

**Zero Electric Bike
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The following text was originally published at website for BMW Sport-Touring forum, June, 2010.

I had a test ride this morning on the Zero electric bike in a large parking lot at York University (sponsored by a physics professor who likes EVs). Goes really fast but not far and top speed around 70 mph (105 kph). Excellent engineering in every way to achieve the goals of the designer – with light weight being very high on that list.

[Zero website](#)

Feels like a 125 cc light dirt bike. Smooth as could be and silent, which is kind of weird. There's a risk you'll grab the throttle and twist it inadvertently at "idle" and it will take off to your surprise. Without engine braking (no regeneration here) the grabbers have to do all the braking. They're OK but more disks would be better but heavier, of course.

Live better electrically.



Spokes! SS brake lines! Pretty disks! No tach, eh. But has both speedo dial and digital!



Where is the rest of the motor? Won't do wheelies but takes off real smartly. Street legal!



Some people (on the forum) argue an electric bike has to have all the same performance parameters as an internal combustion bike. But isn't that just a bit too tightly focused on today's IC bikes? Seems to me that Detroit has spewed that sentiment (I struggle to find nice words to describe Detroit-logic) about everything from tailfins to engine displacement.

You could just as easily say, until they have as many gas stations as electric outlets in the world, I ain't buying a stinking dangerous gasoline bike. Or, just a handful of foreign countries got you by the shorthairs when you pump gas, Canada excepted. Or waste of time playing with gears when all you need is electric torque. Or arrive rested, not shaken-and-stirred by a twin engine. Or 25-cents a "fill-up" is dandy. Or give me a 200 lb very fast bike any day.

Not entirely kidding.

Yes, 40 highway miles is pretty slim range and nobody has mentioned the price of lithium replacement batteries (don't ask.... like \$4000 – has a gazillion little lithium cells).

I would say this: the Zero S is a great ride for short hops. Quite a nice experience twisting the throttle and having the well-designed and constructed bike pull away strong, silent, no slipping clutches, and gear-free. Probably riding with no engine braking and letting the brakes do all the braking makes more sense too even if it feels pretty odd at first.

Regenerative braking (when the bike is coasting, makes it pump electricity *back* into the battery) is a natural good idea. But... the issues are a bit different with bikes: weight, complexity, space/shape, cost, differences in the motor, kinds of stop-and-go proportions....

At the best, maybe 10% regenerated power is possible, Zero told me today. Who knows?

I think they really need two kinds of "jerry cans" - one that is a small box with a tiny engine-generator set (using model airplane engines - you read it here first) and one that lets you cannibalize car batteries with jumper cables.

About this Detroit-think thing again, yes, of course, obviously, some differences from today's stuff are different and some pretty severe. Not helpful to repeat the obvious limitations again and again. For the moment, these limitations and their expression in terms of selling price, keep me remote from being a buyer.

I didn't mention that one model is off-road. Range not as big an issue there but maybe the torque, smooth power roll-on, and no gear shifting makes that a natural application.

The question is whether creative people like David R can think of ways to get around the limitations, to nudge the technology forward, or otherwise to make progress.

The Zero designer, a very clever person with experience in NASA and high-tech bicycles, opted to trade cruising range for performance. Do I hear anybody on this forum complaining? Would you prefer a bike that topped out at 30 mph but went 100 miles on a charge? He opted for fast, very very light (that means "expensive," eh), and competent handling.

As far as I can tell, and I don't want to sound like I'm shilling for the company, the replaceable part, the battery, is the core limitation. That can improve.

But back to Detroit-think. Anybody hear ever hear their friends and relatives wonder why any sane person would buy a motorcycle that gets you and the bike soaking wet EVERY TIME you get caught in a little rain. Heard that once, twice, or a million times? Sound to you like some kind of severe shortcoming of the mode?

Someone said wouldn't it be terrible if everybody in town recharged their bikes at 5 PM. So I say: 5 PM, that *would* be terrible.

But in Ontario, homes and users have smart meters and time-of-day pricing. 9 PM till like 7 AM and all day weekends and holidays, electricity is like 4.5-cents per megawatt-hour versus 9.8-cents at peak. Almost trouble giving the stuff away at off-peak times.

Electric systems are costly almost according to peak use and making the stuff is the small

part of the cost. Also, in the future, cars sitting in garages might put some juice back into the system at peak times.

A person at the BMW Sport-Touring website commented:

I just got back from China where the majority of the personal scooters (not taking into account the delivery bikes here) in the big cities appear to have been replaced by electric ones with a range of about 40km/25miles and a purchase price of about 300euros/360USD. Even the Chinese find them reasonably priced, but then they're made ultra-cheaply in the home market.

I know its not the same playground or performance as we want for our electric tourers, but it shocked me as to how, in the right market with the right user profile electric bikes are viable- especially for in-town commutes. Plus, here in Holland we have excellent cycle/scooter lanes and it's so flat...

Electric wont push you up a mountain for three hours, but if people were to switch from using cars in towns- what a difference.

How did Beijing/Peking clean its air up for the Olympics? You can bet getting all those 2-strokes off the streets helped (yeah, the new, awesome subway too)!