



**CASE STUDY**  
**ENERGY EFFICIENCY & LIGHTING IMPROVEMENTS**  
**TYLER ISD**  
**GYM LIGHTING RETROFITS**



Tyler ISD replaced the lighting in the gymnasiums at the following schools: Boulter Middle School, Dogan Middle School, Hubbard Middle School, Moore Middle School, Stewart Middle School, and John Tyler High School.

The 400-watt metal halide fixtures in these gyms were replaced with fluorescent high bay fixtures utilizing T-5 high output (HO) lamps. Fixtures with both six lamps and four lamps were used.

The fluorescent high bays use only 234 watts per 4-lamp and 351 watts per 6-lamp fixture, compared to about 458 watts each for the 400-watt metal halide fixtures they replaced.

Because the fluorescent fixtures offer the advantage of instant off/on with no warm up period, they can be turned on and off as needed. This should encourage coaches, P.E. teachers, etc. to turn lights off during the day when no classes are present. Research shows that this feature results in additional energy savings beyond that realized just from reduced fixture wattages.

The fluorescent high bay fixtures produce very even, glare-free lighting without excessive brightness. Before and after readings were taken with a light meter in each gym. Because the lighting is very uniform and non-glare, illumination levels are quite a bit higher than they might first appear, which results in a better environment for students.

The following table summarizes the decrease in fixture wattage. Additional savings will be realized from turning off the lights each school day (potentially several hours each day) when the gyms are not in use. Motion sensors automatically turn off lights when they are left on for extended periods with no activity. The gyms at Boulter, Dogan, Hubbard, and Stewart all have windows, which may allow light usage to be reduced during some periods. More savings will also come from reduced air conditioning load in the gymnasiums, since the fluorescent ballasts give off less heat. In all cases the replacements resulted in higher light levels.

Facility	Power Requirement before/after (kw)	Power Reduction with New Lighting (kw)	Potential Annual Energy Savings*	Simple payback (years)
Boulter MS	10.5/7.0	3.5	\$756	-
Dogan MS	5.5/4.2	1.3	\$281	-
Hubbard MS	16.5/6.1	10.4	\$2246	-
Stewart MS	4.8/5.1	n/a	n/a	-
Moore MS	9.2/7.0	2.2	\$475	-
John Tyler HS	16.5/7.7	8.8	\$2218	-
<b>TOTALS</b>	-	26.2	\$5976	12

\*Based on reduction in wattage only (annual lighting usage 1800 hours middle schools and 2100 hours high schools). Savings from turning lights off when not needed would be additional.

**Annual Energy Cost Reduction \$5976+**