

# SMART SHELTER

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Smart Shelters are outdoor transit shelters that integrate Landscape Forms structure with solar powered LED lighting. Smart Shelter's combination of high-design structure and cutting edge solar lighting is unique in the industry.

Smart Shelter technology was developed in response to customer requests for an illuminated transportation shelter requiring no external power that could reliably meet the tough demands of urban environments. They are rugged, durable, cost-effective and low maintenance solutions for cities and transit agencies that enhances safety, security and service.



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## Safety

Smart Shelter supports public safety during nighttime hours. People using the shelter can see curbs and pavement for safer footing. Dark corners are illuminated, enabling users to see who is in the shelter before they enter. Continuous low-level lighting reduces loitering and vandalism.

## Security

Smart Shelter lights continue to function even in power emergencies. The level of light in the occupied shelter enables waiting riders to see the faces of other people — a key factor in measures of comfort and security.

Smart Shelter is a self-contained system. The canopy is fitted with a solar engine consisting of solar panel, battery-pack and power management microprocessor. Thin, low profile solar panels are neatly integrated into the canopy, avoiding the visual clutter associated with some solar technology. Under the canopy, light fixtures illuminated by high-intensity LEDs provide dusk to dawn lighting. Because it requires no external power, Smart Shelters eliminate disruptions in service and the trenching and installation costs associated with hardwiring. Smart Shelter lighting is designed to operate with no scheduled maintenance for up to 5 years, after which the battery packs can be replaced and recycled.

## The Benefits of Being Smart:

- Smart Shelters are solar powered. It is environmentally responsible in its reliance on sustainable energy. The absence of hardwiring saves on installation, maintenance and energy costs. The use of a renewable energy resource enhances the profile of public transportation as a sustainable enterprise.
- Smart Shelters are off the grid. In case of power emergencies due to natural or man-made causes, it continues to provide light.
- Smart Shelters are intelligent. Microprocessor technology automatically turns lights on at dusk and off at dawn.
- Smart Shelters are efficient. LED lamps are powered by silicon chips which require a much smaller electrical charge than incandescent bulbs, and waste almost no energy through heat dissipation. And high-intensity LEDs have a life up to 100,000 hours. As a result, they are 100 times as efficient at producing light as incandescent bulbs and last about 20 times longer.
- Smart Shelters are state of the art. They integrate solar powered LED lighting developed for commercial applications where durability and reliability are the bottom line. The crystalline solar panels have been tested under extreme environmental conditions and are more efficient than solar panels used in consumer products. These lights are used by the US armed forces and in industrial/commercial applications, including buoys, piers, wharves and aquaculture facilities, around the world.
- Smart Shelters are environmentally healthy. Light color mimics natural moon light, avoiding blue light health hazards, and is directed to avoid light pollution.

## How Smart Shelter Works:

The solar panel collects energy from the sun and converts it to electrical current. Energy is stored in fully recyclable valve regulated lead-acid batteries that provide enough energy capacity to deliver extremely reliable power output over a long period of time. (expected battery life is five years) The solar system begins charging at dawn and discharging at dusk when the LED lights automatically turn on.

Smart Shelters require adequate sunlight and suitable ambient temperature to function effectively. It is a viable solution for areas with an average of at least 3 hours or more sunlight per day year round, at latitudes within 50° North or South, and at a temperature range of -30° F to 122° F. Care must be taken in the placement of shelters. Even in sunny locations the light will not function if the shelter canopy is in the shade for most of the day. Smart Shelters will provide five nights of lighting from fully charged batteries.

Smart Shelters meet Landscape Forms' stringent standards of quality, durability and performance. It is covered by the Landscape Forms three-year warranty. Batteries are replaceable and can be recycled locally. Contact Landscape Forms for replacement and recycling information.

## Kaleidoscope OS:

Illuminated Area	Inside the shelter
Illumination Level ( <i>all night</i> )	1.0 foot candle at seat level (10 lux)
LAMP	Cree XR-E 1.3w LED(s)
Color Temp	3,700 °K warm white
LED Working Life	Up to 100,000 hours
Luminaire Dimensions	115mm square
Solar Panel	(2) Flexible, triple-junction-silicon solar cells (40 watt total) protected with UV stabilized polymers
Battery	(3) 12 Volt 18 AH sealed valve regulated lead acid with spill proof construction Fully recyclable
Power Management	Morningstar SunLight
Minimum Autonomy	5 nights with no sunlight
Operating Temperature	-30° F to 122° F
Latitude Range	50° S to 50° N

## Connect:

Illuminated Area	Inside the shelter and to the curb
Illumination Level	1 foot candle max, .5 fc min
LAMP	(18) or (30) Avago Technologies .5 w LED's
Color Temp	3,700 °K warm white
LED Working Life	Up to 100,000 hours
Luminaire dimensions	Integrated
Solar Panel	Uni-Solar PVL-68T
Battery	(14) or (20) Panasonic 6V 7.2 AH wired in series and parallel
Power Management	Morningstar SunLight
Minimum Autonomy	6 nights with no sunlight
Operating Temperature	-30° F to 122° F
Latitude Range	50° S to 50° N