

The big road.cc lights test: the data

How did this year's crop of lights compare in terms of output? Here's how

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by [dave_atkinson](#) on



Beam test comparison shot

Almost time for the clocks to go back again: that extra hour in bed doesn't really compensate for the long months of riding home from work in the dark, does it? You'll be needing some lights then. We've got a whole bunch of lights in on test and the full reviews will start going live from next week; we like to make a thorough job of things. Jo's had his [Exposure Flare](#) on the go for a whole year...

In the meantime, however, we thought we'd share our beam testing data with you so you have something to be going on with. We took all the lights that came into the office before our Big Test deadline - about 40 of them - and gave them all the once over. The great thing about lights is that it isn't just subjective: you can measure the beam and take directly comparable photos of what it looks like in real life. So that's what we done. Next thing you'll see is the results, below. And under that we'll explain what we did.

One23 Intense Bright 1
£28.99



One23 Super Bright 0.5
£16.29



Knog Boomer £23.99



So, what did you do?

The meat of the testing is the beam data, which we've made into natty graphs so you can compare and contrast the different lights. Light manufacturers use a number of different metrics to describe light output. Top of the pile right now is lumens, which is a measure of the total output of the light across the whole beam. Some cheaper lights use candlepower, candela or lux, which are measurements of the brightest part of the beam at a set distance. We've used lux here, but measured at a number of points across the width of the beam. That gives an indication of the brightness of the beam at the centre, the amount of peripheral light and the shape of the beam. Specifically, we measured the lux value of the beam at two metres distance, in 10cm increments from the centre of the beam to 0.9m from the centre, giving ten readings.

On top of that, we took all the lights out into the lanes one dark night, and set up a bike on a rig so that we could photograph the beams of all the different lights in a comparable way. Each of the beam shots you can see above was taken on the same night, attached to the same bike, and using the same settings on the camera. Specifically, they're all shot from directly above the saddle, using a 28mm lens on a Canon EOS550D (effective 45mm),



they can be, they're directly comparable to one another. If one looks brighter than another, that's because it was.

Is that it, then?

No, of course not. A super-bright beam isn't much use if the light ends up in a hedge after the first pothole, or fizzles out when it starts raining. We'll be subjecting all the lights to the rigours of the road.cc testing process and when we're happy that we've thrashed them they'll each get a full review. We'll include the comparison tool in each review too. In the meantime, we thought you'd like to see how they fared.

A word about logs

The graph displaying the beam data uses a logarithmic scale to display the output of the lights. If you understand or care about such things, here's why:

Firstly, light beams follow an inverse square law regarding the strength of the light at increasing distance, because they're illuminating a two-dimensional plane. So at twice the distance, the light beam is spread over four times the area. Consequently, a light that is measured as twice as bright at its centre won't let you see twice as far. The logarithmic scale produces a more realistic comparison because of this.

Secondly, the variations in the amount of peripheral light, though much smaller than the variations in the centre, make a big difference to how much peripheral vision you get. The logarithmic scale amplifies these differences relative to the centre of the beam, so it's easier to see which unit is putting out more light at the sides.

A word about prototypes

Some of the lights we tested – specifically, the Silva Singletrack and the three Lezyne lights – were pre-production samples. So far as we're aware, having talked to the manufacturers, they're as close to the production lights as makes no odds. But when we receive production samples we will re-test them.

A word about the Germans

Some of the lights on test don't have a uniform circular beam pattern. Some, like the Exposure Strada, are a bit flattened. Others, like the Trelock LS-950, the B&M Ixon IQ and the Cateye Econom 540, have a very square beam pattern that's designed to comply with the German road lighting regulations which specify strict limits for the amount of the beam that's allowed to land anywhere other than the road. You can see how the beam pattern looks on the beam shots.

Because of this, the beam values are a bit inflated because there's more light concentrated in the axis we're measuring, and less illuminating the tree canopy. It doesn't skew the data hugely though, and the beam graph in conjunction with the beam shot should give you the whole story.

Brand: One23

Product: Ultra Bright & Super Bright

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