

EBus Air Quality Monitoring Project Proposal

Project Proposal: The project goal is to use a emissionless mobile platform (Ebus) to provide real time air quality monitoring data for criteria pollutants PM2.5, ozone, and nitrogen oxides. The data collected from this project will inform strategies used to improve air quality.

Project Background: Air quality monitors have been used in SLCo since 1963 to help scientists, policy makers, and the public better understand the types and various levels of particulates in the air that are unhealthy to breathe. In the past, air quality monitors were only at fixed locations. In December 2014, the University of Utah partnered with UTA to place air monitoring equipment on electric powered TRAX trains that cover 45 miles of rail lines. This created the first mobile non emission platform in the United States that collected real time air quality data with research grade sensors. The research yielded valuable insights into the complex nature of how harmful particulates interact with the Wasatch Front airshed across Salt Lake County. This has led to a better understanding of which areas in the Salt Lake Valley are at a greater risk of breathing unhealthy air that has high levels of particulates.

Project Summary: Building on success of the TRAX monitoring platform, the project is proposing to place air monitors on 3 electric buses within the Salt Lake City Business Unit UTA fleet. This project is being conducted as a proof-of-concept model which can be scaled up to increase coverage to provide real time air quality monitoring.

Data Management

Daniel Mendoza (UOFU) and his research team will collect the data from the monitoring equipment and process it to be easily understandable by members of the general public. Data will need to be available in a dashboard format which would be hosted and available for viewing on SLCo, the U of U and DAQ platforms. SLCo will retain ownership of data but agree to make findings public.

Organizational Roles

Organization	Role
Salt Lake County	SLCo will act as primary project manager handling logistics, coordination between parties, and fiscal agent. Hosting website and owner of data
UTA	UTA will focus on primary operational integration of equipment and vehicles. Coordinate route planning. Responsible for installation of equipment
Aquehs Corp	Aquehs will handle data gathering, storage and, analysis in addition to sourcing the monitors themselves. Advise and coordinate route planning. Advise future infrastructure installation. Equipment installation
DAQ	Will provide additional data analysis expertise

Expenditures

Budget Item	Subcost	Total
<ul style="list-style-type: none"> <u>Three Sensor System Construction:</u> The PM_{2.5}, ozone, and NoX sensor systems will consist of two components: 1) the monitor and 2) the data logging equipment. The two components will always be connected to each other and can be mounted on the bus 	\$2000	
PM2.5: MetOne ES-642 Sensor	\$1,000	
Ozone: 2B Technologies Model 205 Sensor	\$12,000	
NOx: 2B Technologies Model 405 Sensor	\$15,000	
3 sensor systems total		\$90,000
Ongoing maintenance and operational costs <ul style="list-style-type: none"> Two to three-month maintenance needed 	\$20,000	
Installation Costs	Minimal	
Equipment needs related to access to data collection	A cell phone modem: \$900 Data logger as backup: \$3,500	
Future Monitors/backups	\$40,000	
Operational Costs total		\$ 63,000
Total Project Budget		\$155,000

Project Timeline:

Forming Project Proposal	August 2020
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Finalizing Project Funds	February- March 2021
Project Finalized and approved	February 2021
Installation of one monitor	March 2021
Research Begins	March 2021
First two-month observation report	February 2021
Midway Research Report	July 2021
Seasonal observation report	Fall 2021
Research ends	March 2022

Funding Sources

Funder	Committed	Pending (request made)
SLCo	\$20,000 (2021)	
UTA	\$20,000 (2021)	
DAQ		
Rocky Mountain Power	\$20,000	
UCAIR	\$10,000	
WFRC	\$5000	
Legislature		\$80,000
UofU	\$20,000 (internal grant covering time and labor and not part of overall budget)	
Total	\$75,000	\$155,000

Project Partners: collaborators

- Salt Lake County
 - Michael Shea, Environmental Manger
 - Primary Contact
 - Mshea@slco.org
 - 385-271-3745
 - 2001 S. State Street S2-100
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 - Helen Peters, Transportation Program Manager
- UTA
 - Hal Johnson, UTA Project Development and Systems Planner
 - Laura Hanson, UTA Director of Planning
- U of U
 - Daniel Mendoza, PhD Atmospheric Scientist
- DEQ Division of Air Quality
 - Chris Pennell
 - Manger Technical Analysis Section
 - Rachel Edie

- Atmospheric Scientist

Verifiable Impact

Project will produce a mid-project update report and a final project summary report as final product for initial project scope. Report will include data analysis and conclusion if project can be expanded.