



## It's Not Just About the Technology: Accelerating Adoption of Energy Saving Approaches to Parking Facilities

Thursday, May 8, 3:30 - 5:00 PM

### Moderator:

Paul Wessel, Green Parking Council

### Speakers:

Chris Magee

MGM Resorts International

Nicholas Stolatis

TIAA-CREF

# Session Overview

- Welcome, Introductions, Agenda Review *Paul Wessel, GPC*
- Parking Market: Energy Opportunities *Paul Wessel, GPC*  
*Jeff McCullough, PNNL*
- What's a "LEEP"? *Linda Sandahl, PNNL*
- MGM & LEEP *Chris Magee, MGM*
- Green Garage Certification *Paul Wessel, GPC*
- TIAA-CREF & Green Garage Certification *Nicholas Stolatis,*  
*TIAA-CREF*
- Challenges & Opportunities: Discussion *All*
- Next Steps *Paul Wessel, GPC*

# The Parking Market

- "[Parking] is the single biggest land use in any city. It's kind of like dark matter in the universe, we know it's there, but we don't have any idea how much there is."  
- *Professor Donald Shoup, UCLA*
- \$24-25 billion industry, highly fragmented but experiencing consolidation and outsourcing of operations
- 100 - 800 million parking spaces in the US
- 40,000 parking garages with paid spots
- 3000 parking companies with \$8 billion annual revenue

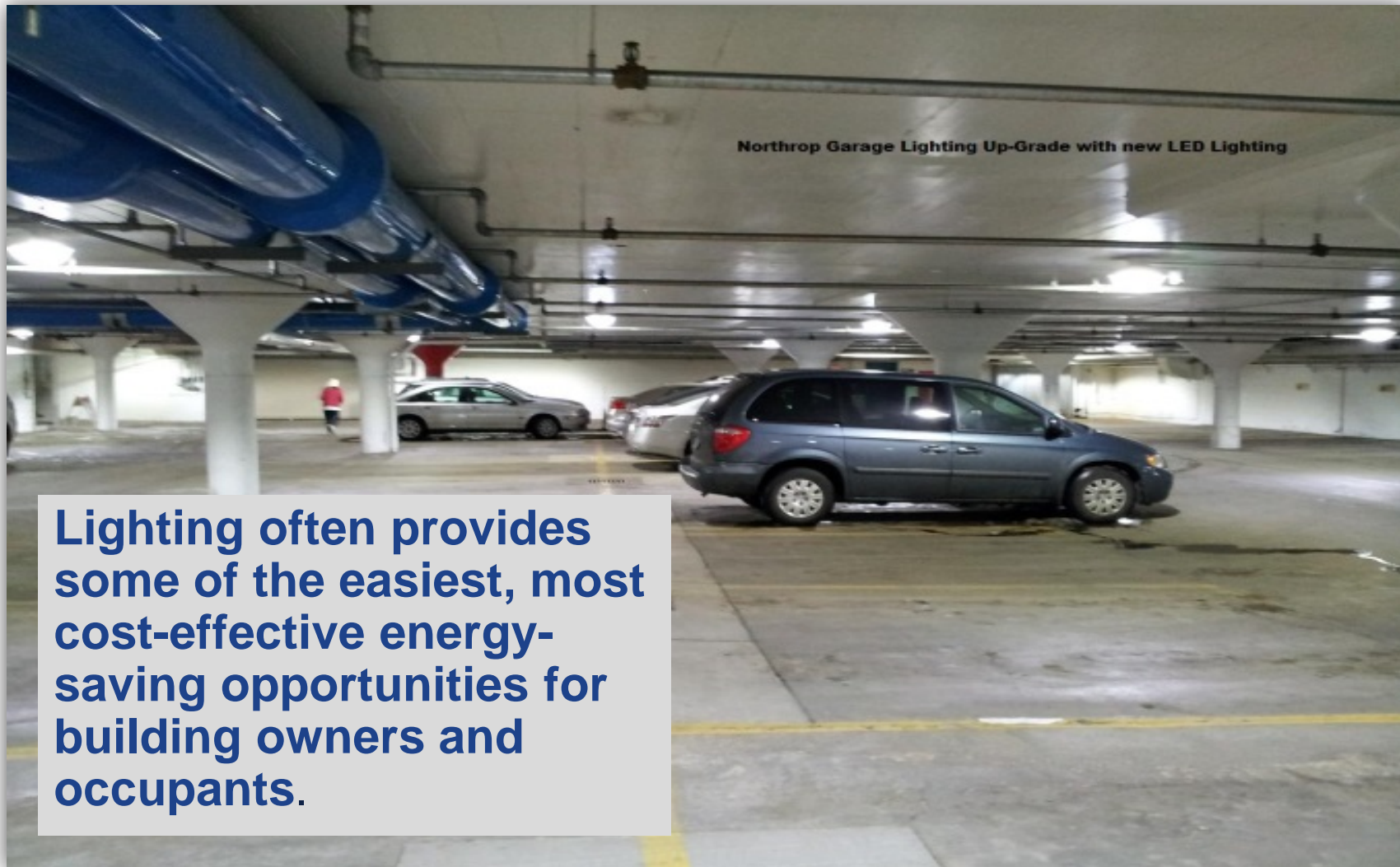


# Parking Market Segments

- Commercial
- Universities
- Airports
- Hospitals
- Hotels
- Municipal
- Shopping Mall



# High Performance Parking Lighting



# Parking Lighting Energy Opportunity

## The Opportunity

The nation could save  
 $\approx 187$  TBtu annually or  
 $\approx \$1.84$  billion  
with high efficiency  
parking lighting



# Lighting Energy Efficiency in Parking (LEEP) Campaign

Organizers:



Federal Energy Management Program



Better Buildings Alliance

Resources:



Cleveland Clinic Goes LED in Parking Garages

Cleveland, Ohio



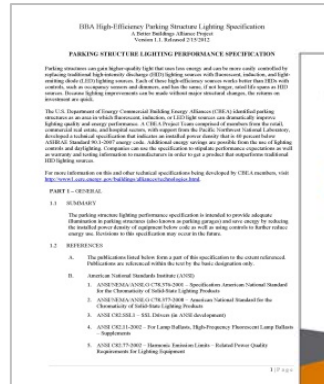
CBEA LED Site (Parking Lot) Lighting Specification

The U.S. Department of Energy (DOE), its national laboratories, and Commercial Building Energy Alliance (CBEA) members are working to support the market introduction of light-emitting diode (LED) parking lot lighting. A CBEA Project Team is focused on making reliable, energy-efficient, and competitively priced outdoor

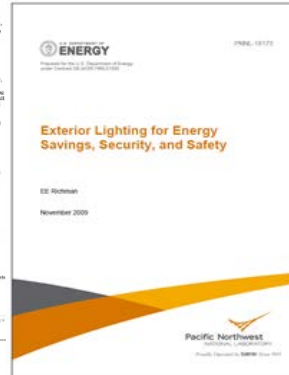


A Ward in Leavenworth, Kansas, just the first retail parking lot designed from scratch to meet the CBEA LED parking lot lighting specification. The operation is aimed at a test site and is not intended to demonstrate the viability of expanding LED parking lot lighting throughout national street networks.

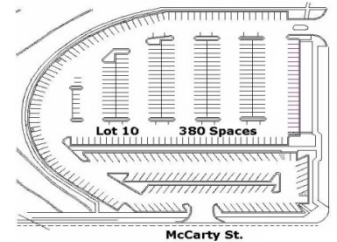
Case Studies



Specifications



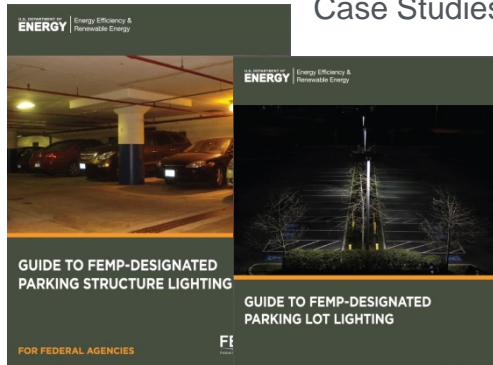
M&V guidance



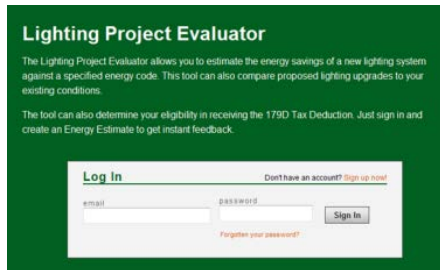
Technical Assistance (limited)

List of utility incentives

Parking Garage	Utility	State	Technology	Product	Rebate Amount
	Alliant Energy	IA	LED	Fixture	\$30
	Alliant Energy	IA	Controls	Occupancy Sensor	\$20



Design Vignettes



Energy Estimator to compare against code



A Program of the U.S. DOE



Webinars

# Parking Lighting Market – challenges and possibilities (continued)

## LEEP Campaign Year 1 results:

- over 100 Participants
- over 160M sq ft of installed parking space
- about 45 million kWh/year saved
- Recognition
- It can be done!





# LEEP Award Winners - 2014

Awardee	Category
Cox Enterprises, Inc.	Highest Absolute Annual Energy Savings in a Retrofit at a Single Parking Area
MC Realty Group LLC	Highest Absolute Annual Energy Savings in a Retrofit at a Single Parking Structure
<b>MGM Resorts International</b>	<b>Highest Absolute Annual Energy Savings in a Retrofit at a Single Parking Structure</b>
<b>MGM Resorts International</b>	<b>Largest Percentage of Facilities Upgraded (minimum of five facilities)</b>
Regency Centers	Highest Percentage Energy Savings in a Retrofit at a Single Parking Area
Marine Corps Base Quantico	Highest Percentage Energy Savings in a Retrofit at a Single Parking Area
Walmart Stores, Inc	Highest Percentage Energy Savings in a Retrofit at a Single Parking Area
Walmart Stores, Inc	Highest Absolute Annual Energy Savings in a New Construction Single Parking Area
Walmart Stores, Inc	Highest Percentage Energy Savings in a New Construction Single Parking Area
Walmart Stores, Inc	Largest Portfolio-wide Annual Absolute Energy Savings
Thedacare	Highest Percentage Energy Savings in a Retrofit at a Single Parking Structure
University of Minnesota	Highest Percentage Energy Savings in a Retrofit at a Single Parking Structure
JBG Companies	Highest Absolute Annual Energy Savings in a New Construction Single Parking Structure
JBG Companies	Highest Percentage Energy Savings in a New Construction Single Parking Structure
California Lighting Technology Center	Best Use of Lighting Controls in a Single Facility
Howard Hughes Corporation	Best Use of Lighting Controls in a Single Facility
Kimco Realty Corporation	Largest Absolute Number of Facility Upgrades

# MGM Resorts International: LEEP and the Property Owner



# MGM Resorts International: LEEP and the Property Owner

- What we did and why
- Obstacles, challenges & opportunities
- Lessons learned

**Award Category:**

***Highest Absolute Annual Energy Savings in a Retrofit at a Single Parking Structure***



# ***MGM Detroit Grand*** **MGM Resorts International**

- Location: Detroit, MI
- Square Feet: 2,657,160 sq ft
- Parking Spaces: 5,233
- Key Features: Conversion from metal halide to LED

	<b>Existing</b>	<b>New</b>	<b>Energy Savings</b>
Energy Use	4,993,796 kWh	1,015,248 kWh	3,978,548 kWh
Lighting Power Density (LPD)	0.25	0.05	---

**Award Category:**

***Largest Percentage of Facilities Upgraded (minimum of five facilities)***

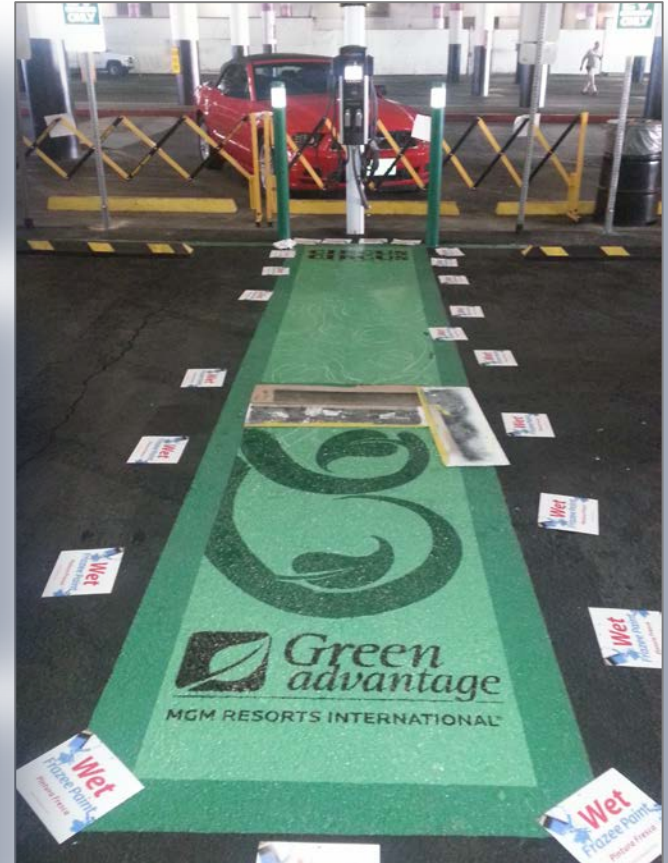
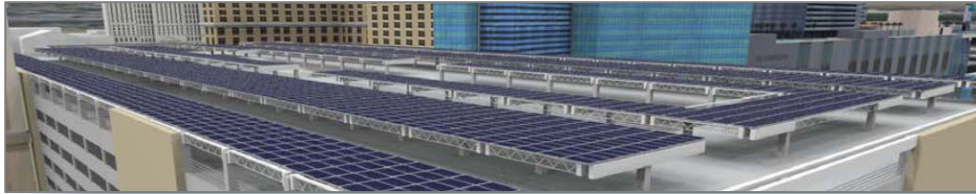


## ***MGM Facilities*** **MGM Resorts International**

- Location: Various locations
- Area: 8,000,000 sq ft (submitted for awards)
- Number of sites: 13 (65% of total sites)
- Key Features: Removed metal halide and high pressure sodium lighting – reduced wattage and increased lamp life

	<b>Existing</b>	<b>New</b>	<b>Energy Savings</b>
Average	645,587 kWh	189,667 kWh	455,919 kWh
Lighting Power Density (LPD)	0.11	0.04	---

# MGM Resorts International: Garages beyond lighting





**BMW GROUP**



Northeast Utilities

TRANSCORE



TOWNE PARK



impark



OSRAM SYLVANIA



Central Parking System

AMPCO SYSTEM PARKING

INTEC CONTROLS  
A Wilson Mohr Company



juice bar™  
FREE EV CAR JUICE™

SCHEIDT & BACHMANN SB

MACERICH  
The Road to Remarkable

SIMON PROPERTY GROUP

OLX FLOID



Standard Parking®  
Superior People. Superior Performance.

Propark AMERICA

Hines

DENISON PARKING

AmeriPark

Carl Walker  
Parking Planning Engineering Restoration

LAZ PARKING

chargepoint

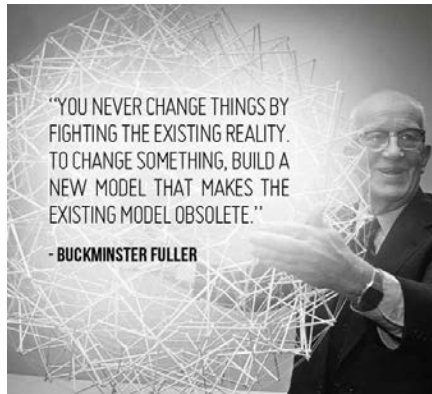
Brookfield

AMANO McGANN



Brandywine Realty Trust

# GPC's Green Garage Certification





"All the News  
That's Fit to Print"

# The New York Times

Late Edition

Today, sun followed by increasing clouds, high 68. Tonight, cloudy, periodic rain, low 51. Tomorrow, mostly cloudy, colder, patchy rain, high 59. Weather map is on Page C8.

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\$2.50

## Chinese Giant Will Go Public, Listing in U.S.

### Price Tag Could Eclipse Silicon Valley Rivals

This article is by Vinu Goel,  
Michael J. de la Merced and Neil  
Gough.

The Chinese e-commerce behemoth the Alibaba Group filed paperwork on Tuesday in the United States to sell stock to the public for the first time, in an embrace of the global capital markets that represents a coming-of-age for China's booming Internet industry.

"Alibaba is the fastest-growing Internet company in one of the fastest-growing economies in the world," said Sameer Sinha, an analyst with B. Riley & Company, a boutique investment bank in Los Angeles. "They are like an Amazon, an eBay and a PayPal."

In the filing, Alibaba said it intended to raise \$1 billion in an initial public offering — a figure used to calculate its registration fee. But the company is expected ultimately to raise \$15 billion to \$20 billion, which would make it the biggest American I.P.O. since Facebook's \$16 billion offering in May 2012.

When it makes its debut on the New York Stock Exchange or the Nasdaq market, Alibaba is also expected to have a share price that could value the company at roughly \$200 billion — more than the market value of Facebook, Amazon.com or eBay, although still trailing that of Google or Apple. [Page B1.]

The immense size of the offering means that Alibaba shares will probably find a home in many mutual funds and pension funds — and thus indirectly in the portfolios of small investors around the world.

Wall Street has been eagerly awaiting the Alibaba I.P.O., seeing it as perhaps the best chance yet to bet on China's growth. Double-digit growth is expected

## NEW ABDUCTIONS DISTRESS NIGERIA; U.S. OFFERS HELP

### NO GIRLS RESCUED YET

### 11 Taken, Local Officials Say — Terror Group Is Suspected

By ADAM NOSSITER

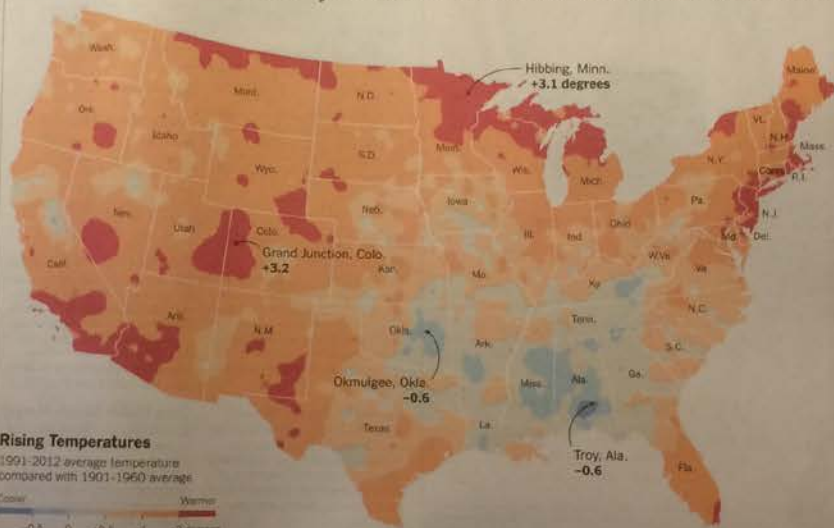
ABUJA, Nigeria — A second kidnapping of schoolgirls in Nigeria's northeast by Islamist militants put new pressure on the country's troubled government, which had been hoping to showcase its emergence as Africa's largest economy this week but instead has been forced to confront its failure to contain a growing insurgency in its north.

Men suspected of being fighters from the radical group Boko Haram kidnapped 11 more girls in Nigeria's northeast, local officials said Tuesday, an intensification of its campaign against female education and the Nigerian government since the abduction of hundreds of schoolgirls three weeks ago.

The spectacle of red-shirted protesters in the streets of the capital here, angry at the government for its tepid response to the crisis, put President Goodluck Jonathan under an uncomfortable spotlight as executives from across the world arrived in private jets to attend the Africa meeting of the World Economic Forum, the continent's answer to Davos.

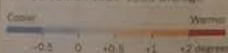
The authorities here — and particularly the military, itself implicated in numerous massacres of civilians — appear to be floundering in their response to a crisis that social media have transformed into a cause célèbre. The new kidnappings underlined the inability of the Nigerian government to protect civilians from the growing insurgency. Not a

## U.S. CLIMATE HAS ALREADY CHANGED, STUDY FINDS, CITING HEAT AND FLOODS



### Rising Temperatures

1991-2012 average temperature compared with 1901-1960 average



Source: National Climatic Data Center

TIMOTHY WALLACE/THE NEW YORK TIMES

## Sotomayor Finds Her Voice Among Justices

By ADAM LIPTAK

WASHINGTON — "I am a lawyer's judge," Justice Sonia Sotomayor said last year. "I write very technically."

That was true at the time. But something has changed in the current Supreme Court term. In opinions concerning human rights abuses, the death penalty and, most notably, affirmative action, Justice Sotomayor has found her voice.

"She's setting a public agenda," said Cristina Rodriguez, a

### In 5th Year, Speaking Out With Questions and Vivid Dissents

any other justice. In the current one, she has staked out positions that have led to testy exchanges with colleagues across the ideological spectrum.

She is a kind of folk hero to the adoring crowds who attend her public appearances by the thou-

coration that inevitably results from elevating ethnic-identity politics over the law." Linda Chavez, a New York Post columnist, said Justice Sotomayor was "unable to divorce her legal reasoning from her own sense of racial grievance."

Both articles said Justice Sotomayor's reasoning was of a piece with her most famous comment, made in a 2001 speech as a federal appeals court judge.

"I would hope," she said, "that a wise Latina woman with the richness of her experiences would

### Issue Moves 'Firmly Into the Present' for the Nation

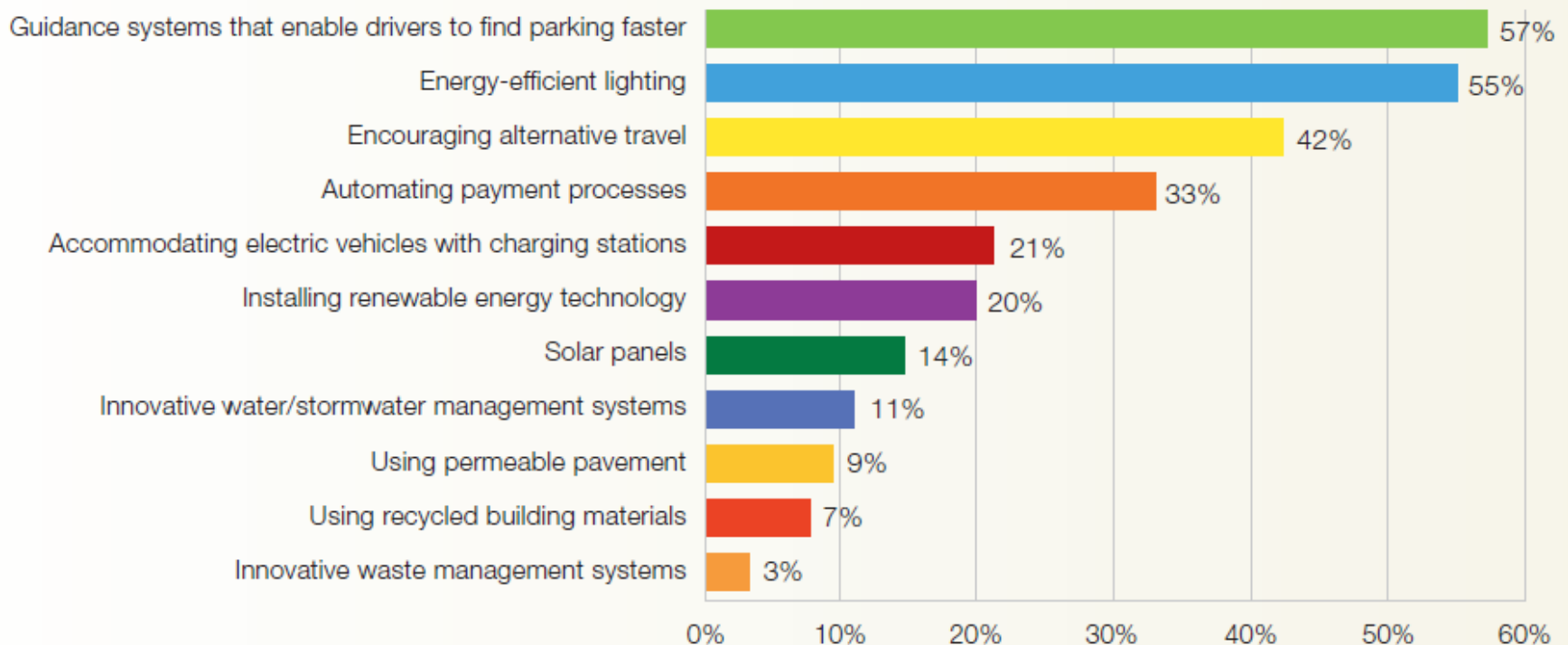
By JUSTIN GILLIS

The effects of human-induced climate change are being felt in every corner of the United States, scientists reported Tuesday, with water growing scarcer in dry regions, torrential rains increasing in wet regions, heat waves becoming more common and more severe, wildfires growing worse, and forests being under attack

# Sustainability & Parking

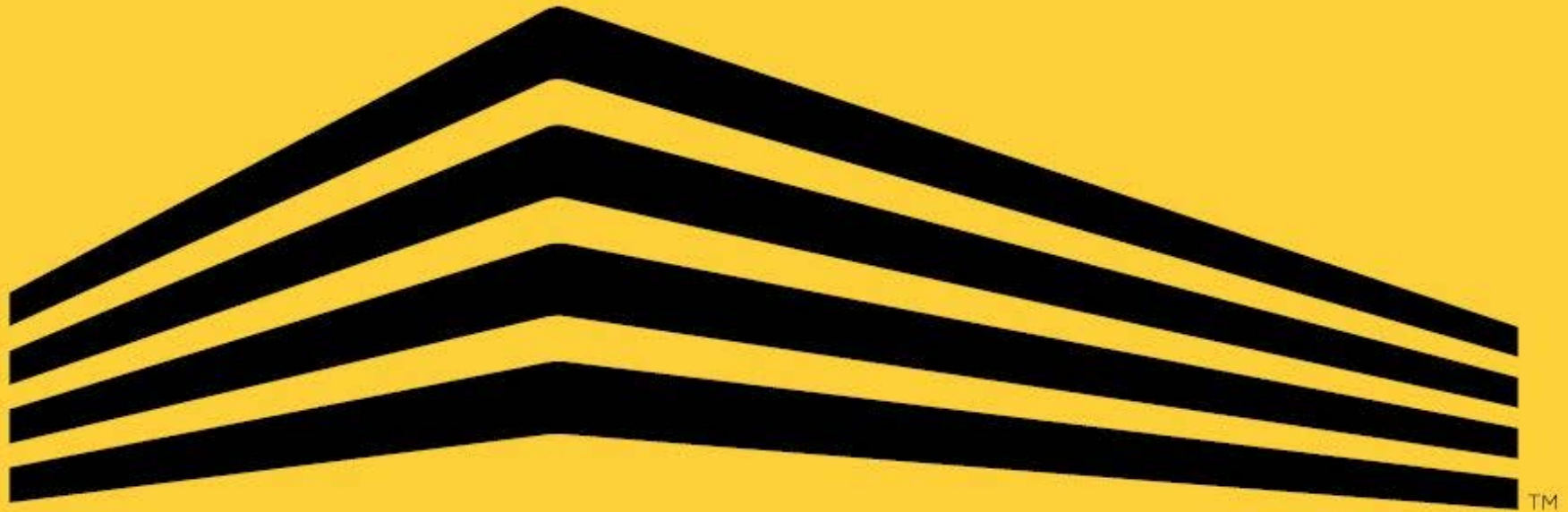
## Sustainability, and Parking

*Which of the following do you believe has the greatest potential to improve sustainability in parking?*



Source: International Parking Institute 2013 Emerging Trends in Parking

**GREEN GARAGE CERTIFICATION**  
the recognized standard for  
parking sustainability



**GREEN PARKING COUNCIL**

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AN AFFILIATE OF THE INTERNATIONAL PARKING INSTITUTE

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# GPC's Garage Certification

## Elements of Green Garage Certification 1.0

MANAGEMENT	PROGRAMS	TECHNOLOGY AND STRUCTURE DESIGN
Parking Pricing	Placemaking	Idle Reduction Payment Systems
Shared Parking	Access to Mass Transit	Fire Suppression
TMO/TMA	Wayfinding Systems - External	No/Low VOC Coatings, Paints, Sealants
Recycling	Wayfinding Systems - Internal	Tire Inflation Station
Sustainable Purchasing Program	Traffic Flow Plan	EV Charging Stations
Proactive Operational Maintenance	Carshare Program	HVAC Systems - Occupied Spaces
Cleaning Procedures - Occupied Spaces	Rideshare Program	Ventilation Systems - Parking Decks
Cleaning Procedures - Parking Decks	Fuel Efficient Vehicle Program	Lighting Controls
Building Systems Commissioning	Alternative Fuel Vehicles	Energy Efficient Lighting System
Construction Waste Management	Alternative Fuel Fleet	Stormwater Management
Regional Materials	Bicycle Parking	Rainwater Harvesting
Regional Labor	Bicycle Sharing	Greywater Reuse
Reused/Repurposed/Recycled Materials	Marketing and Educational Initiatives	Indoor Water Efficiency
LEED or Green Globe Certification		Water Efficient Landscaping
Credentialed Management		Roofing Systems
Life Cycle Analysis		Sustainable Power & Net-Zero Energy
		Design for Durability
		Energy Resiliency - Storage

# TIAA-CREF:

Why sustainability is important to an investor



# TIAA-CREF:

## Why sustainability is important to an investor

**The buildings of the future have a smaller carbon footprint... and that delivers investment benefits**



TIAA-CREF's Global Real Estate Group has succeeded in reducing the energy intensity (the amount of energy used per square foot) in its real estate portfolio by 15%. Our experience shows how a greener approach to energy and water use produces direct economic benefits through lower fuel bills and may also increase the value of the property.

As one of America's largest institutional real estate investors, TIAA-CREF owns 31 million square feet of office buildings, 13,200 multifamily units, and other properties. In the office portfolio alone, our savings during 2013 were the equivalent of 121.3 million kilowatt hours of electricity saved and 54,500 metric tons of greenhouse gas emissions prevented (comparable to removing about 10,640 cars from the nation's roads).

TIAA-CREF's Global Real Estate Sustainability Initiative makes sustainability an integral part of our decision-making, starting with the budget process and extending through all of our ongoing property management activities. This includes focused checklists, site assessments and gap analyses that are used to identify sustainability opportunities and challenges at any property we consider acquiring.

# High Performance Parking Lighting Challenges

Barriers include:

- unfamiliarity with new, rapidly changing technology or approaches
- lack of reliable, actionable information that demonstrates real world applications of the technology and its cost-effectiveness,
- difficulty in quickly locating applicable utility incentives, and
- lack of market recognition for exemplary energy practices.



# Key Points Identified on Wednesday

## Challenges

- Utility incentives not always attractive for exterior lighting
  - off peak usage means lower incentives
  - Companies that already have lowered lighting use may not be willing to allow load shedding when needed since light levels are already at minimum levels. Safety is an issue.
- 3<sup>rd</sup> party M&V can be a challenge since rated life is not easily understood or measured.

## Comprehensive Value of Energy Efficient Lighting

- Reduced circuits
- Package savings
- HVAC (indoor)
- Extra capacity for electric vehicle charging
- Correct number/light levels for applications

## Comparing Light Sources

- A new metric is needed
- Incumbent footcandles do not equal LED footcandles



- Challenges:  
**What held us back?**
- Opportunities:  
**LEEP 2.0:**  
**What moves us forward?**

# Washington Hilton

# Next Steps



<http://darkroom.balTIMOREsun.com/2012/12/the-earth-at-night-nasas-black-marble/#1>



[www.greenparkingcouncil.org](http://www.greenparkingcouncil.org)

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