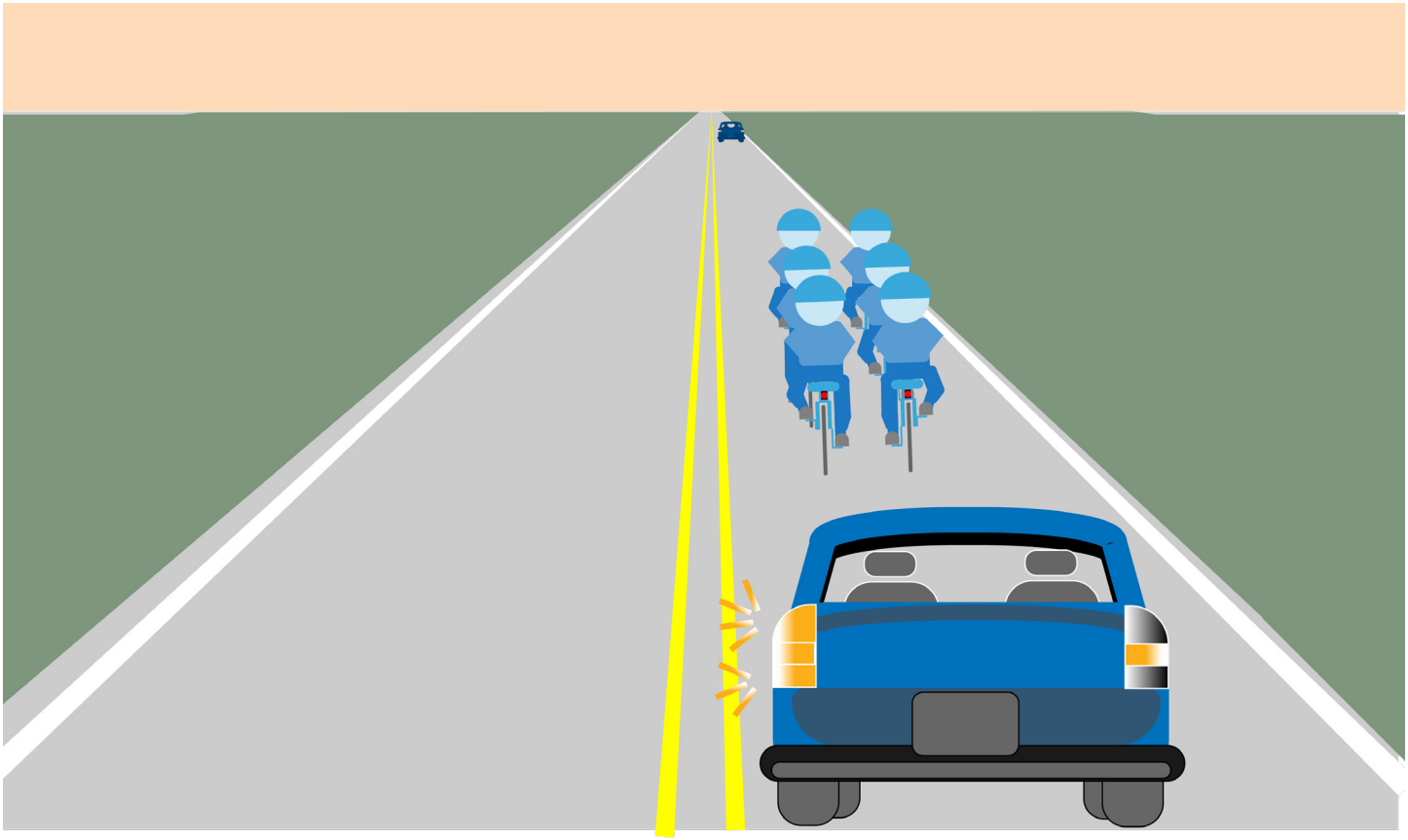
Passing

Motorists should understand that passing a group of bicyclists requires more time than passing individual bicyclists. It is the responsibility of motorists to identify when there is sufficient time and space to safely change lanes to pass bicyclists riding in a group. Passing a group of bicyclists may require more patience in order to ensure the safety of all roadway users. When in doubt of their ability to safely change lanes to pass a group of bicyclists, motorists should wait and attempt to pass only when they are sure there is adequate time and space to do so.

Bicyclists riding in a group, just like individual bicyclists, should position themselves in a way that discourages unsafe passing. This involves bicyclists locating themselves towards the center of the lane to discourage same-lane passing. While it is the responsibility of motorists to find a safe time and location to pass group rides, bicyclists may take measures to facilitate safe passing when they are comfortable with the roadway conditions and feel it is safe to do so. This may include forming smaller clusters, which require less time for motorists to pass than large groups, or pulling over to release traffic when a safe opportunity presents itself. Neither forming smaller clusters nor releasing traffic are legally required of bicyclists – these actions are roadway courtesies that bicyclists can utilize when they feel safe and comfortable with roadway conditions.

Bicyclists Changing Lanes

Bicyclists riding in groups should visibly communicate their intention to change lanes. When traveling as a group, each bicyclist should ensure that the group's intended movement has been clearly communicated to all roadway users that may be affected by the movement.
When a motorist sees a group of bicyclists changing lanes or signaling to change lanes, the motorist should provide group riders with adequate distance ahead to allow the bicyclists to make the signalized movement safely and without feeling crowded. Motorists approaching a group of bicyclists who are signaling an intended lane change should not attempt to pass the group before they are able to execute their intended lane change.



All laws and best practices discussed previously in this manual apply to groups of bicyclists as well as individual bicyclists. However, group rides can add an additional degree of complexity to the dynamics of roadway interactions. The following section expands on previously discussed best practices to provide additional guidance for how bicyclists should behave while on a group ride and how motorists should behave when interacting with groups of bicyclists.

Turning Bicyclists

Groups of bicyclists must signal their intention to turn. When traveling as a group, it is important that each member of the group appropriately signals to surrounding traffic. It is also important that each member of the group individually look and confirm that their path is clear before choosing to execute a turn.

Intersections

Bicycles are considered vehicles on the roadway. The best practice at intersections is to pass through in the order in which roadway users arrive. Motorists should never wave traffic through but rather yield to bicyclists riding in groups when the bicyclists have the right-of-way and proceed when they have the right-of-way. Abiding by traffic laws and proceeding through an intersection only when one has the right-of-way will minimize confusion and create a safer environment for all roadway users.

While bicyclists riding in groups may elect to ride single-file, riding two abreast increases visibility and allows a group of bicyclists to pass through an intersection more quickly. When approaching signalized intersections or stop signs, bicyclists riding in groups are responsible for appropriately signaling, stopping if necessary, and then moving through intersections in the formation in which they approached. When an intersection is upcoming, bicyclists riding in groups should recognize that movements such as lane changes require additional time and begin destination positioning well in advance of reaching the intersection.

Traffic Signals

All bicyclists are required to stop at red traffic lights. This applies to bicyclists riding in a group even if other members of the group have passed through the traffic signal. If bicyclists riding in a group become separated from the rest of their group at a traffic signal, they should pull over in a safe place to wait for the rest of the group to pass through the intersection after the light turns green.

4-Way Stop Sign

At a 4-way stop sign, all vehicles must come to a complete stop. Each vehicle may then proceed through the intersection in the order in which they reached the stop sign. As bicyclists are considered vehicles on the roadway, the dynamics of a 4-way stop sign should not change when bicyclists (including bicyclists riding in groups) are present. Only members of the group who arrive and stop at the stop bar together should pass through the intersection together.

2-Way Stop Sign

When approaching 2-way stop signs, bicyclists riding in groups should be highly alert and cognizant that they will either be crossing or turning into free-flow travel lanes. It is the responsibility of stop-controlled traffic to yield to traffic that has the right-of-way. This includes yielding to traffic on the cross street as well as yielding to roadway users at the stop sign on the other side of the cross street who have the right-of-way.

Bicyclists Traveling on Shared-Use Paths

Bicyclists riding in a group should be cognizant of any local regulations that might restrict their use of shared-use paths. Shared-use paths are often heavily used for pedestrian travel. Bicycle speed and formations while riding on a shared-use path should be adjusted to preserve a safe and comfortable pedestrian space. Typically, shared-use paths are narrow enough that bicyclists riding in a group should ride in single-file formations. Bicyclists riding in a group should take the same measures used by individual bicyclists to alert other shared-use path users that they are approaching, whether by voice, bell, or both. Bicyclists riding in a group should travel at a speed that allows them to quickly react to unforeseen movements when approaching other trail users or animals. Just as on a roadway, bicyclists riding in a group should not attempt to pass slower moving traffic unless there is sufficient room to maneuver around the other shared-use path users while allowing them to feel safe and comfortable.

Ride Purpose

As with all roadway users, the reason a bicyclist is on the road is inconsequential. Whether bicycling for exercise, commuting purposes, or just for fun, bicycles are considered vehicles on the roadway. Roadway users should afford the same degree of respect and consideration for the safety of all roadway users, regardless of the vehicle type and trip purpose.

HIGHLY ORGANIZED GROUP RIDES

Highly Organized Group Rides with Group Ride Organizers

When possible, bicyclists traveling as a group should host a pre-ride briefing to coordinate ride logistics before beginning a ride. These activities include the designation of a group ride leader, expectations, formations, route, and inter-group communication basics. A group ride leader can assist with coordinating movements during the ride, guiding the group's route, establishing expectations, and providing a designated contact should issues occur. It is important to note that no matter what direction is given from a group ride leader, each individual bicyclist is ultimately responsible for his or her own safety and actions.

The following topics describe best practices to assist group ride leaders of highly organized group rides.

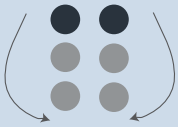
Route Selection
As best as they can, group ride leaders should be familiar with the current state of their selected route. If a group ride leader is planning a group ride on a new route or route that has not been ridden for some time; group ride leaders may review the route to check for construction, changes in roadway conditions, or any other factors that might complicate the ride. A group ride leader may also find it beneficial to identify stopping points along a route to allow the group to re-organize and continue.

Starting Off
The best practice is for the group to wait until there is sufficient time for the whole group or cluster of bicyclists to enter the roadway together when embarking on a group ride.

Intersections
Group ride leaders should anticipate that groups can easily be separated when passing through intersections. If a group is separated at an intersection, the best practice is for a group ride leader to help the group in identifying a safe place to pull over and wait for other riders after safely making it through the intersection, rather than encouraging riders in the back of the group to unsafely or unlawfully pass through intersections. Keeping the group safe and together can be particularly challenging at traffic signals. The best practice at traffic signals involves signaling and conducting necessary lane changes as early as possible. In order to keep the group together, riders at the front of the group should stop at traffic lights that are turning yellow.

Changing Lanes
The group ride leader should signal when a lane change should occur and the other members of the group should ensure that the group's intended movements have been clearly communicated to all roadway users that may be affected by the movement before changing lanes. Ideally, lane changes should occur back to front, that is, the last rider in the group shall initiate the movement.

Cluster Sizes
Group ride leaders should consider the roadway conditions of their selected route. On heavily traveled roads, narrow roads, or roads with poor sight distance, the group ride leader may find it safer to stay in smaller clusters; however, on quieter roads or roads with a dedicated passing lane, it may be safe for the group to remain in larger packs.



Pacelines
Highly organized group rides sometimes ride together in tight formations (aka "pacelines") with choreographed maneuvers for changing positions within the group. Before starting a ride, group ride leaders must help bicyclists who participate in such rides to understand and agree upon expected maneuvers in advance to avoid crashing. Unpredictable movements in a group also pose risk of collision with other roadway users. Bicyclists riding in a formation must look and wait for other traffic (including overtaking motor vehicles or other bicyclists) to clear before executing any maneuver that changes the shape, size, or position of the group formation.

When organizing a special event which may require road closures and/or traffic control, work with NCDOT and local authorities to coordinate and obtain any necessary permits. Pursuant to General Statute §20-169, submit approval to NCDOT through NCDOT Special Event Request Form.

BICYCLES ON SHARED-USE PATHS

Bicyclists should note that rules concerning bicyclists on shared-use paths are governed by local ordinance and may vary from place to place within North Carolina. On some more recreational-oriented trails, it may not be legal for bicyclists to travel on trails.

Shared Use Path

A facility which may be used by bicyclists, pedestrians, and other non-motorized users. They are separated from the roadway by an open space or a physical barrier or within an independent-right-of-way.

*Also known as a "**multi-use path/trail**" or "**greenway**."*

Call Out "On Your Left" or Sound Bicycle Bell

COMMUNICATE

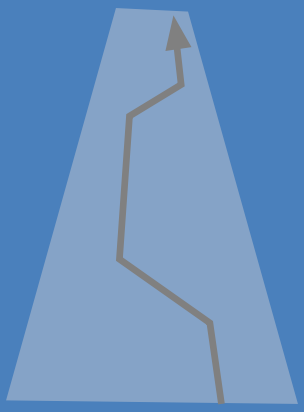
Before riding your bicycle on a shared-use path, look to local ordinances, signage, and pavement markings for specific instructions for the use of any particular shared-use path in North Carolina. Bicyclists should communicate their presence on shared-use paths by traveling on the right side of the pavement. When approaching slower traffic from behind, a bicyclist should wait until the left side of the pavement is clear from oncoming traffic and then use a bicycle bell and/or verbally call-out "on your left" as they approach to pass.

Anticipate Distracted Traffic Ahead - Other Shared-Use Path Users

ACKNOWLEDGE

Bicyclists should acknowledge that shared-use paths are designed primarily to accommodate users traveling at pedestrian speed. Bicyclists on shared-use paths must be prepared for unpredictable movements from pedestrian traffic caused by distractions, young children, or pets. Bicyclists should also be aware that oftentimes pedestrians on these pathways will be ill-prepared to encounter approaching traffic moving at faster speeds, especially when using headphones or other distracting devices. These distractions may inhibit pedestrians from hearing and reacting to bicyclists' communication techniques such as calling out or using a bell. Bicyclists should strive to identify cues from traffic ahead that their communicated presence and position has been understood. Bicyclist should slow down and be prepared to stop as they approach shared-use path traffic ahead if that traffic has not visually or verbally acknowledged the bicyclists' approach and physically positioned themselves out of the bicyclists' path.

Pass with Predictability



ACT

Bicyclists should wait until after the other shared-use path traffic has moved to the right of the pathway and acknowledged the bicyclist's presence and intention to pass. Bicyclists should slow down as they approach to pass on the left side of the pavement, only resuming speed and position on the right side of the pavement after all shared-use path traffic has been successfully passed.

BICYCLES ON SIDEWALKS

Bicyclists should note that rules concerning bicyclists on sidewalks are governed by local ordinance and may vary from place to place within North Carolina. In some places, it may not be legal for bicyclists to travel on sidewalks.

Looking for cross-traffic at driveways along sidewalks and at intersections = Reduced Crashes.

Almost 10% of bicycle crashes statewide occur during the process where motorists or bicyclists come out of driveways and alleyways. Bicyclists riding on sidewalks are particularly vulnerable in these conditions.[1]

1 Thomas, L., Vann, M., Levitt, D. (2018). North Carolina Bicycle Crash Types. Chapel Hill, North Carolina: UNC Highway Safety Research Center

Scan Path Ahead: Identify Who to Communicate with

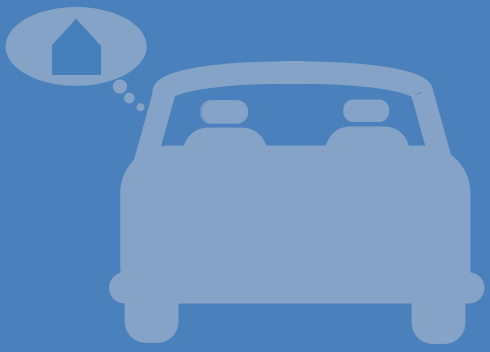
COMMUNICATE

Before riding your bicycle on a sidewalk, look to local ordinances and signage for specific instructions for the use of any particular sidewalk in North Carolina. Those who choose to ride their bicycles on sidewalks must understand that there is a need to identify and clearly communicate both with traffic that may be turning or crossing across the sidewalk path (such as motorists at driveways and intersections), and traffic ahead on the sidewalk (such as pedestrians).

When approaching a driveway or intersection, bicyclists should scan for motor vehicle traffic intending to cross the sidewalk's path. Bicyclists should clearly communicate their use of the pathway by attempting to make eye contact with approaching motor vehicles.

When approaching slower traffic from behind, a bicyclist should slow down and use a bicycle bell and/or verbally call-out "on your left" and wait until the left side of the pavement is clear from oncoming traffic as they approach to pass.

Anticipate Distracted Traffic Ahead



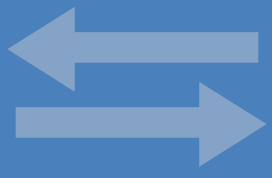
ACKNOWLEDGE

Roadway users typically expect sidewalk users to travel at a pedestrian speed. Bicyclists on the sidewalk should plan to travel at a speed close to that of a pedestrian in order to safely interact with other roadway and sidewalk users. Traveling at a slower speed allows bicyclists time to safely react to other sidewalk users and allows motorists additional time to see and react to bicyclists at potential conflict points, such as driveways and cross streets.

Bicyclists traveling on sidewalks should be particularly aware of upcoming driveways and intersections, expecting vehicular traffic to enter or exit. Bicyclists should always stop at intersections and look for oncoming traffic before proceeding. Bicyclists should also be prepared to stop for cross-traffic as they approach driveways. Bicyclists should always practice defensive riding skills and recognize that there is limited space for maneuvering around obstacles and conflicting traffic on sidewalks.

Bicyclists should be aware that sidewalks are designed primarily to accommodate users traveling at pedestrian speed. Bicyclists should strive to identify clues from sidewalk users ahead that their communicated presences and positions have been understood. Bicyclists should slow down and be prepared to stop as they approach sidewalk traffic ahead if that traffic has not visually or verbally acknowledged the bicyclists' approach and physically positioned themselves out of the bicyclists' path, toward the right of the sidewalk pavement.

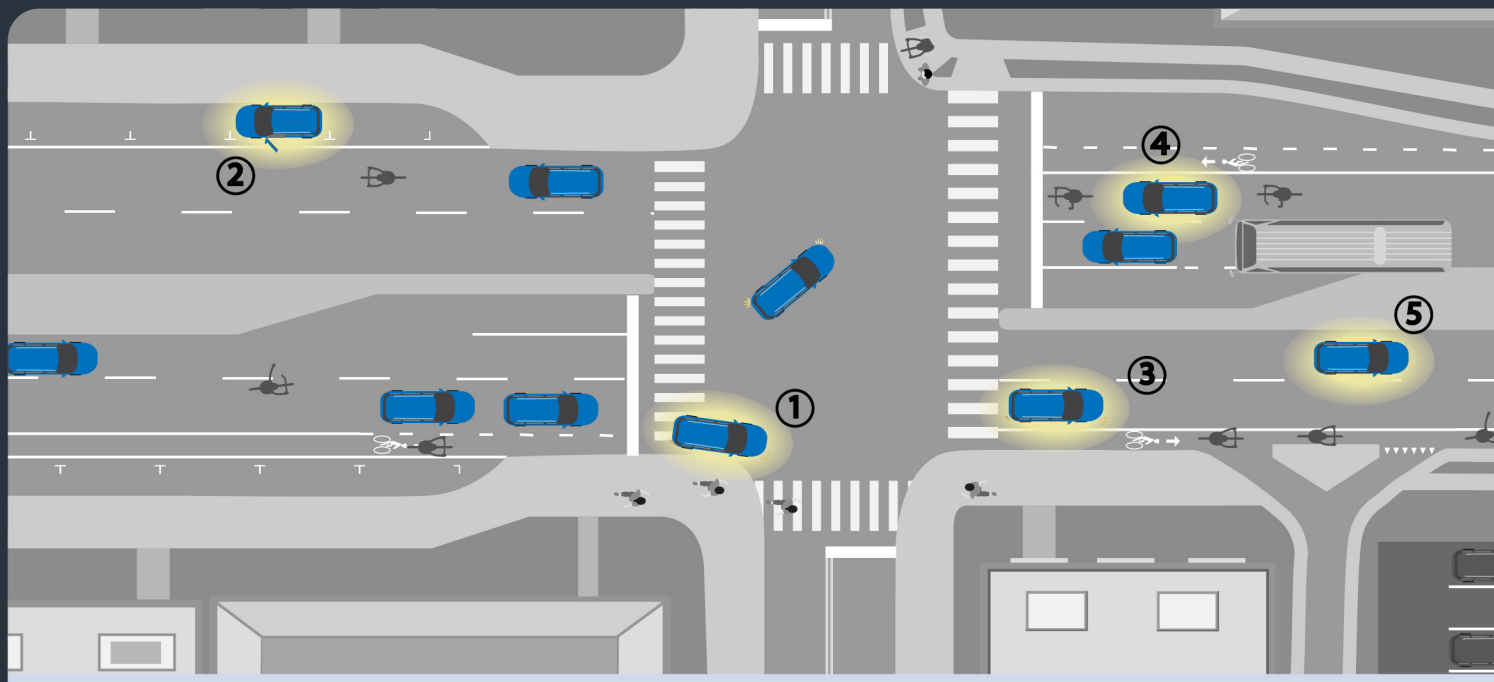
Pass with Predictability



ACT

When intending to pass other sidewalk users, bicyclists should wait until after the sidewalk traffic has moved to the right of the pathway and acknowledged the bicyclists' presence and intention to pass. The bicyclists should slow down as they approach to pass on the left, only resuming speed and position on the right side of the pavement after all sidewalk traffic has been successfully passed. When intending to cross driveways and crosswalks, bicyclists quickly proceed after checking that approaching vehicular traffic has completed their movements across the sidewalk path.

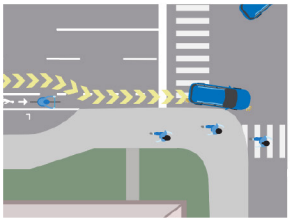
04 PULLING IT ALL TOGETHER



Urban conditions increase the complexity of traffic maneuvers for all roadway users. Some of the most common and dangerous interactions occur between right-turning motorists and bicyclists. Less common traffic control devices, which are discussed in the document conclusion, also increase the complexity of interaction in urban areas. This page is meant to illustrate and describe how motorists should behave in urban areas.

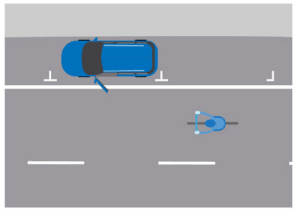
1 Right-Turning Motorists

When turning right, motorists must yield to roadway users traveling in the right-hand lane, including bicyclists in bicycle lanes. In order to avoid conflict with bicyclists traveling in bicycle lanes, motorists who are approaching a right hand turn should merge as far right as practicable before executing a turn. This inhibits bicyclists from moving into the vehicle's blind spot prior to the turn. If motorists are unable to merge to the right-most portion of the roadway prior to turning right due to the vehicle's turning radius, they should be extremely cautious of bicyclists approaching on the right.



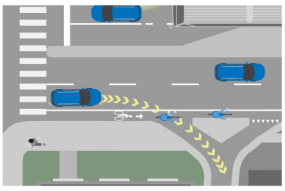
2 Motorists Opening Car Doors

Motorists should be alert to the presence of other roadway users when parking adjacent to travel lanes. The parking vehicle should yield to all roadway users and only open the car door when clearly safe. Bicyclists may be difficult to see approaching, so motorists should check their mirrors and blind spots and open the door with caution even when no bicyclists are observed. It is recommended that motorists open the car door using their right hand. Using a right hand to open the car door naturally forces the roadway user to look towards approaching traffic adjacent to the parking lane.

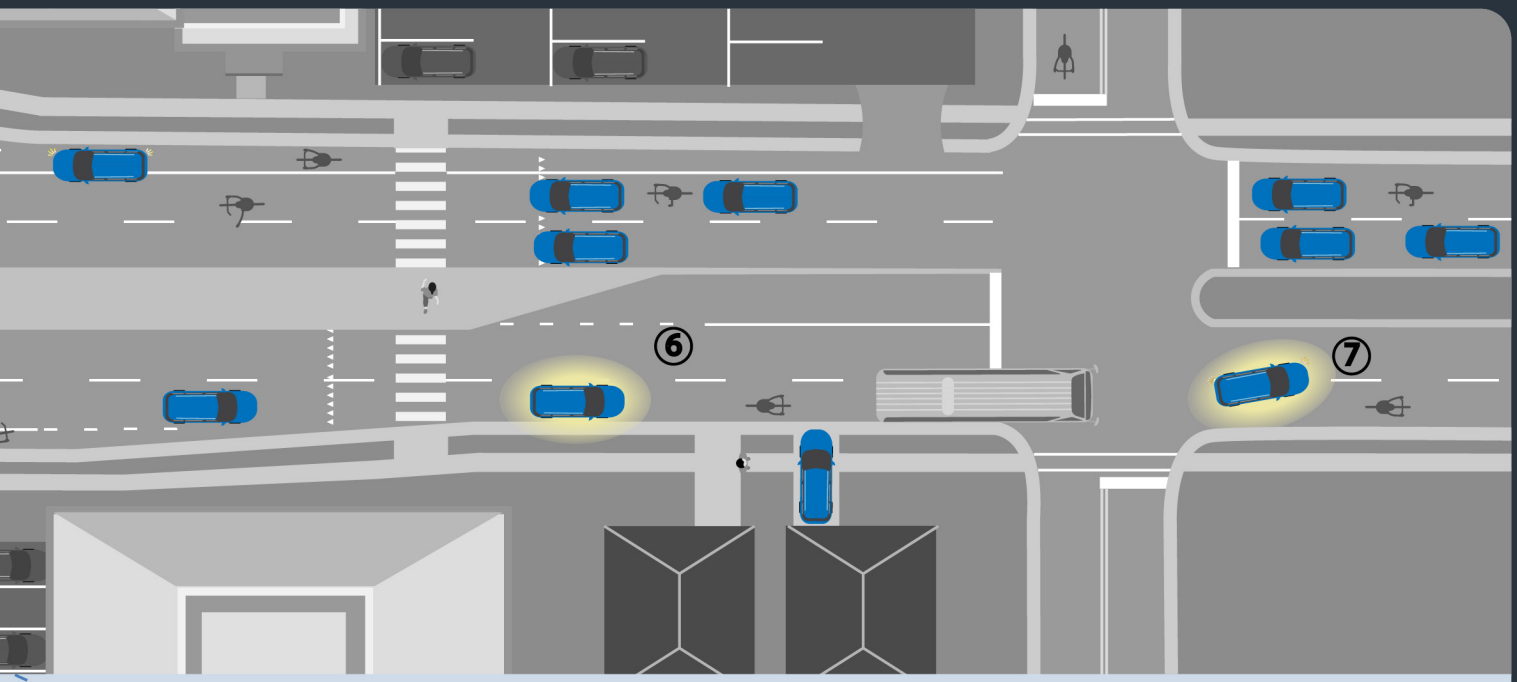


3 Crossing Bicycle Lanes

When crossing a bicycle lane, motorists should follow the best practices noted in the ***Bicycle Lanes & Paved Shoulders*** section. This includes checking mirrors and blind spots, signaling, and waiting until bicycle traffic has cleared before merging into the bicycle lane prior to turning.

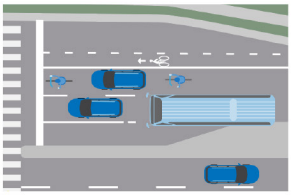


MOTORISTS IN URBAN CONDITIONS



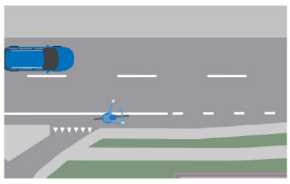
4 Queuing at Intersections

When stopping at an intersection, motorists should stop behind the stop bar or behind the traffic queue. This includes stopping an adequate distance behind bicyclists who are in the stopped queue. Vehicles should proceed through the intersection in the established queue, waiting until after the intersection to change lanes.



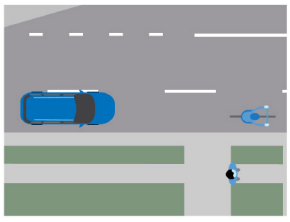
5 Bicycle Lanes Ending

Motorists should always remain alert to potential changes in travel lanes, including bicycle lanes ending. Motorists should slow their speed when they see bicyclists merging into the main travel lane and be aware that bicyclists must merge into their travel lane. While roadway users in the main travel lane maintain the right-of-way in the lane, they should be aware that slower moving bicycle traffic may be merging from the bicycle lane and properly adjust.



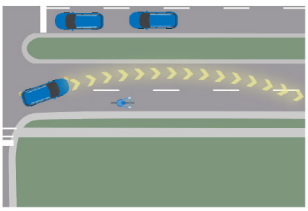
6 Providing Adequate Distance

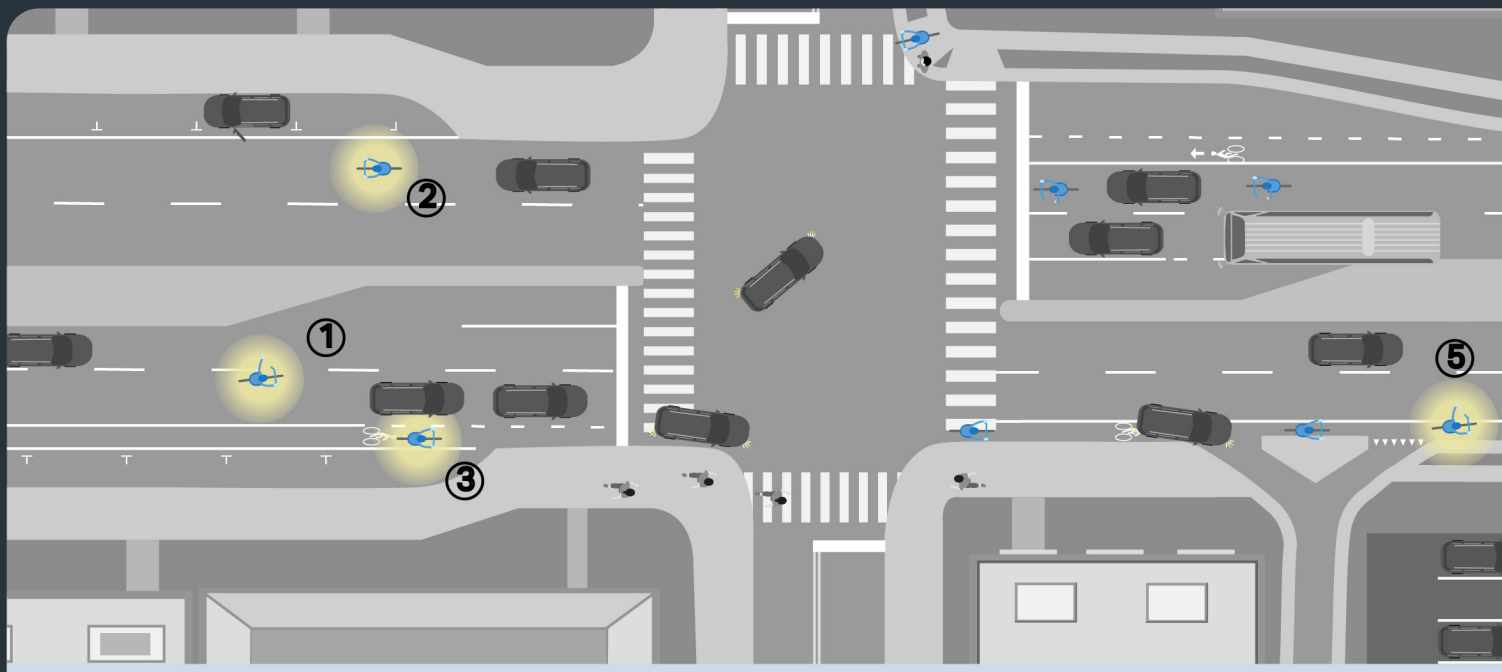
All roadway users should follow at an adequate distance behind others, whether traveling behind a motorist, bicyclist, or other roadway user. Roadway users should act in accordance with the best practices discussed in the ***Traveling Together in the Roadway*** section, which includes counting to three between when the vehicle ahead has passed a stationary object and your vehicle has passed that same object.



7 Motorists Passing Bicyclists

When passing bicyclists, motorists should follow the best practices discussed in the ***Passing*** section. Motorists should exercise patience and wait for an opportunity in which there is space and time to safely change lanes to pass the bicyclist(s).

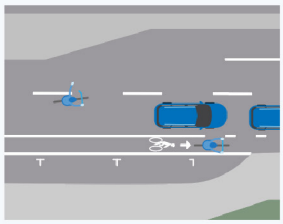




Urban conditions increase the complexity of traffic maneuvers for all roadway users. Some of the most common and dangerous interactions occur between right-turning motorists and bicyclists. Less common traffic control devices, which are discussed in the document conclusion, also increase the complexity of interaction in urban areas. This page is meant to illustrate and describe how bicyclists should behave in urban areas.

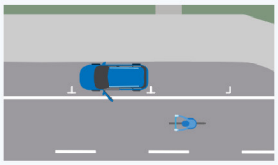
1 Bicyclists Passing Motorists

While bicyclists usually travel at a pace slower than that of motorists, congestion in urban areas may create situations in which bicyclists choose to pass motorists. When passing, bicyclists should change lanes to pass motorists. Bicyclists shall never pass on the right in the same travel lane. If a bicycle lane is present, bicyclists should exercise extreme caution when moving past vehicles. The best practice is for bicyclists to not pass motorists on the right, even when bicycle lanes are present if there is any chance vehicles may be turning right. This is particularly important in regards to passing trucks and buses, as these vehicles have large blind spots and may turn from the left lane.



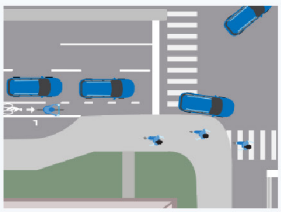
2 Dooring

Where on-street parallel parking exists, it is best practice for bicyclists to ride at least five feet from parked cars in order to avoid striking a suddenly opened car door or being startled into swerving left into overtaking traffic.

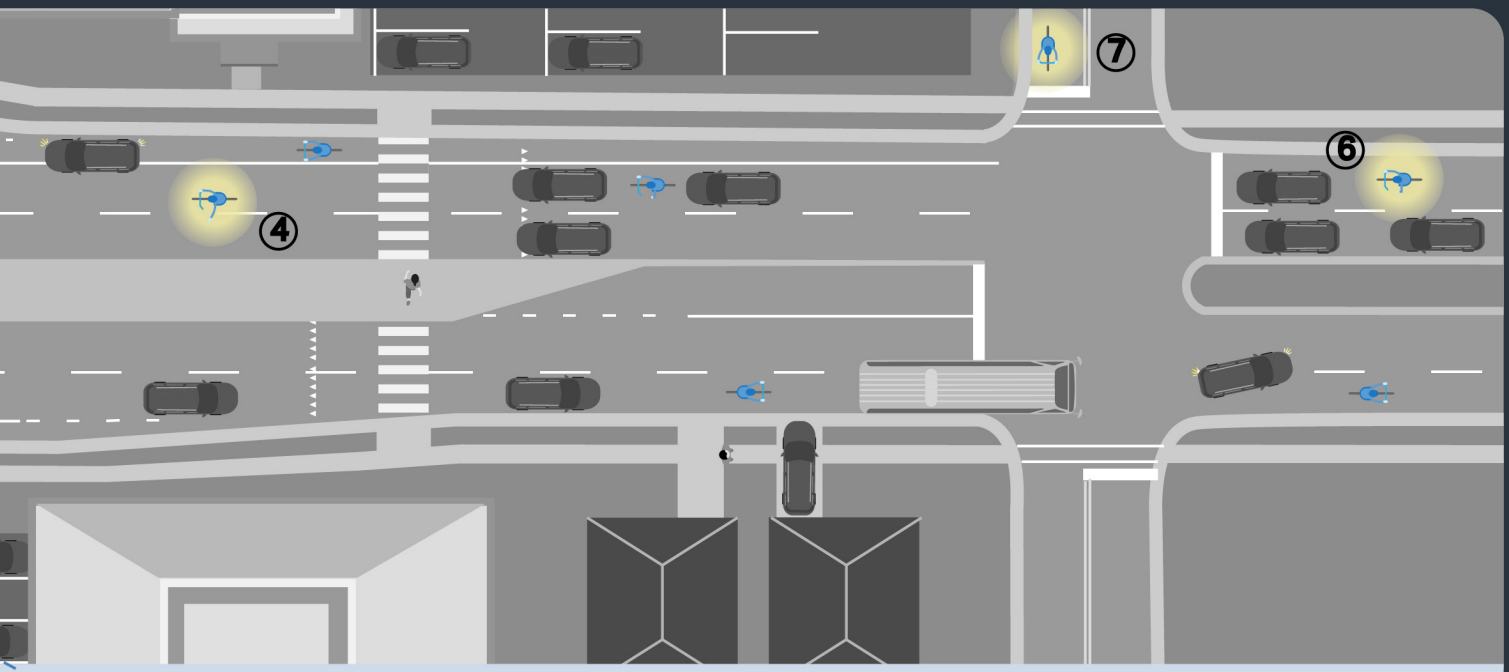


3 Bicycle Lanes at Intersections

When a bicyclist is traveling through an intersection in a bicycle lane, right-turning and left-turning motorists must yield to the bicyclist. However, defensive driving is extremely important for bicyclists traveling through intersections. They should slow down and analyze all travel lanes (knowing buses and trucks may be turning right out of the left lane) to identify potential conflicts with turning traffic and adjust accordingly.

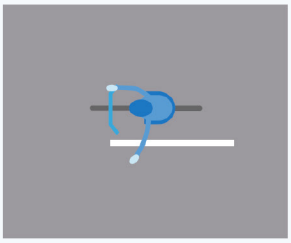


BICYCLISTS IN URBAN CONDITIONS



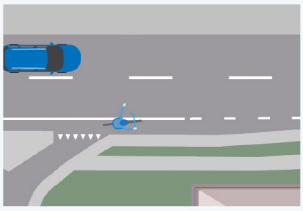
4 Left Turning Bicyclists

When making left turns, especially on multi-lane roads, bicyclists should begin planning far in advance of the actual turn. Bicyclists should take into account that changing lanes may take time and allow themselves time to safely reach their desired lane position. Bicyclists should reference the best practices found in the ***Changing Lanes, Intersections***, and ***Turning*** sections.



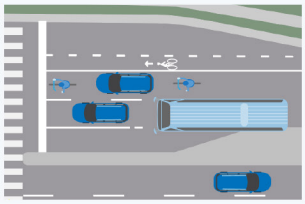
5 Bicycle Lanes Ending

When traveling in bicycle lanes, bicyclists should always remain alert to potential lane changes such as a bicycle lane ending. Prior to where a bicycle lane ends, bicyclists are responsible for safely merging into the main travel lane. Bicyclists should plan ahead and clearly communicate to surrounding traffic their intention to merge into the travel lane by following the best practices discussed in the ***Changing Lanes*** section.



6 Queuing at Intersections

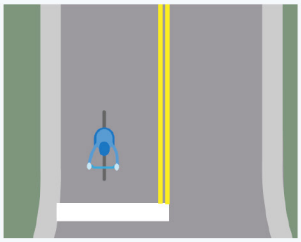
Whether queuing at an intersection, crosswalk, or driveway, bicyclists should remain in the established order of vehicles and position themselves towards the center of the lane to communicate their presence to approaching motorists. Bicyclists should reference best practices regarding queuing in the ***Intersections*** section.



7 Detection at Traffic Signals

Traffic signals may detect bicyclists, but some work better than others. If a detector is present at an intersection but is not detecting a bicyclist, he or she should contact the authorities.

One additional resource can be found at the following link:
https://www.bikewalknc.org/bicycle-detection-at-traffic-signals/



ADDRESSING PROBLEMS

When public safety officials are notified of an incident in North Carolina, crashes involving bicycles are documented and stored in electronic crash databases. Analysis of these data provides information on where bicycle-motor vehicle crashes occur (city street, two-lane roadway, intersection location, etc.), when they occur (time of day, day of week, etc.), and to whom they occur (age of victim, gender, level of impairment, etc.). Data is then summarized in the North Carolina Bicycle Crash Facts summary report.

Establish a Safe Position

COMMUNICATE

Experiencing a crash or case of harassment on the roadway can be extremely unsettling and can bring about all sorts of emotions - even anger. It is critical that the first thing all roadway users do if they are involved in or witness to a crash is establish a safe position and refrain from escalating the emotions of those involved in the incident. Knowledgeable and considerate roadway users communicate a desire to de-escalate and address the situation by physically removing themselves from the travel lane (if possible) and signaling for assistance if needed from a stopped position on the side of the road.

In the case of harassment, roadway users should establish and maintain a safe position and attempt to ignore the harasser. However, if a roadway user feels that he or she is in danger, he or she should immediately leave the roadway and call the police. Harassment is never justified and should be treated seriously by all roadway users. If possible, the roadway user should record any information that will help identify an harasser to the authorities.

Remain on the Scene

ACKNOWLEDGE

All motorists, bicyclists, and passengers involved in a traffic incident are required to remain on the scene until authorities arrive, unless remaining at the scene places the passenger or others at significant risk of injury.

Contact Authorities

ACT

Upon establishing a safe position, all roadway users involved in or witness to a crash or harassment should immediately dial 9-1-1 or otherwise attempt to contact local authorities to report the incident. Crash reports are logged in a statewide database that is analyzed for the installation of safety improvements, so it is very important that a report be filed for every incident. It is important for the person involved in the crash to give their account of the incident. If the person involved is not able to do so, perhaps a travel partner can do so. It is important also to obtain a copy of the official crash report and to check it for accuracy.

05 CONCLUSION

Following a few simple best practices can change the picture of traffic safety in North Carolina and go a long way towards reducing the 22 annual fatalities currently averaged from motor vehicle-bicycle incidents in the state.

As municipalities, counties, and NCDOT continue work to improve roadway safety and efficiency for all roadway users, new traffic control devices and facilities will make their way onto the roadways of North Carolina. These may include separated bicycle lanes, bicycle boxes, contraflow lanes, and bicycle boulevards. As the use of these facilities is part of an emerging trend, the best practices for use of these facilities are still evolving. If you come across a roadway facility that you are unfamiliar with, you should slow down to recall the fundamental best practices communicated in this document.

Improving safety through all traffic maneuvers can be described through the following three distinct actions on the part of all considerate and knowledgeable roadway users:

- **Communicate** the intended maneuver with other roadway users
- **Acknowledge** the reaction of other roadway users to the information that has been communicated
- **Act** quickly upon what has been communicated (acting as soon as it is safe and practicable to do so)

Key for Motorists

Bicyclists are classified as vehicles by state law – motorists must respect bicyclists space when they are present in the roadway.

Key for Bicyclists

Bicyclists are classified as vehicles by state law – bicyclists must follow the rules of the road (stopping at stop signs, stop lights, queuing at intersections, etc.) when they are riding in the roadway.

"Respect for other road users goes a long way"

-Integrated Mobility Division

"*Drive respectfully and we all get home in one piece*"

-Integrated Mobility Division

"*When we drive like we care, we all get home safely*"

-Integrated Mobility Division

"Take your foot off the gas, change lanes to pass"

-BikeWalk NC

"Drive like it's your daughter on that bike"

-Integrated Mobility Division

"*Travel with respect for all*"

-BikeWalk NC

"Every road user is someone's loved one"

-Integrated Mobility Division

"***Imagine each road user you encounter is a dear member of your family***"

-BikeWalk NC