

Managing Your Sports Lighting

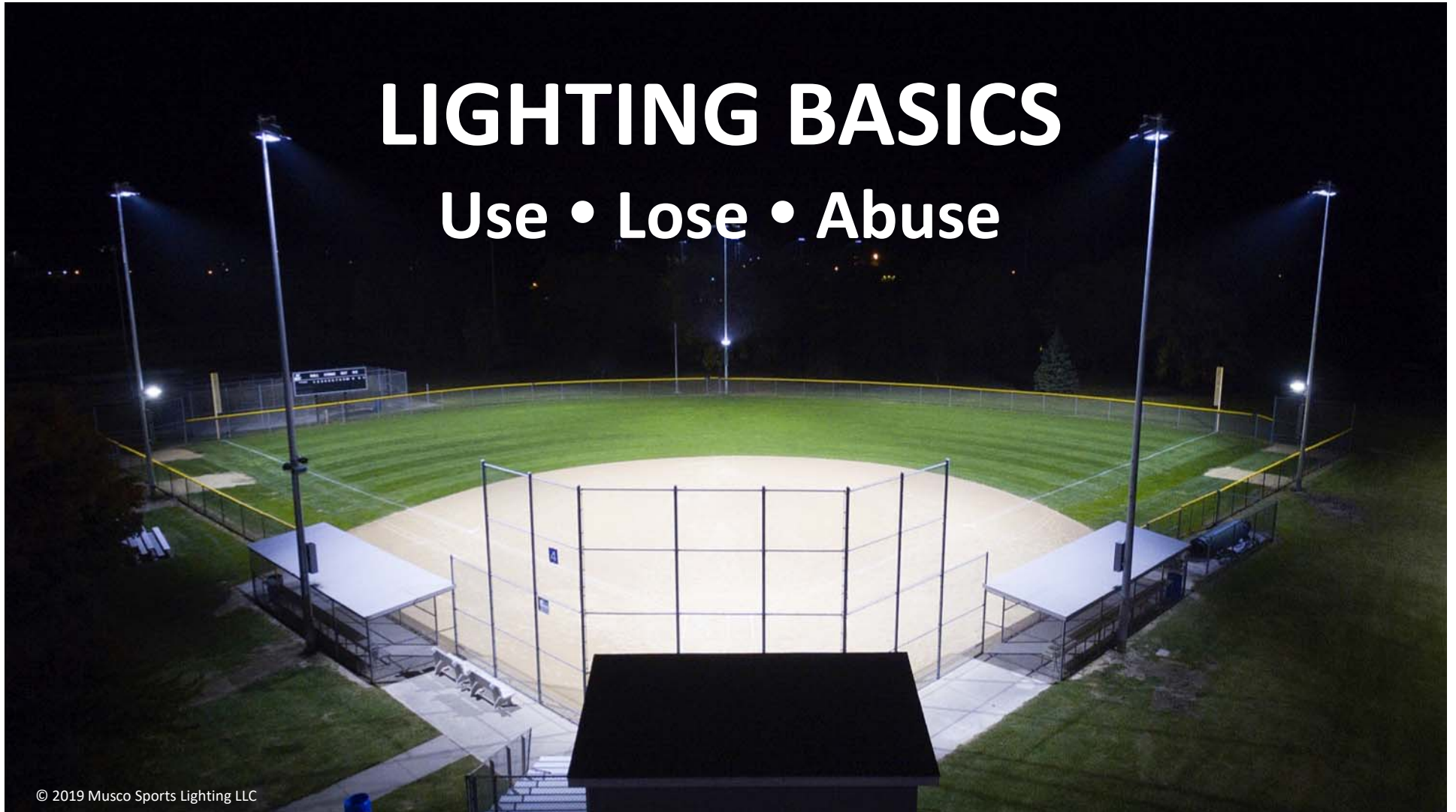


Agenda

1. Lighting Basics – Use • Lose • Abuse
2. Maintenance – ensuring your fields are ready for play
3. Upgrading – how to approach needed updates

LIGHTING BASICS

Use • Lose • Abuse



A satellite night view of North America, showing the continent illuminated by city lights against a dark background. The lights are concentrated in the eastern and central parts of the continent, with some scattered lights in the western part. The year '1970' is printed in the top right corner.

1970

\$2,000,000,000

Today



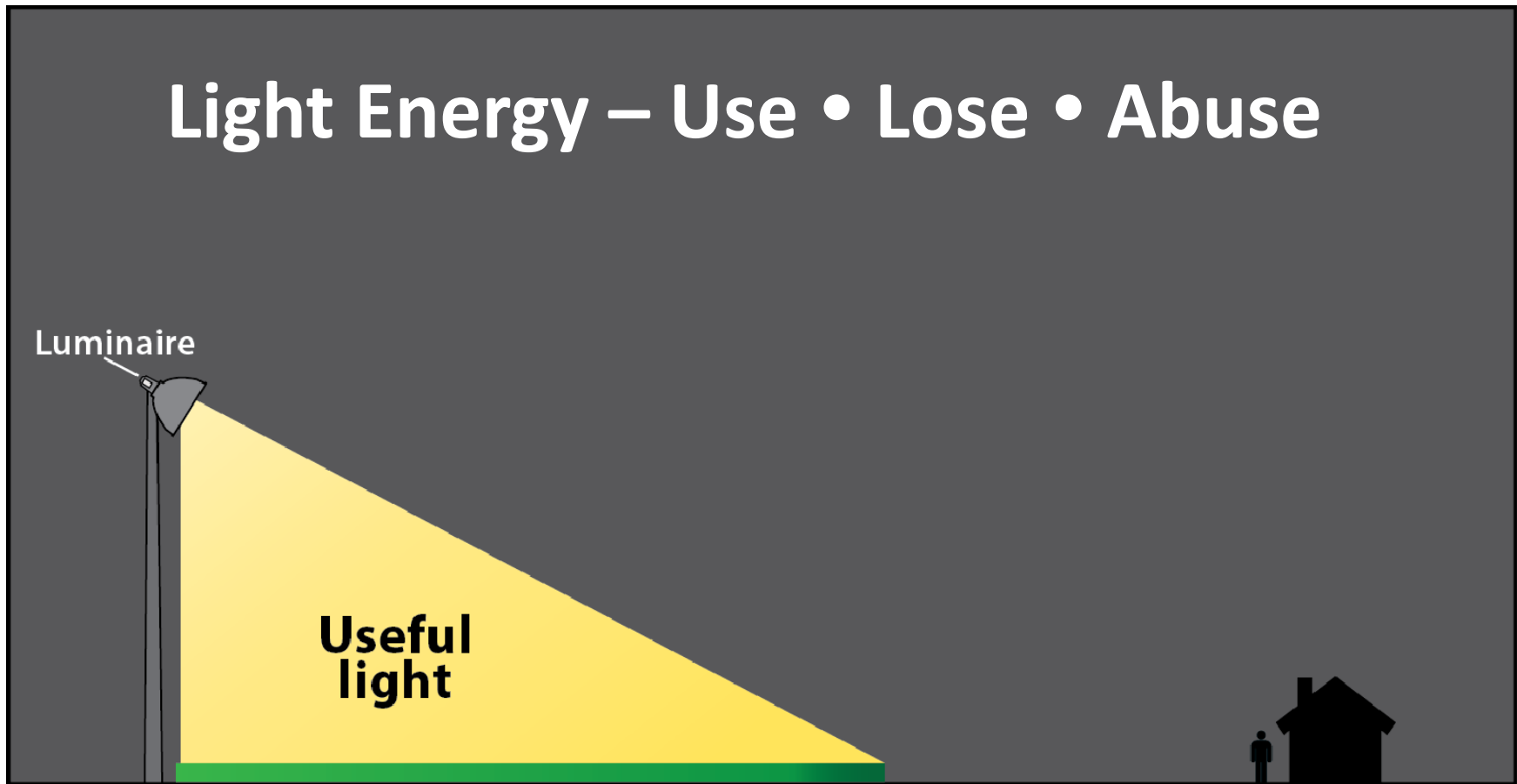
What often is



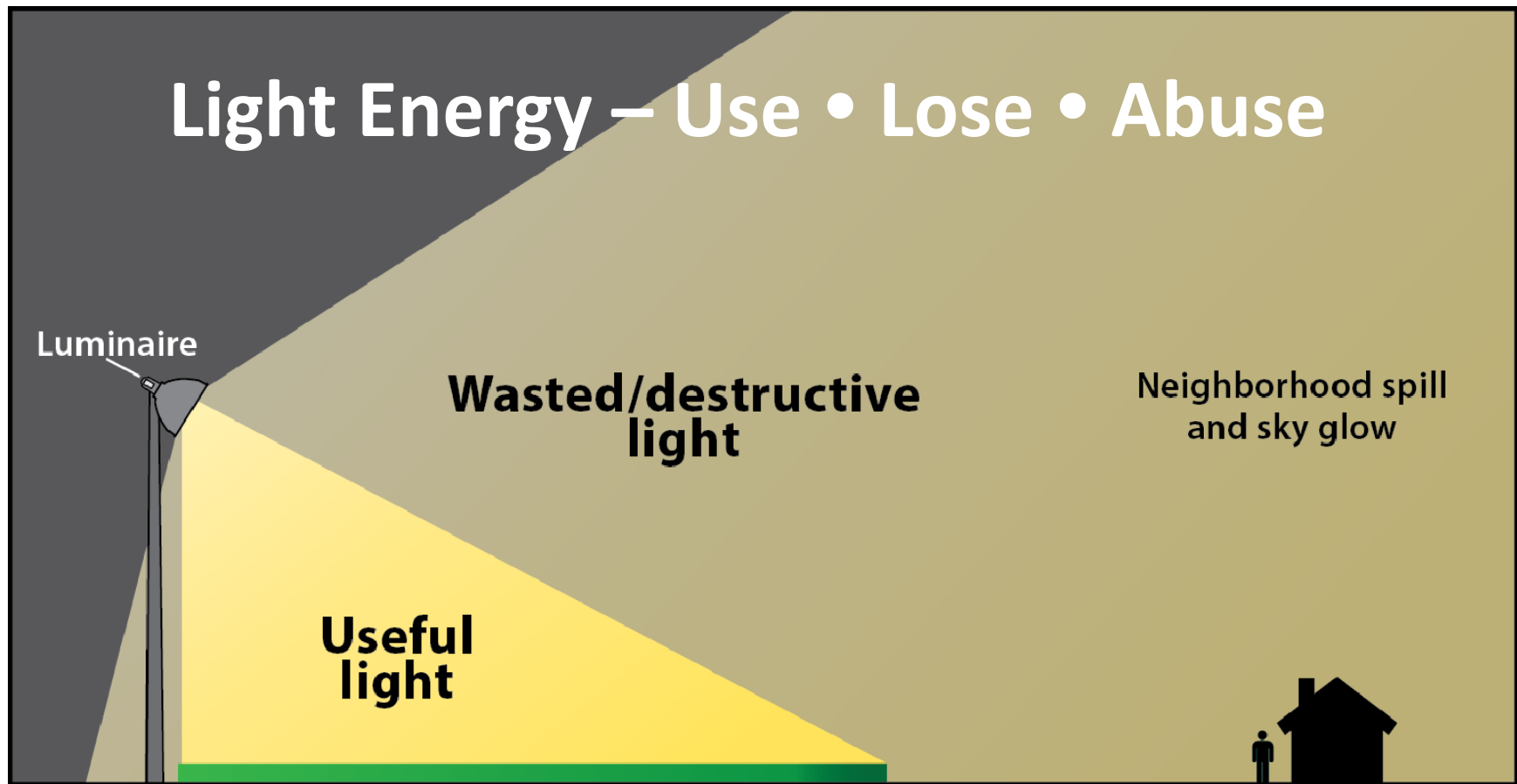
What can be



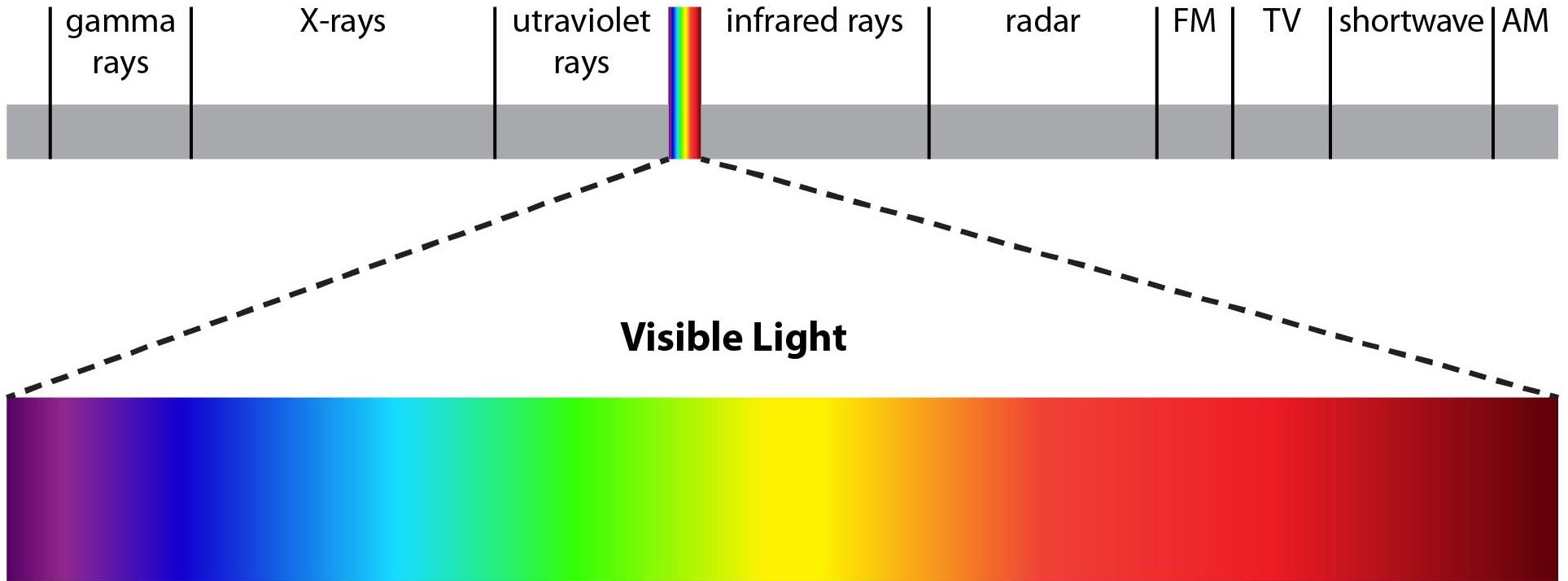
Light Energy – Use • Lose • Abuse



Light Energy – Use • Lose • Abuse



What is light?

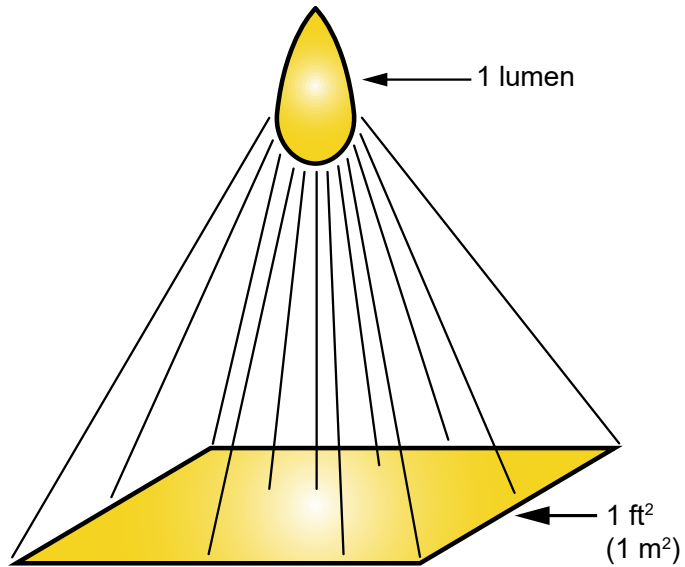


Creating Light Energy

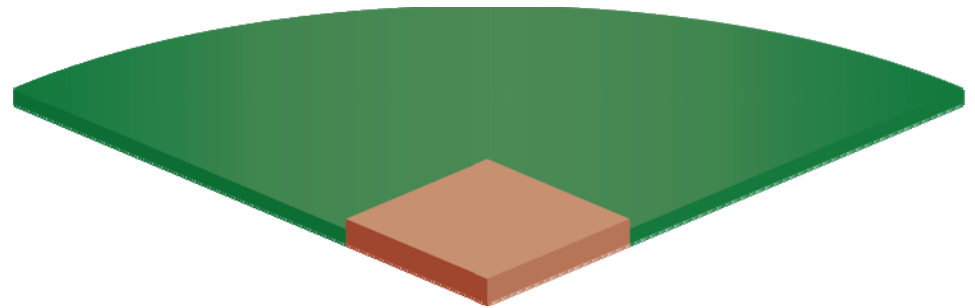


Measuring light energy

Footcandle



Sports Applications



The Eye



8,000 fc



1/100 fc





Broussard Sports Complex at St. Julien Park – Broussard, Louisiana, USA – LED light source



System Energy

484.9 kW – 64% reduction compared to typical HID equipment

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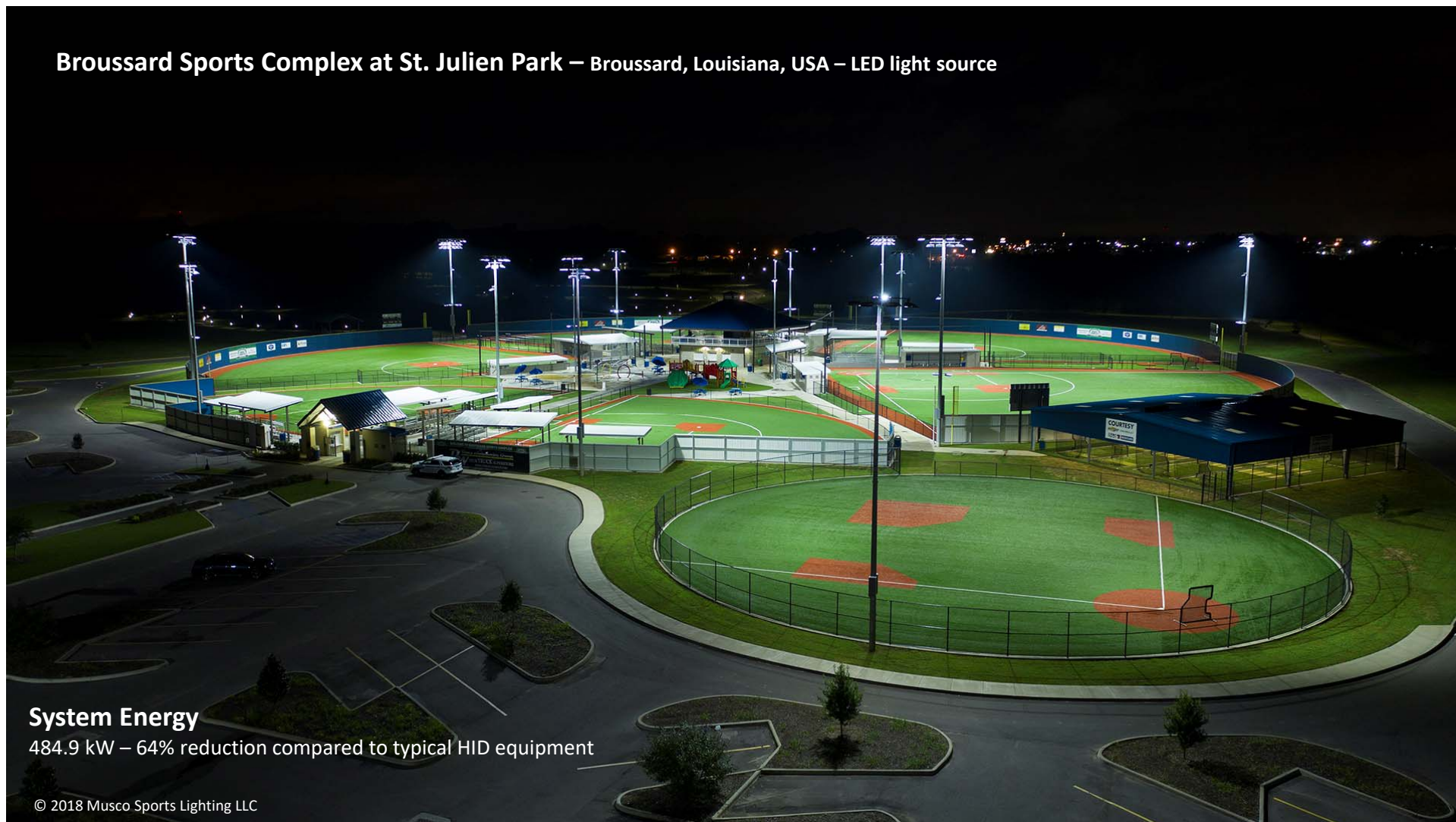


Boulder, Colorado 1978



Sedona, Arizona 1979

Broussard Sports Complex at St. Julien Park – Broussard, Louisiana, USA – LED light source



System Energy

484.9 kW – 64% reduction compared to typical HID equipment

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1977

Musco Metal
Halide System

40 years of research, increasing efficiency and decreasing environmental impact

Today

Musco LED
System

Today

Other Luminaire
Manufacturer
LED

60,000
candela

12,000
candela

500
candela

Lighting Solution Decisions

Lighting

Structural

Electrical

Design

?

?

?

Supply

?

?

?

Install

?

?

?

OPERATE

MAINTENANCE

**Are your fields
ready for play?**



Safety Checklist

- Light levels – field testing
- Electrical
- Poles
- Lighting fixtures
- Start a program today!

ANNUAL SYSTEM OPERATION & MAINTENANCE CHECKLIST

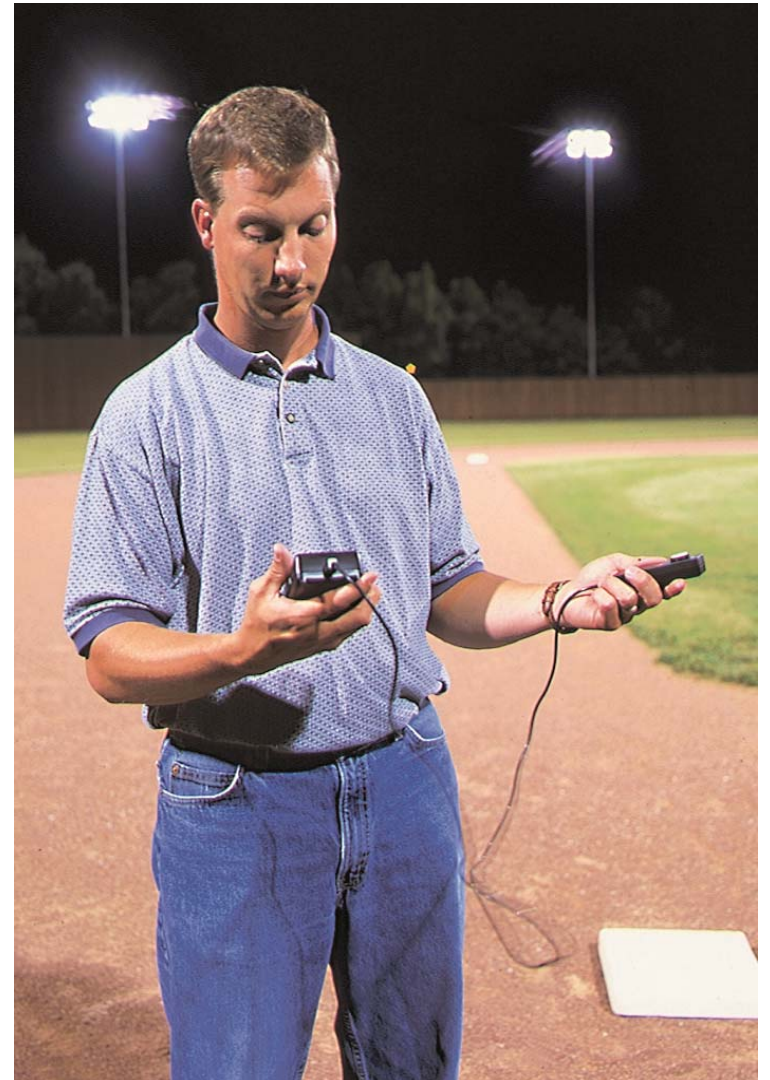
School Name _____ Field Name _____ Inspection Date _____
 Voltage/Phase _____ Date Installed _____
 Type of Pole _____ Type/# Luminaires _____ Needs OK Repair None

Lighting Performance Testing				
Use test forms for appropriate sport following this checklist				
• Average footcandles meet guidelines				
• Average uniformity meets guidelines				
Service Entrance & Pole Distribution Boxes				
Check service panel for proper markings.				
• Emergency information should be visible				
• Warning stickers, wiring diagrams, circuit labels and other servicing information signs should be posted and clearly legible				
Test reset action on all service breakers.				
• Snap all breakers on and off several times to ensure firm contact				
• If fuses are used at main service, check continuity.*				
Check the wiring.				
• Insulation around wiring should show no signs of deterioration.				
• Wiring should show no frayed deterioration.				
Check all taped connections.				
• Signs of wear should be replaced				
Make sure no live parts are exposed.				
• Bare wires and exposed connections should be wrapped with insulated covering.*				
Padlocks for service entrance & distribution boxes should be in place and operational.				
Poles				
Wood poles:				
Check to see that poles aren't leaning.				
• Leaning poles may be unsafe and replacement or re-installation and/or re-aiming may be necessary.				
Check for fastening.				
• If poles have moved, re-aiming of the fixtures may be necessary.				
Check for decay.				
• Wood poles decay from the inside out. Core testing is the best method to determine the condition and safety of the pole.				
Steel poles:				
Check baseplate for signs of deterioration caused by corrosion or fatigue.				
• Check anchor bolt for signs of corrosion.				
• Check grouting under pole to make sure proper drainage exists.				
Check for all pole access covers, replace missing covers.				
Cables and conduit:				
• Pull on conduit to check for looseness.				
• Check for loose fittings and damaged conduit.				
• All cables should be straight and properly strapped.*				
• If cables are exposed to the elements, make sure the insulation has the proper rating.*				
Check overhead wiring:				
• Wiring should be properly secured.				
• Check that new growth on tree branches and limbs won't obstruct or interfere with overhead wiring.				
Luminaires				
Check luminaire housings.				
• Housings should show no sign of cracking and/or water leakage.				
Check lenses.				
• Clean lenses.				
• Replace broken lenses.				
Replace burned-out lamps.				
Check luminaire fuses.				
• Replace burned-out fuses.				
• Fuses should be the correct size.				
Insulation covering on wiring should show no signs of wear or cracking.				
Ground wire connections must be secure.				
Check around ballasts for signs of blackening.				
Check that capacitors aren't bulging.				
Check aiming alignment of all fixtures.				
• On wooden poles, see if crossarms are still aligned with the field and horizontal.				
Ground				
Check grounding connections.*				
Check nearby metal objects.				
• Make sure metal bleachers and other metal objects are located at least 6 feet from the electrical components.				
• Metal objects, such as bleachers, must have their own individual grounding system.				

* These tests and/or repairs require the services of a qualified electrician.

Light Levels

- Use calibrated meter
- Grid field
- Calculate average light levels
- Calculate uniformity
- Do you meet guidelines?



Electrical

- Check for proper markings
- Reset breakers
- Check wiring
- Check connections
- No live parts exposed
- Padlocks
- Grounding!



Poles

- Wood poles
 - Leaning, twisting, decay?



Poles

- Steel poles
 - Corrosion at baseplate?
 - Access covers?
 - Cables & conduit?
 - Overhead wiring?



Lighting Fixtures

- Housings
- Lenses
- Lamps
- Wiring ground & insulation
- Drivers, ballasts & capacitors
- Aiming



UPGRADING

Repair or Replace?



Light Levels

- Depreciation
- Quality
 - Sport type
 - Skill level
 - Field Size
 - Seating
 - TV / video

Generally Accepted Lighting Standards			
SPORT	SPORT LEVEL	TARGET / CONSTANT LIGHT LEVELS	
		FOOTCANDLES	LUX
Baseball/Softball	Recreational	30/20	300/200
	Schools/Competitive Leagues	50/30	500/300
	Little League ¹	50/30	500/300
	Amateur Softball Association (ASA)	50/30	500/300
	College ¹	100/70	1000/700
Basketball (indoor)	Elementary	30	300
	High School	50	500
	College ¹	80	800
Football	Schools/Competitive Leagues	30	300
	College ¹	50	500
Soccer	Recreational/Practice	20	200
	Schools/Competitive Leagues	30	300
	College/Municipal ¹	50	500
Tennis – 2 court (side by side)	Recreational	30	300
	Schools/Competitive Leagues	50	500
	College ¹	75	750

¹ May vary due to seating capacity and television requirements.

Maintenance

- Relamping
- Re-aiming
- Multiple outages
- Safety issues



Energy

- LED can save up to 80%
- Calculate savings based on usage
- Rebates / grants

Standard Soccer Field – 360 x 225 ft (110 x 69 m)
30 footcandles (300 lux)

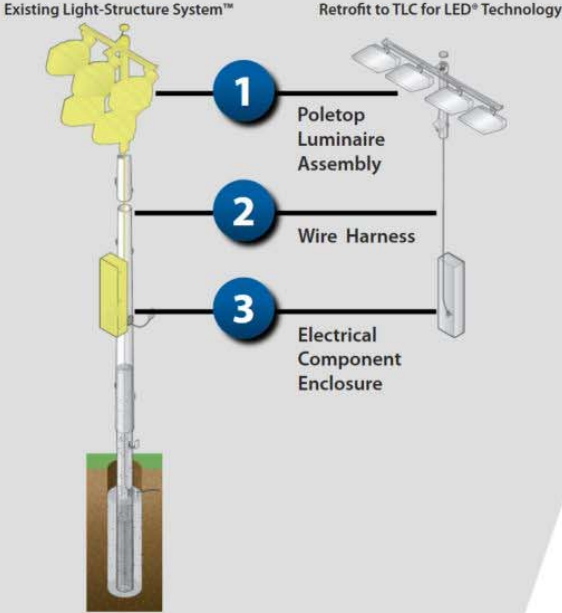
	Musco		Other Manufacturer
	1150 W LED	1500 W Metal Halide	1500 W Metal Halide
Fixtures required	28	32	52
Hourly energy cost	\$3.22	\$5.00	\$8.42
Annual energy cost	\$1,610	\$2,502	\$4,212
25-year energy cost	\$40,250	\$62,560	\$105,300

Assumes 10¢ per kWh electrical rate, 500 hours per year operation

Structural & electrical considerations

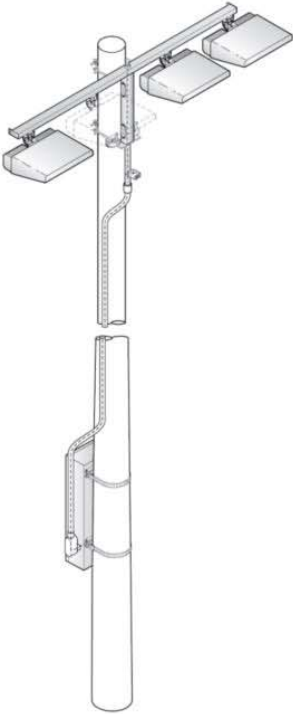
LED UPGRADE

Upgrade your existing Light-Structure System™ from HID to LED



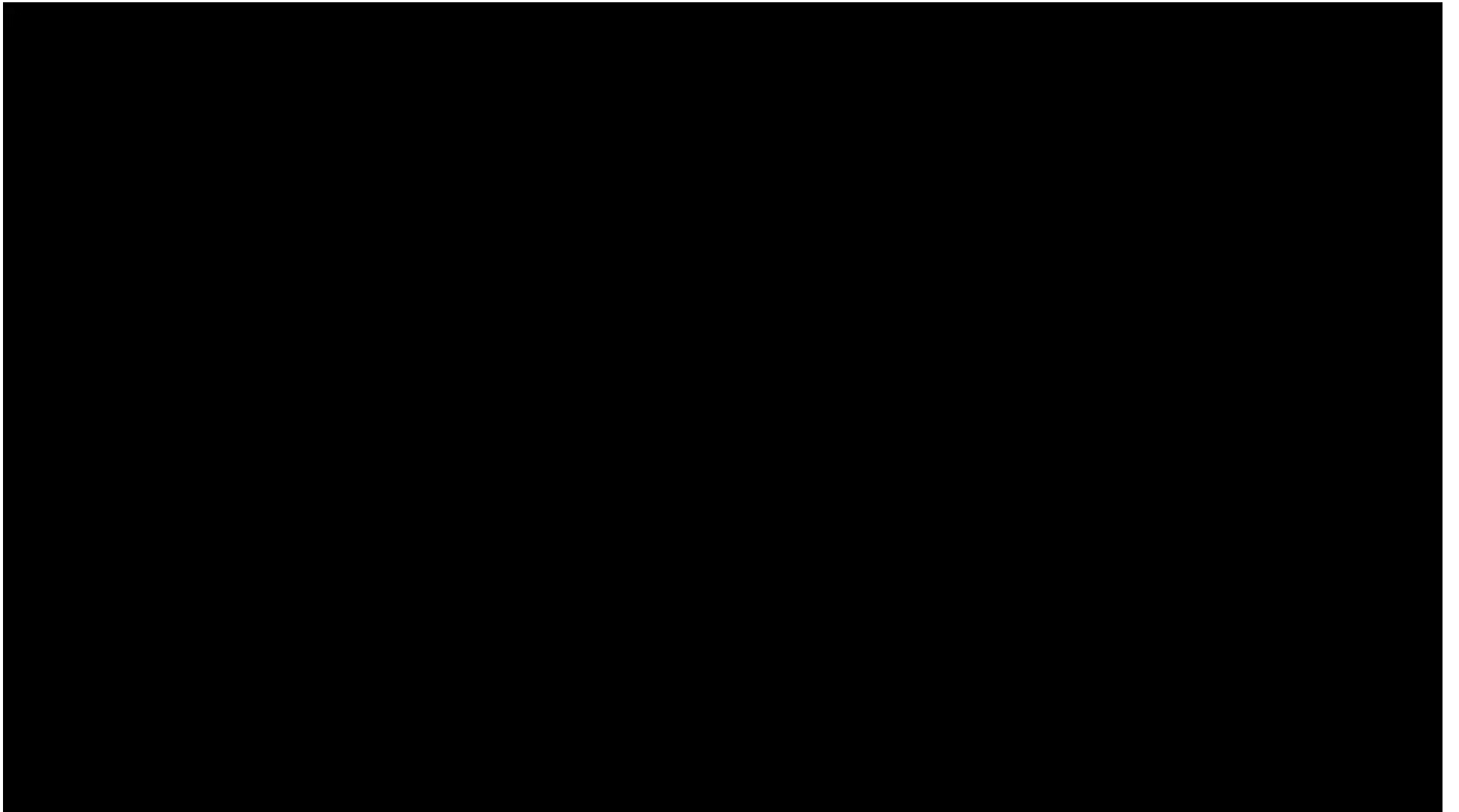
LED RETROFIT

Upgrade non Light-Structure System™ poles with TLC for LED®



New capabilities

**Big time light shows
at your hometown field**





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QUESTIONS?



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