

# Field Test DELTA: PV Lighting Retrofit Kit for Bus Shelters

The DELTA research team at the LRC tested a field installation of a photovoltaic (PV) lighting retrofit kit for bus shelters. The kit is designed to backlight advertising signs with lights powered by PV cells mounted on top of the shelter. DELTA tested the kit to verify its performance over an extended period and to gauge public reaction to the bus shelter at night.

## Product description

The PV retrofit kit is installed on existing bus shelters and contains flexible PV panels (shaped to fit the barrel-vaulted roof), batteries, controller, timer relay, photosensor, and a fluorescent luminaire. The panels charge the batteries, and the controller determines charging times. The photosensor informs the controller when to turn on the backlighting, and the timer relay turns the system off after a set period.

## Field evaluation

DELTA evaluated 12 retrofitted shelters throughout Long Island, N.Y., by:

- Testing the ballast's electrical conditions
- Measuring photometric conditions on a prototype
- Checking for consistent operation
- Calculating energy use and environmental impact
- Verifying visibility and collecting subjective opinions from bus shelter users

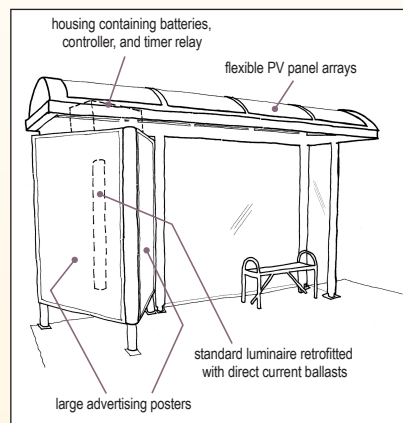
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**Field Test DELTA: Photovoltaic Lighting  
Retrofit Kit For Bus Shelters** is available at  
[www.lrc.rpi.edu/programs/delta](http://www.lrc.rpi.edu/programs/delta).



An enclosed space at one end of the shelter forms a light box for backlighting two advertising signs. The light box holds a linear fluorescent luminaire with two T8 lamps and two dc ballasts. The backlighting system is powered by batteries that are recharged by roof-mounted PV panels.

## Findings and recommendations

- The PV lighting systems operated reliably and effectively with no utility-powered electricity, providing significant energy savings over similar, non-retrofitted shelters (0 kWh vs. 4993 kWh per year).
- People equally accepted the PV shelters and shelters with higher-wattage mercury vapor lamps.
- The luminance of the sign was uniform and comfortable to look at, but may need to be increased to visually "compete" in typical commercial boulevard environments.

