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**Barry Isett & Associates**

**Stephen Helms**

**Director, Environmental Health & Safety  
Kutztown University**

## Today's program

- A. Why study lighting?
- B. Field data
- C. Research & references
- D. Lighting by area
- E. Consistency
- F. Applications
- G. Lessons learned



## Presenters






### Environmental, Health & Safety Office

#### Safety...First

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The Kutztown University's Environmental Health and Safety Office under the Facilities Department Division promotes a safe and healthy environment for all members of the University community.

**Director**  
Stephen Helms      610-683-4050  
helms@kutztown.edu

It is the mission of Environmental Health and Safety (EH&S), to provide an environment conducive to a healthy and safe learning experience, to protect Kutztown University's human resources and preserve the environment. To that end, EH&S is dedicated to creating a partnership with the campus community and providing services to assist the campus constituency in integrating safety and compliance into their workplace/classroom culture and behavior.

**Fire Safety Tech.**  
Mark Hostetter      610-683-4050  
hostette@kutztown.edu



For more information about the EHS Emergency Response Vehicle click the picture above

The Office of Environmental Health and Safety is obligated to ensure that Kutztown University is in compliance with those Commonwealth and Federal regulations that impact on Health, Life Safety and the Environment. This includes interaction with Commonwealth Agencies such as the Department of Environmental Protection, Labor & Industry, the Emergency Management Agency, Department of Health and the Department of Transportation. At the Federal level, agencies include the Environmental Protection Agency, the U.S. Department of Transportation and the Occupational Safety and Health Administration.



# Begin with the end in mind

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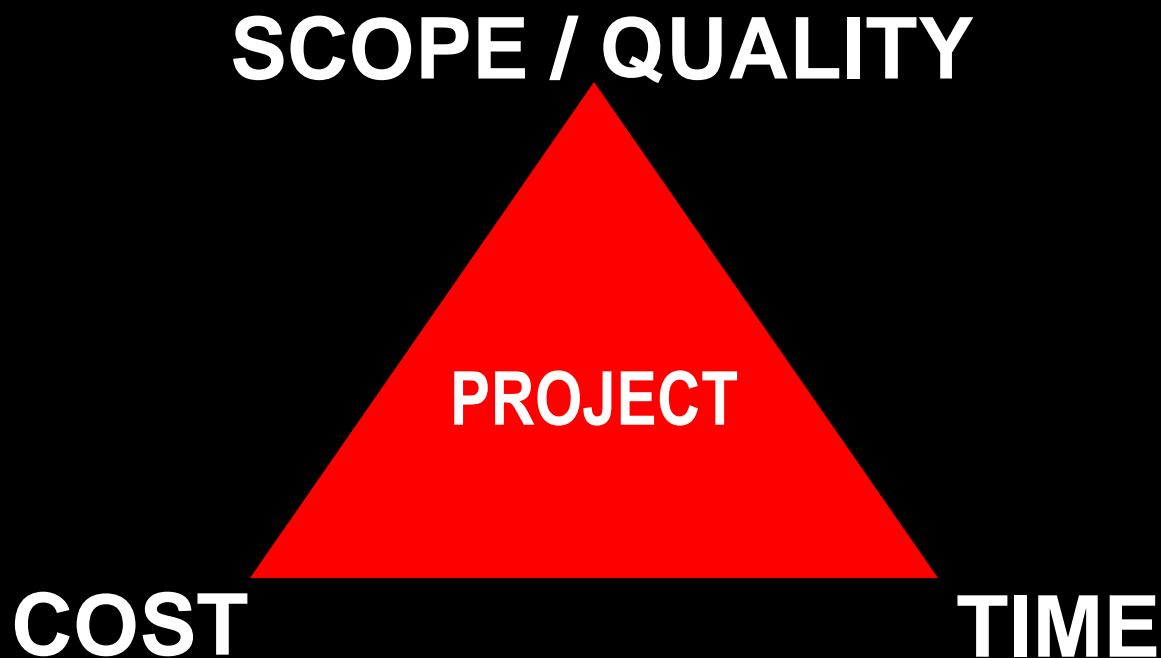
**Without goals, and plans to reach them,  
you are like a ship that has set sail with  
no destination.**

- Fitzhugh Dodson

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**“If you don’t know where you’re  
going, any road will get you there.”**





Coverage area or aesthetics?  
Capital cost or energy savings?  
Large-scale or phase installation?

## A. Why study lighting?

1. Better safety & security
2. Support university teaching/learning
3. Rein in evolutionary diversity
  - Light levels
  - Color rendering
  - Types & styles
  - Less stock / easier maintenance
4. Energy cost / code
5. Guide future planning / projects

## ***KULG Goals***

- *Provide sufficient light to enhance safety/security of occupied interior/exterior spaces*
- *Unify lighting standards*
- *Balance cost efficiency with other goals*
- *Reduce light pollution & trespass*
- *Use dark-sky friendly fixtures near special facilities*
- *Model LEED criteria*
- *Guide future design/construction*

## B. Field data

### 1. Safety walks

- Annual observation & comments from user groups, recorded & addressed

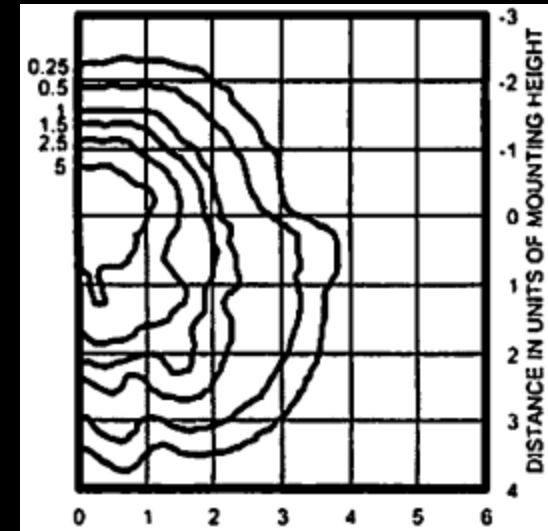
### 2. Automated user reports using fixture IDs

### 3. Maintenance records

- What areas / fixtures have more problems?

### 4. Light meter readings

## B. Field data



### 1. Safety walks

### 2. Light meter readings

- Footcandles – high, low, average
- Illuminance & uniformity
- 67 zones
- While readings met basic standards, areas contained significant variation in levels
- Perception = some areas “not adequately lit” despite meeting standards

## C. Research & references

1. IESNA
2. International Dark-Sky Association
3. International Energy Conservation Code
4. NFPA
5. USGBC
6. Criteria

- Illuminance
- Uniformity
- Color rendering
- Lamp types
- Fixture types

- Style & color
- Height
- Bases
- CCT
- LLF



## D. Lighting by area



1. Lighting eases surveillance
2. Allows pedestrians to see surroundings, walks, stairs
3. Facial recognition @ 30', uniformity 4:1
4. Glare & trespass inefficient, anti-LEED, contrary to municipal regulations

## D. Lighting by area (cont'd)

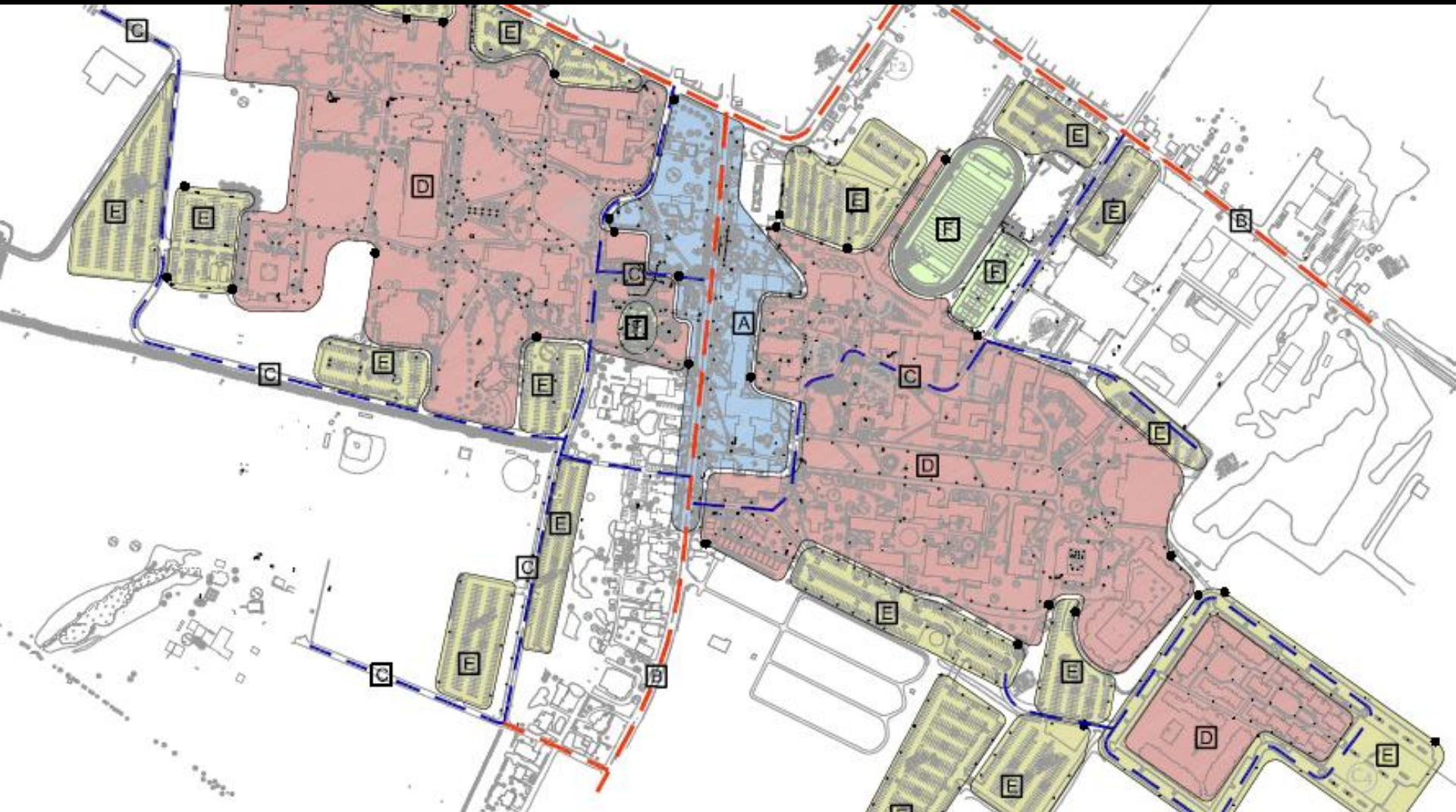
5. Roads
6. Perimeter sidewalks
7. Exterior stairs
8. Interior paths
9. Building entrances (main vs. emergency)
10. Building perimeter
11. Parking lots (& associated paths)
12. Gathering spaces (special use)
13. Unoccupied spaces



## D. Lighting by area (cont'd)

Design Issues	Appearance of Space and Luminaries	Color Appearance (and Color Contrast)	Direct Glare	Light Distribution on Surfaces	Light Pollution/Trespass	Identification of Faces and Objects	Peripheral Detection	Point(s) of Emphasis	Reflected Glare	Shadows	Specific Task Lighting	Aesthetic Emphasis	Surface Characteristics
<b>Parking Facilities, Garages, and Covered Parking Spaces</b>													
On pavement													
Gathering points (stairs, elevators, ramps)													
<b>Multi-family Residences</b>													
Common Areas													
Common mailbox area													
<b>Schools and Institutions</b>													
General parking													
Sidewalks and footpaths													

## D. Lighting by area (cont'd)



## D. Lighting by area (cont'd)

USE AREA	Illuminance (minimum)	Illuminance (average)	Uniformity	CRI (minimum)	Lamp <sup>(1)</sup>	Fixture Mounts <sup>(2)</sup>	Height	Style <sup>(3)</sup>	Control <sup>(4)</sup>
1. Kutztown Road (Collector) <sup>(5)</sup>	0.6	1.3	3:1	65	MH/LED	A	20-30'	H,C	P
2. Perimeter Street (Collector)	0.4	0.9	4:1	50	MH/LED	A	20-30'	C	P
3. Interior Street (Local)	0.4	0.8	6:1	50	MH/LED	A	20-30'	S/C	BAS
4. Perimeter Sidewalks	0.5	1.0-3.0	4:1	50	MH/LED	A	10-20'	H, D	BAS
5. Exterior Stairs	.06	1.0	3:1	65	INC/FLU/MH HAL/LED	A	10-30' (5)	D/S/O	P, BAS
6. Interior Paths	0.5	1.0	4:1	65	MH/LED	A	10-20'	D	BAS
7. Building Entrances	1.0	3.0	4:1	75	INC/FLU/ HAL/LED	B	10-20'	D/W	BAS
8. Building Entrances (Emergency/Service)	1.0	1.0-3.0	4:1	50	INC/FLU/ HAL/LED	B	8-15'	W	M/P

## E. Consistency

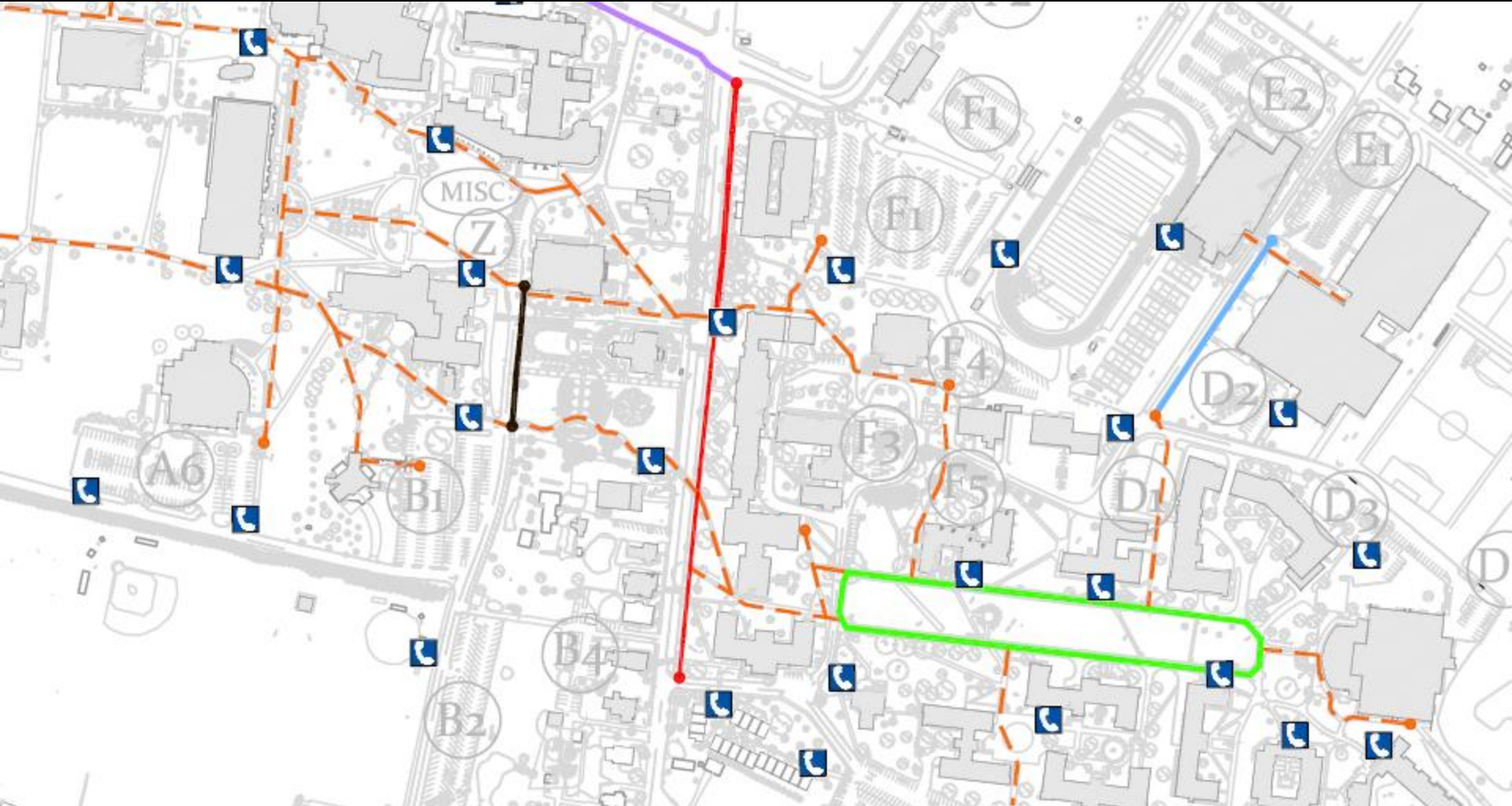
1. Adopt / implement standard light level guidelines for renovation & new construction
2. Light uniformity + fixture consistency = cohesive atmosphere, *sense of place*



## F. Applications

1. Guidance to designers
2. Design reviews
3. Add neighboring infrastructure to projects
4. Recommended night accessible path plan
5. Capital planning
6. Financing
7. Grants

## F. Applications: Night Accessible Path Plan



## F. Applications: CIP

Project	Year 1 2010	Year 2 2011	Year 3 2012	Year 4 2013	Year 5 2014	Year 6 2015	Year 7 2016	Year 8 2017	Year 9 2018	Year 10 2019
Parking Lot A2		504,700								
Parking lot A3			200,128							
Parking Lot B1					199,080					
Parking Lot B2	332,156									
Parking Lot B3						252,180				
Parking Lot C1								301,401		
Parking Lot C3				214,695						
Parking Lot C5										499,850
Walk and LED Crossing Old Main (southside)							330,400			
South Dining Hall			68,301							
DMZ to Kutztown Rd			2,682							
Kutztown Road					175,112					
Walk E. of Shaffer						31,510				
	332,156	504,700	271,111	214,695	374,192	283,690	330,400	301,401	105,393	499,850

## G. Lessons learned

1. Define data collection objective – best case, worst case, average case
2. Define audience(s)
3. Data & findings first
4. Voice & format last
5. Go modular
6. Less is more
7. Progress reporting



# Questions

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