

Oregon Department of Transportation
Safe Routes to School



ALTA · COMMUTE OPTIONS · THE STREET TRUST

OREGON BICYCLE FLEET PURCHASING GUIDE



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I. Background and Information

Teaching and developing the habit of cycling – especially at a young age – creates lifelong benefits. Physical activity helps promote focus and engagement in the classroom and forms healthy behaviors. Bike safety programs are important at both urban and rural schools, and it is important to recognize the different challenges they face. Access to bicycles can provide immense opportunities to all students, and rural schools face unique challenges due to car-centered streets and distances to school. Through these programs we hope to create a lifelong excitement for biking, walking, and rolling.

Having access to a bicycle fleet within schools is crucial for teaching bike safety. Students need to have the opportunity to practice the skills necessary to ride a bicycle safely on the street. A bike fleet is also an equity tool that allows every student access to a working bike and dedicated space to learn on. This guide was developed to share best practices for organizations that are considering investment in a bike fleet. It provides recommendations and advice on the style and components of fleet bikes, the accessories that are useful for teaching and bike maintenance, and how to safely store and transport the fleet.

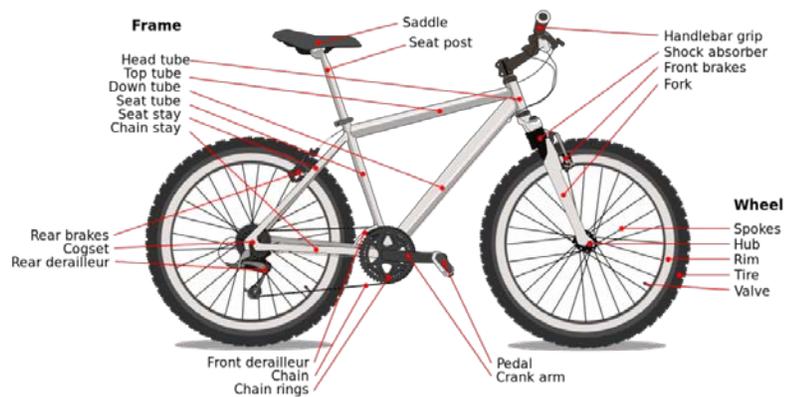
II. Selecting Bikes for a Fleet

When constructing a bike safety education fleet, it is important to choose bikes that will be easy to maintain, strong enough to handle hundreds of moves and classes, and are the appropriate sizes for your students. A full matching fleet has the advantage of providing more streamlined maintenance and replacement part purchasing because components are the same across sizes. A hodgepodge fleet might be easier and less expensive to obtain but may be more challenging to maintain. In this document, you will find the recommendations for selecting and purchasing fleet bikes.



Components

Bikes come in a seemingly endless array of styles and components, but certain components are unnecessary for teaching bike safety and may even make things more challenging. The following section details many of the components you will need to consider before making a final selection. It will be necessary to decide which features are most important to your program and find a bike that has those options and fits within your budget. The most important thing is to find a dependable bike at the right price for your program.



Checklist of recommended features

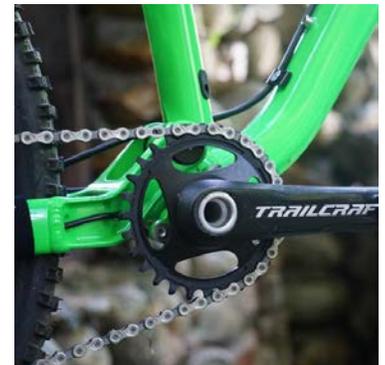
Components	Yes	No
Trigger shifter	✓	
Single chainring	✓	
Rear cassette	✓	
Rim brakes	✓	
Quick release seat *	✓	
Quick release wheel	✓	
Replaceable derailleur hanger	✓	
Threadless headset	✓	
Suspension		X
Kickstand *	✓	
Fenders	✓	
Resin Pedals	✓	
Medium Width Tires	✓	

* Features that can be installed on most bikes.

Shifters – Many kids’ bikes come equipped with grip (aka twist) shifters. While they perform well, over time they can come up apart, making it difficult for students to use. Trigger shifters are much easier to use and last longer. **Recommendation: trigger shifters.**



Chainrings – It is important for students to have more than one gear to gain practice in shifting, but having a single chainring in the front provides fewer opportunities for the chain to fall off and get lodged between the gears and the frame – a dirty, time-consuming and annoying problem to fix. **Recommendation: single chainring up front.**



Rear Gears/Cassette – Having gears is important so students are able to learn how to properly shift when riding on various terrains. Kids’ bikes typically have a range of three to eight gears. A wider range of gears may be helpful for hilly terrain, although many bike safety classes don’t travel long distances. **Recommendation: have some gears.**

Derailleur hanger – Since most kids’ bikes are aluminum, this component is important for ensuring longevity of the bike. The derailleur hanger connects the derailleur to the frame. In the likely event the hanger becomes bent, it will cause the derailleur to function improperly. If the hanger is replaceable, this becomes an easy fix. Otherwise, the bike may become unusable. **Recommendation: have a derailleur hanger.**

Brakes – Select bikes that have hand brakes, not coaster (aka pedal) brakes. Hand brakes are easier to modulate, provide better power, and will be the type of brake used on adult bikes. **Recommendation: avoid coaster brakes, use hand brakes.**

Quick release (QR) seat – Since many students could be using a single bike over the course of a day, it is helpful to the seat height to be easily adjusted. A QR seat clamp will allow for this. If a bike is purchased without one, they are easy and cheap to install. **Recommendation: have quick release seat posts clamps.**

Quick release (QR) wheels – Flats will happen during bike ride and having a QR wheel will make it faster to remove a wheel for repair. However, during storage the quick release mechanism can get caught on other bikes and cause damage to spokes or other bike parts. If the QR mechanism is accidentally loosened and the wheel comes off during a ride, it would create an unsafe situation. **Recommendation: if quick release wheels are used, take care to double check before riding.**

Headset - Headsets are either threaded or threadless. To simplify this document, we'll just say threadless headsets are preferred because they are easier to maintain. **Recommendation: threadless headsets.**

Suspension - While suspension might raise the cool factor of a bike fleet, it is heavy, unnecessary and can become a maintenance issue. Avoid it if possible. **Recommendation: no suspension.**

Kickstand - These are crucial. Students are able to park bikes easier and teachers can set the bikes up faster and easier with kickstands. If a bike is purchased without kickstands, they are relatively easy and cheap to install. **Recommendation: have kickstands on bikes.**

Tires - Tires can be skinny, fat, smooth or with tread. Since bike safety classes will most likely be happening on asphalt, smoother, medium-width tires are preferred. **Recommendation: medium width tires.**

Pedals - Virtually all bikes come with platform pedals, which is preferred. Most come with resin pedals, which are preferred because metal ones scrape and bruise shins more. **Recommendation: resin pedals.**

Fenders - Essential in rainy Oregon! Be sure to add them if your bikes don't already have them. **Recommendation: install fenders.**

Bike Sizes

It is recommended to have different sizes of bikes to fit a wide range of student heights. Small sized bikes should be bikes with 20" wheels. Medium-sized bikes should be bikes with 24" wheels. The large bikes should have 26" or 700c wheels.

New riders do best learning on bikes without pedals, so consider also adding 1-2 balance bikes to your fleet or familiarizing yourself with removing pedals off bikes to turn them into balance bikes.

Here are some fleet-size breakdown recommendations.

4th/5th Grade Students

	30 bikes	
Bike size	# of bikes	% of fleet
Small (20")	4	13%
Medium (24")	20	67%
Large (26")	6	20%

	35 bikes	
Bike size	# of bikes	% of fleet
Small (20")	5	14%
Medium (24")	23	66%
Large (26")	7	20%

Middle School Students

	40 bikes	
Bike size	# of bikes	% of fleet
Small (20")	1	n/a*
Medium (24")	13	33%
Large (26")	26	67%

	45 bikes	
Bike size	# of bikes	% of fleet
Small (20")	1	n/a*
Medium (24")	15	34%
Large (26")	29	66%

Adaptive Bikes

Students who have mobility challenges or physical or cognitive differences may need another style of bike so they can also participate in bike safety education programs. Adaptive bikes are important to plan ahead for because they can be expensive and need more space for storage. Having a wide range of styles is ideal in order to meet varying needs of students. If you are not able to purchase adaptive bikes, you may be able to rent or borrow one from a local organization. Be creative and flexible in figuring out ways to include every student.

Some examples of adaptive bikes and techniques:

Recumbent Trike: especially the tadpole design (two wheels in front) have a low center of gravity, great stability and don't require ability to balance.



Tandem: a variety of set-ups are available, including two wheeled bikes, with a guide in front (for vision impairments) or a side-by-side style (allows people to pedal at different rates).



Handcycle: for those with spinal cord injuries, amputations, Spina Bifida and other conditions affecting the lower extremities



Bike trailer: allows any kid to have the experience of traveling by bike.



Note: Bicycle education programs should address inclusivity by asking the coordinating teacher/administrator about any specific needs for participating students. It is important to communicate flexibility for all students and highlight what to expect for students and families with an Individualized Education Program (IEP).

III. Purchasing and Funding

Once you've determined a basic set of criteria for the type of bikes and specifications you will need for your bike fleet, research bike manufacturers that have bikes in the range of sizes you need. Compare options to create a fleet that meets your budget and provides the majority of desired features. It may be helpful to speak with existing programs for their recommendations on brands or models that have worked well.

Purchasing a bike fleet is a large investment but there are many options for funding sources. Here are ideas to fund or acquire new or used bicycles for a fleet:

- Donations (e.g., solicitations or a bike drive)
- Used bike fleets or portions of fleets from existing bike safety programs
- *Free Bikes 4 Kidz*, a nonprofit that distributes bicycles to kids in need in Portland and Eugene/Springfield (<http://fb4k.org/>)
- Parent or community-led fundraising efforts such as a bicycle ride event or bake sale
- [Safe Routes to School](#), Transportation Enhancements and other federal or local funding sources
- Grants and Foundations whose goals include addressing childhood obesity, active lifestyles, environment, etc.
- Grants from bicycle manufacturers (e.g., Specialized's Outride Fund)
- Local corporations or retail businesses such as bicycle clubs, teams, shops, or outdoor retailers

- Community wellness initiatives
- Healthcare providers
- Service organizations (e.g., Lion's Club, Kiwanis, Rotary, etc.)

People may suggest getting bikes from police auctions (typically recovered or impounded bikes) or used bike sales. This is not recommended as bikes may be poor quality and not the appropriate size or type of bike needed for kids' bike safety education. And as previously noted, a fleet of mixed brand bikes will be more labor-intensive and challenging to maintain than a standardized fleet.

Note: Some funding sources have specific requirements or limitations for purchasing. Familiarize yourself with your funding guidelines as you consider purchasing bikes.

IV. Storing and Transporting the Fleet

Bikes should be stored where they are secure and protected, both between classes and when not in use. They should be kept dry and prevent unauthorized users from accessing them. Preferably, the bikes would have a dedicated covered and locked space, with a storage system to prevent accidental movement of the bikes. This could include an outdoor storage shed, utility closet, garage, or any other identified space that meets these recommendations. Depending on the model of bike and storage system used, each bike will need about 12-18" of lateral space, and occupy 54-78" of length (4.5-10sf per bike); this space can be reduced by staggering the bikes and/or hanging them vertically, as depicted below.

If the fleet is intended to be transported and used at different locations, a dedicated cargo (enclosed) trailer is strongly recommended. This will include a storage system inside to secure the bikes during transit. The trailer can also provide secure storage for the bicycles and related equipment when not in use. Our research suggests that the optimal fleet size is between 25-40 bikes which would require a 20 ft long trailer. A fully loaded trailer should weigh less than 2,500 lbs (depending on exact specifications). Most mid-size and larger vehicles will be able to tow this weight if they are properly equipped with a hitch and electronics. If you have a secure indoor location to store the bikes, another option is to rent a box truck to transport bikes but care must be taken so the bikes don't move during transit.

Following are recommended specifications for a trailer to hold and transport 40 bikes and equipment:

20'L x 8'6" W x 6'6"H:

- Electric brakes on all axles
- Ramp door (rear)
- Side door
- Interior dome lights (minimum 2)
- Roof vent
- Undercoated frame
- Stabilizer jack
- Welded safety chains
- 4 D-rings on floor (*recommended*)
- Anti-theft locks for both doors

Additional items:

- Ball hitch (or Universal ball hitch)
- Wheel immobilizer mini-boot or hitch ball lock (for additional security when trailer is not in use)
- Storage cabinet to keep supplies and materials organized (will need to be installed to the trailer wall)
- Webbing, ratcheting devices, and/or hooks to mount and strap bikes

Hooks:

With a full fleet of bikes, hanging them along the wall may be the best way to store and transport them in the trailer. This is the system that Eugene Springfield SRTS program uses in their trailers:

- Delta Cycle Leonardo Da Vinci Wall Mounts
- 3/4" plywood (2 ft wide) was added to the top of the trailer walls for mounting the hooks.
- Alternate height of the hooks if possible. Measure to make sure bikes fit. If bikes are all of the same height, flip bikes so handlebars alternate up and down.



V. Other Recommended Supplies

Teaching and safety supplies

In addition to the bicycle fleet and the transport/storage trailer, the following equipment is important for safety and will be useful for teaching your curriculum:

- First aid kits
- CPSC-certified helmets of various sizes (see additional notes below)
- Safety vests for youth and volunteers
- Large mesh soccer bags for storing & moving helmets (one bag should hold 15 to 20 helmets)
- Orange cones - a selection of 9" and flat for various set-ups
- Sidewalk chalk or spray chalk
- Whistle or megaphone
- Traffic signs: stop/yield/one way (optional)
- 20' of cable for locking bikes when set up outside and not in use and several padlocks
- Bike maintenance tools and parts (see additional notes below)

Helmets:

A good source for youth bike helmets is helmetsRUs.net. A recommendation is to color-code helmets when you buy them, i.e., all small helmets are red, mediums are blue, etc., so that you can quickly identify helmets by size.

The chart below is a recommendation to cover a variety of students; numbers and sizes will vary depending on the helmet manufacturer's size specification.

	Elementary	Middle School
Small	14	
Medium	40	14
Large	14	40
XL		4

Sharing helmets between students and classes does have the potential to spread head lice. The [Bicycle Helmet Safety Institute](http://BicycleHelmetSafetyInstitute.com) has many solutions and resources; here are some of the most practical:

1. Have students use the same helmet for the duration of the course. Label each helmet with the student's name on painter's tape. (This also helps volunteers learn students' names.)
2. Provide surgical caps or disposable caps to be worn under the helmet.
3. Vacuum or wipe out helmets after each use.

Helmets should be discarded when they are older than 5 years, have been in a crash, or show cracks in the styrofoam. Engage your students in taking proper care of the helmets. They should be directed to wear helmets throughout the class and should avoid throwing or dropping them to avoid damage.

Replacement Parts, Tools, and Supplies

In order to perform basic adjustments and repairs on the bike fleet, the following list of replacement parts, tools, and supplies is recommended.

- At least 2 spare inner tubes for each size tire used in the fleet
- Spare front and rear wheel for each size bike
- Shop grade floor pump
- 2 replacement chains
- 3 sets of tire levers
- 4 patch kits
- Box of cable tips (brake size)
- Bike grease (Phil's waterproof grease for ball and roller bearings)
- Chain lube
- Bike repair stand (optional)
- Shop rags
- Vinyl or nitrile gloves
- Frame pump and portable tire repair kit
- Tool kit:
 - Needle nose pliers
 - Multi tool (Topeak Mini 9 bike multi tool)
 - Hex "Y" wrench (Pyramid bicycle allen wrench, 4,5,6mm, Y-type)
 - Socket "Y" wrench (Pyramid Y socket wrench, 8,9,10mm, Y-type)
 - Adjustable wrench
 - Metric combination wrenches
 - Crank extractor tool (Sunlite Crank Extractor Bike Repair Tool)
 - 8mm hex wrench
 - Chain tool (Park Compact chain tool)
 - Pedal wrench

VI. Fleet Maintenance

Safety Checks and Routine Maintenance

Any person authorized to use the fleet should be trained to perform basic safety checks on the bicycles to determine their proper function and suitability to be ridden. Preferably this training would include information on how to perform simple adjustments and repairs (e.g., changing seat height, positioning handlebars, replacing an inner tube, aligning brakes). Routine repairs will be identified through safety checks before/after each usage and will include at a minimum performing an “ABC Quick Check” (outlined below) and checking tightness of stem and axle bolts.

Annual Maintenance

To keep bikes in good operating condition and extend the life of the fleet, bikes should be on a regular maintenance cycle performed by a professional bicycle mechanic. The frequency of this cycle is based on usage and need, but should be performed at least annually. Many schools or organizations using bike fleets have been able to arrange with local bike shops for a maintenance contract, including some amount of as-needed repair work and a regular service, frequently performed during the winter months. There may be other non-profit service organizations in the community with interest and capacity to perform this work. Some school districts have set up a class or after-school program for students to learn bicycle maintenance skills and help maintain the fleet for use in the district.

Existing Fleet Maintenance Contracts

For SRTS partners that are currently running a fleet program, there are a range of service models and agreements in place. Those surveyed budgeted approximately \$40–80 per bike for annual service work, which generally covers a standard “tune up” package, including basic adjustments, lubrication, and safety checks. The more costly service agreements included a budget for replacement parts as needed, while the less expensive plans did not include these costs in the agreements. An example of included service is here:

- Safety inspection
- True wheels
- Tighten and adjust bearings, headset, hubs, and bottom bracket
- Inflate tires to proper pressure
- Adjust brakes and shifting
- Quick lube of drivetrain
- General cleaning of drivetrain and frame

Each of these service agreements from those surveyed is contracted with a professional bike shop.

“ABC Quick Check”

The ABC Quick Check is a basic check to confirm that bikes are in good working order and should happen each day before riding. Engaging the students in this process serves two purposes. First, it is more efficient when all the bikes are checked at the same time. Second, it teaches students a skill that they can use when riding bikes on their own.

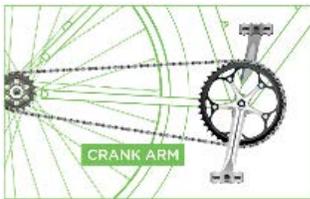


“A” is for Air

Check tire pressure: squeeze front and back tires. They should be firm, not soft or squishy. A tire with low tire pressure will be more difficult to ride because of the added friction; it can also lead to tire damage such as a pinch flat.

“B” is for Brakes

Check the brakes: squeeze the brake levers. There should be a thumb-width between the handlebar and brake lever when the brake is engaged all the way. Hold down the brakes and try to move the bike back and forth. If it doesn't roll, you are good.



“C” is for Chain and Cranks

The chain should be clean (free of gunk), rust-free, and lightly lubricated. It should fit snugly on the chainring and not appear loose or drooping. Do not ride a bike with a loose chain.

Spin the pedals and pull on the crank arms. They should not be loose or wiggle from side-to-side. Check that the derailleur is straight and clears the spokes.

“Quick” is for Quick Releases

Quick releases have a lever that acts as a clamp to hold either a wheel or seat post in place. Make sure the both are properly secured – tight but not overlapping the frame or fork.

During this check, adjust the seat height as needed. The seat should be roughly at the student’s hip height when standing next to the bike, so when they sit on the seat the balls of their feet touch the ground. If the student’s feet are flat on the ground while seated, the bicycle may be too small for them.

Check:

The final check is a short slow ride around the parking lot to make sure everything works well.

VII. Appendix

Links to Additional Resources

Helmets:

- Recommendations and strategies for managing health and safety when sharing helmets. [Bicycle Helmet Safety Institute](#)
- Affordable kids' helmets: [Helmets R Us](#)

Purchasing and Funding Bikes:

- [Outride Fund](#)
- [Free Bikes 4 Kidz](#) (Portland and Eugene/Springfield)
- [Safe Routes to School](#)

Adaptive Bikes:

- [Oregon Adaptive Sports](#): A beginning guide to adapting bikes for youth
- [Adaptive Mall](#) bikes & trikes
- [Freedom Concepts](#) adaptive bikes
- Adaptive bike rental in Portland: [Adaptive BIKETOWN](#)
- [Eugene Rec](#) adaptive recreation
- [Compilation resource](#) showing wide variety of adaptive bikes for kids