Millcreek Canyon Air Quality Study
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Millcreek Canyon is a highly used, year-round recreation facility that is multi-use (cycling, running, hiking, snowshoeing, skiing, summer camps, etc.) and centrally located in Salt Lake County. Increased motorized and human traffic necessitates a workable solution to ensure the canyon is protected from environmental degradation. One commonly-cited concern is the rising number of automobiles traveling to the canyon and potential air quality impacts. Two seasons tend to be of most concern: winter during inversions when fine particulate matter (PM2.5) is trapped and elevates above healthy levels, and summer when elevated ozone rises into dangerous levels and occasional wildfires compound the problem resulting in elevated PM2.5 levels. Traffic results primarily in nitrogen oxide (NOx) emissions (and some PM2.5) which chemically react to produce ozone and additional PM2.5. A reliable way to estimate human impacts due to traffic on pollution is to use high-quality research grade sensors. Monitoring all three pollutants (PM2.5, ozone, and NOx) would provide a baseline estimate of these impacts and guide policy decisions. Furthermore, a study of potential alternatives (i.e. shuttle buses) necessitates a clear understanding of emissions from these alternative transportation options. The sensors cost approximately $6,000 for PM2.5, $10,000 for ozone, and $25,000 for NOx.

One possibility would be to deploy two sets of sensors at two points in the canyon (entrance and approximately midway to the top where the gate is located) where cars routinely travel. Another option is to set up 4 sets of sensors, only including PM2.5 and ozone, located at the entrance and approximately one third, two thirds, and at the top of the canyon.

The first option would measure detailed direct traffic impacts at two points, while the second option would provide a more spatially disaggregate view of air pollution, without a direct measurement of immediate car emissions.

Having enjoyed Millcreek Canyon multiple times, I know first-hand that there are substantial dead zones for cell phone reception. These sensors can be programmed and coupled with a cell modem to provide constant air quality monitoring or they can store the data to be downloaded later. The sensors need electricity to function so siting is critical to ensure power and potential cell phone reception for real-time monitoring, if desired.

Additional Costs:

- The person time to install is included in the sensor cost unless it is unreasonably difficult to install - which we would figure out when we look at the sites.
- If we choose to site the sensors where there is no power, we can purchase a solar panel kit which would cost between $500-750 (I need to confirm with the manufacturer as prices change).
- If we want real-time data collection (available on a website), that would cost approximately $720/year ($60/month for a cell modem to be running).

- For a standard data analysis and report, including 2 site visits/year to check on equipment, $5,000.