REBUTTAL TESTIMONY OF DAVID W. ISAKSON
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recommendation that the Commission review the entire book from top to bottom should be rejected because it is duplicative and unspecific in its purpose.

Q. Can the Commission rely on GLREA witness Rafson's direct testimony or exhibits to support any recommendations in the instant case?

A. No. As shown throughout this rebuttal, GLREA witness Rafson's direct testimony should not be relied upon by the Commission in any of its decisions regarding either GLREA's, the Company's, or any other parties' proposals in the instant case. The fundamental misunderstanding of basic regulatory theory and practice means that any evidence, arguments, counter arguments, or recommendations made by GLREA witness Rafson should be dismissed by the Commission as unsupported.

MI-MAUI — Streetlighting; Contribution in aid of construction

Q. Does Staff agree that existing streetlighting customers subsidize new streetlighting customers?

A. No. MI-MAUI argues that "The subsidization occurs because those [new] costs are recovered in the rates that *all* customers pay, meaning new-light customers will end up paying less for the installation of the light due to the contributions of existing customers through their rates."[32] This is partially true. The true part is that if a customer takes new streetlighting service, they will pay the same base rates as other existing streetlighting customers after their contribution in aid of construction (CIAC) payment. Included in those same base rates is the added cost

[32] Direct Testimony of MI-MAUI witness Richard Bunch, p 6, lines 9-11.

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of serving those same new customers. The incorrect part is that the new customers will end up paying less for the installation than existing customers. Two customers paying the same rate will pay the same rate as long as they are both customers. A new customer does not get grandfathered into existing rates while the current customers are saddled with the cost to connect new customers. There are not two tiers of lighting rates – before and after – depending on when and where two similarly situated customers came to be in the Company's lighting service. Additionally, MI-MAUI hints at a possible reason for cost subsidy may be that growth in the lighting class is occurring in areas that are less densely populated but provided no evidence to show that it is the case.[33]

MI-MAUI incorrectly frames the addition of new streetlighting customers as if those customers will not pay the same rates as other customers on the same rate.

Q. Does MI-MAUI correctly calculate the supposed subsidy between new and existing lighting customers?

A. MI-MAUI calculates the subsidy between customers by taking the net present value of the directly allocated depreciation expense for Rate UUL per light per year and finds that in total a customer pays per $709 streetlight.[34] When the $100 CIAC payment is included, then a new customer pays a lifetime amount of $809 for each new installation. MI-MAUI then avers that the remainder of the cost of the new streetlight installation falls *to all other customers*. This is not so. New customers will pay the same rates as current customers, which means *they also*

[33] Direct Testimony of MI-MAUI witness Richard Bunch, p 6, lines 11-14.
[34] Direct Testimony of MI-MAUI witness Richard Bunch, p 6, line 20 through page 7, line 10.

REBUTTAL TESTIMONY OF DAVID W. ISAKSON
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pay for the new streetlights added to the system. Current day customers were once new customers themselves, and yet they also paid the same rates as their contemporaries when they began their service under streetlighting tariffs.

Essentially, every customer was once a new customer that likely increased the cost to serve their customer class, which is why all similarly situated customers pay the same base rates. Also, utility equipment used to serve customers does not last forever and must eventually be upgraded or replaced. Should existing customers not be expected to pay rates that include the cost of replacing end-of-life equipment because the equipment serving their load still works? Yes, they should, if not only for the fact that those customers with currently serviceable equipment will, undoubtedly, one day require replacement equipment of their own.

MI-MAUI makes a similar complaint that existing customers will end up paying for a new luminaire that is not lighting up their street.[35] However, new customers could make the same complaint that their rates will pay for existing lights over someone else's street. All streetlighting customers are part of the same streetlighting class which take service in a similar fashion from the Company; therefore they all do, and should, pay the same base rates.

Q. Does MI-MAUI also mischaracterize the effect of adding new customers to the lighting class?

A. Yes. MI-MAUI claims that it is untrue that other customer benefit from having "more lights across which to apply the costs of providing service" because the

[35] Direct Testimony of MI-MAUI witness Richard Bunch, p 7, lines 7-10.

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population of taxpayers is not growing evenly across the Company's service territory.[36] First, the Company does not collect taxes or allocate service based on tax base. Second, regardless of where new customers enter the system, they will still contribute to their class's share of revenue requirement responsibility. Class billing determinants used to set lighting rates are unaffected by where, physically, that load growth occurs. Just because a new streetlight goes into service where population growth is happening does not mean the revenue from those lights will not offset the same class revenue requirement.

Q. If the Commission approves MI-MAUI's proposal to charge customers the full cost of new streetlighting installations, is any credit for the return on or of investment necessary?

A. No. If the customer is required to pay the full cost of its streetlight installation, then the asset should be considered fully depreciated and therefore never actually enter into the Company's plant-in-service. Therefore, these assets will never produce a return on or of the investment, so MI-MAUI's proposal should result in a credit of zero for these customers. However, MI-MAUI calculates that the credit should equal 9.4 years of tariff payments for any given light, which should be credited against the CIAC assessed to the customer.[37] This figure is based on the net present value of the return on and of existing average lighting rate base. This means that according to MI-MAUI's own calculations, the average new lighting customer will have fully paid for their lights via base rates in less than a decade. All this shows is that eventually those new lighting customers will fully entered

[36] Direct Testimony of MI-MAUI witness Richard Bunch, p 7, lines 11-20.
[37] Direct Testimony of MI-MAUI witness Richard Bunch, p 9, lines 8-12.

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into rate base alongside all their class peers, and no change to CIAC is actually necessary. It is unclear how setting CIAC to, essentially, 100% less 9.4 years of tariff payments will have MI-MAUI's desired effect of reducing new business expense, which MI-MAUI identifies as a driver of the lighting class's revenue deficiency.

Q. MI-MAUI recommends that the entirety of the new business expense for streetlighting should be disallowed because those costs should be borne only by new customers.[38] Does that fit with MI-MAUI's proposed CIAC credit?

A. No. It is unclear who would pay the expense related to 9.4 years of tariff payments that represent MI-MAUI's CIAC offset credit. Logically, the revenue shortfall created by issuing MI-MAUI's proposed CIAC credit would be paid for by all lighting customers. So new lighting customers would pay the full cost of installation, receive a credit worth 9.4 years of revenue, and then pay full rates that included the missing revenue from the credit. As Staff understands it, this process would not create MI-MAUI's intended effect of eliminating a subsidy between new and existing customers—which Staff disputes. This is because instead of the class paying the proposed $3.94M for new business in base rates, they would end up paying nearly, if not the same, amount in CIAC revenue offset costs. Furthermore, under MI-MAUI's lighting CIAC proposal, there is no reason for a new customer to take service under company-owned lighting provision in the first place, because the customer would have already paid off the entire cost of the new lighting installation.

[38] Direct Testimony of MI-MAUI witness Richard Bunch, p 11, lines 4-6.

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Q. Does MI-MAUI's proposed lighting CIAC policy contradict its position in the concurrent DTE electric general rate case?

A. Yes. In DTE's electric rate case U-21297, MI-MAUI advocated for the elimination of CIAC charges for the conversion to LED lights. In that case MI-MAUI argued that the basic reason to assess a CIAC fee was if the customer receives a special service or benefit then other customers should not have to pay for it through rates.[39]

Q. Please summarize Staff's analysis of MI-MAUI's streetlighting CIAC proposal.

A. Requiring new customers to first pay off their entire embedded costs of service minus a credit assuming they will be in service for 9.4 years and then entering those new customers into service paying the same rates as their peers is not only convoluted and incorrect, but also unnecessary. Using MI-MAUI's math and assumptions, it would be far simpler to inquire with the Company about the longevity of the average lighting customer, and if the average customer retains lighting service for longer than 9.4 years, we could assume that customers tend to eventually pay their way into the embedded costs of serving them and not require a CIAC payment at all. Again, that is all supposing one agrees with MI-MAUI's conversion of the net present value of depreciation expense and rate design revenue into years. As explained by MI-MAUI in the DTE electric case, CIAC should be used for special circumstances where the customer's attachment to the Company's system requires unique investment not otherwise required for other customers in its class, or otherwise socialized for all similarly situated customers.

[39] See MI-MAUI Initial Brief in MPSC Case No. U-21297, p 7. (link)

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Staff argues that new lighting customers are not distinct from existing customers because of their newness and should therefore not be charged more in CIAC than what was already approved by the Commission.

For these reasons the Commission should reject MI-MAUI's proposal to collect CIAC for the full cost of new streetlight installations minus a revenue credit.

Q. Is it fair to compare lighting installation and removal costs as context for MI-MAUI's lighting CIAC proposal?[40]

A. No. Lighting installation and lighting removal are not equal and opposite activities for cost recovery and thus should not necessarily be treated the same. The key difference between the two activities is that after installation the customer begins contributing revenue to the Company for its service, but after its removal the customer no longer pays base rates that would include the cost of the removal. Installation implies that the customer will join the lighting class and eventually cover the cost of their installation by continuing to pay base rates long enough and by absorbing the cost of subsequent new installations via new business expense. All customers were once new customers, after all. Removal implies that the customer is leaving the class, and thus there will be no future opportunity for them to pay for the cost of said removal.

[40] Direct Testimony of MI-MAUI witness Richard Bunch, p 10, lines 1-21.

MPSC Case No: U-21534

Requester: MAUI

Question No.: MAUIDE-4.28b

Respondent: R. Bellini

Page: 1 of 1

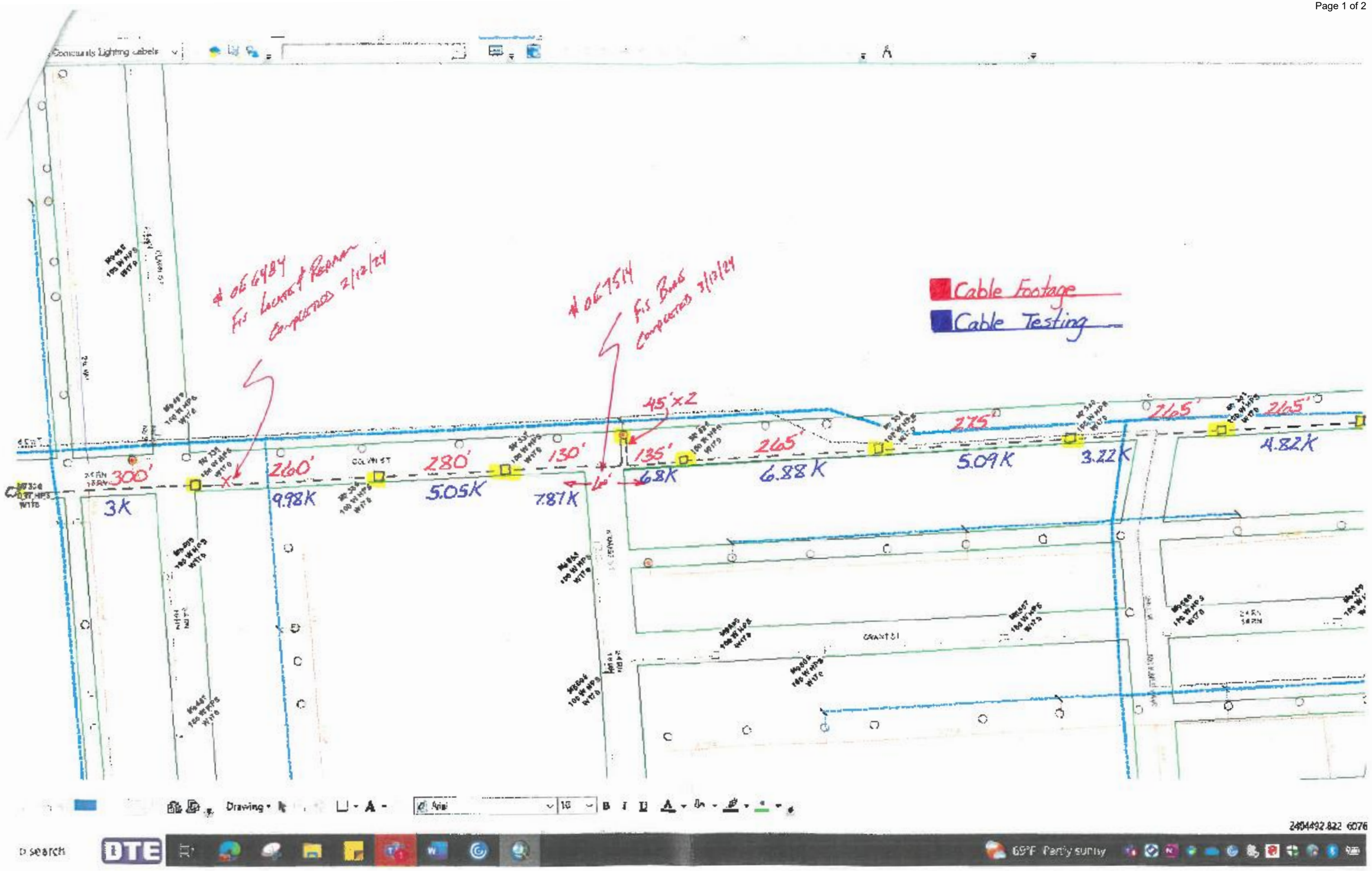
Question: Refer to the table titled "O&M 2024 Rate Case Test Period" in witness Bellini's Lighting Rate Model workpaper, Assumptions worksheet, rows 21-33.

b. Please provide O&M actual cost data for calendar years 2019-2023 inclusive, in the same format as the referenced table.

Answer: Please see below table for actual cost data in the format requested:

	Year				
O&M Category	**2019**	**2020**	**2021**	**2022**	**2023**
Group Relamping	$ -	$ 384,929	$ 175,601	$ 48,551	$ -
Streetlight Inspection	$ 108,068	$ 123,004	$ 121,192	$ 93,694	$ 30,160
Streetlight Painting	$ 238,674	$ 76,027	$ 139,845	$ 124,311	$ 72,726
LED Washing	$ 248,946	$ 165,412	$ 132,839	$ 136,691	$ -
Night Patrols	$ -	$ 287,224	$ 392,909	$ 322,608	$ 139,483
Supervisory & Administration	$ 1,211,979	$ 1,184,387	$ 1,450,714	$ 1,317,958	$ 1,159,891
Cancelled Projects/Other	$ 66,304	$ 7,048	$ 4,580	$ 3,444	$ 21,778
Outage Restoration	$ 6,519,039	$ 4,972,381	$ 5,300,190	$ 5,322,901	$ 6,667,615
OPL Outage Restoration	$ 813,078	$ 606,053	$ 568,260	$ 665,636	$ 778,858
Capitalization Credit	$(5,941,230)	$(4,519,892)	$(3,666,926)	$(4,045,128)	$(5,452,658)
Damage Claims	$ 457,577	$ 501,653	$ 587,062	$ -	$ (12,996)
Total	**$ 3,722,435**	**$ 3,788,226**	**$ 5,206,266**	**$ 3,990,666**	**$ 3,404,857**

Attachment: None.


Cable Footage
Cable Testing
0676484
Fis Locate & Repair
Completed 3/12/24
0677514
Fis Bore
Completed 3/13/24
45'x2
300'
3K
260'
9.98K
280'
5.05K
130'
7.87K
135'
6.8K
265'
6.88K
275'
5.09K
3.22K
265'
4.82K
COLVIN ST
GRANT ST

2nd- this is a RETURN TO LOCATION after multiple events for same location/complaint since January 2024. Please have your crews do the following:

* TROUBLESHOOT & Repair/Replace all listed assets* as necessary to return to working order.
* Test cable to see if this is a candidate for cable replacement.
* In Kloudgin include photos of all assets for confirmation of status.
* see included (and attached) ESRI Circuit map for reference.

3rd- once the job is complete, please reply to this email with findings of results from cable test and recommendation for cable replacement.

*assets:

M7334
M7335
M7336
M7337
M7338
M7339
M7340
M7341
M7342

** see attached spreadsheet listing previous events as downloaded from Kloudgin.
***see attached ESRI- Circuit Map.

If you have any questions please let me know.

system reliability and maintain the quality of power delivered to customers. The current state of the Company's grid will be discussed next in Section 4. Section 5 will revisit the impacts of scenarios in determining the gaps that need to be addressed to improve the system.

4 State of the Grid

4.1 Current Electric System Overview

DTEE's distribution grid includes approximately 31,000 miles of overhead distribution lines and 14,500 miles of underground distribution lines. Its service territory encompasses 7,600 square miles and includes approximately 2.3 million residential, commercial and industrial customers. DTEE's electrical grid consists of six voltage levels: 120kV, 40kV, 24kV, 13.2kV, 8.3kV and 4.8kV. Maps depicting the distribution and subtransmission voltages across the service territory can be found in Exhibit A.1. in Appendix A.

As many of DTEE's distribution assets have been in operation for several decades, a significant portion of the distribution system's equipment is reaching, or has exceeded, the typical industry lifespan, resulting in a higher occurrence of outage events when compared to peer utilities. Older equipment may have deteriorated due to long exposure to the elements, but in many cases this equipment was also built to less resilient standards of the past. Certain areas of the distribution system are in locations difficult to access such as backyards or wooded areas. Distribution lines in abandoned alleyways are particularly challenging to access, causing delays in restoration efforts and complicating equipment maintenance. Additionally, the electric system faces limitations on capacity in some areas, which at times present difficulties in accommodating new customer loads. The Company has seen a growing number of outages, particularly during extreme weather. Redesign and modernization will improve reliability and help to meet the evolving demands of today's energy landscape.

Under some conditions, the color temperature of an LED or HPS light source does not affect the visual performance of drivers. However, as mentioned above, color contrast can be improved by the selection of the light source. National Cooperative Highway Research Program (NCHRP) research evaluated driver visual performance by measuring the detection distance of pedestrians at two different offset distances (2 and 10 ft on the right shoulder) and under two speeds (35 and 55 mi/h), three light sources (3000K, 4000K, and 5000K LEDs), and two surround ratios (high and low). Visual performance was maximized under the 4000K LED at both offset distances (Figure 10) and speeds (Figure 11), especially at the higher surround ratio. This result indicates that at higher speeds, 4000K LED lighting might be beneficial for increasing driver visibility (Engineering & Medicine, 2020). Similarly, other research has shown that the use of 4000K light sources generally improves object detection distance (Clanton & Associates & Virginia Tech Transportation Institute, 2014; Mutmansky et al., 2010)

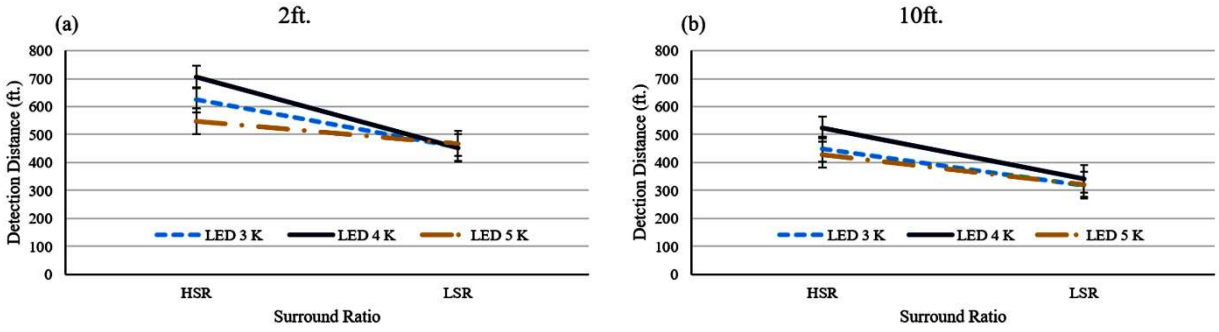


Figure 10. Line graphs. Effect of light source, surround ratio, and offset on the detection distance of pedestrians (Engineering & Medicine, 2020).

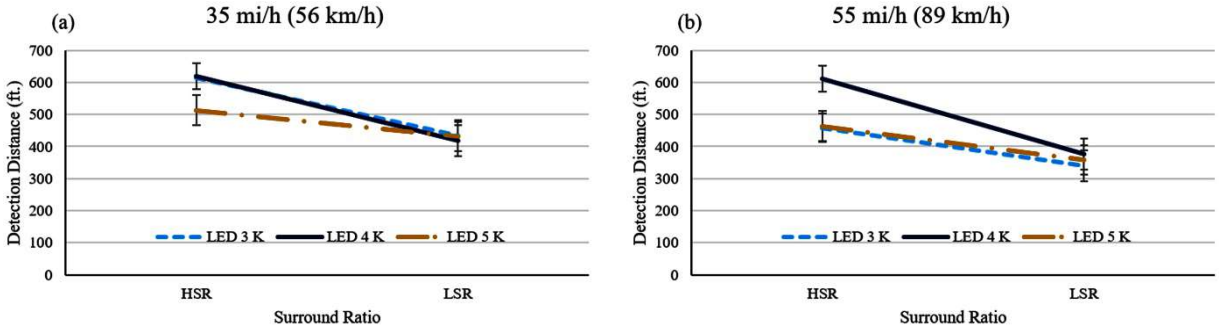


Figure 11. Line graphs. Effect of light source type, surround ratio, and speed on the detection distance of pedestrians (Engineering & Medicine, 2020).

The CIE S 026/E:2018 international standard (Commission Internationale de l'Eclairage, 2018) defines spectral sensitivity functions, quantities, and metrics to describe the ability of optical radiation to stimulate each of the five photoreceptor types that can contribute to retina-mediated non-visual effects of light in humans via the melanopsin-containing ipRGCs. CIE S 026/E:2018 is applicable to visible optical radiation in the wavelength range of 380 to 780 nm. It also includes information on the effects of age and field of view when quantifying retinal photoreceptor stimulation for ipRGC-influenced responses to light. An α-optic calculation toolbox and user guide were developed and are available through CIE.

The benefits of increasing the lighting level reach a plateau beyond which there are diminishing returns. It is therefore recommended that lighting not exceed the required maintained level by more than 50%.

Given the vast differences in LED product performance, it is worth properly evaluating the performance of lighting designs. Lighting calculation software and the power of computing systems have evolved, resulting in quick and easy lighting calculations that provide methods to optimize a lighting design.

One area IES RP-8-21 and AASHTO G-7 have not specified is the maximum average maintained illuminance or luminance level. This has led to an impression that increasing the illuminance or luminance level will always improve visibility and safety. However, the benefits of increasing the lighting level reach a plateau beyond which there are diminishing returns. Figure 21 and Figure 26 demonstrate the diminishing returns observed in detection distance and night-to-day crash rate ratio when the lighting level exceeds 12 lux (Bhagavathula & Gibbons, 2019; Gibbons, Guo, Medina, Terry, Du, Lutkevich, & Li, 2014). This threshold level will vary with speed and road class; however, these figures show that over-lighting does not inevitably produce additional benefits, and lighting beyond the level defined in IES RP-8-21 and AASHTO G-7 may not have any real value. Therefore, it is recommended that lighting not exceed the maintained lighting level specified for the roadway by more than 50%. The 50% is a maximum target to allow for variability in the designs and is not absolute. Designers are encouraged to get as close as possible to the required maintained level while not going below that level.

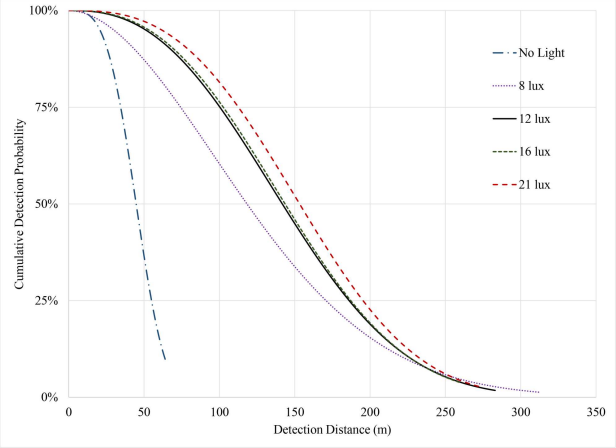


Figure 26. Line graph. Detection distances at various lighting levels (Bhagavathula & Gibbons, 2019).

Typically, when lighting is mounted on utility poles, the necessary lighting levels are difficult to achieve since the pole spacing is defined by the power line design as opposed to the lighting design. In some cases, the poles are two to three times further apart than the distance required for achieving the minimum recommended uniformity ratios (this is often referred to as “half code” lighting). The rationale for half code is that some lighting is better than no lighting, even if well below the requirements (i.e., install half the lighting and get half the benefit). However, reductions in the required lighting

Selecting the most appropriate lighting system is best done through lighting design and calculation on a per-project basis as opposed to using a one-size-fits-all approach.

Michigan Public Service Commission
DTE Electric Company
Revised 100W HPS Analysis With LLF

IES RP-8-22_Maintained Avg. Pavement Luminance (Cd/SqM)

				100 Watt HPS		58 Watt LED		37 Watt LED		30 Watt LED		27 Watt LED	
Local_Average Luminance (Lavg) for A,B,C,F,G				0.3		0.3		0.3		0.3		0.3	
Collector_Average Luminance (Lavg) for D, E				0.4		0.4		0.4		0.4		0.4	
				Initial Output (No LLF)	Adjusted with LLF	Initial Output (No LLF)	Adjusted with LLF	Initial Output (No LLF)	Adjusted with LLF	Initial Output (No LLF)	Adjusted with LLF	Initial Output (No LLF)	Adjusted with LLF
100 A	Local	Low Pedestrian	R2 R3	0.72	0.50	0.94	0.64	0.7	0.48	0.57	0.39	0.51	0.35
				140%	68%	213%	115%	133%	60%	90%	30%	70%	17%
100 B	Local	Low Pedestrian	R2 R3	0.43	0.30	0.52	0.36	0.43	0.29	0.35	0.24	0.26	0.18
				43%	0%	73%	19%	43%	-2%	17%	-20%	-13%	-41%
100 C	Local	Low Pedestrian	R2 R3	0.51	0.36	0.59	0.40	0.46	0.32	0.44	0.30	0.33	0.23
				70%	19%	97%	35%	53%	5%	47%	1%	10%	-25%
100 D	Collector	Medium Pedestrian	R2 R3	0.34	0.24	0.45	0.31	0.32	0.22	0.26	0.18	0.23	0.16
				-15%	-40%	13%	-23%	-20%	-45%	-35%	-55%	-43%	-61%
100 E	Collector	Medium Pedestrian	R2 R3	0.66	0.46	0.87	0.60	0.64	0.44	0.53	0.36	0.47	0.32
				65%	16%	118%	49%	60%	10%	33%	-9%	18%	-19%
100 F	Local	Low Pedestrian	R2 R3	0.33	0.23	0.45	0.31	0.36	0.25	0.29	0.20	0.26	0.18
				10%	-23%	50%	3%	20%	-18%	-3%	-34%	-13%	-41%
100 G	Local	Low Pedestrian	R2 R3	0.35	0.25	0.46	0.32	0.33	0.23	0.27	0.19	0.24	0.16
				17%	-18%	53%	5%	10%	-25%	-10%	-38%	-20%	-45%
Average percent over or under avg. luminance (Lavg) target				47%	3%	88%	29%	43%	-2%	20%	-18%	1%	-31%

Luminaire Type	Analysis Results applying Light Loss Factor
100W HPS Cobra Head (DTE)	100 Watt HPS over-lights target Luminance by 3% on average (Acceptable practice per FHWA Lighting Handbook (*))
58W GreenCobra (DTE)	58 Watt LED over-lights target Luminance by 29% on average (Acceptable practice per FHWA Lighting Handbook (*))
37W GreenCobra (Leotek Crossover Table)	37 Watt LED under-lights target Luminance by -2% on average (Not Acceptable)
30W GreenCobra (Leotek Crossover Table)	30 Watt LED under-lights target Luminance by -18% on average (Not Acceptable)
27W GreenCobra (Leotek Crossover Table)	27 Watt LED under-lights target Luminance by -31% on average (Not Acceptable)

MPSC Case No. U-21534
Responding Party: MI-MAUI
Requestor: DTE Electric
Question No.: DEMAUI-4

DEMAUI-4[1]:

Witness Bunch states on page 68, line 1 through line 2 of his direct testimony "…Leotek has not disavowed the chart that the Commission used in U021297…" What discussions did MI-MAUI have with Leotek to understand their position on the crossover chart that is no longer available on their website? Please provide all written forms of communication with Leotek on this matter.

Response:

MI-MAUI has not had any discussions with Leotek regarding its crossover chart.

All written forms of communication on which this testimony was based are found in the Company response to MAUIDE-5.48 and attachments 1, 2 and 3.

Date: August 2, 2024

Respondent: Richard Bunch

[1] Note: renumbered to continue numbering from First Set of Discovery by DTE to MI-MAUI. Previously DEMAU-1.

advanced LED technology. As the Company ramps up its burnout replacement program to convert streetlights across its system, these customers were worried that they would pay twice—once when they paid to have their lights exchanged and again when the system wide conversion of lights at burnout is included in the Company's base rates. To address this concern, the Company is proposing to add a four-year conversion credit for customers who paid to convert to their streetlights to a LED technology prior to the Commission order approving the burnout replacement program in Case No. U-18322.

Q. Which exhibit contains the rate design changes you described above?

A. The present and proposed rate designs are shown in Exhibit A-16 (HWM-3), Schedule F-3. The proposed electric rates are calculated to collect the jurisdictional revenue requirement contained in Exhibit A-16 (HWM-2), Schedule F-2.1. Both the present and proposed electric charges are applied to the billing determinants to calculate the test year revenues shown in Exhibit A-16 (HWM-1), Schedule F-2, and are the source of the proposed charges that appear in the redlined tariffs filed by Company witness Barnes in this case.

Q. What is the monthly bill impact to customers under the Company's proposed rate design?

A. The monthly customer bill impacts for each rate schedule are shown in Exhibit A-16 (HWM-4), Schedule F-4.

II. DISTRIBUTED GENERATION TARIFF

Q. Please provide an overview of the Inflow/Outflow method.

A. The Inflow/Outflow method is an eloquent solution—simple, transparent, and accurate—that leverages investments in advanced metering infrastructure for designing and implementing a DG Program. Under this design, customers with solar or wind generation

DEAA-2.1bi

Question:

Witness Naheedy states on page 2, lines 18 through 20, "…from 2020 through 2022, Ann Arbor's City-owned streetlights experienced an average annual outage rate of 9%..."

b. Please provide for Ann Arbor owned and maintained streetlights for years 2020 – 2023 in native format with formulas intact:
    i. Total number of customer reported outages logged.

Answer:

This information is unavailable because the City of Ann Arbor does not separately track customer reported outages.

Respondents:

Cyrus Naheedy

Attachments:

None.

DEAA-2.1ci

Question:

Witness Naheedy states on page 2, lines 18 through 20, "…from 2020 through 2022, Ann Arbor's City-owned streetlights experienced an average annual outage rate of 9%..."

c. Describe Ann Arbor's outage management systems used to collect its outage data (i.e., smart streetlight nodes, outage management systems, etc. Specifically:
    i. Do these systems allow for identification of root cause analysis (i.e., luminaire failure, cable failure)? If yes, please explain which attributes are tracked.

Answer:

Ann Arbor's outage management system allows identification of root cause analysis only to the extent that the person responding to an outage may include a possible root cause as a comment in the record for the work order associated with the outage. However, the system does not track any specific attributes.

Respondents:

Cyrus Naheedy

Attachments:

None.