

2023 Traffic Engineering Infrastructure Annual Report

Signal Section

The DOTE is responsible for traffic signals and school/warning flashers in the public right-of-way. The City has approximately 6,500 intersections, 800 of which have a traffic signal and 98 school/warning flashers. DOTE’s Traffic Engineering Division rebuilds aging signal infrastructure based on a 30-year life cycle schedule. The average age of the traffic signals in the City’s system is 25 years and many signals are at the end of their service life. On average, over the past 10 years the Division has installed 16 signals a year, which includes signals built with projects and new construction/development and rebuilt signals.

Infrastructure Details- Traffic Signals

Age of Signal Infrastructure	Number of Intersections	Condition
2013 or newer (0-10 years)	159	Very Good
2003 to 2013 (10-20 years)	152	Good
1993 to 2003 (20-30 years)	212	Fair (Near Useful Life)
Older than 1993	277	Poor (Past Useful Life)
TOTAL	800	

The average age of the traffic signal infrastructure is 25 years (1998).

Infrastructure Details- School Flashers

Age of Signal Infrastructure	Number of Intersections	Condition
2013 or newer (0-10 years)	7	Very Good
2003 to 2013 (10-20 years)	9	Good
Older than 2003	82	Fair/Poor (Near/Past Useful Life)
TOTAL	98	

Infrastructure Costs

Total Infrastructure Costs	Replacement Cost (30 yr Cycle)	Annual Budget Allocated
\$96,000,000 (traffic signals)	\$3,200,000	
\$3,450,000 (flashers)	\$115,000	
	\$3,315,000	\$3,032,000

Lighting Section

The City’s lighting system is divided into four categories - City owned electric lights, City owned assessed electric lights, Duke electric lights, and gas lights. The lighting infrastructure consists of poles, fixtures,

foundations, conduit, pullboxes, and wiring. As opportunity and funding has allowed, DOTE has converted the existing electric light fixtures to LED to reduce energy cost as well as reduce occurrences of outage repairs. In general, a portion of each of the three electric lighting categories have been converted to LED.

A majority of the City owned lights (5800 fixtures) were converted to LED in 2014 using a performance contract with Honeywell. The City owned assessed lighting has

The City owned assessed lighting (about 4000 fixtures) is a combination of light types that are located in neighborhood business districts, central business district, and various low traffic residential streets. Approximately 1000 About 700 of these fixtures have been converted to LED. The remaining balance of the City owned assessed lights are HID lamps and will require additional costs to convert to LED. Unfortunately, we are not sufficiently funded to accomplish this with the current capital allocations. About 500-600 Duke owned fixtures around the University of Cincinnati campus have been converted to LED under two separate agreements with UC. We are in discussions with Duke Energy regarding options for converting the remaining Duke owned lights to LED (about 20000 fixtures). The conversion will require City capital that DOTE is not currently allocated to complete the LED change over for the remaining Duke Energy owned lights.

Infrastructure Details- Gas Street Lighting

Age of Gas Street Light Infrastructure	Number of Lights	Avg Condition
Over 40 years	1096	Poor

The annual maintenance cost is \$275,000. The cost to replace the gas light infrastructure with electric lights is \$11M.

Infrastructure Details- City Owned Assessed Electric Lighting

Age of Electric Street Light Infrastructure (Assessed)	Number of Lights	Avg Condition
Over 40 years	4000	Fair

DOTE maintains the assessed street lights. 1000 of the assessed light fixtures have been converted to LED. The condition of most of the CBD lighting infrastructure is in poor to failed condition.

Total Infrastructure Costs	Replacement Cost (40 yr Cycle)	Annual Budget Allocated
\$47,500,000	\$1,187,500	\$0

The current assessment recovery fees collected cover annual maintenance and energy costs only. The assessment fees do not address conversion to LED or replacement costs.

Infrastructure Details- City Owned Electric Lighting

Age of Electric Street Light Infrastructure	Number of Lights	Avg Condition
Over 40 years	5000	Fair

DOTE maintains the City Owned street lights. 4500 of the light fixtures were converted to LED in 2014.

Total Infrastructure Costs	Replacement Cost (40 yr Cycle)	Annual Budget Allocated
\$53,650,000	\$1,341,250	\$350,000.00

Infrastructure Details- Duke Owned Electric Lighting

Age of Electric Street Light Infrastructure	Number of Lights	Condition
Over 25 years	19,300	Poor/Failed
0-10 years	700 (LED)	New to Good

Duke provided an estimate of \$10,300,000 to complete the LED conversion. DOTE has been completing LED conversions in increments as funding allows.

Total Infrastructure Costs	Replacement Cost (10 yr Cycle)	Annual Budget Allocated
\$10,300,000	\$1,300,000	\$215,000

Operations Section

The City has over 985 miles of paved streets with traffic control signs and pavement markings. The roadways contain approximately 100,000 traffic control signs and about 750 miles of pavement marking lines.

Infrastructure Details- Signs

Sign Type	Number of Signs	Avg Condition
Street Name	7,750	Fair
Traffic Control	86,000	Fair

Total Infrastructure Costs	Replacement Cost (15 yr Cycle)	Annual Budget Allocated
\$10,000,000	\$650,000	\$189,000.00

DPS is allocated capital funding.

Infrastructure Details- Guardrail

Sign Type	Total LF	Condition
W-Beam Guardrail	Not available	No data available
Wood Guardrail	Not available	No data available
Concrete Rail	Not available	No data available
Total All Types	328,700+	No data available

+ Estimated total length developed by sampling existing principal arterial streets. More accurate data is being evaluated with the asset management project.

Total Infrastructure Costs	Replacement Cost (15 yr Cycle)	Annual Budget Allocated
\$16,500,000	\$1,100,000	\$0.00

Infrastructure Details- Pavement Marking

Marking Type	Number/ LF	Condition
Symbols	16,856	No data available
Lines	3,864,828+	No data available

Estimated total length developed by sampling existing street network.

Total Infrastructure Costs	Replacement Cost (5 yr Cycle)	Annual Budget Allocated
\$2,600,000 symbols	\$520,000	\$0.00
\$19,400,000 lines	\$3,900,000	\$0.00

DPS repaints the faded pavement markings. DOTE repaints the pavement markings with paving projects.

Infrastructure Details- Raised Pavement Markers

Type	Number of Markers	Condition
RPM	53,343	No data available

Value based on data in asset management GIS layer. Values are to be certified when asset management project is completed.

Total Infrastructure Costs	Replacement Cost (25 yr Cycle)	Annual Budget Allocated
\$2,700,000	\$108,000	\$100,000.00

Summary of Replacement Costs

Asset Type	Replacement Cost Program	Replacement Cost Annual
Traffic Signals/School Flashers	\$99,450,000	\$3,315,000
Gas Street Lights	\$2,400,000	\$60,000
Electric Street Lights (Assessed)	\$47,500,000	\$1,187,500
Electric Street Lights City Owned	\$53,650,000	\$1,341,250
Electric Street Lights Duke Owned	\$10,300,000	\$1,300,000
Traffic Signs	\$10,000,000	\$650,000
Guardrail	\$16,500,000	\$1,100,000
Raised Pavement Markers	\$2,700,000	\$108,000
Pavement Marking	\$22,000,000	\$4,400,000
Total	\$252,420,000	\$13,058,750