



MEMORANDUM

TO: Milton Dohoney Jr., City Administrator

FROM: Cyrus Naheedy, Transportation Engineer
Skye Stewart, Chief of Staff for the Public Services Area
Sue McCormick, Interim Public Services Area Administrator

CC: John Fournier; Atleen Kaur; Dr. Missy Stults

DATE: August 5, 2024

SUBJECT: Agenda Item DC-1 (8/8/24 Council Meeting) – DTE LED Conversion Project

This memorandum provides information regarding the DTE LED Conversion Project (agenda item CA-4 from the 7/15/24 City Council meeting; DC-1 on the upcoming 8/8/24 City Council meeting agenda). It is intended as an update to supplement the existing materials that have already been provided with the agenda item.

Council Questions

City staff have worked closely with DTE staff following the 7/15 City Council meeting to answer questions, summarized below:

1. Question: Would DTE reconsider storing replacement stock of fixtures for City's proposed special order themselves, rather than requiring City to store this inventory?

Staff response: No – DTE has not changed their stance requiring the City to store its own special order backstock inventory. This is a standard term for special order materials across DTE's entire municipal Community Lighting service area. DTE staff expanded upon their reasoning for this position in recent discussions. One practical issue is that DTE cannot guarantee contractor continuity over the life of these assets. If DTE were to manage material purchased by the city, the inventory would need to be stored at one of their installation contractor's facilities rather than at a DTE-owned facility. However, it cannot be guaranteed that the same contractor will be used over the multi-year period that maintenance/replacement needs would arise. As previously noted, City staff does not have the capacity to track the installation of DTE owned fixtures at specific locations and coordinate with DTE contractors as replacement fixtures are necessary and continues to emphasize that a single fixture is necessary to address this practical limitation.

2. Question: Have there been any updates pertaining to the purchase agreement with the addition of the following RESOLVED clause (added as an amendment during 7/15 CC meeting)?

RESOLVED, That City Council's approval is based on the understanding that DTE will, at the time of installation and at no additional cost to the City, utilize luminaires that meet shielding criteria as determined by the City to minimize light trespass or glare onto private property, to the extent practicable, and direct the City Administrator to request that the Purchase Agreement be amended to reflect this understanding;

Staff response: Yes – DTE has updated their purchase agreement to note that shielding will be installed as part of the project, at the previously agreed upon project cost. Consequently, staff recommend City Council strike the

amended RESOLVED clause added during the 7/15 meeting. *See attachment: "REVISED Purchase Agreement HID Conversion – City of Ann Arbor 8-1-24.pdf"*

As part of agenda item DC-1, staff are also including additional technical information on the shield for reference. The shields for this fixture are different than non-LED shields in that they are a rather simple, angled snap-in component. Staff understand that members of City Council and the public may be expecting to see something that looks like a non-LED shield (which resembles more of a small physical plate resting behind the light fixture) and are clarifying how these shields will appear once installed. *See attachments: "GCM H-Series_House-Side-Shield-Drawing.pdf"; and "GCM2_58w_2700K_with House_Side_Shield_Photometrics.pdf"*

3. Question: Can you provide lumen values related to the following fixtures?
- 100W HPS fixture (an existing non-LED fixture common on neighborhood streets)
 - 58W, 4000K LED fixture (DTE’s current standard LED offering)
 - 58W, 2700K LED fixture (staff’s recommendation at 7/15 CC meeting)
 - 27W, 2700K LED fixture (one of the demonstration/pilot lights, advocated for by several members of the public at 7/15 CC meeting)

Staff response: Yes, please see **Table 1** for reference. While recent conversations regarding fixture choice have focused on the wattage of the light, lumens are instead a measure of brightness. Using lumens as a comparison point provides a clearer method of discussing concerns regarding the amount of light provided by each fixture.

Table 1 – Streetlight Fixture Comparison Table

| Fixture Description | Color Temperature (CCT) | Watts | Luminaire Lumens (factory default) | % Change in brightness (lumens) from existing 100W HPS | Luminaire Lumens with shielding | Total % Change in brightness (lumens) from existing 100W HPS with shielding | Dark Sky International Compliant or Listed? | Estimated DTE Count in the City (Existing) | Estimated DTE Count in the City (Proposed) |
|--|-------------------------|-------|------------------------------------|--|---------------------------------|---|---|--|--|
| Existing HPS (100w) | 2100K | 100 | 7,486 | – | NA | NA | No | ~2,875 | 0 |
| DTE standard LED | 4000K | 58 | 7,440 | -0.6% | NA | NA | No, CCT too high | ~205 | No change as part of this project |
| Staff proposed single fixture special order LED | 2700K | 58 | 7,200 | -3.8% | 5,843 | -22% | Yes | 2 | 3,946 |
| Advocates preference for neighborhood streetlighting | 2700K | 29 | 3,463 | -53.7% | 2,121 | -72% | Yes | 2 | 0 |

As shown in **Table 1**, staff have used the 100W HPS fixture and the lumen output associated with it (7,486 lumens) as a baseline for further comparisons – this value is accordingly emphasized with gray highlighting. This is due to the ubiquity of these fixtures throughout the city, including on neighborhood streets where concerns about over-lighting were shared. There are approximately 2,875 of these fixtures currently throughout the city, and all would be replaced as part of this project.

Next, staff have provided information regarding DTE’s standard LED fixture. This is the higher color temperature (4000K) fixture that has been installed in a number of locations throughout the city. The lumen output of this fixture, 7,440 lumens, is quite close to the HPS fixture, with only a 0.6% reduction in lumen output. There are approximately 205 fixtures at this wattage/color temperature currently throughout the city. As previously mentioned, there are a total of around 1,300 existing DTE-owned LED streetlights at various wattages throughout the city – none of these would be replaced through this project which is focused on the conversion of non-LED streetlights.

Prior to considering a citywide LED conversion, staff have occasionally heard concerns regarding DTE LED streetlights after installations have been completed. Additionally, [an outdoor lighting ordinance](#) was passed in 2021 aiming to reduce light pollution coming from private properties. While this ordinance is not applicable to roadway lighting in the public right-of-way, staff have endeavored to use the ordinance as a reference point when making decisions related to public streetlights. For these reasons, staff worked with DTE to determine what other LED fixture options could be considered besides their standard offering. Following those conversations with DTE, and with input from Dark Sky advocates within the Ann Arbor community, staff piloted several alternatives at lower wattages and color temperatures than DTE's standard offering.

The third fixture on this table is one such alternative: a 58W/2700K fixture. This fixture is staff's recommendation (highlighted in green for emphasis). DTE was able to provide lumen output for this fixture both with and without a shield. Since this project is scoped to include shields on all converted lights, the lumen output with shielding (5,843 lumens) is the more relevant value for comparison. This lumen output represents a 22% reduction from the 100W HPS baseline, meaning that neighborhoods – contrary to comments made at 7/15 Council meeting regarding this fixture leading to excessive brightness in residential areas – would in fact see a moderate but noticeable *decrease* in lumen output from the existing lighting level. Choosing this fixture would also mean a decrease in lumen output along major streets. However, the reduction is moderate and with the intent that mid-block/uncontrolled crosswalks will continue to have higher wattage and color temperature fixtures (58W-136W/4000K), staff are comfortable with deploying this option on both major and neighborhood streets.

The last fixture on this table is a 29W/2700K fixture, preferred by some members of the public at recent public commentary. The lumen output with shielding for this fixture is 2,121 lumens, representing a 72% reduction from the 100W HPS baseline. Given this stark reduction in lumen output – in addition to the practical concerns regarding stocking multiple fixtures raised previously – staff remain confident in not recommending installation of this fixture. Staff were urged to consider 29W fixtures relatively late in the project's process, shortly before pilot lights were to be installed. In hindsight, this did not allow enough time to adequately vet these fixture alternatives, both from a technical perspective (lumen output) as well as logistical impact (DTE's stocking protocol). However, upon review, staff remain confident in their original recommendation of 58W/2700K fixtures.

Recommendation

Staff appreciate the robust conversation that has occurred throughout the scope of this project, including discussions and follow-up questions from City Council at their 7/15 meeting. Since then, City staff have worked closely with DTE staff to help answer these questions and to discuss related concerns in more detail. Consequently, the new information accumulated through this process has led to a reiteration of staff's original recommendation: that the selected 58W/2700K fixtures be used as the typical fixture installed in this streetlight conversion project. In staff's judgement, this selection balances considerations contained in adopted plans and principles of the City, including A2ZERO, the Vision Zero Transportation Plan, and the private property impacts included in the Outdoor Lighting Ordinance. Exceptions will remain at mid-block/uncontrolled crosswalks (locations where the highest potential for vehicle-pedestrian conflict exists: 58W-136W/4000K), as well as for a small subset of decorative lights (54W/2700K).

The benefits of this project include reduced carbon emissions, ongoing annual financial savings to the City, and both a warmer color temperature and shielding on all fixtures to better align with Dark Sky International's principles for responsible outdoor lighting. The funding opportunity provided by the Carbon Reduction Program grant makes this project more of a win on multiple fronts. The project, including fixture recommendation, is supported by the Office of Sustainability and Innovations.