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MEMORANDUM

Date: August 17, 2017
To: Hartland Township Planning Commission
From: Planning Department
Subject: **Automobile Fueling Station Canopy Lighting**, potential amendment to the lighting standards for Automobile Fueling Station Canopies

The Ordinance Review Committee (ORC) of the Planning Commission has examined the current lighting standards that apply to automobile fueling station canopies.

Section 5.13.1 and 5.13.2 outline the standards for vehicular canopies. Sub-section D indicates that *“for vehicular canopies the level of lighting shall not exceed an average of 5.0 footcandles. The canopy fixtures shall be installed so that the lens cover is recessed so that the fixture is adequately shielded.”*

The ORC has examined the provision that limits the footcandles to an average of 5.0. A prior Planning Director conducted a fairly extensive survey of several other automobile fueling stations and determined that a more appropriate illumination level would be an average of 25 to 30 footcandles. (Please see survey attached).

In addition, please find attached a document from the Michigan Association of Planning that indicates special provisions for gas stations (up to 20.0 footcandles maximum under the canopy). (Please see attached).

As a result, the ORC has proposed a change to the lighting levels from 5.0 footcandles to 20.0 footcandles.

The ORC would like to get input from the entire Planning Commission on this topic and proceed with an amendment.

Attachments:

1. Gas Canopy Light Levels Memorandum, dated July 6, 2015
2. Spreadsheet of Survey, dated July, 2015
3. Michigan Chapter of APA exterior Lighting
4. Proposed Amendment for Automobile Fueling Station Canopy Lighting

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MEMORANDUM

Date: July 6, 2015
To: Hartland Township Planning Commission
From: Planning Department
Subject: **Commercial Land Use Lighting Levels
Field Research on Under Gas Station Canopy Illumination Levels**

On the evening of Thursday July 2, I had a chance to take light level readings at sixteen commercial locations mostly along the M-59 corridor. Eleven stops were under the canopies of gas stations, and five were commercial parking lots. The locations were as follows:

- White Lake Twp Meijer gas (west of Porter Road)
- Howell Marathon (east of Michigan Ave)
- Hartland Speedway
- Oceola Sunoco / USA 2 Go (Latson Road)
- Highland Citgo (Hickory Ridge Road)
- Howell Kroger gas (Michigan Ave)
- Highland BP (Hickory Ridge Road)
- Hartland BP (formerly Shell)
- Hartland Mobil (Clyde and US-23)
- Highland BP (Ormond Road)
- Highland Mobil / On the Run (west of Milford Road)
- Shops at Waldenwoods (near UPS store)
- Hartland Meijer
- Hartland Walmart
- Hartland Town Center (near Jets Pizza)
- Fountain Square (near Fiesta restaurant)

At each location, I took three light level readings five feet off the ground using a five-foot stake. I did my best to take each reading at what my eyes perceived as a location that was lit at the approximate average lighting level for the area. In other words, I tried not to stand directly under a light source or in a noticeably shadowy area. A table showing the results of this exercise are attached.

Having visited 11 gas stations within a relatively narrow window of time, I believe I developed a fair sense of the appropriate lighting levels under a gas station canopy along a State highway. My conclusions are as follows:

- The White Lake Meijer's gas canopy is under-lit at an average of 10.9 fc. It felt uncomfortable, and I think it would be difficult to search through my wallet to find the right credit card or punch my PIN into the pump's keypad with that level of illumination.
- Several stations were noticeably over-lit, most notably the Mobil station at M-59 and Milford Road (107 fc average) and the BP station at M-59 and Ormond (93 fc average). Particularly at Ormond Road where there is no other exterior lighting in the vicinity, pulling out of an overly-lit gas station onto the dark highway is a safety concern; your eyes cannot adjust quickly enough when there is such a dramatic difference in lighting levels. (The young man working at the Ormond Road BP came out to ask what I was doing. When I explained it to him, his reaction was to confirm his belief that the lights under their canopy were "way too bright".)
- The Citgo and BP stations on either side of Hickory Ridge Road in Highland Township are a good juxtaposition of appropriate lighting (Citgo) and over-lighting (BP). The Citgo seems dim from the road because of how bright the BP is, but once you're under the canopy, the Cito is very adequately lit at 33 fc. The disparity probably serves to show why the station owners are motivated to light their canopies as brightly as possible; the BP is much more apparent from M-59 than the Citgo because of how bright it is.
- As a point of reference, Township Hall's small conference room – a well-lit room with no exterior windows – averages 60 fc. (It is interesting to note how much the light level fluctuates depending on where you stand in the room, likely because the light source is only 10 feet high and the readings were measured at 5 feet.)
- As would be expected, commercial parking lots are much more dim than under gas station canopies (around 1-2 fc). What is interesting is the light level at Hartland Town Center (Kahuna Coffee, Jets Pizza, etc) is 2.8 fc, only 1.2 fc below the maximum 5 fc permitted under a canopy by the Township's Zoning Ordinance. It is hard to stand in a parking lot at 2.8 fc and be convinced that 1.2 fc more would be a comfortable illumination level at which to be pumping gas.
- **The best example of what I believe to be the most appropriate gas station lighting level is the Oceola Sunoco-USA 2 Go at the southeast corner of Latson and M-59, which had an average of 26 fc.** (It is worth noting there were two readings of 28 and 32 fc, and an "outlier" of 19 fc. The true average for the canopy is probably closer to 30 fc.)
- Other stations of comparable lighting levels to the Oceola Sunoco include the Howell Marathon east of Michigan Ave., the Highland Citgo at Hickory Ridge, and the existing Hartland Speedway (although the existing Hartland Speedway could improve on the uniformity of their canopy lights). The Kroger gas kiosk in Howell averages 40.3, and felt a little bright.
- Hartland's two other gas stations – the M-59 BP (formerly Shell) and the Mobil station at Clyde and US-23 – are both over-lit at 60 and 76 fc respectively.

My recommendation for the appropriate illumination level for under the canopy at any new gas station in Hartland Township is an average of 25-35 fc. My belief is that this is enough light to make the customer feel safe and comfortable, but not so much as to purposefully draw attention to the use and/or pose a public safety concern. Keeping the lighting levels relatively uniform is also key to enhancing the perception of safety, as is using modern technology bulbs that provide true color rendering (as opposed bulbs like yellow sodium vapor that distort color).

Land Use	Time	Location of reading	Reading 1	Reading 2	Reading 3	Average
White Lake Meijer gas (west of Porter)	9:47pm	Under gas canopy	9.2	5.9	17.5	10.9
Howell Marathon (east of Michigan Ave)	11:28pm	Under gas canopy	24	25	26	25.0
Hartland Speedway	10:30pm	Under gas canopy	32	13	31	25.3
Sunoco - USA 2 Go (Latson and M-59)	11:19pm	Under gas canopy	19	32	28	26.3
Highland Citgo (Hickory Ridge)	10:15pm	Under gas canopy	33	35	32	33.3
Howell Kroger gas (Michigan Ave)	11:31pm	Under gas canopy	42	37	42	40.3
Highland BP (Hickory Ridge)	10:12pm	Under gas canopy	70	17	74	53.7
Hartland BP (formerly Shell)	10:24pm	Under gas canopy	75	35	71	60.3
Hartland Mobil (Clyde and 23)	10:54pm	Under gas canopy	72	84	73	76.3
Highland BP (Ormond Road)	9:57pm	Under gas canopy	93	98	88	93.0
Highland Mobil - On The Run (Milford Road)	10:04pm	Under gas canopy	105	104	113	107.3
Outdoors on Thursday July 2, 2015 (partly cloudy)	1:30pm	Twp Hall west parking lot	--	--	--	3,200
Fountain Square (near Fiesta)	11:07pm	Parking lot	0.2	0.6	0.2	0.3
Hartland Town Center (near Jets Pizza)	11:09pm	Parking lot	0.5	1.5	6.4	2.8
Hartland Meijer	10:46pm	Parking lot	1	1	1.1	1.0
Hartland Walmart	10:41pm	Parking lot	3.7	1	0.7	1.8
Shops at Waldenwoods (near UPS store)	10:36pm	Parking lot	1.3	2.1	1	1.5
Inside small conference room (no windows)	NA	Indoors	76	70	40	62.0



Michigan Association of Planning
A Chapter of the American Planning Association

Planning and Zoning Officials Academy Vol. 12, No. 7

The Planning and Zoning Officials Academy provides local elected and appointed officials with both basic and advanced topics addressing issues that are unique to the role as a local government representative. To suggest a topic, please contact Kelly McIntyre at (734)913-2000.

Exterior Lighting

Artificial outdoor lighting now dominates the night sky of many communities. Such lighting serves a wide variety of purposes; it attracts attention, entertains, enhances security, warns of danger, and lights paths.

The character of outdoor lighting in any community is the result of many individual decision by government, businesses, electric utilities, advertisers, and property owners.

These decisions may be made without consideration of possible health, safety, and welfare impacts, resulting in unwanted glare, light trespass, and light pollution problems for neighboring properties and the community as a whole.

Put these in a shaded box to the side:

Glare is excessive brightness caused by an unshielded, high intensity light source, which can be a serious safety hazard for nearby pedestrians and motorists.

Light trespass is poorly controlled outdoor lighting that crosses property boundaries, detracting from the quality of life of adjacent property owners and confusing the instinctive daily and seasonal cycles of animals and plants.

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Light pollution is excessive, unshielded or undirected artificial light from signs, parking lots, streetlights and other sources that reflects off particles in the atmosphere, creating a characteristic “sky glow” which limits our enjoyment of the night sky, even in more rural areas.

The zoning ordinance is an effective tool to address these issues. An exterior lighting section should include each of the following elements.

Maximum Illumination Levels

Often the intensity of today’s outdoor light sources exceeds what is needed for visibility, safety, and security at night. Illumination standards within a site and at any property line or street right-of-way should be established to ensure that all sites are adequately, but not excessively, lit at night. In general, a maximum illumination level of 10.0 footcandles with a site and 1.0 footcandle at any property line is more than enough for comfortable night visibility.

Photometric Grid

An outdoor lighting plan with a photometric grid showing illumination levels from all exterior light sources on a site (parking lot fixtures, building lighting, sign lighting, etc.) should be included with all site plans submitted for review.

Light Fixture Design Standards

Parking lot and building-mounted security lighting (often referred to as “wall-packs”) should be “full cutoff” fixtures that are directed straight downward. High intensity lamps should be fully shielded to prevent off-site glare by using louvers, guards or reflectors. Sign lighting should be directed downward from the top of the sign to prevent light pollution.

Standards by Type of Land-Use

Special provision for gas stations (up to 20.0 footcandles maximum under the canopy) and automobile dealership sales lots (up to 15.0 footcandles within the lot) should also be included to minimize off-site glare and light pollution problems from these high-intensity users of light.

Exceptions

The ordinance should include exceptions for holiday decorations, special events, and decorative residential lighting. When reviewing an outdoor lighting plan, keep the following questions in mind:

“Where is light needed...and where is it not wanted?” Adequate light should be provided for high traffic areas, including sidewalks, parking lots, and building

entrances, but check plans carefully to insure that commercial and industrial sites do not cause light trespass problems for neighboring residents and natural areas.

“How much light is needed for a particular site or level of activity?” The human eye is the key factor in determining the proper light intensity for a particular activity. Temporary “night blindness” can be caused by unshielded light sources that interfere with the eye’s ability to adjust for low light conditions, or by extreme contrasts between bright and dark areas of a site. One of the best ways to understand how to particular light levels “feels” is to purchase or rent a small light meter and visit gas stations, parking lots, and other sites a night to measure the on-site lighting intensity. It will then be easier to judge possible impacts of proposed illumination levels shown on a photometric grid upon people actually visiting the site.

“Which type of light fixture would be best suited for the task?”

Lighting decisions are often based on the lowest cost, rather than the best design. Specific fixture design standards in a zoning ordinance help to promote the use of better quality lighting. For more information about outdoor lighting design, visit the International Dark-Sky Association (www.darksky.org), Indiana Council on Outdoor Lighting Education (icole.home.att.net) or Illuminating Engineering Society of North America (www.iesna.org).

In addition, Kim Lighting (www.kimlighting.com) and Lithonia Lighting (www.lithonia.com) are two of the many lighting manufactures that have published online catalogs with pictures and specifications for easy reference.

The zoning ordinance can be an effective tool for balancing outdoor lighting needs for a particular site or use with the possible health, safety and welfare impacts on the greater community. Exterior lighting provisions, combined with educational resources available on the Internet, can be used by professional planners and planning commissioners to promote high quality outdoor lighting design that preserves the night sky for all of us to enjoy.

Zoning Ordinance
Proposed changes to Lighting Standards

5.13 LIGHTING

Subject to the provisions set forth herein, open space and recreational uses, all non-single family residential parking areas, walkways, driveways, building entryways, off-street parking and loading areas, and building complexes with common areas shall be sufficiently illuminated to ensure the security of property and the safety of persons using such public or common areas.

1. Permitted Lighting. Only downward-directed, fully shielded, concealed-source lighting shall be permitted. Lighting shall be placed and shielded so as to direct the light onto the site and away from adjacent properties. The lighting source shall not be directly visible from adjoining properties. Lighting shall be shielded so that it does not cause glare or interfere with the vision of motorists. Fixtures attached to canopies or eaves of a building or structure shall be recessed and flush with the surface of the structure. Low voltage, upward-directed lighting for flags, landscaping or other decorative feature, with the exception of searchlights, may be permitted by the Planning Commission.
2. Intensity. For commercial, office, industrial and multiple-family residential:
 - A. The level of lighting shall not exceed 0.5 footcandles at any adjacent residential property line or 1.0 footcandles at any adjacent non-residential property line. The light intensity shall be measured at 5 feet above ground level on a vertical plane.
 - B. The average footcandles shall be between 2.4 and 3.6 in the main parking area and an average of 5.0 footcandles at the main building entrance and entry/exit drive measured at 5 feet above the ground level on a vertical plane.
 - C. The level of lighting shall not exceed 10 footcandles at any location on the site.
 - D. For vehicular canopies the level of lighting shall not exceed an average of ~~5.0~~ **20.0** footcandles. The canopy fixtures shall be installed so that the lens cover is recessed so that the fixture is adequately shielded.
3. Height. Except as noted below, lighting fixtures shall not exceed a height of twenty-five (25) feet or the height of the principal building, whichever is less, measured from the ground level to the centerline of the light source. Fixtures should provide an overlapping pattern of light at a height of approximately seven (7) feet above ground level.
4. Sign Lighting. Sign illumination shall be in accordance with the regulations set forth in Section 5.26, Signs.
5. Soffit or canopy lighting shall be installed so the lens cover is recessed and the fixture is flush with the building.
6. Subdivision Entrances. All subdivision and site condominium development road entrances shall be lighted and shall be subject to review by the Planning Commission.
7. Site Plan Requirements.
 - A. All lighting, including ornamental lighting, shall be shown on site plans in sufficient detail to allow determination of the effects of such lighting upon adjacent properties,

traffic safety, and overhead sky glow. The objective of these specifications is to minimize undesirable off-site effects.

B. A detail of the lighting fixture, including manufacturer's specifications for shielding, wattage and illumination, shall be provided on a site plan. The location and height of all fixtures shall be noted on the site plan. The Planning Commission may require a photometric plan, if determined necessary to evaluate compliance with this provision.

8. Modifications. The Planning Commission may modify these lighting standards based on consideration of the following: the position and height of buildings, other structures, and trees on the site; the potential off-site impact of the lighting; the character of the proposed use; and, the character of surrounding land use. In no case shall the lighting exceed the maximum building height in the district in which it is located.