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Your Blue Line train may have something in common with a hybrid car

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By **Matt Rocheleau**

GLOBE STAFF JULY 14, 2016

The MBTA has been quietly testing a new system that would recycle the energy lost when subway trains brake, as hybrid cars do, and leaders at the agency say they're encouraged by the savings

they've seen so far.

“We're still pretty early on in figuring this out, but so far, everything has worked really well,” said Andrew D. Brennan, director of energy and environment at the T.

It takes a considerable amount of power, supplied as electricity through the third rail, to get a train moving. Every time a train brakes, energy is lost as heat as the brake pads work to slow the vehicle down.

New technology has made it possible for that energy to be captured, stored and later reused, instead of lost.

The agency launched its pilot project in spring 2015 at the Blue Line's Airport Station, partnering with South Korea-based company Woojin Industrial Systems. The company fronted the cost to install equipment that collects the energy from braking and stores it via the third rail in a nearby supercapacitor. The supercapacitor then can send energy back out through the third rail to power other trains.

“It's the basic concept that makes a hybrid car work,” said Brennan.

T officials estimate the system reduced energy consumption at Airport Station by about 10 percent over the first year, resulting in about \$20,000 in savings. The agency estimates the system also increased the life of train brakes, saving the agency another \$27,000 in maintenance for the year.

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Officials said the system also provides a smoother flow of energy that reduces the wear and tear on, and increases the lifespan of, other components, including propulsion equipment. Officials said they have not quantified the savings generated that way.

The T is now studying other stations where it may be able to deploy the technology. Officials said they expected to outline a list of potential locations by next spring, and, if all

goes well, hope to have more units installed within several years.

The feasibility of installing the system elsewhere, and any potential cost savings, will vary by station, officials said.

The system would have the biggest payoff when installed at stations where trains are likely to approach at higher speeds, including other segments of the Blue Line and the Green Line. Stations in congested downtown areas may not work well since trains there travel shorter distances and reach lower peak speeds.

The T will wait to install equipment along the Red and Orange lines until new vehicles, currently in production, arrive.

Any additional reductions in energy expenditures would be welcome for the T, which officials said is the largest electricity consumer in the state.

In the most recent fiscal year, the agency consumed about 435 million kilowatt hours of electricity, which cost \$42.5 million.

Officials said that, for now, the agency plans to reuse any energy the new technology captures, but plans to later explore selling energy back to the grid.

While Woojin fronted the cost of the equipment for the proof-of-concept project, the T would have to pay for any other installations going forward.

The cost of the equipment can vary by location, but Woojin officials said the equipment installed at Airport Station is worth just over \$1 million.

Other public transit systems have installed similar systems in recent years, including [Philadelphia](#) and Los Angeles, officials said.

The project with the T marked Woojin's first use of the technology in North America, said Joseph Sang-Hyun Kim, vice president and chief operating officer of the company's US-based subsidiary. The company has installed a dozen similar units for rail systems in South Korea.

Kim said that the basic concepts behind the technology are not new, but it took years before the

technology could be adapted for practical use in public transit systems.

The project is [one of a number of steps](#) the T has taken recently to reduce energy consumption and its carbon footprint.

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