



Cycling Skills Curriculum



Smarter Cycling for a Better Adventure

Fellow riders:

For the bicyclist, there's nothing like a few hours, or a day, or many days on a ride. The purpose of this cycling skills curriculum is to help riders enjoy those adventures in Creation to their fullest.

For more than a century, the bicycle has provided the most efficient way for people to transport themselves under their own power. During that time, trails and roads have improved while bicycles have improved in efficiency, comfort, and safety. But, traffic volume, vehicle speeds, and road hazards have also increased.

This curriculum will help the reader ride wisely, safely, and joyfully on today's roads and today's bicycles – alone or in a group.

In the pages that follow, you'll progress from lessons all riders should know about safely preparing their equipment for the ride, through "Introduction to cycling," "introduction to road riding," "intermediate road riding," "group riding skills," and "advanced road riding."

Two *LIFECYCLES* leaders -- Matt Twomey and Les Engle -- invested hundreds of hours researching cycling resources and Pennsylvania laws and applying their combined experience of 100+ years in the saddle to bring us this tremendous resource. This curriculum is dedicated to the wonderful men, women, boys, girls, and families who comprise and grow the *LIFECYCLES* family.

2024 is the tenth year of the *LIFECYCLES* mission of "building young men and women of character in a Christ-centered bicycle touring adventure experience." It's the perfect time to roll out this *LIFECYCLES* Cycling Skills Curriculum. We look forward to combining it with the *LIFECYCLES* Character Curriculum as we strive to change lives "one ride at a time" under God's faithful protection and provision.

It is my prayer that you will find this curriculum to be an accessible and enjoyable way to improve your riding skills, safety, and overall ride experience.

Gratefully,

Lee DeRemer, Ph.D.
Colonel, U.S. Air Force, retired
Director

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"For I know the plans I have for you," says the Lord, "plans to prosper you and not to harm you, plans to give you hope and a future."
Jeremiah 29:11

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Jeremiah 29:11

***LIFECYCLES* and Bicycling**

***LIFECYCLES* exists to build young men and women of character. We believe that God loves -- and has a plan for -- each person. *LIFECYCLES* wraps mentoring, spiritual development, and life skills development in a Christ-centered bicycle touring adventure experience for teens.**

This unique combination introduces new environments, provides physical activity and an enjoyment of Creation that can be sustained for decades. It also opens teens to communication and learning during these crucial years of development and opportunity.

This manual is developed to help guide the learning process of the teens in *LIFECYCLES* for safe enjoyable bicycling experiences. Bicycling is an activity that poses physical risks. This manual is not intended to cover every condition that a cyclist may face while riding a bicycle. Neither is it intended as a stand-alone manual for bicycle training and/or safety.

This manual is designed to present topics and training points that the *LIFECYCLES* community can use for discussion and learning. These discussions are intended to improve the performance and the experience of the riders.

“Share the Road” Philosophy

LIFECYCLES members are committed to being good citizens. This acknowledges that no one — no driver, cyclist, or pedestrian — has sole claim to the road. It’s a shared space where we all have access and responsibilities.

Cycling on trails and roads requires a combination of cooperation, courtesy, and competence to promote safe and enjoyable travel for everyone.

COURTESY. *LIFECYCLES* is committed to courtesy.

1. We initiate friendly greetings to all.
2. We extend courtesy to diffuse potential wariness, distrust, or confrontation.
3. We develop the habit of making good eye contact.
4. We are grateful and thank the vehicle drivers and pedestrians for accommodating us.
5. Whether moving or stopped, we are polite and treat all others with respect and friendliness in our encounters.

COOPERATION. *LIFECYCLES* is committed to cooperation.

1. We see others road/trail users as fellow travelers, not as competitors.
2. We yield to vehicles and pedestrians, when appropriate, to ensure the comfort and safety of all.
3. We communicate with vehicles and pedestrians to confirm our intentions.
4. We realize that our presence on public roads and/or trails may occasionally intimidate others or even be a source of irritation/inconvenience.

COMPETENCE. *LIFECYCLES* is committed to competence.

1. We train to improve our skills.
2. We ride safely, using best practices.
3. We focus on being highly visible with appropriate clothing and lighting.

ADDITIONAL COMMENTS. Confrontations with other road users are uncommon but may occur. *LIFECYCLES* riders are committed to responding appropriately:

1. The *LIFECYCLES* rider should always be polite. If the other person is angry or aggressive, a calm demeanor may help diffuse the situation.
2. The *LIFECYCLES* rider may be wholly or partially at fault. The rider should apologize for their mistake.
3. Although cyclists have similar rights to other road users, *LIFECYCLES* riders understand that yielding to a larger vehicle may be required to protect the safety of the rider and promote good will.
4. If the situation escalates to a concern of physical safety, the rider should call 911.

PREPARATION

ALL 1 - ABC Quick-Check.

“ABC Quick-Check” is the process of preparing a bicycle for riding. It involves the routine process of checking for proper tire pressure, brake performance, gear operation, etc. It is covered in more detail separately in the lesson cards. Here is the summary.

- 1. A is for Air.**
- 2. B is for Brakes.**
- 3. C is for Cranks, Chain and Cassette.**
- 4. Quick is for Quick Releases.**
- 5. Check is for “Check Over”.**

ALL 2 - Helmet Fit

Why it is important: The head is the most vulnerable body part in the event of a bicycle crash. A helmet must be securely fitted and always attached both while riding and during a crash. The helmet must be at the correct position at the time of crash impact.

Summary/Goal: Riders know how to properly adjust and secure their helmet. All helmets must be properly worn while riding.

Training Points: Teach and have riders demonstrate.

- 1. Have the helmet snug on the head using the helmet band adjuster. When you tip the head down, the helmet should stay in place WITHOUT THE CHINSTRAP FASTENED.**
- 2. The helmet's natural positioning should have the front edge only two fingers width above the eyebrows.**
- 3. Adjust the chin strap snug so there is only one finger width gap below the chin. A fake yawn should make the strap feel too tight.**
- 4. Helmet should stay snug when you shake your head. It should not rock front to back or side to side.**

Additional Comments: Helmets should be visually checked for damage before each ride. If the helmet is involved in any incident that could damage the helmet, the helmet should be replaced. When purchasing a helmet, the buyer should look for a label of certification by the U.S. Consumer Product Safety Commission (CPSC). This label means that the helmet has been tested for safety and meets the federal safety standard.

ALL 3 - Frame Size Selection & Cockpit Fit

Why it is important: A correct frame selection and proper cockpit setup provides the most comfortable and efficient riding experience.

Summary/Goal: Riders know how to choose a proper bike frame size and understand the basics of bike cockpit set up.

Training Points: Demonstrate and verify.

- 1. Correct frame sizing choice on a road frame:** When straddling the frame top tube in front of the seat, feet flat on the ground, there should be a 1” to 2” gap between the top tube and you (For a mountain bike frame 2” to 4”). In the above position, when you lift the front wheel only, it should raise up off the ground 3” to 4” before the top tube hits you. It is usually better to ride a frame that is too small than one that is too large.
- 2. Correct reach to the bars:** In the relaxed riding position, the horizontal part of the handlebar should block the riders view of the front axle.
- 3. Seat fore/aft position in the seat clamp:** When either pedal is in the forward horizontal position, the front of that knee should be about vertical with the pedal axle. (This is not a critical setting).
- 4. Handlebar height setting is at the discretion of the rider:** higher is usually more comfortable, lower for more aggressive riding. This setting change requires an experienced bike mechanic.

Additional Comments:

- Cockpit settings are not as critical as frame selection, and the adjustments often require the work of a trained mechanic.
- There are subtle differences between frame materials, angles, etc. The critical selection point is frame size.

ALL 4 - Saddle Height

Why it is important: Correct seat height is essential for maximum comfort and pedaling efficiency. Incorrect seat height can lead to inefficiency, discomfort, and possible injury.

Summary/Goal: Riders learn how to determine and then adjust saddle height to a correct height that suits their body.

Training Points: Demonstrate and teach.

- 1. When a foot is at the bottom of the pedaling rotation, the knee joint should be slightly bent, not locked.**
- 2. Have riders experiment with seat height in $\frac{1}{8}$ " increments.**
- 3. Tip: Riders using the same bike can mark their seat post height with tape.**

Additional Comments:

- (CRITICAL) A seat too low can stress the knees. A seat too high will force the hips to "rock."**
- Seat comfort/discomfort is often due to the setup of the saddle. Before investing in a new saddle, confirm that the current saddle is set up correctly.**

ALL 5 - Park Your Bike

Why it is important: Rear derailleurs need to be protected from being bent. A bent derailleur shifts poorly until it is re-aligned.

Summary/Goal: All *LIFECYCLES* and personal bikes must be parked/stored correctly to prevent derailleur damage. Riders will park their bike correctly and help identify other bikes that are not parked correctly.,

Training Points: Since *LIFECYCLES* does not use kickstands, we park our bikes doing by one of the following.

1. Lay the bike on the grass/ground, derailleurs UP. Be careful if there is a left side bar mirror. If you see a bike laying derailleur down, ask that rider to flip it over, or flip it over yourself.

2. Lean it against a wall or post, derailleur TOWARD the wall or post. Be careful not to scratch the frame paint on a post or scuff the seat on a wall.

3. Rack two bikes together out in the open, head to tail, leaning against each other, derailleurs IN, being careful the frames do not scratch each other. This is helpful for bikes with bags, panniers, etc.

4. When at public spaces (gas station, grocery store, park) always seek a bike parking spot that is out of the way but secure. Keeping the bikes within view is helpful if a lock is not used. If security is questionable, assign a rider to stay with the bikes.

Additional Comment:

A rear derailleur that gets bent will not shift well until it is straightened by a trained mechanic (at significant cost).

ALL 6 - Bicycle Parts Identification

Why it is important: Familiarity with different parts of one's bicycle is necessary for teaching, riding, and troubleshooting. It is one step toward becoming a competent cyclist. This knowledge is not critical at a beginner level but should soon follow as riders are ready.

Summary/Goal: Riders learn the bike parts, starting with the main parts and progressing to the lesser known parts as their riding develops.

Training Points:

1. Teach by going over the parts and quiz the riders on their knowledge of the parts. Start with the major parts and then move to the minor parts. Some of this can be done with a bike on a bike stand or at a rest stop.



“For I know the plans I have for you,” says the Lord, “plans to prosper you and not to harm you, plans to give you hope and a future.”

Jeremiah 29:11

EAGLES

EAGLES 1- Balance and Spacing

Why it is important: Understanding the physics of a bicycle provides a baseline to learn advanced riding skills.

Summary/Goal: Riders learn the basics of how a bicycle remains upright, why it turns, and how rider's natural reactions work with the bike.

Training Points:

- 1. A rider is constantly turning (adjusting) the front wheel left or right to keep the bike under the rider. The brain/body does this subconsciously when learning to "ride a bike." (Possible Drill: Have riders ride slowly in a flat grassy area with eyes closed to feel this concept.)**
- 2. The front wheel must always have space on either side to keep balance while making these small adjustments. When a front wheel cannot turn freely to keep balance, a crash occurs. (See "touching tires", "berm drop-off", "RR track crossing," in separate lessons). This is the reason it is important to keep proper spacing in front and to the sides of the front wheel.**

EAGLES 2 - Stopping and Starting

Why it is important: Safe stopping is necessary for all riders and those whom they are riding with. Stopping in preparation for starting again will always make a start easier.

Summary/Goal: Riders become competent in smooth, safe technique(s) for stopping and starting.

Training Points:

- 1. On all bikes, the right shifter is for the rear brake, the left is for the front.**
- 2. In most riding, use both brakes together.**
- 3. The front brake is the most powerful one. Riders should be aware that extreme application can result in a crash. The front brake should be used in conjunction with the rear in strong deceleration.**
- 4. For safer stopping (and starting), put the left foot down first, especially if stopping along a road.**
- 5. Before stopping, plan your startup by shifting into an easier/lighter gear.**
- 6. For startup, with the left foot on the ground, start the right foot/pedal in about a 2 o'clock position to push off/startup.**

Additional Comments:

Proper braking will help avoid flat tires and extend tire life.

EAGLES 3 - Straight Line Riding

Why it is important: Riding in a straight line is a core skill for riders.

Summary/Goal: Riders master straight line riding early in their riding experience.

Training Points:

- 1. Ride with hands in a relaxed but firm grip on the bars. Riding with the hands nearer the end of the bars will help with straight line riding.**
- 2. Keep your vision/concentration on a moving spot out in front of the bike, not the front wheel. It is helpful to develop the habit of keeping your eyes on the horizon when riding on a relatively flat surface.**
- 3. Practice riding on a straight white line in a parking lot or on the white line (fog line) at the edge of a paved road.**
- 4. Practice riding very slowly in a heavier (slow cadence) gear.**

EAGLES 4 - Cadence

Why it is important: Good understanding and good habits of cadence will increase riders' enjoyment and efficiency while cycling.

Summary/Goal: Riders know the benefits of good cadence and ride at a steady cadence that is efficient for their riding style.

Training Points:

- 1. Cadence is the rotations per minute (RPM) of the pedals and crankset.**
- 2. Cadence for riders is 65 to 85 RPM. A good target for a beginner is about 70 RPM (LIFECYCLES' training simulator may be used to "see and feel" cadence).**
- 3. "Correct" cadence is subject to opinion. Low cadence stresses (and builds) muscle strength, while high cadence stresses (and builds) aerobic capacity (lungs and cardio).**
- 4. For introduction to cycling, LIFECYCLES encourages higher cadence. It is usually more efficient as it stresses the legs less while delivering good oxygen and glucose to the body. This becomes very important as the LIFECYCLES rides get longer in miles with more hours (and days) on the bike. Experienced cyclists sometimes use training sessions of low cadence to build muscle strength.**

Additional Comments:

Experienced cyclists will tend to have higher cadence.

EAGLES 5 - Cornering, Inside Foot Up

Why it is important: For tight cornering around obstacles, the inside foot and pedal should be in the raised position. This position allows for safer turning and puts the rider's body in a better position for balance and traction with the road.

Summary/Goal: Riders consistently raise the inside foot/pedal when making tight turns.

Training Points:

- 1. When making tight turns, slow turns, and turns at speed, put the body weight on the outside pedal at the bottom position while leaning into the turn. Place the inside foot up at the top position.**
- 2. Practice this with 90-degree slow turns at street curbs or a similar obstacle.**
- 3. Practice this position shift while riding a slalom style line around obstacles on an empty road.**
- 4. Make this positioning a subconscious habit.**

Additional Comments:

A rear derailleur that gets bent will not shift well until it is straightened by a trained mechanic (at great cost).

EAGLES 6 - Front Derailleur Shifting & Combinations

Why it is important: The front chainrings add gearing options to the choice of back cogs. Each front chainring has specific use in combination with rear cogs.

Summary/Goal: Riders understand and demonstrate proper front derailleur shifting in combination with the rear derailleur shifting. Riders should learn a good shifting sequence from slow through fast ground speed, all the while keeping the same pedal cadence.

Training Points:

- 1. The easiest/lightest (smallest) front chainring is to be used for the rear cogs toward the bike. This is for slower speeds. It should not be used with the last one or two cogs (heavier) away from the bike (“cross-chain”).**
- 2. The hardest/heavier (largest) chainring is to be used for the rear cogs away from the bike. This is for faster ground speed. It should not be used with the cog closest to the bike (“cross-chain”).**
- 3. On three chainring bikes, the front middle ring chainring can be used on all rear cogs except the hardest/heaviest cog. The lightest chainring on a triple is often called “granny gear.”**
- 4. The shifts between front chainrings should happen while in the middle selection of rear cogs (not at the extreme cogs).**
- 5. All derailleur shifting should be done with a slight reduction of pedal pressure. This reduces stress on the gears and chain and provides a smoother shift.**
- 6. Shifting should be used to maintain an even cadence speed of the pedals. The pedal pressure should be fairly constant, regardless of terrain or wind.**

7. There is a shifting trainer/simulator bike for practice on a bike stand. Riders should practice and demonstrate the shifting sequence that they use while riding.

8. In conversation and training, avoid using the terms “smaller/bigger” when referring to gearing, it is confusing between the front and rear shifting. Use either “easier/harder” or “lighter/heavier”.

EAGLES 7 - Rear Derailleur Shifting and Terms

Why it is important: The goal of shifting is to maintain the same pedaling rotation speed, (cadence) and pedal pressure regardless of terrain and wind. Most of the shifting of a bicycle is done at the rear derailleur. Proper and timely shifting is critical to riding efficiently.

Summary/Goal: Beginning with the rear derailleur, riders learn the mechanics and proper shifting technique.

Training Points:

- 1. Rear gears are cogs (on a cassette), front gears are chainrings (on a crank).**
- 2. For handlebar shifting (and braking) “right is rear” and “left is front”.**
- 3. For terminology, avoid the terms “bigger/ smaller” in referring to chainring and cog sizes, as it gets confusing. Use either “heavier/lighter” or harder/easier”.**
- 4. In all cases, (front chainrings and rear cogs), the gears TOWARD the bike frame are the “easier/lighter” ones, and the gears AWAY from the frame are “harder/heavier.”**
- 5. Easier/lighter rear cogs are used for bike start, ascents, and headwinds- in general for slower and more difficult ground speed. The harder/heavier cogs are used for faster ground speed, on downhills, and with tailwinds.**
- 6. For all shifting, ease up slightly on pedal pressure until the shift is completed. This requires the rider to anticipate the shift when approaching a climb.**
- 7. For practice, ride with only one chainring. (On a triple crank, use the middle or outer ring).**

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Jeremiah 29:11

8. Bikes should usually be shifted into an easier cog BEFORE stopping in preparation for start-up. Practice this when riding.

9. Rear derailleurs that are not properly adjusted make a clicking or rattling chain noise. Bent rear derailleurs do not shift well; see a bike mechanic.

10. There is a shifting simulator that can be set up on a bike stand for riders to visualize and practice gear shifting.

11. For trail/road training, have riders imitate a leader's shifting, or have a leader ride beside a rider to observe and coach shifting.

12. Avoid cross-chain, see separate lesson.

Note: For front/rear shifting combinations, see separate lesson.

CONDORS

CONDORS 1 - Verbal and Hand Signals for Group Riding

Why it is important: Riding in a group can reduce visibility of conditions ahead and behind. Group members ensure safety by communicating to all riders.

Summary/Goal: All riders shall understand and practice consistent verbal communications while riding together.

Training Points:

1. For identifying traffic, there are two verbal signals, “car (or traffic) up!” for oncoming vehicles, and “car (or traffic) back!” for vehicles that are overtaking the cyclists. There are no hand signals for these two events.

2. Spoken warnings for other moves or obstacles:

- a. “Slowing!”
- b. “Stopping!”
- c. “Left!” or “Right!” (turn)
- d. “(Obstacle name) Right!” (or left).

3. Some hand signals can be used to supplement verbal signals.

Additional Comments:

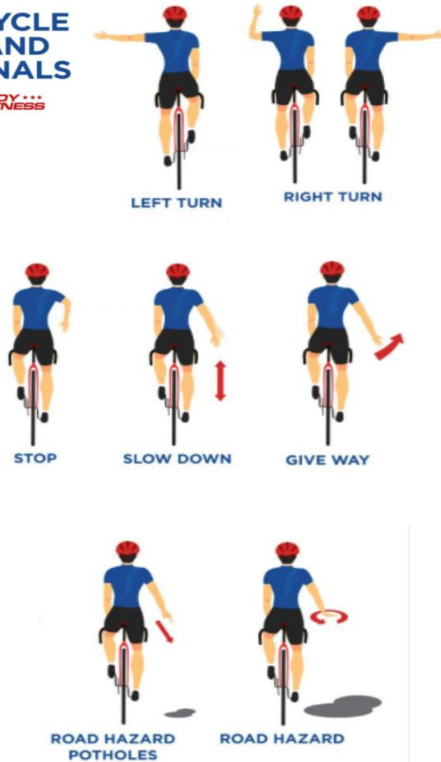
Some cycling organizations discourage the individual verbal announcement of “Clear” when a group is preparing to cross or enter a stop sign

intersection. Instead, they suggest that each cyclist use an individual announcement of “Clear, I’m Going” when beginning to cross/enter. This discourages riders from assuming another person is correct in their “clear” evaluation and instead requires everyone to make their own decision. This is a good habit and agreement to develop for cyclists when riding together.

These diagrams show the proper hand signals used by cyclists.

BICYCLE HAND SIGNALS

PINQY...
FITNESS



“For I know the plans I have for you,” says the Lord, “plans to prosper you and not to harm you, plans to give you hope and a future.”

Jeremiah 29:11

CONDORS 2 - Single File and Bike Spacing

Why it is important: Single file riding with proper spacing is the standard for safety and communication. This allows the safest riding and best communication between riders while allowing the safest interaction with trail traffic (cyclists and pedestrians), and road vehicles (overtaking from rear and oncoming from ahead).

Proper spacing between riders allows safe slowing/stopping but keeps a riding group together for communication and teamwork.

Summary/Goal: Riders understand the single file standard, appropriate spacing and positioning.

Training Points:

- 1. The first (lead) rider chooses the safest line of riding for the whole group.**
- 2. Riders follow at the appropriate distance in line with the leading bicycle or just a few inches to the left.**
- 3. This formation requires the correct use of the signaling system, (separate training) as there may be a blind spot directly in front of any following riders.**
- 4. For trail riding, single file riding accommodates safe and courteous passage around pedestrians and slower cyclists.**
- 5. The space gap between bikes should be one bike length minimum plus one extra bike length for every 5 MPH over 15 MPH.**
- 6. There are rare exceptions to single file riding, (double file). This is covered in a different lesson.**

CONDORS 3 - Passing on the Left

Why it is important: Passing same-direction cyclists or pedestrians can be dangerous. Consistent procedures and communication reduce the risk.

Summary/Goal: Riders properly communicate and execute a safe pass.

Training Points:

- 1. Pass on the left unless a condition warrants a pass on the right.**
- 2. In a group, clearly identify the object being passed to the group before beginning a pass.**
- 3. Select a safe section of path/road to pass.**
- 4. Communicate to the object being passed with a verbal warning. Announce “On your left!” or “passing on your left!.” Attempt to confirm that you have been heard by their response (Be aware of pedestrians with earphones).**
- 5. Make the pass as safely and as efficiently as possible.**
- 6. It is helpful to acknowledge, greet, or thank the person being passed as you ride by.**
- 7. A bike bell is helpful to use from a distance to alert pedestrians of your approach.**
- 8. Be careful passing horses. Do not use bells around horses and horse/buggies. Always give them an extra wide berth without compromising your safety regarding oncoming traffic. Be patient; a minor delay is much better than a major accident.**

CONDORS 4 - Scanning to the Rear

Why it is important: Traffic approaching from the rear must be identified to inform the group and adjust actions as necessary.

Summary/Goal: Riders learn to safely scan by turning their head toward the rear to see an overtaking vehicle(s). Bike or helmet mirrors may be used with or instead of a head turn.

Training Points:

- 1. A head-turn scan to the rear is usually to the left side. Care must be taken to maintain line (It may help to take the hand off the bar on the side of the head turn and put that hand back toward the rear (on the hip or the back of the saddle).**
- 2. Practice must be taken with the remaining hand on the bar to keep a straight riding line. Do not swerve out into traffic when scanning over the left shoulder.**
- 3. Scanning to the rear is a skill for all riders to master. In group riding, the rear riders must constantly be scanning for overtaking traffic and communicate the information forward.**

CONDORS 5 - Touching Tires = Crash

Why it is important: A common type of crash occurs when a rider touches their front tire with the rear tire of another bicycle. This almost always results in the rider initiating the contact crashing due to their losing control of their front wheel. This crash can also cause multiple riders riding behind to crash. Good riding habits and constant vigilance are required.

Summary/Goal: Riders understand the dangers of touching tires and know how to avoid such by practicing good spacing habits.

Training Points:

- 1. All riders should space at least one bike length between bikes when group riding, with increased spacing at higher speeds. (One extra length per 5 MPH above 15 MPH)**
- 2. Experienced riders sometimes ride closer than one bike length to “draft.” Their bike spacing gap should be no closer than one bike wheel. See “Intro to Drafting” lesson.**
- 3. Group riding communication regarding obstacles, slowing or stopping, and traffic is essential to accommodate even spacing between bikes.**
- 4. Riding habits directly affect the safety of all riders in the group. Smooth and even speed and cadence are important to protect the riders in the group. If a rider(s) can’t ride an even pace, more spacing is required.**
- 5. Avoid riding closely behind a rider that is riding unevenly, is unknown to the group, or tired.**

Additional Comments:

Balance training should precede this training. (see separate lesson). This can be simulated on flat grass while straddling/walking bikes and slowly following another bike(s).

CONDORS 6 - Trail/Road Obstacles & Hazards

Why it is important: There is an infinite list of possible trail/road obstacles that can be encountered. Many of these can cause a crash for a cyclist.

Summary/Goal: Riders are prepared to encounter and negotiate a variety of possible obstacles and hazards on a ride.

Training Points:

Normal obstacles (sticks, rocks, gravel, trash) can be avoided by going around them. Other hazards require more thinking.

- 1. RR tracks must be crossed close to a 90-degree angle. They can be especially slippery when wet. Bike wheels that get caught in the track “groove” will cause a crash.**
- 2. Some large bridges have steel expansion joints with gaps between the expansion fingers. These must be negotiated at an angle or walked across. These are more prominent in coastal and water areas.**
- 3. The occasional covered bridge may have the wooden planks laid parallel with the direction of travel. There can be grooves between the planks that will “catch” a narrower bike tire. (wooden decks with planks running “across” are safer, just bumpier).**
- 4. Steel (perforated) bridge decks must be crossed carefully. They are more dangerous when wet. Ride in an easy or light gear and relax the hands on the bars. Do not make sharp turn maneuvers on a steel bridge deck or any other flat steel surface.**
- 5. All cattle guard crossings (western riding) must be crossed at 90 degrees.**
- 6. Steel storm drain covers may have gaps almost as long as a wheel diameter. These are impossible to cross in the direction of the gaps. Avoid these grates or cross them at 90 degrees.**

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Jeremiah 29:11

- 7. Recessed or raised utility covers can have a steel edge that must be avoided or “absorbed.” Ride around these when possible.**
- 8. Some roads have thickly painted or applied vinyl lines or symbols on the surface. Take caution when wet, especially if turning or braking on these lines and symbols, as they have the stopping friction equivalent to ice.**
- 9. Potholes flooded with water are often invisible. Avoid flooded areas completely or ride across these areas cautiously.**
- 10. Berm drop offs at the edge of the pavement can be difficult to negotiate. When riding off or forced off a paved surface, to reenter, enter at a larger angle, or wait till the surfaces are level, or stop completely and lift the bike back on to the road/trail.**

CONDORS 7 - Dog Encounters

Why it is important: Cyclists inevitably encounter dogs. Dog behaviors can be unpredictable, and riders must be prepared for different scenarios.

Summary/Goal: Riders are prepared to respond safely to a dog encounter.

Training Points:

- 1. Most dogs are just territorial, they will only bark or “yard escort” from the beginning to the end of their territory. Many will stop at their yard’s “invisible fence” underground wire. But not all.**
- 2. Dogs that enter the road may run on any side of the bike(s), front, left, right, rear. Do not ride into traffic to avoid a dog. There is a greater chance of group riding crashes when avoiding a dog.**
- 3. A group of dogs often takes cues from its alpha leader.**
- 4. Dogs respect a waving stick-like object, like a frame pump, (old technology).**
- 5. Outriding a dog is possible, but difficult with a group!**
- 6. In worse cases, stop riding and stand/move with your bike between you and the dog. Shouting can also help persuade the dog to leave you alone, and it may alert the owner to come get the dog back on the property.**

OSPREYS

OSPREYS 1 - Road Riding Basics

Why it is important: Bicycle riders can reduce their risk with preparation.

Summary/Goal: Riders can plan ahead to have a positive riding experience.

Training Points:

- 1. Plan a route that is safe. Avoid areas/times of heavy traffic, roads with limited visibility, poor conditions, etc.**
- 2. Check weather forecast and prepare for variable weather with choices of clothes/equipment.**
- 3. Use “ABC Quick-check” before every ride.**
- 4. Do not use headphones or devices that distract attention.**
- 5. Prepare for a flat tire repair. This includes tube(s), levers, and pump, or a CO2 cartridge and the expertise to use them successfully.**
- 6. Carry sufficient water supply and food if necessary for length of ride. Carry cash if relying on purchasing refreshments.**
- 7. Have a plan for a major breakdown. This can include a phone and someone to call that can help.**
- 8. Always ride with personal identification (ROAD ID, driver’s license, etc.)**
Phone apps that let someone at home track your location are seeing increased use by riders.

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OSPREYS 2 - Road Riding Position

Why it is important: Bicycle riders encounter a variety of road conditions requiring decisions on where to ride in conjunction with traffic and road types.

Summary/Goal: Riders wisely select road position for varying conditions.

Training Points:

1. Ride with traffic, not against it.
2. In rare cases of riding on or crossing sidewalks, use extreme caution.
3. On most roads, ride in the lane's right wheel track (the right third of the lane) so that you have 2 to 4 feet of space from the edge of the road.



4. If there is a wide shoulder, use it if it is in good condition.
5. When descending at speed ride further into lane if safe.
6. When passing parked cars, attempt to maintain 5' of clearance where possible to avoid motorists opening doors. Watch for vehicle occupants getting ready to open a door directly in your path.

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OSPREYS 3 - Intersection Dangers

Why it is important: Intersections account for over half of all bicycle-motor vehicle collisions (NTSB).

Summary/Goal: Riders improve safety by having increased visibility and awareness approaching and leaving intersections.

Training Points:

- 1. Collisions can occur when bicyclists are failing to obey traffic laws. This includes riding against traffic, riding on sidewalks, etc.**
- 2. Visibility and group riding improve safety (In about one third of cases in which bicyclists died in crashes involving a motor vehicle overtaking a bicycle, the motorist reported not detecting the bicyclist before the crash).**
- 3. Bicyclist should be aware of:**
 - a. Motorists, while traveling in the same direction of cyclists, misjudging passing space and attempting to immediately turn right after passing (Often referred to as a “Right Hook”)**
 - b. Motorists, while traveling in the opposite direction of cyclists, misjudging closing speeds and distance, turning left in front of cyclists (Often referred to as a “Left Cross”).**
 - c. Motorists changing lanes as they approach intersections.**
 - d. Motorists who are not looking for you. Make eye contact with the driver if possible.**

Additional Comment:

At some stop sign intersections, there is a sign that says: “Look Left, Right, Left” (before crossing or entering). Why? This is a warning that the intersection may have limited sight lines and is potentially more dangerous.

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OSPREYS 4 – Single File Riding & Passing

Why it is important: Bicycle riders shall ride single file during group rides to maintain safety and traffic flow.

Summary/Goal: Riders understand the benefits of the standard practice of single file riding and the proper passing skills.

Training Points:

- 1. *LIFECYCLES* riders should ride single file. In general, riders will only ride double file while passing.**
- 2. In groups, bicyclists routinely pass forward and backward in the group, requiring short sequences of riding side-by-side.**
- 3. Riders should never ride more than two across.**
- 4. Bicyclists should pass other cyclists:**
 - a. On the left side only.**
 - b. With good visibility after checking on traffic both in front and in rear.**
 - c. In a manner that minimizes the amount of time of riding side-by-side.**
 - d. While communicating to cyclists around them (“On your left”).**
 - e. After analyzing whether more than one cyclist must be passed to allow space to come back into the single file line.**

OSPREYS 5 - Visibility

Why it is important: In about one third of cases in which bicyclists died in crashes involving a motor vehicle overtaking a bicycle, the motorist reported not detecting the bicyclist before the crash (NTSB).

Summary/Goal: Riders understand that cyclists improve visibility with high-visibility clothing, lights, and reflectors.

Training Points:

- 1. Bicycle reflectors should not be the sole lighting device for a bicycle. However, reflectors in conjunction with lighting systems assist motorists in seeing bicycles. Reflective tape is available for spokes, frames, helmets, and clothing.**
- 2. A rear (red) light should always be used. A 150-lumen light is recommended. A flashing mode is critical to draw attention from motorists.**
- 3. A front white light is recommended for daytime riding.**
- 4. A front light is required for dusk to dawn riding. A minimum 600 lumen system is typically sufficient for urban areas. Rural areas may require higher rated lighting systems.**
- 5. Bright and/or fluorescent clothing is essential for visibility to motorists. Black, dark, grey, etc. clothing and helmets are highly discouraged. Reflective or battery-powered (lit) lit vests are also useful.**

Additional Comments:

- **Sun conditions can reduce visibility between bicycles and vehicles. Sun glare exists when any oncoming or overtaking vehicle cannot see forward into the direction of a low sun. The driver can be “blinded” by looking into the sun and cannot see cyclists (or anything else) that are between them and the sun.**

- **Clear sunny morning and evening riding is the most dangerous.**
- **Your shadow will always point in the direction where the danger will come from.**
- **A clue to sun glare is watching if drivers are using their vehicle's sun visors.**
- **The use of high visibility clothing and disruptive lighting is essential.**
- **Sometimes it may be best to avoid riding at sun glare time or even change your ride to a different compass direction.**
- **Weekday evening riders need to anticipate sun glare, because this is the time of the heaviest traffic with a low sun near the horizon.**

OSPREYS 6 - Braking

Why it is important: Stopping a bike safely and predictably, particularly at speed or wet conditions prevents mishaps.

Summary/Goal: Cyclists understand proper braking technique.

Training Points:

- 1. As brakes are applied, more weight shifts to the front wheel. The front brake has more stopping power. The rear brake is useful for control. Use both smoothly in coordination.**
- 2. In wet conditions, braking power is greatly reduced. It can take double (or more) of the distance to stop.**
- 3. With hard braking, as much as 90% of the weight goes to the front wheel. Riders should shift as much weight backward on (or behind!) the saddle to counteract the shift.**
- 4. Brake before a corner to avoid hard braking at the sharpest point. If braking is required attempt to control speed with the rear brake first.**

HAWKS

HAWKS 1 - Introduction to Group Riding

Why it is important: Valuable lessons are learned by riding a bicycle individually. The experience is often enhanced when it is shared by a group.

Summary/Goal: Riders understand the value of riding with a group. The positives outweigh the negatives if communicated and understood.

Training Points:

1. Positives - Group Riding can:

- a. be typically safer.
- b. encourage shared experience and friendship.
- c. promote leadership and camaraderie.
- d. encourage increased endurance, speed, and distance which translate into improved fitness.
- e. allow less experienced riders to learn from more experienced riders.

2. Negative - Group Riding can:

- a. prevent individuals from having full control of pace, route, stops, etc.
- b. require commitment to timing and preparedness.
- c. create frustration if the riding levels are not (generally) matched.
- d. create frustration if the group and/or the plan is not cohesive.
- e. require patience and grace.

HAWKS 2 - Group Riding Ground Rules

Why it is important: Bicycle riders can be a danger to themselves and/or other riders when riding in a group without proper skills.

Summary/Goal: Riders learn group riding and communication skills.

Training Points:

- 1. Maintain safe distance (3' or greater) between your front wheel and rider in front of you.**
- 2. Stay behind the rider in front of you, or slightly (a few inches) to the left to allow room when slowing or stopping. Never overlap wheels.**
- 3. Listen and watch for signals from riders in front of you for turns and hazards. Relay signals and voice commands to riders following.**
- 4. Listen for warnings from riders behind you regarding traffic, and relay commands to riders in front.**
- 5. Change speeds and directions slowly, where possible, to allow following riders to react. Choose gearing (typically easier) to allow easier changes in speed.**
- 6. Maintain consistent cadence and pedal pressure. Avoid using a "pedal/coast/pedal" cadence.**
- 7. Communicate when passing ("on your left"), and only pass on the left.**
- 8. Maintain hand proximity to brakes.**

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HAWKS 3 - Traffic Awareness (Group)

Why it is important: Motorized vehicles present the greatest danger to bicyclists. Riders need to be constantly aware of vehicles' proximity.

Summary/Goal: Riders are able to scan forward and backward, while passing information on to other riders in group and taking appropriate actions.

Training Points:

- 1. Riders need to learn to look to the rear (with or without mirror) to evaluate traffic.**
- 2. While riding in a group, the riders in back often are the most able to detect traffic coming from rear. All riders need to vocalize the presence of a vehicle coming from behind.**
- 3. Vehicles coming from behind will be attempting to pass. Riders should take precautions by:**
 - a. Riding in a predictable manner.**
 - b. Anticipating when there will be a safe opportunity for the vehicle to pass.**
 - c. Splitting up into multiple smaller groups, if necessary, to allow the vehicle to pass safely.**
 - d. In some instances, pulling off road in a safe manner and place to allow the vehicle to pass.**
- 4. Vehicles at traffic intersections present additional challenges. Riders must use extra caution for vehicles turning that could threaten safety.**
- 5. Farm vehicles/ Buggies/ Horses may be encountered and require riders to carefully maneuver around them.**

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HAWKS 4 - Large Group Riding

Why it is important: Riding in larger groups presents challenges.

Summary/Goal: Riders learn challenges to riding in large groups and take appropriate precautions.

Training Points:

- 1. Bicyclists should try to accommodate passing vehicles.**
- 2. Groups size is critical. Groups of 3-6 are desirable. 9 should be considered the maximum length of a ride line.**
- 3. Leaders should consider breaking groups up when they get above six riders. Leaders should consider road conditions, traffic density, rider ability, etc.**
- 4. When larger groups are split, there should be adequate spacing between groups for vehicles to fit in between groups (50 yards or more).**
- 5. When a faster group is passing a slower group, the faster group should pick a spot and pace to pass quickly. This might require the faster group to lag behind by 50 yards waiting for an opportunity.**
- 6. Riders should not be “dropped.” If rider(s) are struggling, the group should stop and determine how to proceed.**

HAWKS 5 - Bicycling Posture

Why it is important: Riders are in a fixed position for long periods. Proper posture prevents pain and fatigue, reduces injuries, and increases safety.

Summary/Goal: Riders understand the importance of posture riding. In general, good posture is based on maintaining a relaxed position while adapting to different riding conditions.

Training Points:

- 1. Relax your shoulders. By lowering and relaxing the shoulders, the head is freed up to scan the road.**
- 2. Bend your elbows. This allows your arms to act as shock absorbers, as well as reducing tension on your shoulders.**
- 3. What about hands?**
 - a. In general, the hands should be wrapped around the brake hoods most of the time. There should be little or no bending in the wrist.**
 - b. The hands can be used on the “drops” on descents or in headwinds if desired, since this can reduce wind resistance.**
 - c. The hands can be set on the bars where there is no traffic and no risk that brakes will be quickly required. This is often a good technique for long climbs.**
 - d. Varied hand positions can reduce numbness in hands and arms.**
- 4. Fast descents encourage riders to “tense up.” This is the time that riders need to be relaxed, but attentive. Until a rider can “relax at speed,” the rider should slow down.**

HAWKS 6 - Introduction to Drafting

Why it is important: Bicycle riders can reduce wind resistance by drafting behind another rider or in a group. As riders get stronger there is substantial gain with this technique.

Summary/Goal: Riders know how to control their bicycle to effectively take advantage of this process.

Training Points:

- 1. Do not draft at a pace beyond your fitness level. It leads to poor focus and danger.**
- 2. Maintain a safe distance (greater than 3 feet) and never overlap wheels. Corners, hills, and rough roads require greater distance.**
- 3. Maintain hand proximity to brakes.**
- 4. Keep your eyes ahead as much as possible.**
- 5. Do not eat/drink in a paceline. Pull side or wait for a break in a paceline.**
- 6. Higher cadences typically allow you to modulate speed easier. Communicate turns, speed adjustments, traffic, etc. aggressively.**

Additional Comments:

“Windblast” is a sudden blast of wind pressure, usually caused by a large vehicle passing at speed or in a particularly open area higher than the surrounding area. It can throw an unsuspecting rider off balance. This can be an additional danger while riding in a group or drafting. “Windblast” often comes from oncoming larger vehicles on two lane roads.

To ride through a windblast:

- **Anticipate the situation and the moment of the blast.**
- **Maintain adequate distance from the bikes around you.**
- **Relax with a solid grip on the bars.**
- **Try to “hold your line” of travel.**
- **Be prepared to be pushed to the side by the windblast with some immediate oversteer in the opposite direction.**

Note: In certain remote areas there are permanent road signs alerting traffic for very strong natural crosswinds common to that immediate area.

HAWKS 7 - Drinking in Motion

Why it is important: Bicycle riders require regular hydration. As distances between stops increase, riders need to hydrate on the road.

Summary/Goal: Riders understand the necessity and proper technique for drinking from a water bottle.

Training Points:

- 1. On warm days, a bicyclist may need a full bottle (24 oz) or more per hour to maintain hydration.**
- 2. Gels, additives, etc. can be added to water to provide minerals, protein and carbohydrates that provide important fuel to the rider.**
- 3. Proper drinking technique:**
 - a. Increase space between riders and maintain hand position close to brakes.**
 - b. Do not look down at the bottle. Looking straight ahead, reach down and open the valve.**
 - c. Pull the water bottle from the cage in a manner that does not require readjustment. Bring it all the way to your face but do not block your vision.**
 - d. Bring the water bottle all the way to your lips and tilt it right or left to avoid blocking vision.**
 - e. Tilt and/or squeeze the bottle while maintaining sight of the road to drink.**
 - f. Replace bottle in cage without looking down. Close the valve.**

FALCONS

FALCONS 1 - Eating in Motion

Why it is important: Bicycle riders require proper nutrition. As distances between stops increase, riders will require fuel.

Summary/Goal: Riders understand the necessity and proper technique for eating during rides.

Training Points:

1. Selection of food is critical for eating on a bike:

- a. Never experiment with a new type of food while riding on an epic event. Test out the food on a shorter ride or even at home.
- b. Consider the temperature that the food will be when consumed. On cold days, certain foods may be too solid. On hot days, soft foods might turn to mush.
- c. Consider the mix of carbohydrates and proteins of the food. Are they appropriate for the event? The wrong food on the wrong ride can make the rider ill and ruin the ride experience.

2. Location/accessibility is important.

- a. Energy bars can be “pre-opened” in a pocket to make them more accessible.
- b. Storing food in a handlebar bag may be easier to access than a rear pocket.
- c. Many riders prefer gels or additives to water bottles for fuel.

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Jeremiah 29:11

- 3. Most long rides have short stops that allow riders to safely access snacks.**
- 4. If the conditions require to eat while in motion:**
 - a. Increase space between riders and maintain hand position close to brakes.**
 - b. If easily accessible, eat while maintaining attention on road.**
- 5. Do not toss any non-biodegradable trash. Pack it out.**

FALCONS 2 - Leading a Ride Group

Why it is important: Lifecycle rides are generally designated as “Group Rides.” The rider at the head of the group has an important duty to ride in a manner that supports the goals of the ride.

Summary/Goals: Teen riders develop skills to lead a group in a safe and consistent manner. One of the most important skills is to confirm that the group stays together.

Note that this is not paceline training.

Training Points:

- 1. At the start (or restart after a break) of a ride, the teen leader should make a conscious effort to set a slower pace to allow all riders to make contact with the overall group. This often takes several minutes of riding until all riders get up to speed. The leader should be consistently looking back to check that riders have connected.**
- 2. The teen leader should maintain a comfortable, consistent aerobic pace that is consistent with the abilities of most/all of the riders in the group.**
- 3. The teen leader should be getting information from adult leaders on the route, pace, etc.**
- 4. The teen leader should be monitoring the road and calling out hazards, turns, etc.**
- 5. At appropriate times, breaks will be called by the adult leaders.**

FALCONS 3 - Drafting In Paceline

Why it is important: As riders get stronger there is substantial gain with drafting. Higher speeds require higher skills and the understanding of risks.

Summary/Goal: Riders understand the benefits and dangers of pacelines.

Training Points:

- 1. Only draft with a group who you know and are capable of skillfully handling a bike. Drafting in a group of less skillful riders is unsafe.**
- 2. The objective of riding in a paceline is efficiency, not speed. If a rider is in a paceline and riding beyond an aerobic level, then the rider should abandon the paceline.**
- 3. Pacelines should generally not exceed six riders.**
- 4. Pacelines should only occur on fairly level, straight stretches of road.**
- 5. Pacelines should not occur in urban areas or in a moderate/high traffic area.**
- 6. Paceline riding should be limited to no more than 15 minutes at a time. Riders can break apart and ride less aggressively.**

FALCONS 4 - Climbing From the Saddle

Why it is important: Bicyclists encounter a variety of challenges. Climbing a hill or a mountain is often the most demanding. Riding in the saddle is generally the most efficient and popular approach.

Summary/Goal: Teen riders develop skills to efficiently meet the demands of a climb.

Training Points:

- 1. If the cyclist does not have knowledge of the climb (from experience or research), the cyclist should try to conserve energy as much as possible until the top of the climb can be assured.**
- 2. Riding on inclines magnifies the differences in riding abilities. Cyclists should find their own pace and cadence that is sustainable, and not try to match another rider's pace...who may be going too fast! "Ride your own ride, and climb your own climb."**
- 3. On a long climb (over ½ mile), riders should concentrate on posture. This includes relaxing arms and shoulders while maintaining a comfortable cadence and rhythm.**
- 4. Some cyclists prefer to place their hands on top of the bars during climbs. Since this removes the hands from the brake levers, this is not acceptable in a close group.**

FALCONS 5 - Climbing out of the Saddle

Why it is important: Riding in the saddle while climbing is generally the most efficient and popular approach. However, climbing out of the saddle can be a benefit in certain circumstances.

Summary/Goal: Riders understand the benefits and techniques of climbing out of the saddle.

Training Points:

- 1. Climbing out of the saddle is not typically efficient at lower intensities but can be a powerful tool while climbing on steeper, more difficult sections of hills.**
- 2. Climbing out of the saddle changes the utilization of muscles (more core and upper body) which can relieve stress on lower body (leg) muscles. However, this can come at the cost of needing more oxygen since more muscle groups come into play.**
- 3. While climbing, the bike will naturally sway back and forth. However, the rider should keep their body swaying to a minimum.**
- 4. Climbing out-of-the-saddle is almost always performed at a lower cadence. The transition from seated (higher cadence) to out-of-the-saddle (lower cadence) climbing can result in an instant loss of speed if the rider has not planned properly. Consider a shift to a higher gear before standing.**
- 5. When changing from seated to out-of-the-saddle climbing, the reduction in cadence can dramatically slow the speed bike of the bike and create a problem for the rider following. (This is often called “push-back”). Be aware of the affect you may have on riders behind you.**

FALCONS 6 - Descending a Hill

Why it is important: Descending a steep hill can be thrilling, but also dangerous. Bicyclists should understand techniques to maintain control while descending.

Summary/Goal: Riders understand the dangers of descending and take precautions to ride safely.

Training Points:

- 1. If the cyclist does not have knowledge of the descent, (from experience or research), the cyclist should slow down to be able to slow or stop as necessary.**
- 2. Riders should be spread out based on the speed. On steep slopes five to ten bike lengths may be needed. On descents bicycles can easily travel 50 feet per second (that's the ground covered at 35 MPH).**
- 3. Corners on descents are dangerous. Riders need to slow down to a safe speed well before reaching the corner.**
- 4. Riders should practice bicycle control on lightly traveled roads that have moderate descents. Practice such descents should consist of managing directional changes based on body adjustments (lean).**
- 5. On curving roads with limited sight distances, control speed to allow stopping in space that is visible.**
- 6. When descending at speed ride further into lane if safe.**

Additional Comments: There is a rare occasion when a bike will vibrate or “shimmy” uncontrollably when descending at speed. This happens mostly on a touring bike that is loaded unevenly, although it can also happen with an unloaded bike. The vibration can be stopped by putting a knee against the top tube of the bike frame and/or slowing down.

APPENDIX 1 - Drills to Teach Skills

Drill 1 - On your left

Make a large oval with tennis balls. Have multiple riders ride clockwise outside the markers, at different speeds. Riders will announce “on your left” as they pass other riders and then get back into single file. The slower riders will experience being passed and allow others to get in line in front of them (teaches the “on your left” communication system).

Drill 2 - Lawn walk, group ride

This is an elementary exercise in position and spacing. Have the riding group walk their bikes as they would be riding together, single file, over a grassy area. The leader can determine the path, even navigating obstacles. The instructor can coach proper bike spacing between bikes, following a leader’s line, avoiding touching tires, slowing and stopping, and using verbal and hand signals. This simulation of riding together allows for slower visualization and easier teaching/training (teaches single file, spacing, communication, and intro to group riding).

Drill 3 - Shifting sequence and cadence, simulator

On the *LIFECYCLES* trainer simulator, an instructor can demonstrate good and bad shifting combinations and different cadences. Each teen can experiment with the trainer, and eventually demonstrate competence while off the bike (teaches front and rear shifting and cadence).

Drill 4 - Shifting sequence and cadence on road training

On an empty training course, the instructor can ride beside cyclists and can coach shifting sequences. Cadence training can also be done. As an example, trainer sets the cadence for all riders in a small group to copy.

Drill 5 - Saddle height

One way to demonstrate/experience saddle height is to intentionally have riders ride a short distance with the saddle too low, then too high, and then just right. Riders should have the freedom to self-experiment with their particular bike's saddle height.

Drill 6 - One handed riding

At an appropriate time in the skill progression, riders should learn to ride short distances with only one hand on the bars. This will allow for better hand signaling, scanning, stretching, eating and drinking. Emphasis should be on maintaining straight line riding and overall control.

Drill 7 - Stopping and starting on a hill

A planned stop at the bottom or middle of an uphill will give riders practice with downshifting to a starting gear before they stop. A stop sign at the end of a fast stretch of riding will also work.

Drill 8 - Urban riding

In preparation for challenge rides through large and small urban areas, groups should prepare and ride through the small urban spots near the weekly rides. Riding through Maytown, Marietta, Mount Joy, Columbia, Wrightsville, and Landisville can provide opportunities for urban riding challenges.

Drill 9 - Training rollers (For advanced riders only)

Riding on stationary bike rollers is a great way to develop balance, a smooth pedal rotation, and good cadence. Spotters on each side of the rider are required for this advanced activity.

Drill 10 - Individual time trialing (ITT)

Timed riding over a fixed distance is a great way to set goals and advance riders' stamina, pacing, and form. Pending a safe location for this activity, time trialing is a specialty of cycling that can offer challenges to *LIFECYCLES* riders.

Drill 11 - Team time trialing (TTT)

Two or more riding together can ride together in this manner to train to ride safely toward a common goal.

Appendix 2 - Skills Course Ideas and Components

Introduction.

Off road skill courses can be an effective and fun approach to learning. This is a listing of ideas and components for creating a skills course. This course should be set up on an empty parking lot or on a “dead street,” as vehicular traffic should not interfere.

Notes:

- We use the term “skills course,’ not ‘obstacle course.’
- Some of these concepts may need to be refined in the 2024 riding season. They are offered here as options to develop ride skills.

A basic component of a *LIFECYCLES* skills course is a collection of tennis balls cut in half, painted green or red. They can be laid on the pavement to direct a line of travel, yet they are not a hazard if they are run over with a bike wheel.

The red balls are to be on the right side of the ride route, while the riding line and the green ones are on the left side. These half balls can be used to configure most any type of riding line/direction so long as the resulting line is rideable and safe.

Skills Course 1 - Slalom course

Set up the tennis balls to create a zig-zag course, or to force straight line riding (teaches bike and turning control).

Skills Course 2 - Ride the line

Have riders ride a straight line with the tennis balls or just use a road white line (fog line) or center line on any non-busy road. Have the riders concentrate vision on a spot well ahead of the bike, not immediately in front of the front wheel. Practice in low cadence and then in higher cadence (teaches straight line riding).

Skills Course 3 - Seesaw

Place a see-saw board, (about 12" wide x 60" long with a 2x4 fulcrum) in a path of straight line riding. Riders ride slowly up and over the seesaw (teaches straight line riding in a more challenging way).

Skills Course 4 - Speed bump

Riding over rough roads or rideable obstacles. Place a rideable obstacle in the riding line. Have riders ride over it, slightly standing out of the saddle with arms bent and relaxed, knees relaxed and fluid. Have the body "absorb" the bumps (teaches getting out of the saddle to absorb rough trail/road).

Skills Course 5 - Squeaky toy target

Place a pet squeaky toy in the riding path/line. Have riders try to ride over the toy to squeak it (teaches bike control).

Skills Course 6 - Quick dodge

Place a half golf ball or black half tennis ball in the riding line. Have the riders learn to quickly dodge the obstacle, maneuvering the front wheel on one side of the obstacle and the rear wheel on the opposite side (teaches quick maneuvering to dodge an unexpected obstacle).

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Jeremiah 29:11

Skills Course 7 - Big obstacle “bunny hop”

Place a significant obstacle on the riding line (2x4). Riders SLOWLY ride over the object, hopping the front wheel and then the rear wheel over (teaches riding over an unavoidable object to avoid wheel damage caused by wheel “rimming” or “pinch flattening”).

Skills Course 8 - Pavement drop-off

At a safe location and at a rough right side edge of the course, set up the green tennis balls to force the riding line off the pavement onto the gravel or grass. Have the riders experience riding off the pavement onto the shoulder and then deciding how and where to safely re-enter on to the pavement (teaches emergency or incidental riding off the pavement and re-entering).

Skills Course 9 - Penny drop

Have riders carry a penny, stone, or other small object and drop it in a stationary bucket when they ride past. While riding a straight line (teaches one handed riding and control).

Skills Course 10 - RR track crossing

Use real RR tracks nearby or a simulated one (paint, sticks). Have riders change their line to an approximately 90 degrees crossing of the tracks (teaches correct RR crossing).

Skills Course 11 - Road hazards

Collect and scatter various objects over the skills course. Have riders avoid all objects, practicing verbal and hand signals to riders behind etc. (teaches hazard avoidance, hand and verbal signaling).

Some ideas for objects that can be of use:

- Stuffed animal child's toy, (simulated road kill)
- Large sticks, branches
- Pile of gravel
- Broken glass, (clean up when done)
- Trash items, furniture parts, vehicle parts
- Trash can lid (sewer manhole cover)
- Paint can lid (utility valve)
- Bathmat with lines to simulate storm sewer grate

Skills Course 12 - 180-degree turnaround

Have the tennis balls set up to turn the line of riding 180 degrees to ride in the opposite direction. Have all riders stop and check (or scan) for overtaking traffic before completing the turnaround (teaches the importance of a careful traffic check before a U-turn).

Skills Course 13 - Scanning

Have a volunteer stand in the middle of the course road, facing the rider's direction of travel. As riders individually pass the volunteer on the right side, have the volunteer put up a left arm or a right arm in a horizontal or vertical position. The rider has to look back (scan) to their left side, see the signal, and then imitate the signal to verify, while continuing to ride in a straight line (teaches scanning to the rear while maintaining a straight line of travel).

Appendix 3 - Games to Teach Skills

Game 1 - Snail race

Across a small parking lot or on empty pavement, chalk or tape parallel lines about 4' to 6' apart to make several lanes. With a start line and a finish line, have riders ride in their lane across the course, the last one across the finish line wins the race. Riders must stay in their lane and not put a foot down (teaches bike control, balance, slow riding).

Game 2 - Figure 8

With the colored tennis balls, make a figure 8 course with about 20' diameter circles. Have one or two riders start riding the course, coordinating their speed and spacing to take turns crossing the center of the course. Put a squeaky toy at the center just for fun. Gradually add riders to the course, one at a time. To add complexity, ban all talking (teaches balance, slow riding skills, teamwork).

Game 3 - Start and Stop

Across a parking lot, place a cone or marker near the center area. Chalk a box measuring about 36" wide by 72" long at each side of the lot. Riders start at a dead stop on one side of the course, accelerate as much as possible to the center marker, and then come to a complete stop in the far box, without skidding the rear tire, completely within the marked box, and in the proper pedal position to start again. Repeat the course in the reverse direction. This could be done as a relay race (teaches good starting position, acceleration, quick stopping and correct stopping position).

Game 4 - Shrinking circle

Mark out a 30' diameter circle with the tennis balls. Have two riders ride in the same direction circle inside the course. Slowly move the tennis balls in to make the circle smaller. The last rider to put a foot down wins. This game can be played with more than two riders (teaches bike control, slow turning).

Game 5 - Inside foot up

Across a paved parking lot with grass edges on each side, set up a basic figure 8, with the extreme ends very close (24") to the grass edge. At that turn at the grass edge, place a 12" cone or "soft" barrier on the inside of that turn. The rider must make that turn at the edge of the course with the inside foot up to clear the cone or barrier while staying on the pavement between the cone and the grass edge. The figure 8 layout creates a left turn and a right turn. This could also be a relay race or timed event (teaches inside foot up on tight corners).

Game 6 - Name your horse

If your bike was a horse and you became very attached to it, what would you name your horse? (no lesson...just for fun!)

Game 7 - Foot down

This is for advanced riders only. It is similar to Game 4 but uses a square about 20' or 25' in dimension. Using BMX, mountain, or kids' bikes (and helmets), four riders start in the square and begin riding in a circle. If a rider crosses the boundary line or puts a foot down, they are out. The last rider still riding wins. Riders can block but no ramming or body checking is allowed.

For complexity, when a rider is out, they abandon the bike in the square. (no lesson...just for fun!)

"For I know the plans I have for you," says the Lord, "plans to prosper you and not to harm you, plans to give you hope and a future."

Jeremiah 29:11

Appendix 4 - PA General Bicycle Law

PA 1 - Riding on the Roadway

1. Bikes may be ridden on the shoulder of the road (in the same direction as the flow of traffic) but are not required to do so.
2. Bikes may also ride on the right half of the roadway as follows:
 - a. On a multilane roadway, bikes may be ridden in the right-most travel lane.
 - b. On a two-lane roadway, a bike may be ridden in the right lane.
 - c. On a roadway with no center line, a bike may be ridden anywhere on the right side of the roadway.
3. Bikes may move from the right lane:
 - a. When overtaking another vehicle proceeding in the same direction.
 - b. When preparing to make a left turn.
 - c. When an obstruction exists that makes it necessary to change lanes or cross the center line with due care.
4. Persons riding bicycles upon a roadway shall not ride more than two abreast (side-by-side), unless on paths or parts of a roadway set aside for exclusive use of bicycles.
5. A bicycle or motor vehicle may, with good caution, treat an intersection with an inoperable or malfunctioning traffic signal as a stop condition when red or as a caution condition when green or yellow.

- 6. Often signals with embedded detectors will not respond to the bike awaiting a green light, and this is treated as “inoperable” under law.**
- 7. Motor vehicles must allow 4 feet of distance when overtaking a bicycle and travel at a careful and prudent speed. It is the motorist’s responsibility to provide this distance, not that of the cyclist.**
- 8. Motor vehicles may also overtake a bicycle in a no-passing zone to avoid excessive delays, but this must be done with due care and while providing the required 4 feet of clearance.**
- 9. No person shall open any door on a motor vehicle unless and until it is reasonably safe to do so and can be done without interfering with traffic flow.**
- 10. Cyclists may be injured or killed when a door is opened in their line of travel (dooring). Therefore, a distance of 4 feet should be kept between parked motor vehicles and the line of travel when riding alongside parked vehicles.**

PA 2 - Freeways

Bicycles are not permitted on freeways in Pennsylvania without permission of the Pennsylvania Department of Transportation. A freeway is the general term that denotes a divided highway with complete control of access, which means there are no pedestrians, bikes, horses, signals or intersections.

PA 3 - Traffic Signals

All traffic signals must be obeyed in accordance with standard vehicle laws. If a traffic signal does not detect your bicycle, try positioning the bicycle directly over the saw cuts in the pavement that detect vehicles. If the signal still does not detect you, you may treat the red signal as a stop sign and proceed through the intersection after yielding to all intersecting traffic (including pedestrians).

Appendix 5 - Resources

1. League of American Bicyclists

<https://bikeleague.org/ridesmart>

2. US Department of Transportation Bicycle Safety Page

<https://www.nhtsa.gov/road-safety/bicycle-safety>

3. National Safety Council – Bike Safety

<https://www.nsc.org/community-safety/safety-topics/seasonal-safety/summer-safety/bicycles>