

Memo

To: Gary Fetherolf, ODOT District 6
From: Laurence A Sack, PE
Date: February 20, 2025
Subject: Lighting Warrant Analysis
Project #: FRA-33-24.76 PID 119387

The ODOT TEM Section 1103-2 contains warrants for highway lighting on freeway and interchanges. These are ODOT specific warrants derived and modified by ODOT from the 1984 AASHTO publication titled *"An Informational Guide for Roadway Lighting"*.

These warrants do not mandate installation of lighting, there are many other factors to be considered such as crash history, land use, background lighting, and special locations. Rest areas, long and high bridges, tunnels, underpasses, school zones, bicycle facilities, and intersections are examples of special locations to be considered for illumination. The TEM contains the following lighting warrant criteria for freeways:

Continuous Freeway Lighting (CFL)¹ (CFL-1 and CFL-2 must both be satisfied)	
Case CFL-1	Requires 60,000 or more ADT and three or more through lanes in each direction
Case CFL-2	Requires that three or more interchanges be located with an average spacing of 1.5 miles or less.
Case CFL-3	Not used.
Case CFL-4	Not used.
Complete Interchange Lighting (CIL) (Except per CIL-1 and CIL-2 below, new CIL should be installed only as an upgrade to existing PIL)	
Case CIL-1	The interchange is a System Interchange (freeway to freeway)
Case CIL-2	If one or more of the adjacent freeway segments qualify for CFL (Note 1)
Case CIL-3	Not used.
Case CIL-4	Not used.
Partial Interchange Lighting (PIL)² (All new Service Interchange lighting, when called for, shall initially be PIL, to be upgraded to CIL later if necessary)	
Case PIL-1	Requires that the average AADT ramp traffic entering and leaving the freeway at the interchange in question exceeds 2000. Ramps not meeting this AADT may remain unlit.
Case PIL-2	Requires that the ADT for the through lanes on the freeway exceeds 35,000.
Case PIL-3	Not used.

¹ Where there is continuous freeway lighting, there should be complete interchange lighting (CIL). If continuous freeway lighting is warranted, but not initially installed, then partial interchange lighting is considered to be justified under CFL-1 or CFL-2.

² Interchanges with side-by-side entrance/exit lanes (e.g., folded diamonds) or individual ramps with 2000+ ADT shall have ramp intersection lighting.

³ All volumes should be current or opening-day volumes



STRUCTURAL


 FALL PROTECTION
SAFETY


TRANSPORTATION



SITE DESIGN



SURVEY


 WATER
RESOURCES

 TECHNOLOGY
& INNOVATION

US 33 through this project is both a Principal Arterial Freeway and on the National Highway System. Existing lighting exists at the Refugee Road, I-270, and the SR 674 (Gender Road) interchanges. There is no significant background illumination outside of the Ricart car dealerships on the southwest quadrant of the SR 317 (Hamilton Road) interchange. The adjacent land use is a mixture of rural fields, residential and some commercial/light industrial.

A **detailed analysis table** is attached to this memorandum illustrating the warrants and results of mainline segments and interchanges along US 33. Based on this analysis, LJB recommends the installation of Continuous Freeway Lighting (CFL) from SR 104 (Refugee Road) to the Diley Road interchange and Complete Interchange Lighting (CIL) for the following interchanges:

- SR 104 (Refugee Road)
- I-270
- SR 317 (Hamilton Road)
- Bixby Road
- Gender Road
- Diley Road

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Lighting Warrant Analysis

LAS 2025-01-13



							Lighting Warrant	
Segment From-To		2025 Mainline ADT	Mainline ADT > 60,000?	# Lanes in Each Direction	Interchange Station	Interchange Spacing (miles)	CFL-1	CFL-2
					1211+32.5			
SR 104 (Refugee Rd)	I-270	54,760	No	3		1.8	-	CFL-2 met
					1304+11.53			
I-270	SR 317 (Hamilton Rd)	88,160	Yes	3		1.2	CFL-1 met	-
					1367+42.64			
SR 317 (Hamilton Rd)	Bixby Rd	77,140	Yes	3		2.0	CFL-1 met	-
					1471+80.31			
Bixby Rd	Gender Rd	74,300	Yes	3		1.7	CFL-1 met	-
					1560+91.67			
Gender Rd	Diley Rd	61,650	Yes	3	Sta/Eqn 1644+72.45= 0+00	2.7	CFL-1 met	-
					58+45.02			
Diley Rd	Pickerington Rd	53,860	No	2		1.6	-	-
					141+04.48			
Pickerington Rd	to south	54,580	No	2				

Conclusion: Continuous Freeway Lighting warranted from SR 104 (Refugee Road) to Diley Rd interchange.

Interchange	Ramp	Description	System Interchange?	2025		Lighting Warrant					
				Ramp AADT	Mainline ADT	CFL-1	CFL-2	CIL-1	CIL-2	PIL-1	PIL-2
SR 104 (Refugee Rd) / Ramps	RAMP A	33 SE Exit to Refugee Rd /SR 104 WB	No	11460				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP B	Refugee Rd / SR 104 EB Entrance to 33 SE	No	7290				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP C	Refugee Rd /SR 104 EB Entrance to 33 NW	No	6350				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP D	33 NW Exit to Refugee Rd /SR 104 WB	No	6130				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP F	33 NW Exit to Refugee Rd /SR 104 EB	No	1380				-	CIL-2 met	-	PIL-2 met
SR 104 (Refugee Rd) to I-270				54760		-	CFL-2 met				
I-270 / Ramps	RAMP A	270 NE Entrance to 33 SE	Yes	9040				CIL-1 met	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP B	33 NW Exit to 270 NE	Yes	15020				CIL-1 met	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP C	270 SW Entrance to 33 NW	Yes	2240				CIL-1 met	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP D	33 SE Exit to 270 SW	Yes	3040				CIL-1 met	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP E	270 SW Entrance to 33 SE	Yes	11880				CIL-1 met	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP F	33 SE Exit to 270 NE	Yes	2310				CIL-1 met	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP G	270 NE Entrance to 33 NW	Yes	2840				CIL-1 met	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP H	33 NW Exit to 270 SW	Yes	7890				CIL-1 met	CIL-2 met	PIL-1 met	PIL-2 met
I-270 to SR 317 (Hamilton Rd)				88160		CFL-1 met	-				
SR 317 (Hamilton Rd) / Ramps	RAMP G	317 S Entrance to 33 NW	No	11050				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP H	33 NW Exit to 317 N	No	4450				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP I	33 SE Exit to 317	No	9410				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP J	317 S Entrance (Ramp K) to SE 33	No	1770				-	CIL-2 met	-	PIL-2 met
	RAMP K	317 S Entrance to SE 33	No	3220				-	CIL-2 met	PIL-1 met	PIL-2 met
SR 317 (Hamilton Rd) to Bixby Rd				77140		CFL-1 met	-				
Bixby Rd / Ramps	RAMP A	33 SE Exit to Bixby	No	3100				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP B	Bixby Entrance to 33 NW	No	3220				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP C	Entrance (via Connector) to 33 SE	No	2280				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP D	33 NW Exit to Bixby	No	2900				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP E	33 SE Exit to Bixby E	No	1700				-	CIL-2 met	-	PIL-2 met
Bixby Rd to Gender Rd				74300		CFL-1 met	-				
Gender Rd / Ramps	RAMP A	33 SE Exit to Gender	No	10800				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP B	Gender N Entrance to 33 SE	No	5360				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP D	Gender S Entrance to 33 NW	No	3710				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP E	Gender N Entrance to 33 NW	No	8280				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP F	33 NW Exit to Gender N	No	4780				-	CIL-2 met	PIL-1 met	PIL-2 met
Gender Rd to Diley Rd				61650		CFL-1 met	-				
Diley Rd / Ramps	RAMP ? (1)	33 NW Exit to Diley	No	7410				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP ? (2)	Diley Entrance to 33 NW	No	3040				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP C	33 SE Exit to Diley	No	6740				-	CIL-2 met	PIL-1 met	PIL-2 met
	RAMP D	Diley Entrance to 33 SE	No	3320				-	CIL-2 met	PIL-1 met	PIL-2 met
Diley Rd to Pickerington Rd				53860		-	-				

Conclusion: Complete Interchange Lighting for all above interchanges.