2021 Traffic Engineering Infrastructure Annual Report

Signal Section

The DOTE is responsible for traffic signals and school flashers in the public right-of-way. The City has approximately 6,500 intersections, more than 800 of which have a traffic signal and 91 school flashers. DOTE's Traffic Engineering Division rebuilds aging infrastructure based on a 25-year life cycle schedule. The average age of the traffic signals in the City's system is 26 years and many signals are at the end of their service life. On average, over the past 10 years the Division has installed 14 signals a year. However, this included the new signals installed with development or the addition of new streets in addition to ones that have been rebuilt.

Infrastructure Details- Traffic Signals/Flashers

Age of Signal Infrastructure	Number of Intersections	Condition
2011 or newer (0-10 years)	125	New to Good
2001 to 2011 (10-20 years)	151	Good to Fair
1991 to 2001 (20-30 years)	242	Fair to Poor (Near Useful Life)
Older than 1991	291	Poor (Past Useful Life)
TOTAL	809	

The average age of the traffic signal infrastructure is 26 years (1994).

The average number of signals built per year in the last 10 years is 14, which includes signals built with projects and new construction/development and rebuilt signals.

Infrastructure Costs

Total Infrastructure Costs	Replacement Cost (25 yr Cycle)	Annual Budget Allocated
$85,450,000	$3,418,000	$800,000.00

Lighting Section

The lighting system throughout the City is broken into three categories- City owned lights, City owned assessed lights, and Duke lights. In general, light fixtures in each of the three categories have been converted to LED over the last 5 years. The City owned lights (4500 fixtures) were converted to LED in 2014 using a performance contract with Honeywell.

The City owned assessed lighting (about 4000 fixtures) is a combination of light types. 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 for 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	Condition
Over 40 years	1096	Poor

DOTE has routinely requested the gas street light program be setup for assessment.

Total Infrastructure Costs	Replacement Cost (25 yr Cycle)	Annual Budget Allocated
$4,400,000	$176,000	$0

The current annual maintenance spend is over $275,000 annually.

Infrastructure Details- City Owned Electric Lighting (Assessed)

Age of Electric Street Light Infrastructure (Assessed)	Number of Lights	Condition
Over 40 years	3990	Fair

DOTE maintains the assessed street lights. 700 of the incandescent fixtures were converted to LED in 2018. The condition of much of the downtown assets is poor to failed due to the condition it was in when sold by Duke to the City.

Total Infrastructure Costs	Replacement Cost (25 yr Cycle)	Annual Budget Allocated
$47,500,000	$1,900,000	$0

The current assessment recovery covers annual maintenance and energy costs only and does not address conversion to LED or replacement costs.

Infrastructure Details- City Owned Electric Lighting

Age of Electric Street Light Infrastructure	Number of Lights	Condition
Over 40 years	4,500	Fair/Poor

DOTE maintains the City Owned street lights. 4500 of the light fixtures were converted to LED in 2014. The conversion represented about 75 percent of the fixtures being upgraded with 25 percent being replaced.

Total Infrastructure Costs	Replacement Cost (25 yr Cycle)	Annual Budget Allocated
$53,650,000	$2,144,000	$116,000.00

Infrastructure Details- Duke Owned Electric Lighting

Age of Electric Street Light Infrastructure	Number of Lights	Condition
Over 25 years	2,1000	Poor/Failed

DOTE has routinely requested the electric street lights owned by Duke to be converted to LED. DOTE currently pays lighting maintenance charges (since 2009 sale) that more than cover the cost to replace the fixtures. Duke has provided a quote of $10,300,000 to replace the HID lights with LED. The City continues to insist Duke replace the fixtures as part of the lighting maintenance charges.

Total Infrastructure Costs	Replacement Cost (25 yr Cycle)	Annual Budget Allocated
$,8,400,000	$336,000	$190,000

The current annual lighting maintenance spend is over $500,000 annually.

Operations Section

The City has over 985 miles of paved streets with traffic control signs and pavement markings. The roadways contain approximately 300,000 traffic control signs and about 750 miles of pavement marking lines.

Infrastructure Details- Signs

Sign Type	Number of Signs	Condition
Street Name	18,590*	No data available
Traffic Control	258,058*	No data available

*Calculated value based on historical data. Values are to be certified when asset management project is completed.

Total Infrastructure Costs	Replacement Cost (15 yr Cycle)	Annual Budget Allocated
$31,800,000	$2,120,000	$0.00

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

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

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	$85,450,000	$3,418,000
Gas Street Lights	$4,400,000	$176,000
Electric Street Lights (Assessed)	$47,500,000	$1,900,000
Electric Street Lights City Owned	$53,650,000	$2,144,000
Electric Street Lights Duke Owned	$,8,400,000	$336,000
Traffic Signs	$31,800,000	$2,120,000
Guardrail	$16,500,000	$1,100,000
Raised Pavement Markers	$2,700,000	$108,000
Pavement Marking	$22,000,000	$4,420,000
Total	$272,400,000	$15,722,000