# UTAH Air Quality Monitoring Using Fixed and Mobile Stations DRAFT ONLY

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# Abstract


- As part of the NSF US Ignite grant, mobile air pollution monitoring stations was developed within a GIS environment.
- Monitoring is carried out for Utah and Salt Lake Counties in Utah.
- As part of the Utah EPA, there are a couple of fixed air monitoring stations.
- These fixed stations report XXXXXX for every one hour interval.

- A GIS platform was integrated from the mobile and fixed stations

# Overview

- Introduction
- Literature Background
- Design
  - Sensor
  - Server
  - Mapping
- Results
- Conclusions
- Acknowledgement

# Introduction

- The greater Salt Lake and Utah Valleys, like other areas of the country, experiences severe unhealthy “inversion” days, as well as localized air pollution "hot spots" throughout the year. These conditions cause major health problems for people living and working throughout the valleys including asthma, increased head and chest colds, reduced lung function and potentially chronic lung and heart disease. Current air pollution monitoring stations are cumbersome, expensive, and too few in number to provide sufficient real-time information to the community at large to facilitate rapid response to air pollution avoidance.  The use of both mobile and fixed low-cost sensors programed to identify pollution creation conditions (i.e. wind, weather conditions, vehicular traffic, point sources, etc.) at ground level will allow faster mitigation of pollution which reduces the number of unhealthy air days per EPA guidelines in the Salt Lake and Utah Valleys. Stored in Utah Valley University’s Big Data center, real-time air quality information will be communicated to stakeholders, local, state, and federal air quality agencies, and community organizations. This same information will be available to individuals via a free downloadable App for individual mobile devices. It is anticipated that by empowering the individual with real-time street-level information regarding air pollution, they will make adjustments to their planned activities and routes in order to avoid and/or reduce exposure to unhealthy air quality.

# Goals

- Can low-cost portable air pollution sensors effectively capture real-time, street-level data regardless of whether they are affixed to fixed (i.e. a building) or mobile (i.e. a vehicle) stations?
  - Availability of low cost air pollution sensors?
  - Sensor Integration with server?
- How many low-cost portable air pollution sensors are needed to create an accurate air quality map?
  - Simulation model
- How to create a live air quality map?
  - Online GIS platform

# Current State Sensors – Utah DEQ

- Utah Department of Environmental Quality
- PlaceEdit: Map of All Stations in Utah (Attach from GIS)
- The air pollution monitors currently utilized by the state of Utah are large and expensive. Current air pollution monitoring utilizes a limited number of fixed sampling and data collection points, and data is only downloaded every hour. Little opportunity exists to create control methods to reduce pollution levels in real-time as they change during the day. The air quality at street level of deta
- The typical pollutants studied are nitric o monoxide and particulates. These pollut area spanning just a few blocks (Lorinc, 2 fixed or static, and since meteorological important to have the capacity to analyz data processing center to create more ac data. It is also important to identify low used by communities to understand and they are exposed.