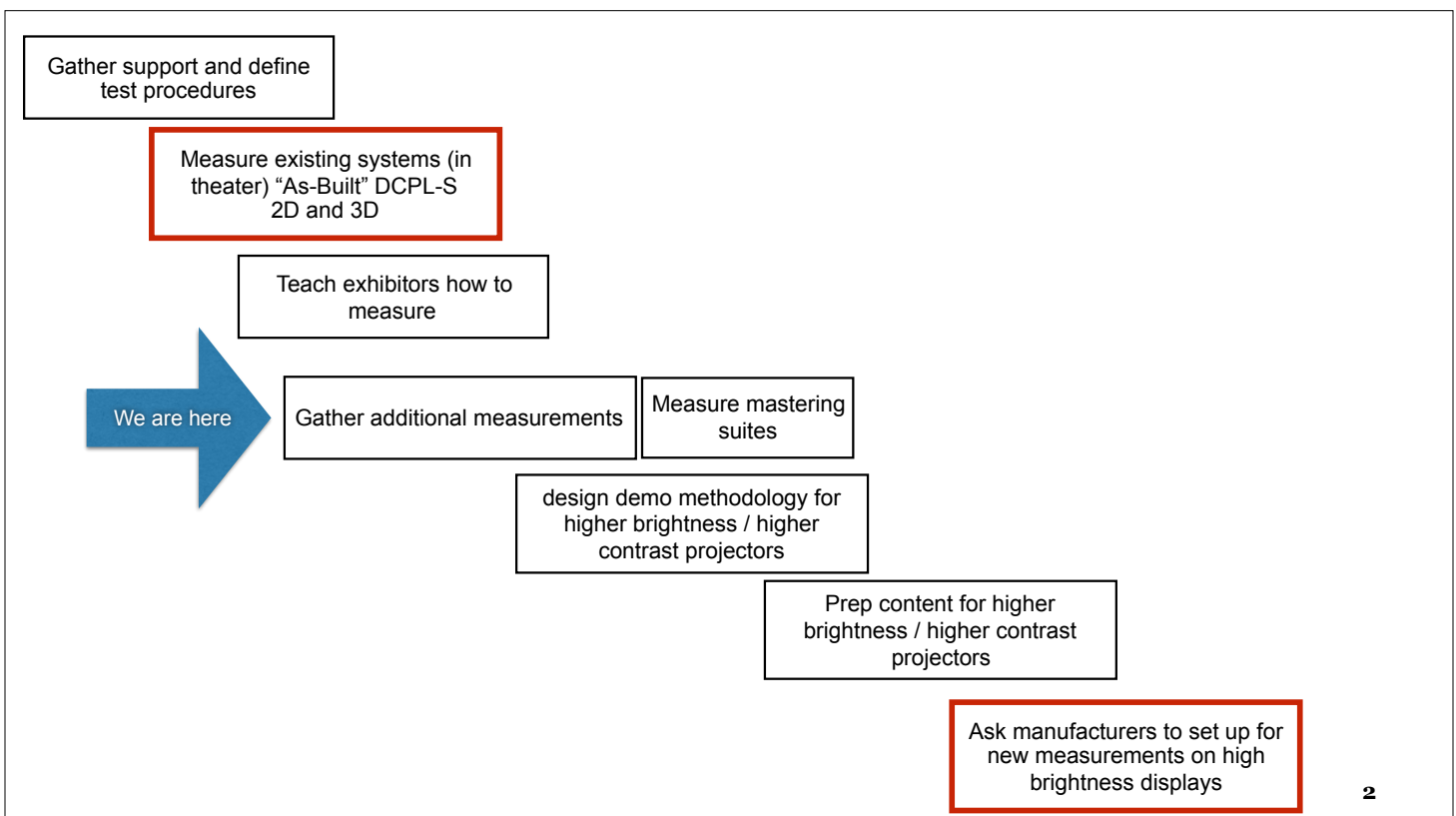


What's Happened?

- ICTA Conference and presentation of status of DCPL
- NATO/ISDCF held a training/demo session 1/23
 - AMC Burbank, demo at 7 screens! Lots of data to report!
 - Many exhibitors, manufacturers - no studio or creative
- DCI held viewing session of clips on a high brightness display
- A question has been raised on the validity of the low light measurements
- Need to add a color temp measurement to test methodology.

1



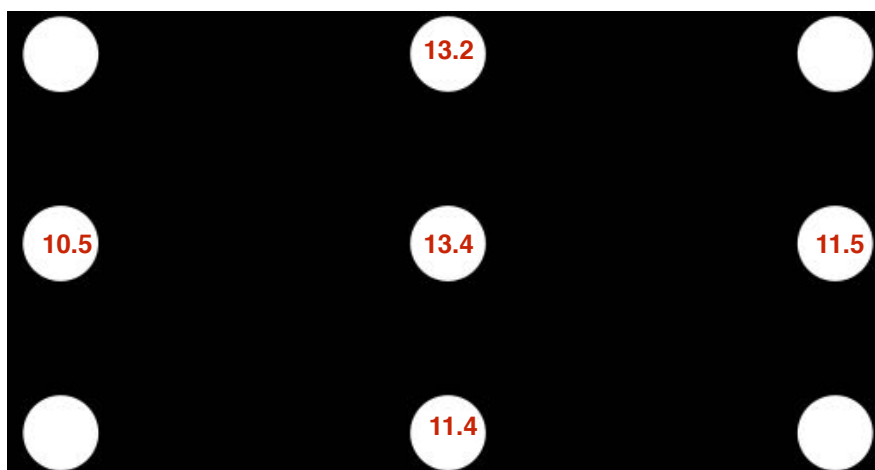
2

What We Learned...

- If properly prepared, a screen can be measured in 30 minutes
- Data captured in an on-line Google Sheet
 - Requires knowledge of spreadsheet and methodology
 - Easy to screw up entry
 - Requires being on-line
 - Could be a problem in some locations
- Lots of data - trying to correlate numbers with picture quality

3

20200114 4:30pm

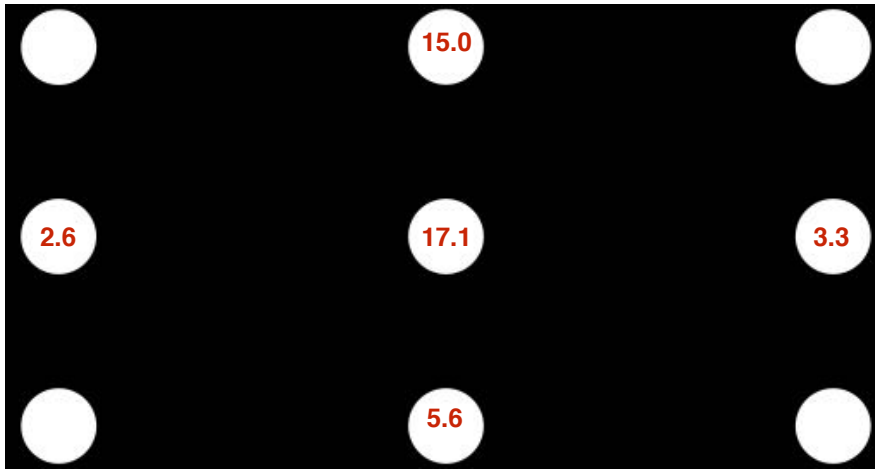


16' screening room
Matt screen (no gain)

Average 5 point brightness (fL)	12.0
Projector Black (mNits)	50.0
System Black (mNits)	0.7
DCIC average Contrast	527
Picture Rating	9.0
Sequential Contrast	916
Reference Center Brightness (fL)	13.4

4

20200114 4:00pm

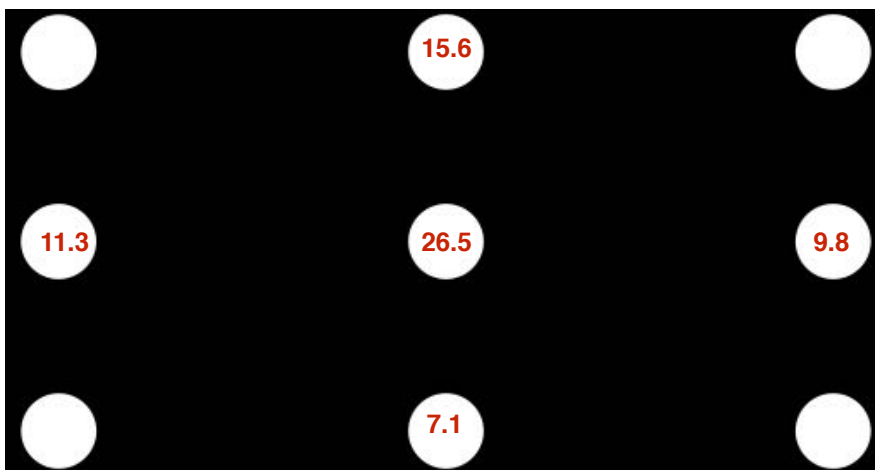


16' screening room
Silver screen (gain = 3)

Average 5 point brightness (fL)	8.8	>11
Projector Black (mNits)	18.8	<40
System Black (mNits)	0.2	<4
DCIC average Contrast	677	>800
Picture Rating	8.5	
Sequential Contrast	3113	
Reference Center Brightness (fL)	17.1	

5

20200123 8:15am

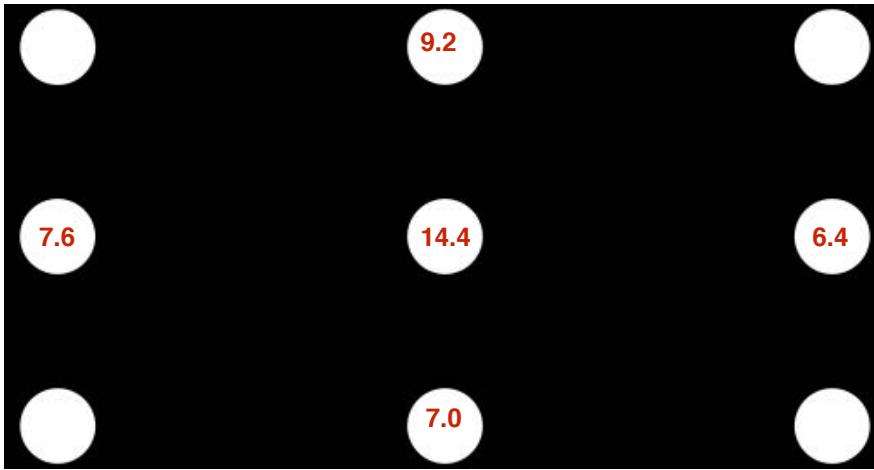


33' wide screen
Silver screen (gain?)

Average 5 point brightness (fL)	14.1	>11
System Black (mNits)	44.0	<40
Theater black (Center, mNits)	3.7	<4
DCIC average Contrast	1076	>800
Picture Rating	8.8	
Sequential Contrast	2064	
Reference Center Brightness (fL)	26.5	

6

20200123 8:45am

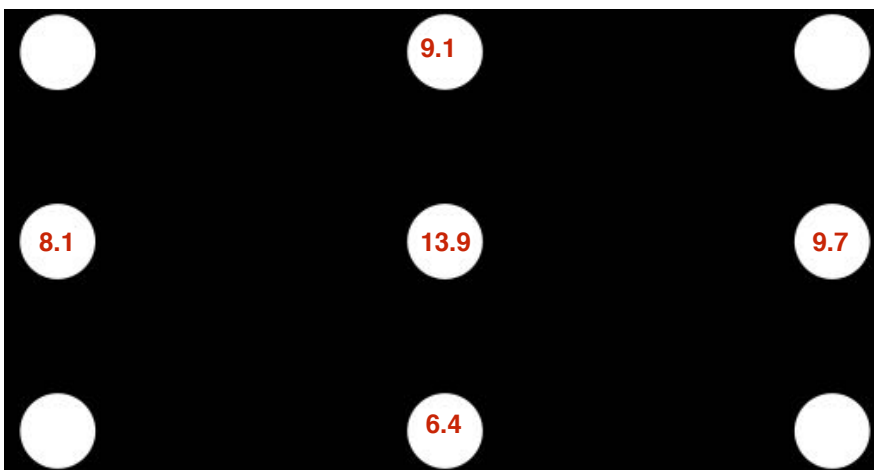


34' wide screen
1.8 gain screen

Average 5 point brightness (fL)	8.9	>11
System Black (mNits)	27.0	<40
Theater black (Center, mNits)	7.4	<4
DCIC average Contrast	648	>800
Picture Rating	8.2	
Sequential Contrast	1822	
Reference Center Brightness (fL)	14.4	

7

20200123 7:50am

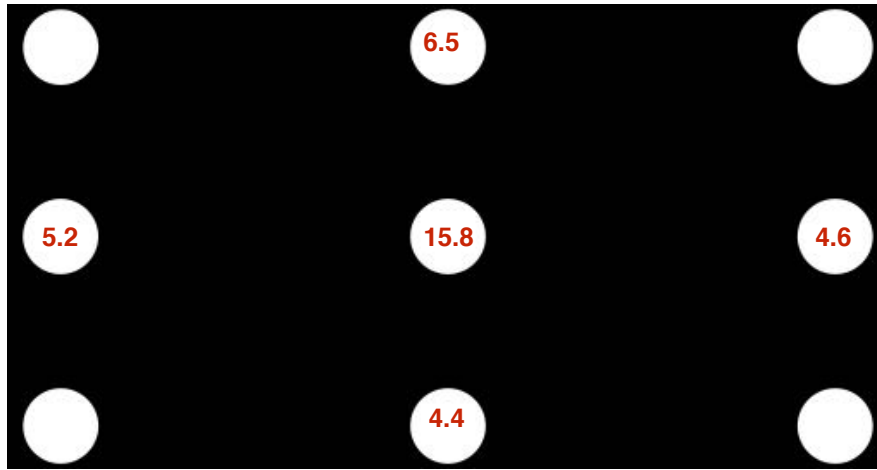


59' wide screen
1.8 gain screen

Average 5 point brightness (fL)	9.5	>11
Projector Black (mNits)	43.5	<40
System Black (mNits)	2.8	<4
DCIC average Contrast	672	>800
Picture Rating	8.2	
Sequential Contrast	1092	
Reference Center Brightness (fL)	13.9	

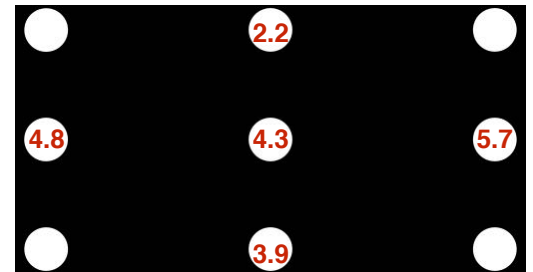
8

20200123 9:05am



50' wide screen
2 gain screen

Theater Black - mNits



Average 5 point brightness (fL)	7.3	>11
System Black (mNits)	43.0	<40
Theater black (Center, mNits)	4.3	<4
DCIC average Contrast	948	>800
Picture Rating	8.2	
Sequential Contrast	1256	
Reference Center Brightness (fL)	15.8	

9

11 screens...

Results	Target Values	Screen 1	Screen 2	Screen 3	Screen 4	Screen 5	Screen 6	Screen 7	Screen 8	Screen 9	Screen 10	Screen 11
Date of Test		2020-01-23	2020-01-23	2020-01-23	2020-01-23	2020-01-23	2020-01-23	2020-01-23	2020-01-14	2020-01-14	2020-01-14	2020-01-14
Time of test		9:45:00 AM	9:05:00 AM	8:45:00 AM	8:15:00 AM	7:11:00 AM	7:50:00 AM	10:30:00 AM	5:00:00 PM	5:30:00 PM	4:00:00 PM	4:30:00 PM
Reference Center Brightness	>13	12.5	15.8	14.4	26.5	13.5	13.9	15.0	13.3	21.4	17.1	13.4
Average 5 point brightness	>10	6.7	7.3	8.9	14.1	8.7	9.5	8.6	11.9	19.0	8.8	12.0
System Black (mNits)	<40	19.0	43.0	27.0	44.0	9.5	43.5	37.0	10.0	10.0	18.8	50.0
Theater black (Center, mNits)	<4	4.7	4.3	7.4	3.7	0.3	2.8	3.6	0.2	0.2	0.2	0.7
DCIC average Contrast	>800	865	948	648	1076	1058	672	855	1271	1244	677	527
Sequential Contrast		2258	1256	1822	2064	4877	1092	1386	4570	7330	3113	916
Picture Rating		7.1	8.2	8.2	8.8	9.0	8.2	8.0	9.5	9.5	8.5	9.0
Flat or Scope native screen		Flat	Flat	Flat	Flat	Flat	Flat	Scope	Scope	Scope	Flat	Flat
Curve Screen?		Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Screen Gain		1.4	2	1.8		2.2	1.8	2.2	1	1	3	1.3
Screen Notes			Silver		Silver			Silver			Silver	
Width of Screen		29.62	50.62	34.25	33.33	67.42	59	32.75	33	33	16	16
Height of Screen		16.83	27.92	19.92	18.83	36.42	31.33	19	14	14	9	9
Screen Aspect		1.76	1.81	1.72	1.77	1.85	1.88	1.72	2.36	2.36	1.78	1.78
Projector Throw		44.66667	76.5	44.5	60.5	90	93.16667	60.3			29	29
Projector bulb size / hours / %		4K / 430 / 80%	6k / 100 / 75%	3k / 86 / 80%	4k / 153 / 54%	Laser	6k / 108 / 100%	4K / 438 / 53%	Laser	Laser	1.2K / 2.2k / 80%	1.2K / 2.2k / 80%
Measurement Distance (~2x Height)		32.5	54	38	36.5	70	62	38	31.5	31.5	18	18

Unofficial Results

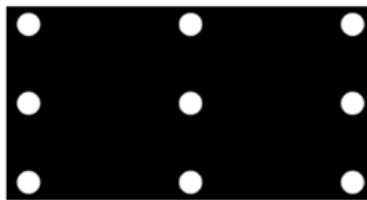
- Theater black is still really good
 - System (former Projector) black was 30-40 mNits
 - iPhone test - adds about 0.2mNit to black
- The eye is amazing at **ignoring** non-uniform illumination during normal image playback
- Pictures look good
 - The goal is to make pictures look good, not the numbers
- Pictures looked better on bigger screens
- Bigger screens did not need as high light levels to still look good

11

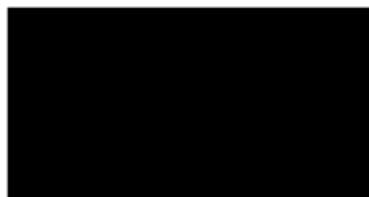
Most Useful Test Patterns



DCP of black and white



DCP of 9-dice pattern
(SMPTE spec)

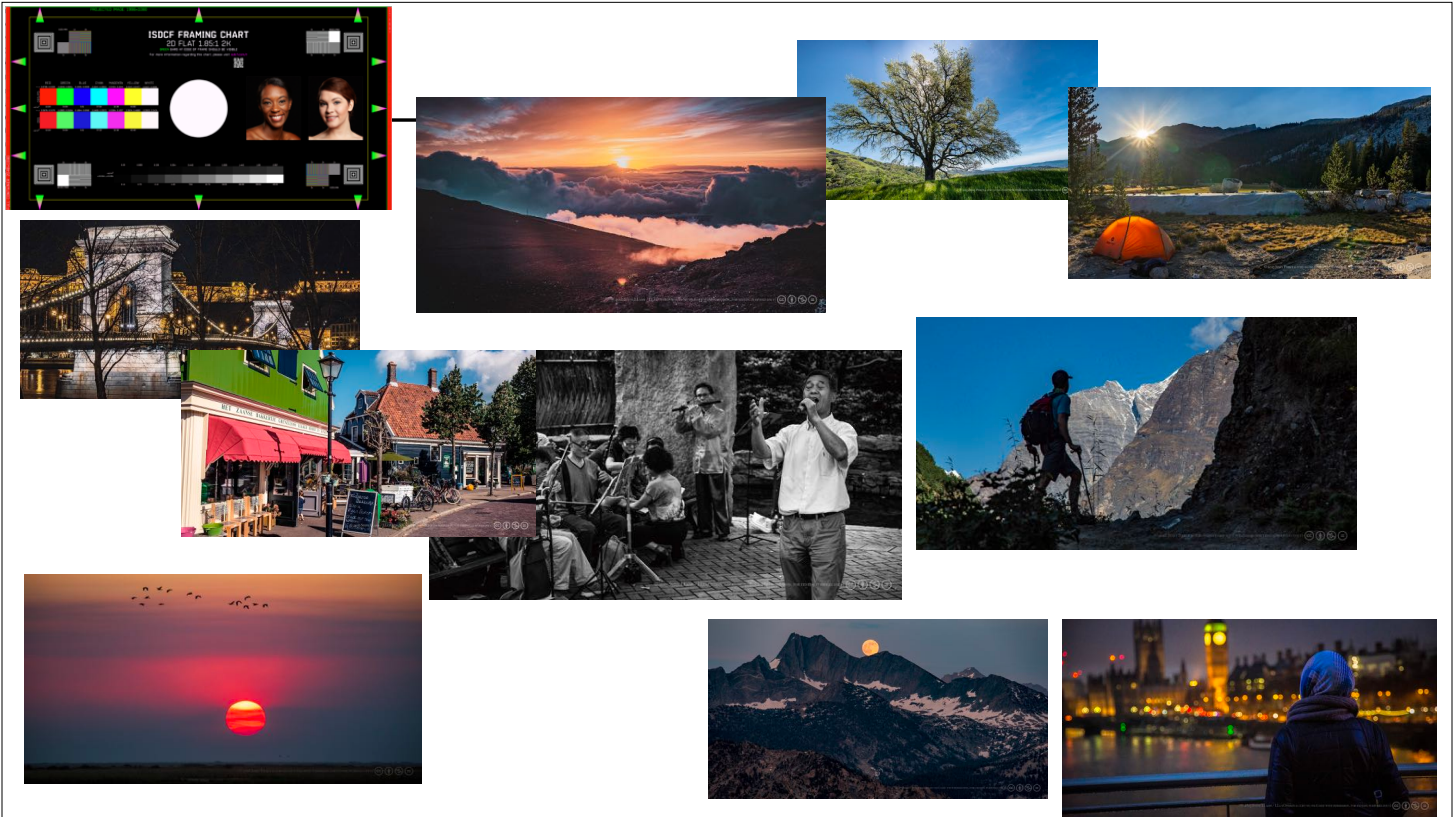


No projector - House lights at feature
playback level and trailer/walk in level



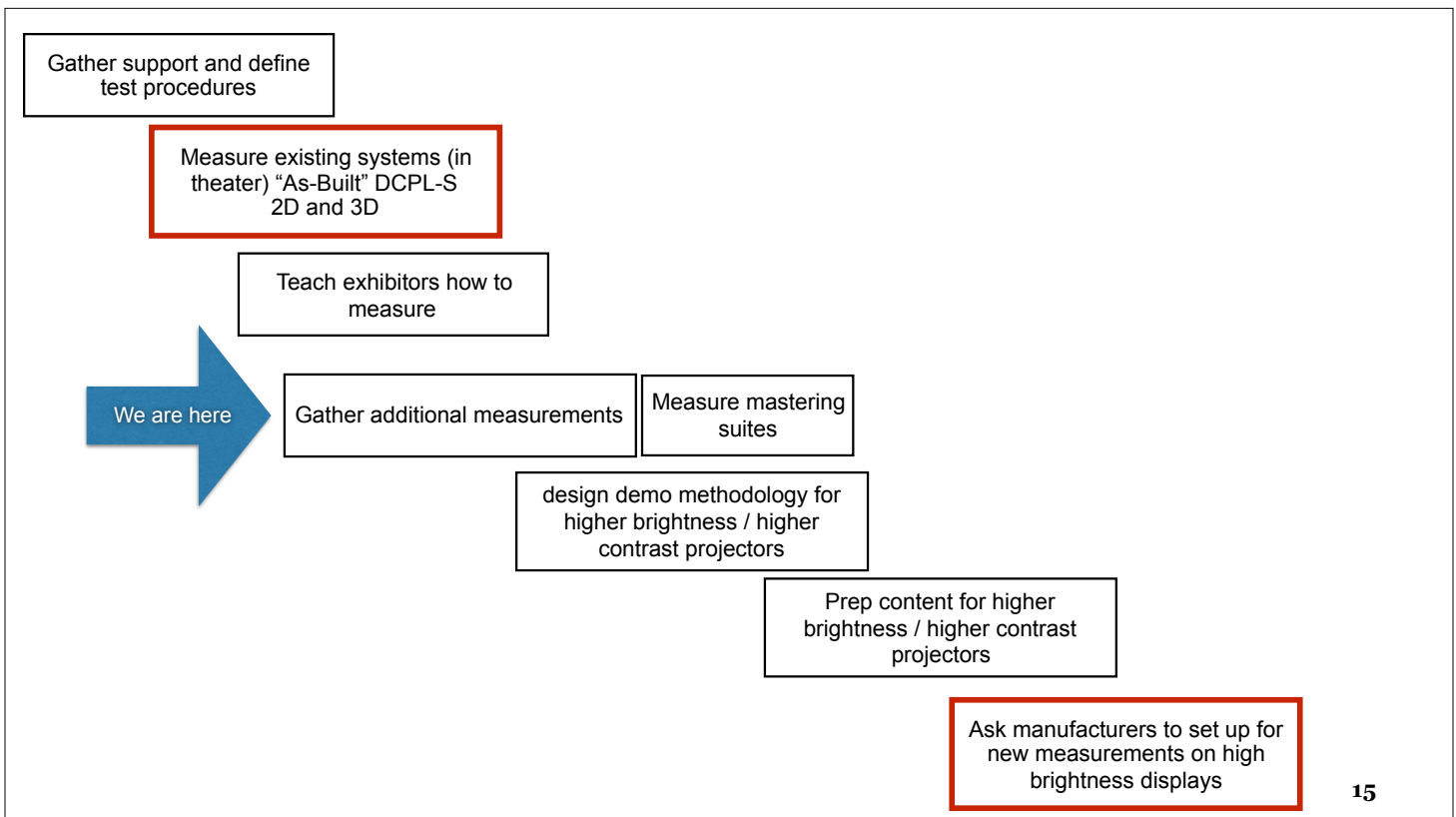
DCP of DCIC - a NATO
invention - Digital Cinema
Intraframe Contrast

12



Short Term Goals

- Check detector to compare black readings and color readings
- Share DCPs and spreadsheet for others to use
 - Errors were found in the DCPs - one image grading and targets in wrong place
- Share initial results with other groups
 - especially creatives



Next Steps

- Demo / Testing of higher brightness displays
- What master?
 - 14fL on high contrast projector (10mNit system black)
 - 30fL on 30mNit system black
 - 30fL / PQ on 10mNit system black
 - 88fL (300Nit) on 10mNit system black
- What content?
- When/Where?
- Who to participate
- Concept: create test targets/images used for as-built mastered at these 4 levels PLUS motion segments.