



To: Open Space Advisory Committee
From: Scot Grossman, Project Management Supervisor
Through: Tom Hoby, Director
Subject: Colorado School of Mines Capstone Project – Off-Grid Timed Door Lock
Date: November 2, 2023

At the November 2 Open Space Advisory Committee Meeting, students from the Colorado School of Mines (CSM) will present the results of their capstone project to the Open Space Advisory Committee.

Background

Every graduating senior studying Civil, Mechanical, Electrical, or Environmental Engineering at CSM is required to complete a yearlong capstone project prior to graduation. For the sixth consecutive year, Jeffco Open Space (JCOS) has sponsored a project. This year's project is a culmination of work started by a capstone group in 2022.

Whenever grid power is available, JCOS staff install a timed lock on every restroom door that coincides with normal park hours. This helps minimize after-hours vandalism. Unfortunately, the only commercially available products require continuous power which makes a small solar array infeasible. As such, many of the restrooms in the JCOS system are left unlocked at night.

Staff have tasked the students to create a system that can work off the grid so all the restrooms can be locked at night.

They were given the following requirements:

1. It must utilize as many components from the commercially available product as possible.
2. The product can be battery-powered but must operate for at least one year before the batteries need to be changed.
3. It must be easily replicable.
4. It needs to have a signal that the battery is running low.
5. The entire product cannot cost more than \$300.

The students' first prototype was beta-tested in the Tunnel 1 restroom for multiple months this summer. The device worked perfectly without any problems. They will provide the Open Space Advisory Committee with an overview of their work, discuss the rationale behind the decisions made, show the inner workings of their system, and walk through how it physically works.