

Energy & Store Development Conference

E+Scd 2014

September 7-10, 2014
St. Louis Union Station Hotel
St. Louis, MO



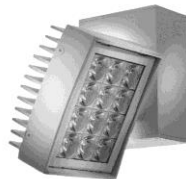
THE VOICE OF FOOD RETAIL 



Sales Floor LED Lighting – Is it Time?

Eric Johnson – Brookshire Brothers, Inc.

Keith Tarver – Axiom Energy Solutions, Inc.

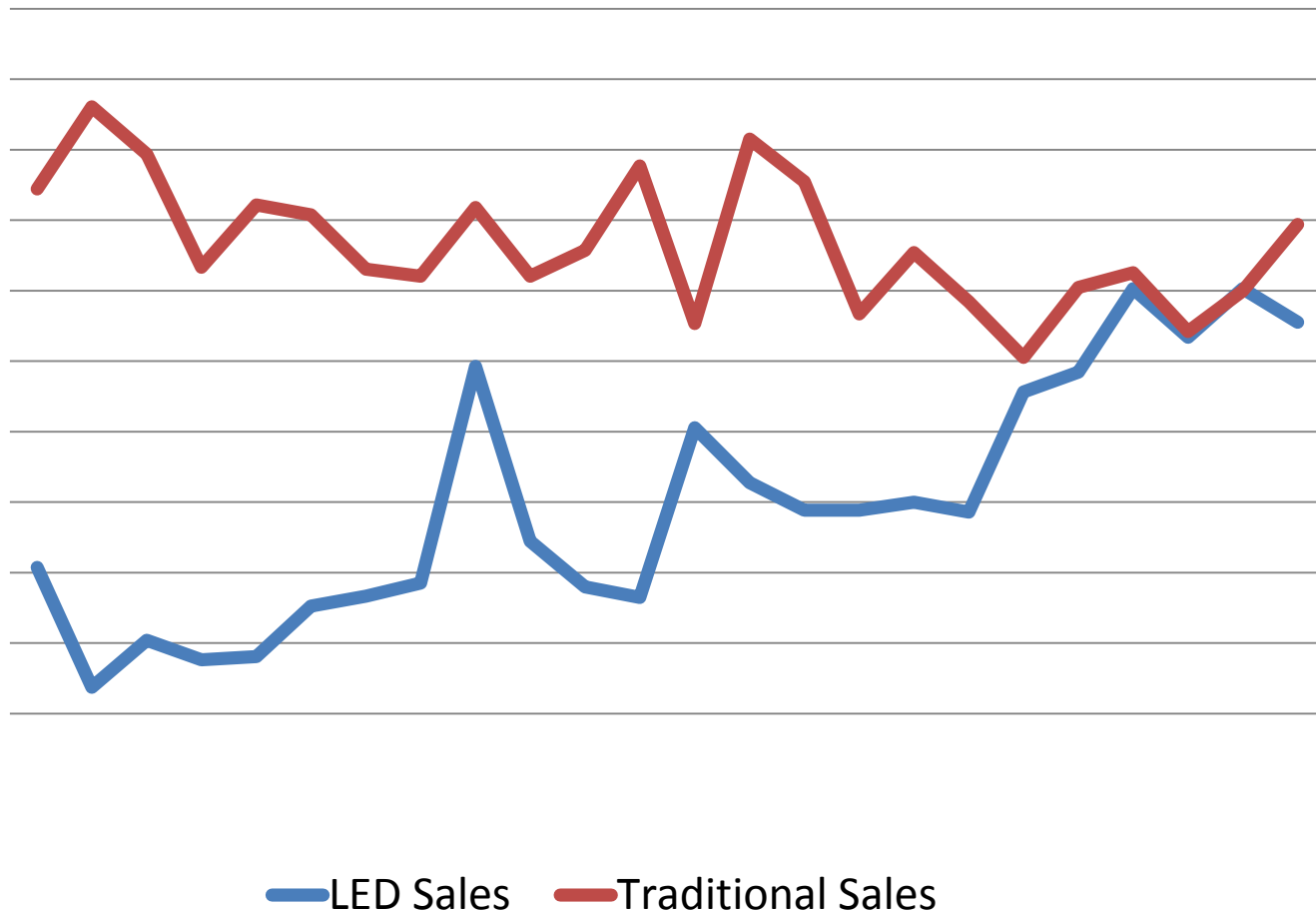


- Shedding light on LED's and Solid State Lighting
 - Technology
 - Application consideration and timing
- Other Types of Lighting Technologies
 - Florescent, HID, Halogen and Incandescent
- Store Lighting Design Considerations
 - What makes sense today
 - Factors to consider
- Engineered Approach To Lighting Solutions
 - Project Goals
 - Areas Addressed and Solutions Applied
 - Results and Lessons Learned
- Brookshire Brothers LED Store
- Conclusions, Questions and Answers

Shedding Light On LED's & Solid State Lighting



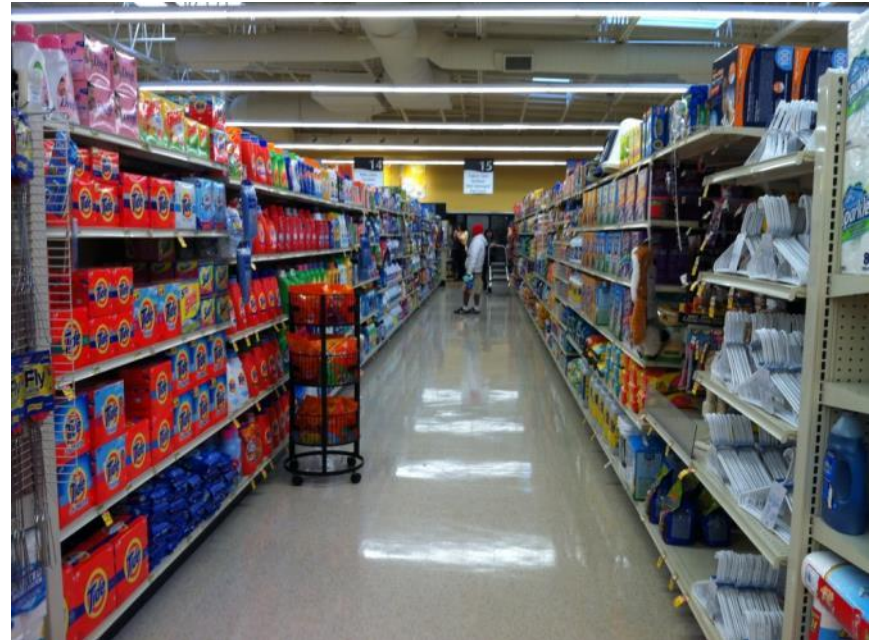
Lighting Trends



What is the Most Efficient System?

System	T8	T5	LED
Initial Lumens	2850	2730	4700
# of Lamps	2	2	0
Ballast Factor	.88	.95	1.0
Total Lumens	5016	5187	4700
Fixture Efficiency	80%	87%	100%
Delivered Lumens	4043	4523	4700
Input Watts	57	58	47
LPW	71	78	100

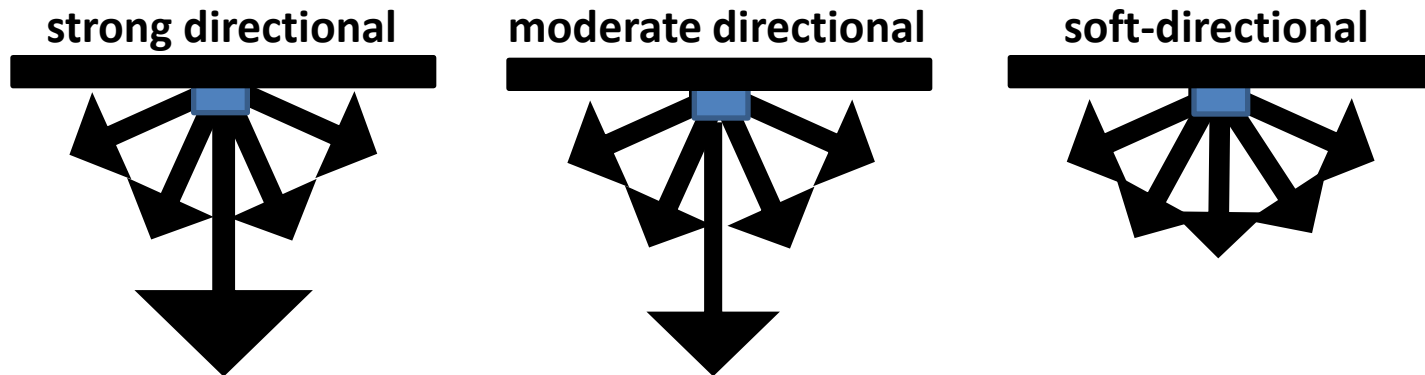
Comparing LED with Tradition Lighting



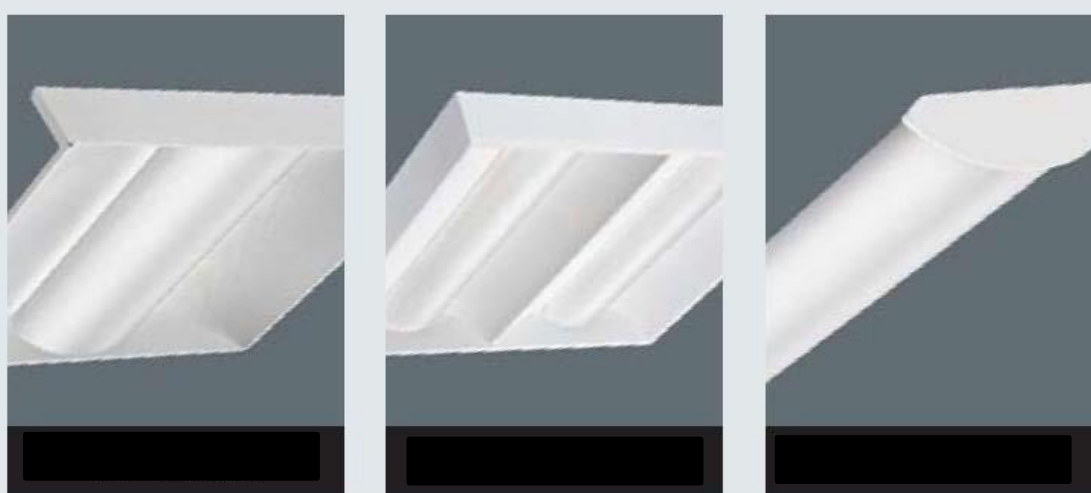
LED Rows 14' Centers



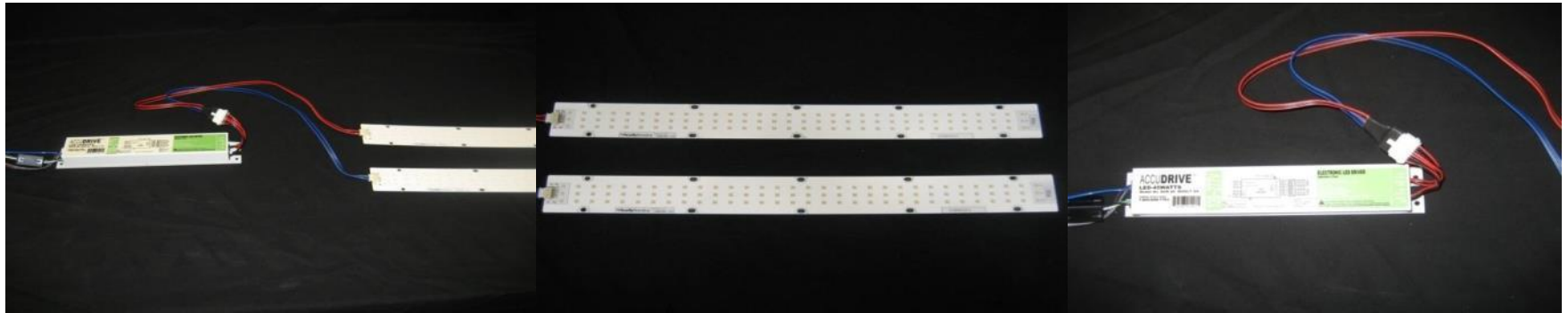
Distributions



Optimal mix of direct and diffuse components
- tailored for the interior application



Basic LED/SSL Light Engine



Benefits Of LED over Traditional Lighting Systems

- Lumen Packages
- Multiple Kelvin temperature
- Improved electronics – control systems
- Dimming standard
- Optical control and performance
- Multiple fixture designs options
- More sizes, more distributions

Before (250W MH, 295W)



After (144W LED)



Dimming to 50% Power



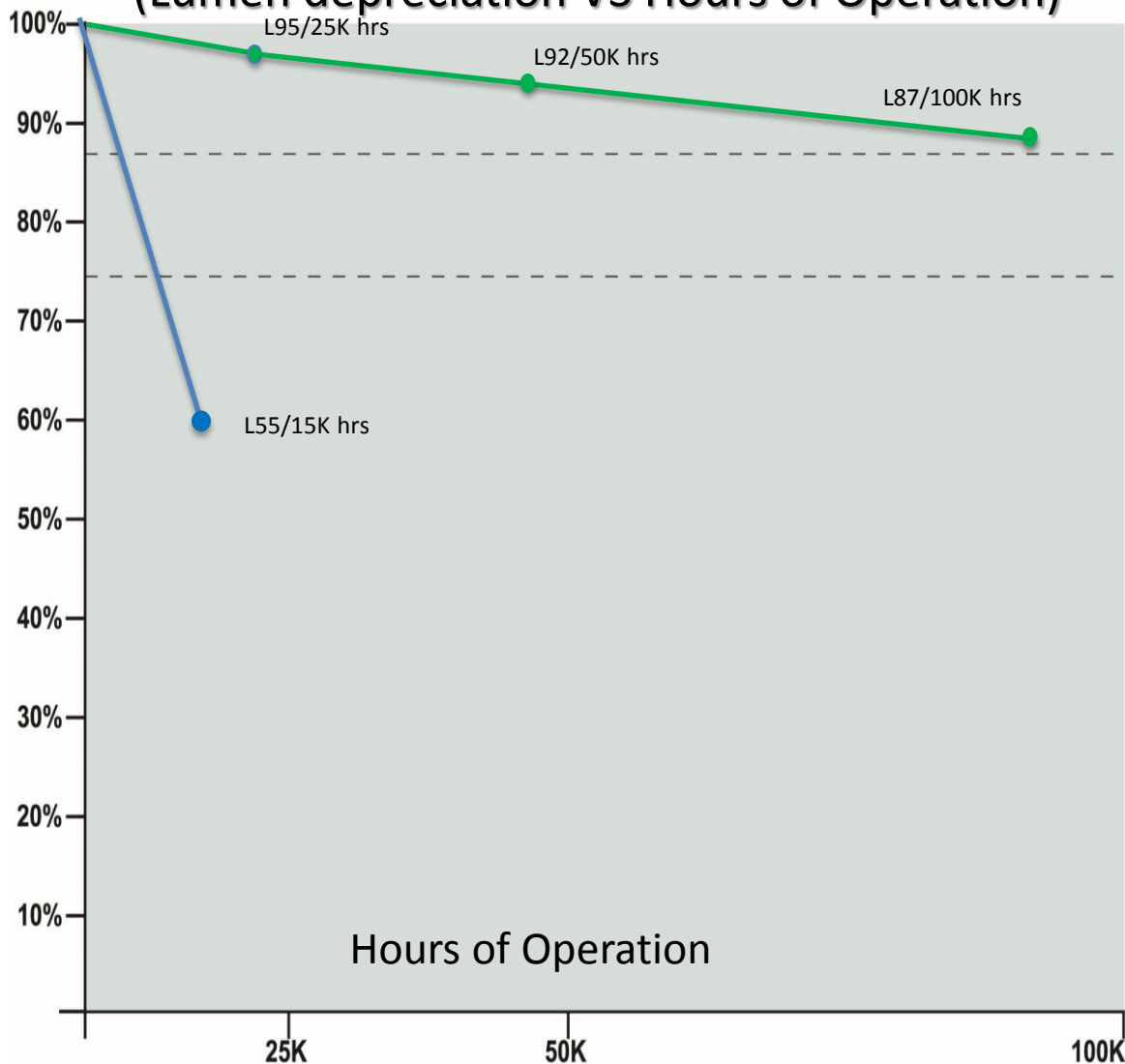
100%



50% Dim

Longevity

(Lumen depreciation VS Hours of Operation)



LEGEND

— 144W LED

— 400W Metal Halide

Challenges Of LED over Traditional Lighting Systems

- First cost premium of about 50%
- Availability and cost of parts
- Inconsistent specifications from one manufacturer to another
- Misleading life and performance claims
- Overall Lighting Maintenance Issues

Important Factors to Consider with LED Lighting Systems

- Light Fixture Designs
- Light Fixture Overall Efficiency
- Performance Ratings
- Life Expectancy
- Compatibility with Building Control System
- Maintenance & Upgrades

Other Types of Lighting Technologies

- Linear & Compact Fluorescents
 - Recessed or Surface Mounted Strips, 2x2's, 2x4's, Wraparounds, & Etc. Recessed
- HID's
 - High Bay, Spot & Accent, Recessed Cans, Outdoor Parking Lot & Wallpacks
- Halogen & Incandescent
 - Spots & Accent, Walk-In Freezer & Cooler Boxes



New Store and Retrofit/Remodel Considerations

New Stores

- When do LED's make sense?
- What are the factors to consider?

Remodels Options

- Traditional lighting sources
- Applications for LED lighting
- Budget considerations

Retrofits

- Working with existing lighting system
- Incentives opportunities
- Goal - More light, better light, lower energy and maintenance costs

Engineered Approach To Lighting Solutions

- What are your project goals?
 - Look? Energy and Maintenance Savings?
- Areas to address
 - Whole store, sales floor, departments, exteriors and entry way?
- Lessons learned
 - Well-thought-of lighting engineers
 - Important where you procure products
 - First costs are trending lower based on good designs

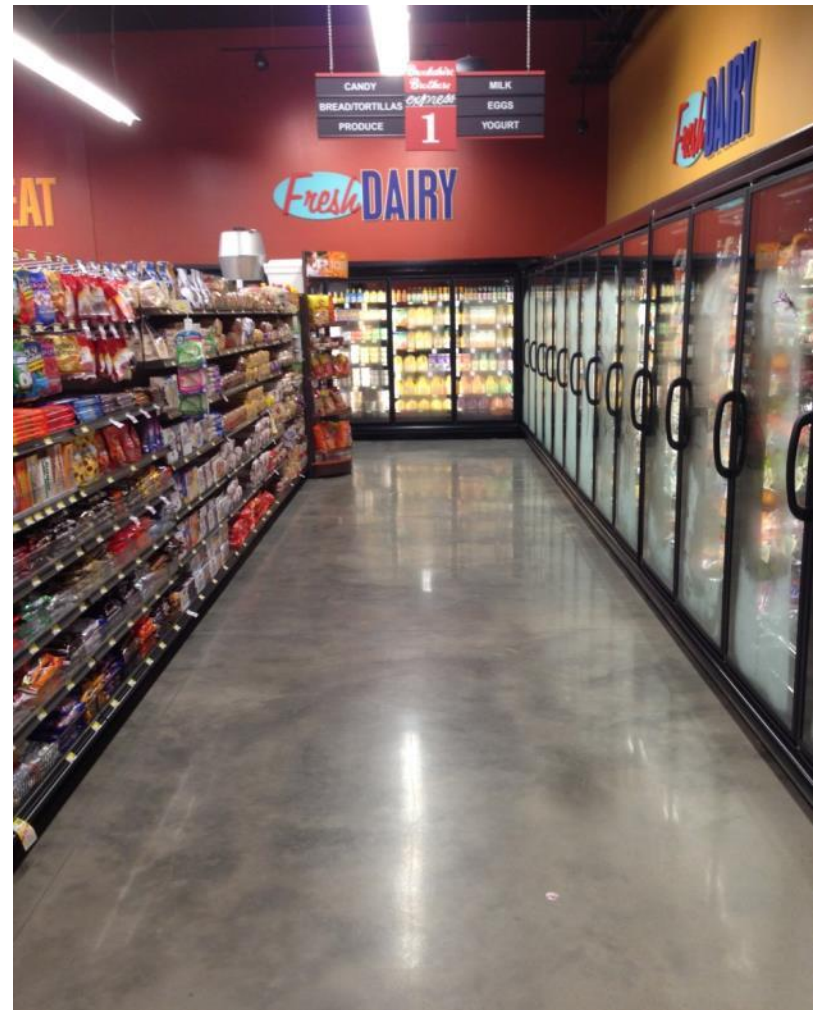
Brookshire Brothers LED Store



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Conclusions, Questions and Answers