

Time to Light Up

By Maury Brown

In case anyone hasn't noticed, the days are getting shorter. Evening group rides are now finishing after dark, and commuters and other solo riders face increased likelihood of being caught out after dark. It's time to get out the bike lights, or perhaps invest in your first set, or an upgrade.

Bike lights serve two purposes: to make the rider visible to motorists, and to illuminate the path of the rider. While most lights designed for cycling provide adequate visibility, not all headlamps are powerful enough to light the road ahead.

Be Seen

Visibility to other users of the road is absolutely essential to safe riding in low light or dark conditions. Just because you can see where you are going at dawn or dusk, or on lit streets, doesn't mean that drivers can see you from a safe distance. The earlier a driver sees a cyclist, the better the chances of safely avoiding an accident. The cheapest and most basic lighting systems can alert drivers to the presence of a cyclist from a significant distance. These little LED blinky lights are widely available at bike shops. Many of them can run 100 hours or more on a set of batteries. The headlights are generally mounted to the handlebar. The tail lights are mounted to the seat post, a seat stay, the helmet, or clipped to the rider's clothing. They are compact and light-weight. A pair of these lights can be had for less than \$30.

The tail light is probably the most important light of all for cyclists riding in traffic: it allows you to be seen from behind. If I had no other light, I would want a good tail light. Be sure and mount it where it can be easily seen. Clipping it to a jersey pocket may result in it pointing in an ineffective angle. I have seen cyclists place them inside a jersey pocket, where they are somewhat visible through the fabric. While convenient, this is not very effective. If in doubt, ask someone to check your visibility from a block away.

When choosing a tail light, consider where you want to mount it and the type of battery it requires. Not all lights can be mounted in all positions. Many take AA or AAA batteries, but some take other types, which can be more expensive and harder to find.

A head light is also very important for visibility purposes. Drivers will pull out in front of you or make left turns across your path if they can't see you coming. The inexpensive LED lights have gotten better in the last few years, and are brighter than ever. However, most of them are still inadequate for actually lighting the road ahead of you.

Even though I have a powerful lighting system, there are times when I prefer to use the light-weight and convenient LED's. If visibility is my primary concern, if I'm doing a short ride on lit streets, if I'm carrying a light just in case I don't make it home before dark, the LED's are the way to go.

See Where You're Going

Throughout much of the year, those doing evening group rides or early morning commutes, will be out in very dark conditions, and will want a headlamp that is powerful enough to illuminate the road ahead. There are many headlights to choose from. They come in a wide range of price, which generally corresponds to performance. There are different measures of performance, however. Be sure and look at all of the performance specifications before buying a light.

The most obvious measure of performance is lighting power. How much you need depends on where you are riding and how fast you go. If your routes take you on unlit streets, you will depend upon your light to see where you're going, and avoid potholes. When you are climbing a steep hill, you don't need to see the pavement 30 feet ahead. When you are descending that hill at over 30mph, you do. I would suggest buying the most powerful light you can afford. Many lights have two or three different brightness settings. If you don't need full power, you can dim the light and conserve your battery.

Battery performance is another important consideration. Buy a light with an adequate run time for the kind of riding you do. Remember that the manufacturer's claimed run time is based on a new battery at about 70 degrees Fahrenheit. As your battery ages, its performance will decrease. Most of us use lights primarily during the cool or cold weather months. Cooler temperatures decrease run time. Cold temperatures can dramatically decrease run time. I have found that Lithium Ion batteries give about 50 percent of the manufacturer's claimed run time at temperatures below 35 degrees. Consider the charging convenience too. The first lighting system I bought required nine hours to charge the battery. If I forgot to plug in the battery before I went to work, I didn't get to ride that evening. Moreover, charging the battery longer than nine hours would result in damaging the battery, and shorter run times. Many batteries have much shorter charging

times and can safely be left on the charger beyond the minimum charging time.

Weight is another factor to consider. After spending thousands on a 17 pound bicycle, do you really want to weigh it down with a two pound lighting system? All other things being equal, the longer the run time, the bigger and heavier the battery. There are some lights that are very bright and very light, but they tend to also be very expensive, and have limited run times.

There are different types of headlight technology. Halogen lamps are reasonably affordable. Their power is measured in watts. Five or ten watt lamps give marginal performance for seeing the pavement. Fifteen and twenty watt lamps are better. HID (high intensity discharge) lamps are the brightest available, but quite expensive. Their power is also rated in watts, but multiply the wattage by three to compare light output with a halogen lamp. LED technology is evolving. LED lights range from inexpensive units that are adequate only for being seen, to new (much more expensive) models, some of which are claimed to be as powerful as HID lamps. One advantage of LED lamps over other types is their relatively low power draw. This leads to longer run times, and/or lighter batteries. LED lamp output is usually measured in lumens, making it difficult to compare power with other systems, for which lumen ratings may not be given. Wattage or lumen ratings are not the only measures of power, however. The design and quality of the reflectors and lenses will also affect the light quality and effective light output.

A final consideration with headlight choice is where to mount it: on the handlebar or the helmet. As many headlights can now be mounted in either position, you may have the option of experimenting with both to see which you prefer. There are advantages and disadvantages to either position. Be sure you know the mounting options of a light before purchasing it.

Mounting the headlight on the handlebar allows you to see the button and the power gauge (if it has one). The angle of the light can be adjusted exactly where you want it, and it will stay put. The bicycle will support the weight of the light and the battery. You will not have a cord running down your back, and you will not have to mess with your cord and battery every time you take off your helmet.

On the helmet, the light will always point the direction you are looking. You can point the light at a driver you're afraid might not have seen you. However, every time you move your hands to a different handlebar position, your headlight angle will change. Your helmet will feel heavier, and your body will support the weight of the lighting system. Keeping the battery in a jersey pocket, warmed by your body, can increase run time in cold weather. If you regularly ride more than one bike, you will not have to re-mount the light and cord every time you switch bikes.

Even after upgrading to a powerful headlight, it is a good idea to keep that cheap little LED light as a back-up light. Don't be left out in the dark.