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The Case for Daytime Running Lights



HOW ABOUT THIS, DARRYL?

INTRODUCTION

I was recently riding my bike during a sunny South Carolina morning. Someone rode by and smugly yelled to me, "hey your headlight is on." Yep, it was. I had a small, but bright headlight on my handlebars operating in "interrupted" flash mode. It was not a mistake. In fact, I also had two separate bike taillights operating at that moment. I always ride with an illuminated headlight and two taillights during the day. Some of my fellow riders think I'm silly for doing so. Perhaps you think so too? Hmmm.

So, you might ask, Darryl, why DO you ride with lights during the day? The short answer is that riding a bike with lights on during the day reduces accidents with motor vehicles. I'm not making that up, there is documented proof that bike riders using daytime lights are more visible to motorists than those without lights.

Few serious riders would ride at night without lights on our bikes, right? If you go to a good bike shop and tell them that you want to purchase bike lights, they likely will ask you if you want "see" or "be seen" lights. That's right, bike light manufacturers make lights to allow riders to (1)

better see things as they ride at night, and also, (2) to better be seen by motorists, pedestrians, and other bikers. Really? Yep, that's right. Why do they do that?

Well, it's common sense that a rider would want to illuminate their path at night...those lights would be "see" lights....meaning the rider is using the lights to see the road or path on which they are riding. What may not be as obvious is that we also need lights with tailored attributes that allow us to "be seen" better during daylight conditions. The reasons and logic for daylight running lights are revealed and affirmed in research.

Rather than copy and paste a bunch of research information into a witty column, I thought you might enjoy the following article from cyclingtips.com that I recently read. After you read it, please let me know if you still think I'm silly for using daytime lights.

The ABCs of Awareness

**By Lain Treloar
Cyclingtips.com**

PROLOGUE

There's a rider in Michigan who's got a story to tell, and it goes like this: he's out riding by himself one late afternoon, on his favourite backroad. Dappled sunlight and lengthening shadows of trees fall across the road. As it so often is for so many of us in these beautiful moments, the cyclist is perfectly at peace doing what he loves, on a perfectly peaceful evening. From the rear, he hears the familiar hum of a car approaching, and sticks to the shoulder. The car safely passes him and continues down the road and through the shadows into the sun – an apparently uneventful pass like this happens dozens of times every ride, hundreds of times a week, thousands of times a year. But this one's different. Ahead the car's brake lights come on as the car slows, then speeds up and drives on. The rider doesn't think much of it, until the brake lights illuminate again. The car comes to a standstill right in the middle of the lane. A guy gets out and stands next to his idling car, looking back towards the oncoming rider, waiting. The rider slows, curious and a little concerned about what he might encounter up the road but continues on. As the rider nears the stopped car, the driver waves him down and says, in the nicest possible way: "I did not see you at all back there. I just thought you should know – I thought you needed to know. I was paying attention, I drive this road often, but I never saw you. I had to stop and tell you."

And that's it. He gets back in his car and drives off. The cyclist continues his ride safely home.

It's not a particularly remarkable encounter in itself, but when you pause and insert yourself into the situation, it can get you thinking – little questions like 'how many times has this happened to me on this ride?'. Big questions like 'what if I'd been a foot further over?'. And when you confront that big question, really mull over the implications of it, two things might happen. You either get paralysed by fear and stop riding (but that's not an option, *really*), or you start thinking about how you can stack the deck to give yourself the best chance of being seen.

Bontrager has spent a lot of time thinking about rider safety as they've developed their growing range of visibility-enhancing products. Rather than embracing the prevailing wisdom around visibility – lights on at night, hi-vis gear at all times – Bontrager worked in partnership with the Visual Perception and Performance Lab at Clemson University to develop best practice recommendations to help cyclists increase their detectability.

Crucially, these recommendations acknowledge that to understand how to increase the safety of cyclists, you first need to understand a driver's visual perception. And once you've understood that, you've got a much clearer idea of what you need to do to increase the likelihood that you'll be seen. What they came up with was deceptively simple – indeed, as simple as ABC.

A: ALWAYS ON

Front and rear lights, day and night

Bontrager articulates a three-tiered hierarchy in relation to improving detectability of riders in their ABC – 'good, better, best'. The first tier, and easiest for any rider to put into practice, is the use of lights at all times on the bike, day or night. Bontrager's data from the Clemson University studies is just one demonstration of the benefits of this practice; a year-long [Danish study](#) involving almost 4,000 participants, showed a 19% reduction in likelihood of an accident when counting all accidents, and – most significantly – a 47% reduction in injury-causing accidents involving more than one party.

As telling as these results are, they're perhaps not a massive surprise – after all, the automotive industry has steadily introduced daytime running lights (DRLs) onto cars for some time now, partially off the back of studies showing a 25% reduction in collisions for cars using DRLs. However, the cycling industry was slow to catch on, focusing instead on lights for nighttime use – despite the fact that 80% of accidents involving bike riders occur during the day – and Bontrager's [Flare R tail light](#) was, they claim, the first cycling light designed with daytime use in mind.

Light brightness in the cycling industry is most commonly reported in lumens, a measure describing the amount of light produced by the source. It's an easily understood measure that works well as a selling tool – more must be better, right? – but it doesn't take into account the way the light is directed or the way a flash pattern catches attention, both of which have greater impact on a cyclist's visibility.

The team at Bontrager aimed to design a [range of lights](#) that would help riders stand out – not in a lab or to a light meter, but in the real world. Their testing determined that design rather than absolute power was the key determinant of conspicuity.

Bontrager's Flare R tail light, for instance, punches out 65 lumens – potent, but not class-leading in terms of absolute strength – yet is visible from 2km during the day and even further at night. Its interruptive flash pattern is specifically designed with varying lumen pops to increase detectability, while the focused lensing amplifies the light's beam to travel further. A light with a greater range is visible from farther away and gives drivers more time to react, – which could prove crucial for a potentially fast-moving, potentially distracted driver to recognise a cyclist, gauge their speed and trajectory, scan for other traffic and hazards and execute a safe pass. An undistracted driver's reaction time to an unexpected object is generally in the region of 2 seconds, but that's a best-case scenario and cyclists are up against a wealth of distractions both behind and beyond the dashboard.

To choose just one such distraction, the National Highway Traffic Safety Administration [estimates](#) that at any given moment in the United States, about 660,000 people are using mobile phones behind the wheel; 2.2% of all drivers are '[text-messaging or visibly manipulating handheld devices](#)' at any time. This figure has almost quadrupled over the past decade.

Bontrager's marketing around the use of daytime running lights uses the tagline, 'Be the Bigger Distraction'. Given the horrifying prevalence of driver distraction and its potentially lethal consequences, daytime running lights seem a canny choice.

B: BIOMOTION

Highlight your body's moving parts

Bontrager's second guideline – the 'better' in 'good, better, best' – is to pair lights with clothing that [accentuates the body's moving parts](#). People are great at recognising other people, and this is especially true when they're in motion. The familiar, repetitive motion of walking has been shown to be identifiable even in [cluttered visual environments](#), and cyclists who draw attention to their moving parts are [up to 83%](#) more noticeable.

Visual aids such as reflective and fluorescent materials are enormously helpful in highlighting this biological motion, in a couple of different ways.

Moving parts are far better at attracting attention than static ones. In a crowded streetscape, the motion of legs moving up and down identifies the moving shape as a person, giving a driver the time to react accordingly and pass. The familiar pedalling motion, meanwhile, is a cue that it's a cyclist – providing more detail around potential behaviour, speed and placement on the road.

Despite the wealth of fluorescent jackets and tops on the market, a cyclist's upper body isn't a star performer when it comes to drawing a driver's attention, as it's mostly static. Highlighting a body's moving parts with fluorescent or reflective material makes more sense, as the legs of a cyclist are squarely in a driver's field of view.

C: CONTRAST

Choose the right gear for day and night

Bontrager's final guideline, and best practice, is to pair lights and biomotion gear with the right clothing for the conditions you are riding in.

Fluorescent clothing is widely used in the cycling world, but its proper application is often misunderstood.. Fluorescent materials convert ultraviolet light and reflect it back in the visible spectrum, meaning they can be as much as 200-300% more visible in daytime than darker colours.

Fluorescent colours don't occur in nature, so they contrast strongly against natural surroundings. In fact, the use of fluorescent clothing has been found by one study to result in as much as a [53% lower risk of incident](#).

However, streetlights and car lights don't produce UV rays, meaning that after dark, fluorescent clothing is no more effective than any other colour. This misunderstood fact means that cyclists wearing fluorescent clothing tend to overestimate their visibility at night, and ride accordingly – potentially putting them at peril.

At night, reflective materials are the best solution, reflecting car headlights and making cyclists 72% more visible. These are particularly effective when drawing attention to moving parts. Through the use of reflective elements at the feet, knees and ankles, our innate ability to recognise biomotion is triggered. Reflective sidewalls on tyres are useful in improving side-on visibility, and the shape and spacing of the wheels is a clear visual indicator of a cyclist. There's a [growing market of gear](#) that combines reflective elements with fluorescent colouring, resulting in [apparel](#) that performs effectively regardless of the hour.

CONCLUSION

Okay fellow riders, there is ample food for thought in this great article. By focusing on the human factors around visual perception, this study has furthered our understanding of what makes riders safer and how to improve attentional capture of drivers on the road.

If you don't currently use lights on your bike, my hope is that you have sufficient information from this article to support a personal decision.

Until next time,

Make Every Ride Epic,
Darryl