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Improving Campus Security with Increased Lighting Efficiency while Simultaneously Reducing Light Pollution ANDREW SCHENK, DAN MILLER, ERIC MARTELL, Millikin University — Many outdoor lighting fixtures fail to enhance the security of the assets they were designed to protect; moreover, they simultaneously increase the levels of light pollution for astronomers. The problem is simple: most lighting fixtures do not properly aim the light they produce downward. In fact, up to fifty percent of the light rays escape upward, thus wasting a significant amount of energy and severely degrading the environment in which to do astronomy. To resolve these problems, I first created a scale model of Millikin University's campus and took time exposures and photometer readings from the replicas of the existing light fixtures. I then fastened improved fixtures to the scaled lamps and retook the camera exposures and photometer readings for comparison. With this information I was able to take my work full scale and physically change one of the light fixtures on campus. Finally to wrap up my project I took my findings to safety and security to show the improvement that these new fixtures represented to Millikin's safety and to its astronomy equipment.

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