



International Police Mountain Bike Association Board Position Paper – Use of Flat Pedals by Public Safety Cyclists – June 1, 2016

IPMBA endeavors to keep abreast of changing technologies, methodologies, and other factors applicable to public safety cycling. This includes equipment and devices for use in training and in the field.

Of interest to certain members within IPMBA has been the request to authorize the use of flat pedals for IPMBA training and approve use during public safety cycling operations. IPMBA Treasurer Mike Harris completed this position paper, which was reviewed and approved by the IPMBA Board in May 2016.

Background

IPMBA has identified pedal retention as one of four mandatory pieces of safety equipment, and requires all who participate in IPMBA training to utilize it. IPMBA has further recommended that operational guidelines likewise mandate pedal retention for public safety cyclists operating their bicycles in an on-duty capacity.

The primary purpose of pedal retention as stated is to keep the cyclist's feet on the pedals while negotiating obstacles. Pedal retention also helps keep the feet engaged with the bicycle on steep descents and in crash situations such as side-impact falls. The proper use of pedal retention can prevent or lessen the severity of injuries.

A secondary benefit of pedal retention is improved pedaling efficiency. It allows the rider to both pull up and push down on the pedals to maintain a "good spin." Exerting nearly equal force throughout the pedal revolution can reduce muscle fatigue and potential muscle imbalances.

Pedal retention has historically been divided into three categories: toe clips/cages (with straps or strapless mini-clips), Power Grips or similar, and clipless systems, such as the Shimano® SPD, which uses a cleat system to bind a specially equipped shoe to the pedal. Each pedal system has pluses and minuses for public safety cycling.

Advancements within the pedal/footwear industry have led to the emergence of the flat pedal, also known as the platform pedal. Once associated almost exclusively with the BMX community, flat pedals have expanded into the mountain bike community as riders have discovered that when high-quality equipment is properly deployed, flat pedals can function as a form of pedal retention. By using proper weighting and loading/unloading techniques to maintain contact and pressure on the bike, the rider can handle the bike fluidly and safely while retaining the ability to separate quickly from the bike.

As this is an increasingly popular and demonstratively effective pedal system, IPMBA has researched the pros and cons of flat pedals. As a result, the use of flat pedals during IPMBA training sessions has been approved, with the following recommendations.



IPMBA offers the following recommendations to assist any agency that chooses to approve flat pedal use for public safety cycling training and operations in developing policies and procedures governing equipment selection. It is further recommended that all personnel are required to demonstrate proficiency with this form of pedal retention prior to deploying it.

Flat Pedal Selection



Flat pedals vary with respect to the level of traction provided, thickness and width, number of pins, etc. Most public safety cyclists will benefit from a pedal with thinner construction, a wider profile, and longer removable pins. Thinner pedals lower your center of gravity on the bike and improve your power transfer into the crank arms. They are also lighter and less clunky but can be less durable; therefore, it is advisable to select a model with multiple seals or ones that can be disassembled for service. Wider platforms give the shoes more surface area to grip. The foot should not be more than ½” wider than the pedal, or numbness may result. Longer pins will keep the feet more securely in place on the pedals, providing the feeling of being locked into the pedal. Removing pins will reduce this grip. A pedal with replaceable traction pins (preferably ones that can be removed from the back) can increase the lifespan of the pedal.



Flat/platform pedals without removable pins are not acceptable in IPMBA training and not recommended for public safety cycling operations. This includes the type of flat pedals typically installed on most bicycles at the point of purchase and those designed to be equipped with toe clips/cages or mini-clips. Removal of the cage and strap from this type of pedal during IPMBA training is not authorized and is not considered safe or acceptable.

Shoe Selection

In order to be effective as pedal retention, flat pedals must be used in conjunction with shoes designed for this purpose. Footwear designed for flat pedals improve the rider’s ability to control the bike and offer both comfort and protection. When picking a shoe, it is important to assess how it will be used. Public safety cyclists who are off and on their bikes throughout their shifts may benefit from a slimmer design with a thinner, more comfortable sole. Ventilation needs should also be taken into consideration.



The most important feature of the high-quality flat pedal shoe is the sole. Unlike regular bike or athletic shoes, the soles of flat pedal shoes are treated with a sticky rubber compound. The stickier the rubber, the more grip it will provide. Other features to consider are grip pattern and stiffness. Avoid any shoe that has large lugs for traction such as a trail running shoe. Uppers are available in various materials, including suede, genuine and synthetic leather, nylon, and plastic, so finding a shoe that meets uniform requirements should be possible.



Pros and Cons

As with any type of pedal system, there are pros and cons to riding with flat pedals.

The benefits of flat pedals include the ability to instantly disengage from the bike in the event of a potential crash, to leverage slick corners, or toe tap if needed in technical sections.

Flat pedals provide a more stable mid-foot position, where the ball of the foot is placed in the front of the axle as opposed to directly on the axle. This more centered position contributes to better balance on the bike. The pedal stroke is more efficient as well due to the placement close to the axis of rotation.

A switch to flat pedals will require practice and adaptation to proper flat pedal technique. While practice will help reduce the risk, the most significant “con” to flat pedals is the risk of slipping off, which can cause the pedal to strike the shin, resulting in pain, bruising and/or abrasion.

Foot Placement Tips

(James Wilson, MTB Strength Training Systems, www.bikejames.com)

On flat pedals, the feet naturally go to a mid-foot position, where the ball of the foot is placed in front of the pedal axle. Most clipless pedals position the ball of the foot directly over the axle, but having it in front of the axle is a more natural and potentially better position. This mid-foot position enables more effective driving of the pedals and improved involvement of the hips during the pedal stroke, especially when standing. It also allows for the heels to drop when standing up in the “attack position”, which causes the rider to shift back into the hips, which both lowers the center of gravity and shifts it back. This also keeps the feet pressing into the pedals and prevents them from bouncing off when navigating over obstacles.

Instructor Responsibilities

It is the responsibility of the instructor to familiarize him/herself with the flat pedals, their advantages, limitations, and the way they affect riding skills. If an instructor has little or no experience with flat pedals, it may be difficult to diagnose and correct rider error and assist students in overcoming problems.

When conducting any course with riding drills, it remains the responsibility of each IPMBA instructor to ensure that his or her students are equipped with an approved form of pedal retention. In the case of flat pedals, this includes both the pedals and the shoes.

Five Tips for Learning to Ride Flat Pedals

(James Wilson, MTB Strength Training Systems, www.bikejames.com)

When learning to ride flat pedals you may suffer “The Dip”, a short-term decrease in performance while learning a skill that will ultimately lead to increases in performance. Here are some tips for learning how to ride flat pedals with speed and confidence as quickly as possible.



- 1) *Stick with them for at least 12 rides.* Riding with flat pedals – and only flat pedals – for several rides in a row will force you to learn how to use them.
- 2) *Stand up more.* When you sit down you un-weight your feet, which makes it much more likely that your feet will fly off the pedals when you hit a rock or bump in the trail. Try to stand up when descending or powering down on the pedals, which are the most common times riders lose contact with the pedals. Standing up is also much easier on the knees and lower back than being hunched over in the seated position. It forces a co-contraction of the hamstrings and quads at the knee joint to stabilize the knee at the bottom position, which does not happen as effectively when seated.
- 3) *Invest in shin pads.* Keeping your feet planted on your pedals will require you to stand more and to actively “ground” your feet into the pedals, two skills that will take time to develop. You will also learn how to slip a pedal and move your shin out of the path of the pedal. In the meantime, using shin pads can prevent a lot of pain.
- 4) *“Reset” your pedal stroke with running.* Several lab tests have shown that the majority of power is produced on the downstroke and that the upstroke is primarily to get the trailing leg back into position to drive down again, not to add power to the pedal stroke. This is how you run, and by engaging the running mechanics, you develop the lower body movement you need to pedal more effectively, especially when standing. Try sprinting 15-20 yards, repeating four times, and then mount your bike. Try to make your standing pedaling “feel” the same way, and be ready for an instant increase in pedaling power and foot stability.
- 5) *Get a good pair of shoes and flat pedals.* You should spend about \$100 on a pair of riding shoes with a sticky rubber sole and \$50-\$100 on a pair of flats.

References

Cebedo, Francis. *Round Up: Best New Flat Pedals*, MBTR and RoadBike Review, May 19, 2015. <http://reviews.mtbr.com/round-up-best-new-flat-pedals>, accessed March 1, 2016.

IPMBA, *Complete Guide to Public Safety Cycling*, 2nd Edition, Jones & Bartlett Learning, 2008.

Vital MTB. *How to Choose Mountain Bike Flat Pedal Shoes*, <http://www.vitalmtb.com/product/category/Flat-Pedal-Shoes,60>, accessed March 1, 2016.

Wilson, James. *The Flat Pedal Revolution Manifesto*. <http://www.bikejames.com/strength/the-flat-pedal-revolution-manifesto-how-to-improve-your-riding-with-flat-pedals/>, accessed March 7, 2016.

Wilson, James. *Shoe, Pedal, and Foot Placement Tips for Flat Pedals*: <https://youtu.be/Y31azZdx1gI>, accessed March 1, 2016.