

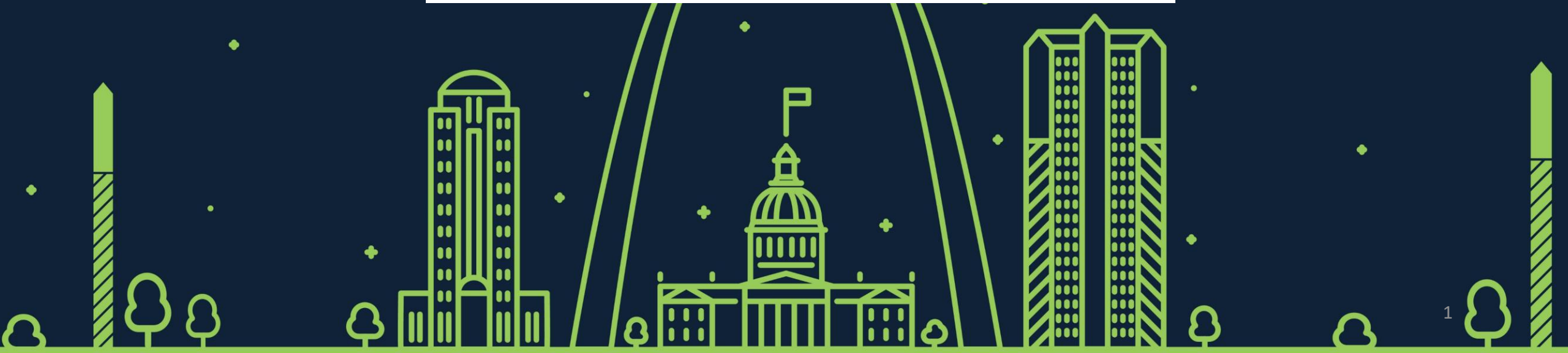
2019



April 1 - 3 • St. Louis, MO

STAKEHOLDER MEETING

As you find your seats,
don't sit alone and find
folks you don't know!



2019  April 1 - 3 • St. Louis, MO

STAKEHOLDER MEETING

Discussion Session:
Distribution and Glare



Technical Team:



**Ute
Besenecker**
DLC



**Greg
Barker**
*Energy
Solutions*



**Yao Jung
Wen**
*Energy
Solutions*

Facilitation Team:



**Andy
Black**
*Interaction
Associates*



**Bernadette
Boudreaux**
DLC

Notes and Records Team:



**Kasey
Holland**
DLC



**Dan
Hannigan**
*Energy
Solutions*



**Dave
Ryan**
D&R



Objectives, Desired Outcomes, and Agenda

Session Purpose:

- Get actionable feedback on specific specification topics to inform Draft 2 of the specifications

Agenda:

- Welcome and Introduction (Facilitator)
- Distribution + Glare Requirements Overview
- “What we like so far”
- Key Issues for Input w/Input Gathering
- Report Out and Next Steps
- Plan for Reporting to Larger Group



Ground Rules

- Participate
- Be respectful
- Defer to the facilitator



Audience

- Different stakeholder groups provided different feedback
- Who do we have in the room?
 - Manufacturers
 - Researchers
 - Specifiers
 - Labs
 - Utilities
 - Distributors
 - Others

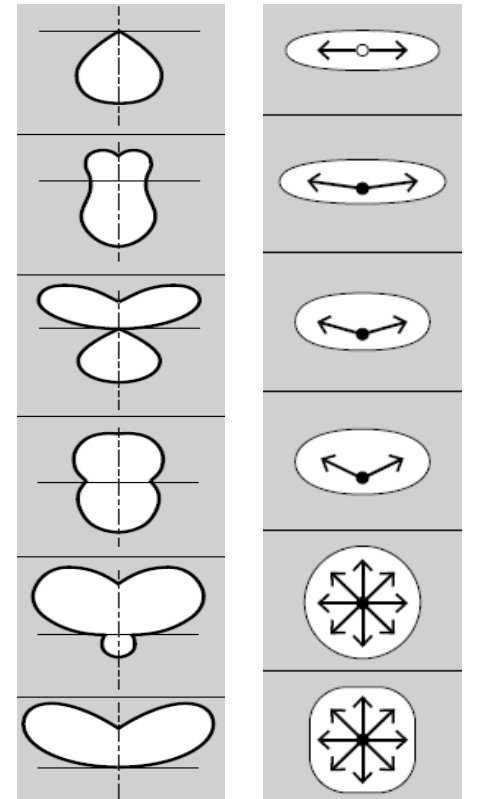


Distribution & Glare Requirements Overview



Distribution

- Light Distribution:
 - impacts **energy consumption**
 - directly influences **task performance**
 - is a major factor in **aesthetics**
 - is important for **comfort** and **wellbeing**



Source: IES HB-10-11 (Figure 8.1, 8.4, Indoor and Outdoor Classification Systems)



Glare

- Glare:
 - directly influences **task performance**
 - is related to occupant **safety**
 - is critical for **comfort** and **wellbeing**



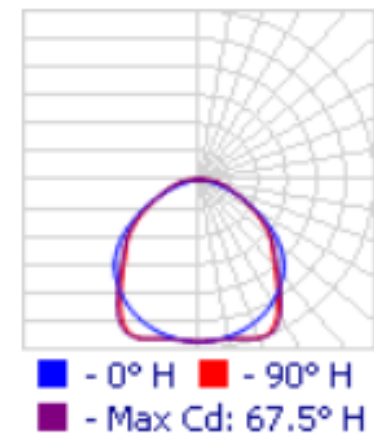
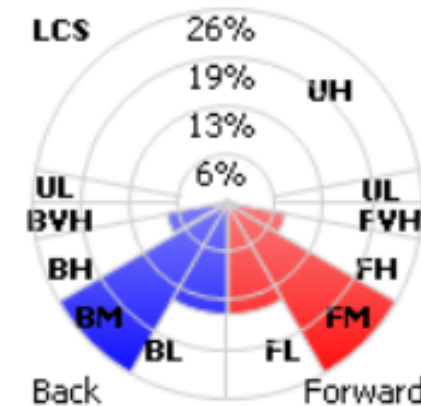


Draft Requirements Distribution

Metric and/or Data set	Current V4.4 Requirement	V5.0 Draft Requirements		Method of Measurement	Applies to
		Threshold	Reported		
Zonal Lumen Distributions & Spacing Criteria	PUD-specific requirements	PUD-specific requirements, identical to V4.4		Produced by photometric analysis from .ies file	All PUDs
Polar Plot of Distribution	No related requirement	None	Polar plots for 0°, 90°, and Maximum Intensity angle	Produced by photometric analysis of .ies file	All PUDs

Summary:

- ZLD requirements stay the same
- Reporting of polar plot (from .ies file)



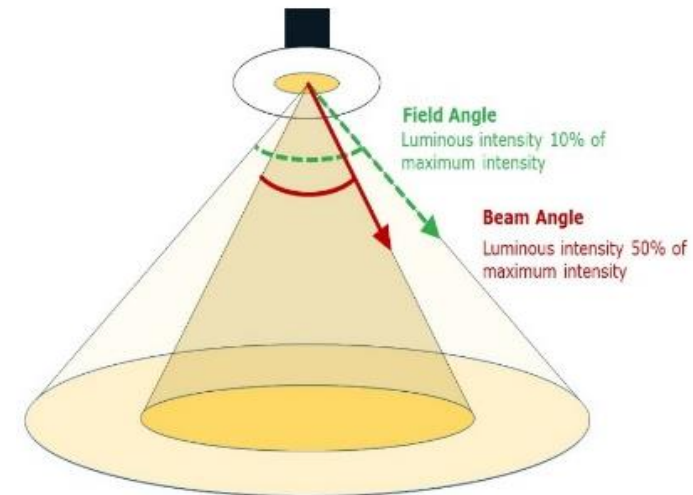


Draft Requirements Distribution

Metric and/or Data set	Current V4.4 Requirement	V5.0 Draft Requirements		Method of Measurement	Applies to
		Threshold	Reported		
Beam Angle	No related requirement	None	Angle from 0 - 180°	Values produced by photometric analysis from .ies file	<ul style="list-style-type: none"> • Landscape/ Accent Flood and Spot Luminaires • Architectural Flood and Spot Luminaires • Track or Mono-Point Luminaires • Wall Wash Luminaires
Field Angle	No related requirement		Angle from 0 - 180°		

Summary:

- Reporting of beam angle (from .ies file)
- Reporting of field angle (from .ies file)



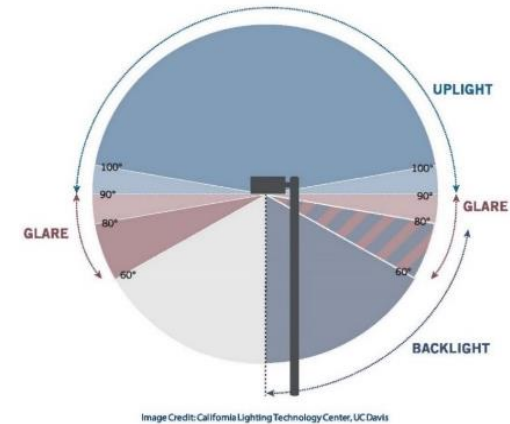


Draft Requirements Distribution & Glare

Metric and/or Data set	Current V4.4 Requirement	V5.0 Draft Requirements		Method of Measurement	Applies to
		Threshold	Reported		
Backlight, Uplight and Glare (BUG) Rating	No related requirement	None	BUG values from 0 to 5	IES TM-15-11, Addendum A: Luminaire Classification System for Outdoor Luminaires	All QPL outdoor products, except: <ul style="list-style-type: none"> • Landscape/ Accent Flood and Spot Luminaires • Architectural Flood and Spot Luminaires

Summary:

- Reporting of B U G values (from .ies file)





Draft Requirements Glare

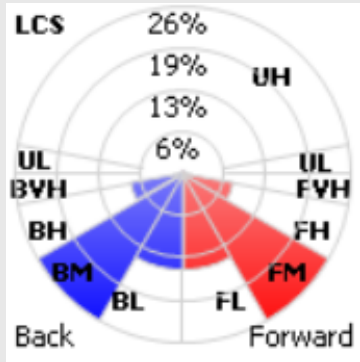
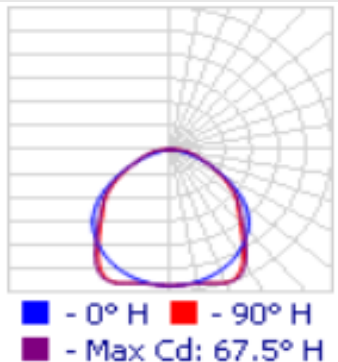
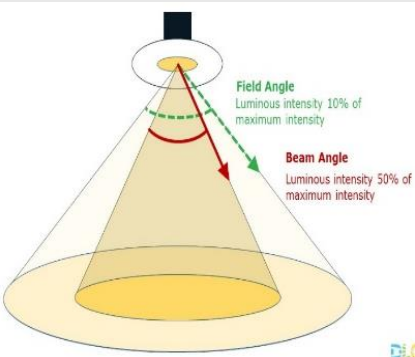
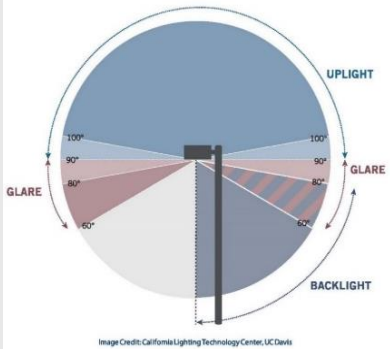
Metric and/or Data Set	Current V4.4 Requirements	V5.0 Draft Requirements			Method of Evaluation
		Threshold	Reported	Listing	
Unified Glare Rating (UGR) <i>Applicable to indoor luminaires and indoor retrofit kits only</i>	No related requirement	None	Uncorrected UGR Table (1000 lm) and Corrected UGR Table (product lm)	Designation of glare potential: <ul style="list-style-type: none"> Low Medium High (to be defined in a later draft)	UGR tables as per CIE 117-1995, CIE 190-2010

Summary:

- Reporting of the UGR tables (calculated using .ies file and software)
- Designation of glare potential (low, medium, high) based on UGR values

Reflectances:		0.7	0.7	0.5	0.5	0.5	0.7	0.7	0.5	0.5	0.5
Ceiling (cavity)		0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
Wall		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Reference plane											
Room Dimensions		Viewed crosswise					Viewed endwise				
X=2H	Y=2H	8.9	10.5	9.3	10.8	11.1	10.7	12.2	11.0	12.5	12.9
	3H	10.5	11.9	10.8	12.2	12.6	12.4	13.8	12.8	14.2	14.5
	4H	11.0	12.3	11.4	12.6	13.0	13.1	14.5	13.5	14.8	15.2
	6H	11.5	12.7	11.9	13.1	13.5	13.6	14.8	14.0	15.2	15.6
	8H	11.7	12.9	12.2	13.3	13.7	13.8	14.9	14.2	15.3	15.7
	12H	12.0	13.2	12.5	13.5	14.0	13.8	15.0	14.3	15.3	15.8
	4H	2H	9.6	11.0	10.0	11.3	11.7	11.0	12.4	11.4	12.7
		3H	11.4	12.5	11.8	12.9	13.3	13.0	14.1	13.4	14.5
		4H	12.0	13.0	12.4	13.4	13.9	13.9	14.9	14.3	15.3
		6H	12.7	13.5	13.1	14.0	14.4	14.5	15.4	15.0	15.8
		8H	13.0	13.8	13.5	14.2	14.7	14.7	15.5	15.2	16.0
		12H	13.4	14.1	13.8	14.6	15.0	14.8	15.6	15.3	16.0
	8H	4H	12.4	13.2	12.8	13.6	14.1	14.0	14.8	14.5	15.3
		6H	13.2	13.8	13.7	14.3	14.8	14.8	15.4	15.3	15.9
		8H	13.6	14.2	14.1	14.7	15.2	15.0	15.6	15.5	16.1
		12H	14.1	14.7	14.6	15.1	15.7	15.2	15.7	15.7	16.2
	12H	4H	12.4	13.1	12.9	13.6	14.1	14.0	14.8	14.5	15.2
		6H	13.2	13.8	13.8	14.3	14.8	14.8	15.4	15.3	15.9
		8H	13.7	14.3	14.3	14.8	15.3	15.1	15.6	15.6	16.1

Distribution & Glare Metrics Generation

Zonal Lumen Distribution	Polar Plot	Beam / Field Angle	BUG Values	UGR Tables																																																																																																																																																																																																																																																																																																
				<table><tr><th colspan="2">Reflectances:</th><th>0.7</th><th>0.7</th><th>0.5</th><th>0.5</th><th>0.5</th><th>0.7</th><th>0.7</th><th>0.5</th><th>0.5</th><th>0.5</th></tr><tr><th colspan="2">Ceiling (cavity)</th><td>0.5</td><td>0.3</td><td>0.5</td><td>0.3</td><td>0.3</td><td>0.5</td><td>0.3</td><td>0.5</td><td>0.3</td><td>0.3</td></tr><tr><th colspan="2">Wall</th><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td></tr><tr><th colspan="2">Reference plane</th><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td></tr><tr><th colspan="2">Room Dimensions</th><th colspan="5">Viewed crosswise</th><th colspan="5">Viewed endwise</th></tr><tr><td>X=2H</td><td>Y=2H</td><td>8.9</td><td>10.5</td><td>9.3</td><td>10.8</td><td>11.1</td><td>10.7</td><td>12.2</td><td>11.0</td><td>12.5</td><td>12.9</td></tr><tr><td>3H</td><td>3H</td><td>10.5</td><td>11.9</td><td>10.8</td><td>12.2</td><td>12.6</td><td>12.4</td><td>13.8</td><td>12.8</td><td>14.2</td><td>14.5</td></tr><tr><td>4H</td><td>4H</td><td>11.0</td><td>12.3</td><td>11.4</td><td>12.6</td><td>13.0</td><td>13.1</td><td>14.5</td><td>13.5</td><td>14.8</td><td>15.2</td></tr><tr><td>6H</td><td>6H</td><td>11.5</td><td>12.7</td><td>11.9</td><td>13.1</td><td>13.5</td><td>13.6</td><td>14.8</td><td>14.0</td><td>15.2</td><td>15.6</td></tr><tr><td>8H</td><td>8H</td><td>11.7</td><td>12.9</td><td>12.2</td><td>13.3</td><td>13.7</td><td>13.8</td><td>14.9</td><td>14.2</td><td>15.3</td><td>15.7</td></tr><tr><td>12H</td><td>12H</td><td>12.0</td><td>13.2</td><td>12.5</td><td>13.5</td><td>14.0</td><td>13.8</td><td>15.0</td><td>14.3</td><td>15.3</td><td>15.8</td></tr><tr><td>4H</td><td>2H</td><td>9.6</td><td>11.0</td><td>10.0</td><td>11.3</td><td>11.7</td><td>11.0</td><td>12.4</td><td>11.4</td><td>12.7</td><td>13.1</td></tr><tr><td>3H</td><td>3H</td><td>11.4</td><td>12.5</td><td>11.8</td><td>12.9</td><td>13.3</td><td>13.0</td><td>14.1</td><td>13.4</td><td>14.5</td><td>14.9</td></tr><tr><td>4H</td><td>4H</td><td>12.0</td><td>13.0</td><td>12.4</td><td>13.4</td><td>13.9</td><td>13.9</td><td>14.9</td><td>14.3</td><td>15.3</td><td>15.7</td></tr><tr><td>6H</td><td>6H</td><td>12.7</td><td>13.5</td><td>13.1</td><td>14.0</td><td>14.4</td><td>14.5</td><td>15.4</td><td>15.0</td><td>15.8</td><td>16.3</td></tr><tr><td>8H</td><td>8H</td><td>13.0</td><td>13.8</td><td>13.5</td><td>14.2</td><td>14.7</td><td>14.7</td><td>15.5</td><td>15.2</td><td>16.0</td><td>16.4</td></tr><tr><td>12H</td><td>12H</td><td>13.4</td><td>14.1</td><td>13.8</td><td>14.6</td><td>15.0</td><td>14.8</td><td>15.6</td><td>15.3</td><td>16.0</td><td>16.5</td></tr><tr><td>8H</td><td>4H</td><td>12.4</td><td>13.2</td><td>12.8</td><td>13.6</td><td>14.1</td><td>14.0</td><td>14.8</td><td>14.5</td><td>15.3</td><td>15.8</td></tr><tr><td>6H</td><td>6H</td><td>13.2</td><td>13.8</td><td>13.7</td><td>14.3</td><td>14.8</td><td>14.8</td><td>15.4</td><td>15.3</td><td>15.9</td><td>16.4</td></tr><tr><td>8H</td><td>8H</td><td>13.6</td><td>14.2</td><td>14.1</td><td>14.7</td><td>15.2</td><td>15.0</td><td>15.6</td><td>15.5</td><td>16.1</td><td>16.6</td></tr><tr><td>12H</td><td>12H</td><td>14.1</td><td>14.7</td><td>14.6</td><td>15.1</td><td>15.7</td><td>15.2</td><td>15.7</td><td>15.7</td><td>16.2</td><td>16.8</td></tr><tr><td>12H</td><td>4H</td><td>12.4</td><td>13.1</td><td>12.9</td><td>13.6</td><td>14.1</td><td>14.0</td><td>14.8</td><td>14.5</td><td>15.2</td><td>15.7</td></tr><tr><td>6H</td><td>6H</td><td>13.2</td><td>13.8</td><td>13.8</td><td>14.3</td><td>14.8</td><td>14.8</td><td>15.4</td><td>15.3</td><td>15.9</td><td>16.4</td></tr><tr><td>8H</td><td>8H</td><td>13.7</td><td>14.3</td><td>14.3</td><td>14.8</td><td>15.3</td><td>15.1</td><td>15.6</td><td>15.6</td><td>16.1</td><td>16.7</td></tr></table>	Reflectances:		0.7	0.7	0.5	0.5	0.5	0.7	0.7	0.5	0.5	0.5	Ceiling (cavity)		0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3	Wall		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Reference plane		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Room Dimensions		Viewed crosswise					Viewed 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Distribution + Glare data (.ies file) based on Goniophotometer testing



Draft Requirements Distribution & Glare

Metric and/or Data set	Current V4.4 Requirement	V5.0 Draft Requirements		Method of Measurement	Applies to
		Threshold	Reported		
.ies file	.ies file for each optical variation	None	.ies files for each variation	IES LM-79-08, ANSI/IES LM-63-02, ANSI/IES TM-33-18	All products

Summary:

- Reporting of distribution data (.ies file)



Clarifying Questions?

We'll get to the technical issues shortly...



What Works.....?

Turn to the person sitting next to you....what do you like, what works about what you have heard so far?



Comment Themes



Theme 1: Both support and concerns for using .ies files to generate glare/distribution metrics

- Support for using .ies files
 - Autogeneration of glare/distribution data would streamline the submission and update process
- Concerns for using .ies files
 - **Consistency/Format** – How would DLC ensure consistency of file data and reported format?
 - **Accuracy** – How to ensure files are accurate and up-to-date?
 - **Testing/Reporting Burden** – How to capture .ies files for each product without creating significant testing and reporting burden?
 - **Data Accessibility** – Should .ies file data be accessible to QPL users?



Theme 2: Misunderstanding or misapplying glare and distribution metrics

- Support for using Distribution & Glare Metrics
 - Provides useful information using industry established methods and helps assure quality for QPL listed products
- Concerns for using Distribution & Glare Metrics
 - The proposed Glare metrics (UGR, BUG) have limitations that will not be understood by all QPL users
 - UGR is not an accurate predictor for some applications and types of LED luminaires
 - BUG is not a good predictor on glare and light trespass for some use cases
 - The proposed glare assessment (low, medium, high) could give false information on superiority of products for an application
 - QPL users may misuse or misapply these metrics



Theme 3: Balancing quality and efficacy

- Support for efficacy allowances of fixtures that demonstrate low-glare
 - Glare control and optics can impact efficacy; low-glare fixtures should not be penalized, and allowances would enable that
- Concerns for efficacy allowances of fixtures that demonstrate low-glare
 - The proposed Glare metrics (UGR, BUG) have limitations and therefore this could lead to hindering innovation and good products being supported
 - Sophisticated optics have only minimal impact on efficacy



Clarifying Questions?

If not, on to discussions...



Discussion Questions: Each table please pick 1 topic

Task: Develop a list of possible solutions to address the issues

Topic 1 .ies file generation	Topic 2 QPL metrics generation	Topic 3 Preventing metrics misapplication	Topic 4 Allowances for low-glare products
<ul style="list-style-type: none"> What method(s) could be used to generate .ies files for every product that would minimize testing burden? What are the pitfalls of the method(s) you have come up with? 	<ul style="list-style-type: none"> What approaches could be used for generating reported values (BUG, beam/field angles, UGR)? From independent testing? From software tools using .ies files? Other? Who would generate them (Labs, manufacturers, DLC), and what tools might be used? 	<ul style="list-style-type: none"> How could misapplication concerns be addressed? What suggestions would you make for education, user tools, or strategies to prevent or mitigate concerns? <p>Be specific.</p>	<ul style="list-style-type: none"> What are the reasons that efficacy allowances for low-glare products would be beneficial? What would be the best way to determine allowances? What proposals might you make and what would be the rationale?



Discussion Break-out Sessions

30 minutes ...



Discussion Questions: Each table please pick 1 topic

Task: Develop a list of possible solutions to address the issues

Topic 1 .ies file generation	Topic 2 QPL metrics generation	Topic 3 Preventing metrics misapplication	Topic 4 Allowances for low-glare products
<ul style="list-style-type: none"> What method(s) could be used to generate .ies files for every product that would minimize testing burden? What are the pitfalls of the method(s) you have come up with? 	<ul style="list-style-type: none"> What approaches could be used for generating reported values (BUG, beam/field angles, UGR)? From independent testing? From software tools using .ies files? Other? Who would generate them (Labs, manufacturers, DLC), and what tools might be used? 	<ul style="list-style-type: none"> How could misapplication concerns can be addressed? What suggestions would you make for education, user tools, or strategies to prevent or mitigate concerns? <p>Be specific.</p>	<ul style="list-style-type: none"> What are the reasons that efficacy allowances for low-glare products would be beneficial? What would be the best way to determine allowances? What proposals might you make and what would be the rationale?



Audience Report Out

Topic 1 .ies file generation	Topic 2 QPL metrics generation	Topic 3 Preventing metrics misapplication	Topic 4 Allowances for low-glare products



Other Issues Not Discussed

Is there another issue that you think should be addressed by this group?



Next Steps

Now:

- Summary of our discussion for tonight's report to audience

Next Couple of Days:

- We'll continue to collect your feedback throughout the conference

Coming Months:

- Development of draft 2 for the V5.0 policy; we might reach out for targeted follow-up conversations



Thank You!

Questions? Feedback?

Please feel free to find us throughout the conference
or

Send questions and feedback to:

Comments@designlights.org

DesignLights Consortium[®]
www.designlights.org

