Upgrading transit stations to reduce operating costs and ensure rider satisfaction

At the intersection of Smyth Road and Riverside Drive

OC Transpo demonstrates its commitment to environmental stewardship by ensuring all its stations are utilizing the latest in energy efficient technology in order to reduce operational costs and improve rider satisfaction.

Installing low-voltage dimming control system

$47,135

Savings of approximately 375,000 kWh and $47,135 annually

Figure 1: Existing fluorescent strip luminaires

Lighting upgrades at the RIVERSIDE TRANSITWAY STATION
**INTRODUCTION**

Riverside Station is a bus stop along the OC Transpo transitway situated near the intersection of Riverside Drive and Smyth Road\(^1\). It was built in 1991 as part of the Ottawa Hospital’s 390 m\(^2\) expansion which included a platform with a new administration wing\(^1\).

The Station is directly connected to the Riverside Campus of the Ottawa Hospital, making it easy for patients who travel by bus to get to their appointments regardless of the weather. Since there are no connecting bus routes, the Hospital remains the primary trip generator and the main purpose for this Station\(^1\).

There are multiple lighting systems throughout Riverside Station: from recessed linear fluorescent strip luminaires that function as the primary lighting source for the transit platform, to metal halide luminaires that light up elevator lobbies and the tunnel under the platform.

All of the aforementioned lights are operated through an antiquated controls system in the electrical room. The system was designed to operate under three scheduling scenarios according to the time of day and ambient light sensing.

Upon investigation of the site in 2014, it was concluded that the control system did not function correctly and that the actual lighting configuration did not match the scheduling scenarios that the facility staff had programmed.

**PROJECT DETAILS**

After conducting a site visit to verify the malfunction and collect information on facility operations and equipment, Energy Ottawa recommended implementing a full redesign of the platform and tunnel lighting.

The project saw the installation of new 4-foot, 8-foot, and 12-foot extruded aluminum Light Emitting Diode (LED) platform luminaires above the platform (as shown in Figure 3), with each 4-foot section consuming 71W at full output. However, in order to achieve the required illuminance, the luminaires are dimmed to 55% of this maximum output\(^2\).

As for the tunnel, the existing 129 metal halide luminaires in the ceiling were replaced with 94 new LED luminaires that are designed specifically for tunnel application, such that they are able to reduce glare. Furthermore, a dedicated low-voltage dimming control system was installed to adjust the space lighting in accordance with the Illuminating Engineering Society of North America (IESNA), which recommends that tunnels be lit to a very high level during the day to match daylight conditions, and dimmed at night to match street lighting conditions\(^2\).

The total cost to implement the project was $295,744 with payback period of 9.2 years. The cost includes an incentive rebate of $18,704 from Energy Ottawa on behalf of the Ontario Power Authority (OPA) through their saveONenergy program.
3 RESULTS

Energy results: The project reduced the Station’s power demand by 89.2 kW, cutting down electricity consumption by 374,090 kWh annually. This value translates to $47,135 in annual cost savings[2].

GHG reduction: The primary objective of the project was not to reduce greenhouse gas emissions; however, the retrofit helped prevent 278 tonnes of carbon dioxide from being released into the atmosphere[2]. This is equivalent to removing 60 passenger vehicles from the road for an entire year.

The total cost to implement the project was $295,744 with payback period of 9.2 years

4 CONCLUSIONS & REFLECTIONS

The project was successful in upgrading the Riverside Station’s lighting equipment and ensuring that the control systems in the electrical room function properly and the lighting configuration matches the specified control scenarios[3].

Energy saving projects, such as the Riverside Station lighting upgrades project, highlight OC Transpo’s commitment to reducing energy usage and maintenance costs for taxpayers, while setting high standards for efficiency at their facilities and taking steps to become a more sustainable workplace.

With the help of Energy Ottawa, OC Transpo continues to explore new opportunities to cut down energy costs and improve their energy portfolio[3].

REFERENCES