Howard Lake • Waverly
Winsted Public Schools

LED RETROFIT 2024

Enhancing Learning Environments through Efficient Lighting

LED vs. Traditional Lighting

- **Energy Consumption:** LEDs use significantly less power for the same amount of light output, dramatically reducing energy bills.
- **Lifespan:** LEDs have a lifespan of up to 50,000 hours or more, which is 25-50 times longer than incandescent bulbs and about 3-5 times longer than fluorescent lamps.
- **Durability:** LEDs are more durable and resistant to breakages and vibrations since they do not have fragile components like glass tubes or filaments.
- **Environmental Impact:** LEDs are more environmentally friendly as they contain no hazardous substances like mercury and produce less waste due to their longer lifespan.

Enhancing Learning with Better Quality Light

- **Why Light Quality Matters in Schools**
  - **Cognitive and Visual Performance**: Adequate lighting is crucial for the visual and cognitive tasks that students engage in daily. Studies have shown that good lighting improves reading speed and comprehension, reduces errors, and generally supports academic performance.
- **Benefits of LEDs in Educational Settings**
  - **Consistent Light Quality**: LEDs provide a high Color Rendering Index (CRI), which enhances color fidelity in the classroom environment. This makes texts and materials easier to read and colors more accurate and vibrant.
  - **Adjustable Lighting**: Modern LED systems can adjust in color temperature and intensity, matching the natural circadian rhythms of students, which can enhance focus and learning efficiency.

Cost-Effectiveness of LEDs in Maintenance

- **Reduced Labor Costs:**
  - Due to their longevity, LEDs require fewer replacements over time, which reduces the direct costs associated with purchasing new bulbs, **AND…**
  - The extended lifespan of LEDs also means that the tasks associated with routine maintenance and replacement are significantly reduced. This translates to lower labor costs, time to work on other projects, and less disruption to daily activities within school environments.
- **Durability:**
  - LEDs are more robust than traditional bulbs, with no filaments or glass enclosures that can break. This resilience further reduces the likelihood of needing replacements due to damage.

Impact on Operational Budgets

- **Predictable Expenses**: With LEDs, schools can predict their lighting maintenance costs more accurately, allowing for better budget management.
  - LED lights have a significantly longer and more predictable lifespan allowing schools to plan for replacements on a more reliable schedule.
  - Traditional lights degrade in brightness and performance over time. LEDs maintain consistent light output and performance eliminating replacement due to diminished light quality, further stabilizing maintenance costs.
- **Funding Reallocation**: Money saved from reduced maintenance can be redirected towards other educational needs or improvements, maximizing the utility of school budgets.

Howard Lake • Waverly
Winsted Public Schools

HLWW PROJECT DETAILS

Project Summary

- **What are we going to do?**
  - LED retrofit of 1984 fixtures with ballast-bypass LED tubes.
  - Replacement of emergency lighting where needed.
  - Replacement of can lights with new fixtures.
  - Replacement of gym fixtures with new high bays with occupancy sensors.
- **What is a kilowatt-hour (KWH)?**
  - A kilowatt-hour is the amount of energy you would use by running a device that consumes 1000 watts for one hour. For example: A 100-watt light bulb running for 10 hours consumes 1000 watt-hours, or 1 kilowatt-hour of energy.
- **How many KWH per year are we going to save by doing this?**
  - High School 157,589 KWH
  - Humphrey Elementary 55,373 KWH
  - Winsted Elementary 59,055 KWH
  - Total KWH savings = 272,017 KWH

How do they figure out the KWH savings?

- Believe it or not, the contractor counted every light fixture district wide.
- We told them how many hours the lights are on—additionally, they have retrofitted a lot of schools, and have a pretty good idea how to pinpoint lighting hours.
- Based on how many fixtures we have, how much energy each fixture uses, and the number of hours they are on, they calculated the total KWH our current lighting system consumes each year.
- They reviewed our bills, so they know how much we pay per KWH and it's just simple math from there. KWH x cost/KWH = how much we spend currently for lighting.
- Last step? They know how much energy the new fixtures will use, compare it to our current system and there you have it. We will save 272,017 KWH per year.

Okay, so how much money will we save?

- **Good question!**
  - **Utility Cost:** We're projecting an annual savings of $39,392.67.
  - **Equipment Savings:** Fewer bulbs to buy means saving $7,109.10.
  - **Air Conditioning:** A smaller annual savings here at $1,614.26.
- **Total annual savings: $48,116.03**
- **Labor savings:** While savings on labor does not equate to saving money, it does save time. We're estimating 293.3 hours of labor time saved.

How much will this cost?

Total Project Cost:	$160,585.24
Less Utility Rebates:	-$40,776.78
Net Cost:	$119,808.46

How will we pay for it?

- **It more than pays for itself!** Hard to believe, but it's true.
  - Remember that the projected annual total savings is $48,116.03, or $4,009.67 per month.
  - Financing the project @ 6.25% over 5 years means a monthly payment of $2,317.65.
  - **Instant cash flow!** Completing this project produces $1,692.02 per month in savings, $20,304.24 per year, or $101,521.20 over the 5 years of the loan. 10 years? $342,101.40!

$4,009.67
-$2,317.65
$1,692.02

What about our environmental impact?

1. **Reduces Energy Consumption**: LEDs are much more energy-efficient than traditional lighting, which decreases electricity usage and lowers carbon emissions from power plants.
2. **Decreases Greenhouse Gas Emissions**: Lower energy consumption means fewer greenhouse gases are released, helping to combat climate change.
3. **Minimizes Waste**: LEDs last longer than traditional bulbs, reducing the frequency of replacement and lessening waste production.
4. **Eliminates Toxic Elements**: Unlike some traditional bulbs, LEDs do not contain harmful substances like mercury, avoiding potential environmental contamination.

Our project's annual environmental impact

CARS REMOVED FROM ROADS	TONS OF COAL NOT BURNED	FOREST ACRES NOT CUT
		
43	**109**	**5250**