

Duarte Unified School District (DUSD), Duarte, California

District-wide Lighting Upgrades



SUMMARY

Willdan Energy Solutions helped Duarte Unified School District (DUSD) save over \$50,000 annually in energy costs and nearly \$130,000 in labor and material by implementing projects designed to save energy and reduce overall electrical demand. Willdan primarily focused on eliminating fixtures containing outdated T-12 fluorescent lamps and magnetic ballasts, replacing these materials with higher efficiency options for improved performance while consuming less energy. Along with eradicating T-12 lamps, project scopes included the retrofit of the existing T-8 fixtures, de-lamping, high-bay/high-wattage lighting fixtures, and also the installation of compact fluorescent lighting and occupancy sensors, providing energy savings and demand reduction.

In addition to completing projects at schools throughout the District, Willdan completed a full lighting retrofit for the Performing Arts Center, providing a much-needed upgrade that will not only save a substantial amount of energy, but also improve the aesthetics of the facility.

GOALS AND CHALLENGES

Making the Case for Energy-related Improvements

Willdan's primary goal in implementing this project for Duarte Unified School District was to maximize energy savings and demand reduction in the most cost-effective manner possible, while also emphasizing quality and safety during the installation process. Our secondary goals were to maintain lighting levels that satisfy American National Standards Institute (ANSI) standards, provide consistency in lighting levels and color temperature, and utilize the most cost-effective upgrades.

Willdan completed energy efficiency upgrades in classrooms, offices, restrooms, and all other applicable locations within DUSD's facilities—providing financial savings of nearly \$130,000 in utility incentives. Willdan saved the district over 300,000 kWh in total annual energy savings, translating into additional energy cost savings of over \$50,000 per year.

Estimated Annual Utility Cost Savings:
\$51,750

Total Utility Incentive Rebate:
\$129,575

Energy Savings:
304,409 kWh
3.24 kW

Cost to School District:
\$0

Each DUSD facility varied in regards to ambient lighting levels and the number of lighting fixtures in each location, along with light color temperatures. Willdan retrofitted all existing linear fluorescent fixtures, whether the existing base case included T-12 or T-8 lamps, down to two-lamp T-8, 28-watt reduced-wattage linear fluorescent lamps at 5000 Kelvin (color temperature) with an electronic ballast. Three or four lamp fixtures required de-lamping, which added greater energy savings to each of these retrofits. In order to ensure consistent lighting levels, Willdan utilized high-light-output ballasts and reflector kits, when necessary. High-light-output ballasts and reflectors are typically used to boost insufficient lighting levels, and as such, these additional upgrades were used when existing ambient lighting did not allow for a standard retrofit with de-lamping and the replacement of a standard light output ballast.

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While performing approved lighting retrofits in hard-to-access, high-bay areas within DUSD's Performing Arts Center, Willdan retrofitted additional lighting fixtures outside of the project scope at no additional charge. The district provided a letter of recommendation acknowledging the hard work put forth by Willdan staff in completing the Performing Arts Center project. One of the most important factors in successfully implementing the overall energy upgrade with DUSD was Willdan's close coordination with district staff.

SOLUTIONS AND OUTCOME

Retrofits Result in Operational Savings

Willdan installed lighting upgrades at nine DUSD facilities. All retrofits were performed after school hours while students were no longer present. This way, students were not in danger and the installers could focus on the installation. For quality assurance, Willdan inspected 100% of all projects, and provided a one-year warranty on all workmanship, with additional warranties on materials.

Table 1
Summary of Savings per Facility

Facility	Project Cost	Annual Kilowatt Savings (Energy Savings)	Annual kWh Savings (Demand Reduction)	Annual Energy Cost Savings
<i>Elementary Schools</i>				
Andres Duarte	\$28,534.29	73,606	0.87	\$12,513.10
Beardslee	\$16,766.52	40,036	0.32	\$6,806.15
Maxwell	\$16,776.02	39,363	0.46	\$6,691.65
Royal Oaks	\$2,948.28	10,536	0.16	\$1,791.13
Valley View	\$16,683.70	35,453	0.44	\$6,027.07
<i>Intermediate Schools</i>				
Northview	\$3,897.04	5,133	0.19	\$872.63
<i>High Schools</i>				
Duarte	\$30,512.10	68,203	0.51	\$11,594.51
Mount Olive	\$7,961.43	22,970	0.22	\$3,904.89
<i>District Facility</i>				
Performing Arts Center	\$5,495.98	9,109	0.07	\$1,548.55
Total	\$129,575.36	304,409	3.24	\$51,749.68

