DSCI 554 Project

AirWatch Insight

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INTRODUCTION

- **Air Quality Monitoring**: The dashboard offers instant access to air quality data, emphasizing its relevance in assessing environmental health.
- **User-Friendly Design**: With a focus on user experience, the interface is intuitive, ensuring that information on air quality, traffic situation and other climatic conditions is easily understandable for a broad audience.
- **Prominent AQI Display**: The Air Quality Index (AQI) is featured prominently, providing a quick and essential reference for assessing air pollution levels, and how its affecting the climate.
- **Wide Applicability**: Ideal for residents, health professionals, environmentalists, and policy makers, the dashboard is a versatile tool for making informed decisions and fostering environmental stewardship.

MOTIVATION

- To safeguard public health by providing accessible information on air quality and environmental conditions. Poor air quality has direct consequences on respiratory and cardiovascular health, and timely data can help individuals take preventive measures.

- Providing detailed and localized data on air quality, traffic congestion, and climate conditions can guide policymakers and urban planners in making informed decisions. This can lead to the development of cleaner, more sustainable urban environments.

- By analyzing traffic patterns and their impact on air quality, the dashboard can contribute to more efficient traffic management strategies, reducing vehicular emissions and improving overall air quality.

User and user stories

- **Urban Planners and Policymakers**: The need to have comprehensive data on AQI trends, traffic patterns, and climate conditions to develop sustainable urban development plans and public health policies.

- **Healthcare Professionals:** The need to access environmental data to advise patients with respiratory conditions on precautionary measures during days with poor air quality.

- **Residents and General Public**: As a resident of any metropolitan area, the need to check the daily AQI and traffic conditions so that they can plan outdoor activities and commuting routes to minimize exposure to pollution and avoid congested areas.

Dataset

The data has been collected from various sources, and has been combined to make a dataset for presentation in the dashboard.

- **AQI** : **https://www2.purpleair.com/**
- **Weather and climate** : **https://www.visualcrossing.com/**
- **Traffic : https://ladot.lacity.org/residents/traffic-counts**

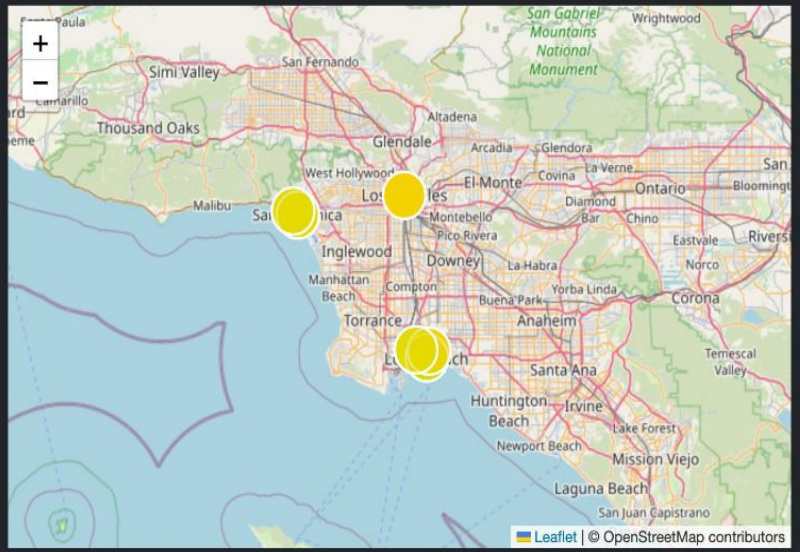
TECHNICAL STACK

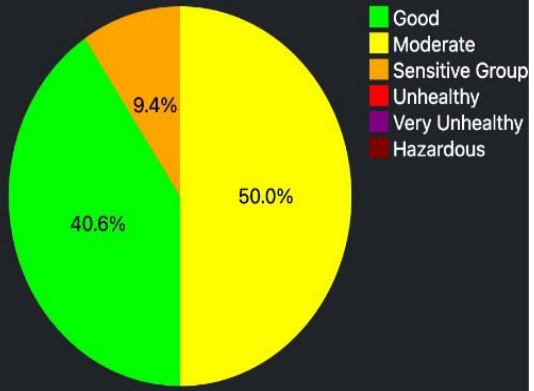
- Bootstrap 5.3 : Utilized for responsive design and layout components.
- D3.js: Integrated for dynamic and interactive data visualizations.
- Bootstrap Icons: Employed for UI elements and enhancing visual appeal.
- Vue.js in part of application for dynamic components and interactivity.

AQI Dashboard

- AQI Analysis
- Climate Condition Analysis
- Traffic Analysis

LA County AQI Weeekday / Weekend / Monthly analysis

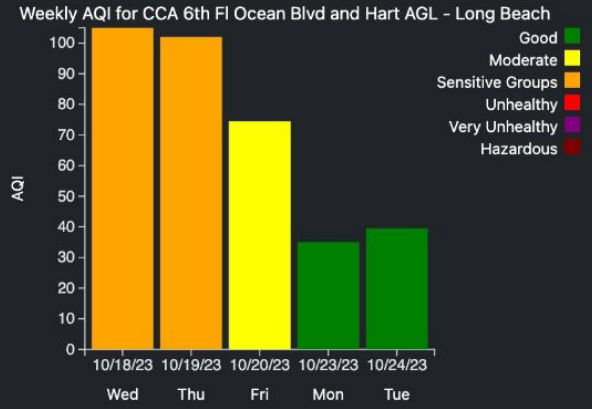


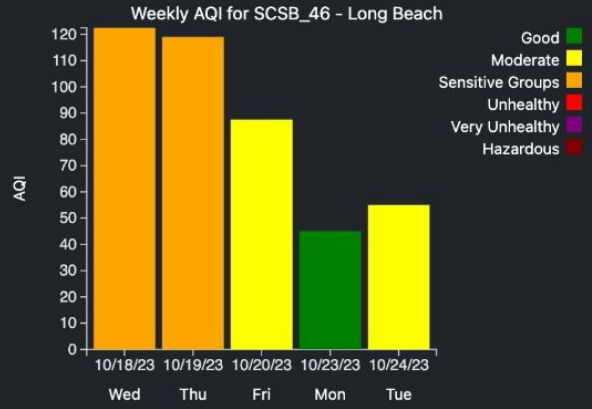


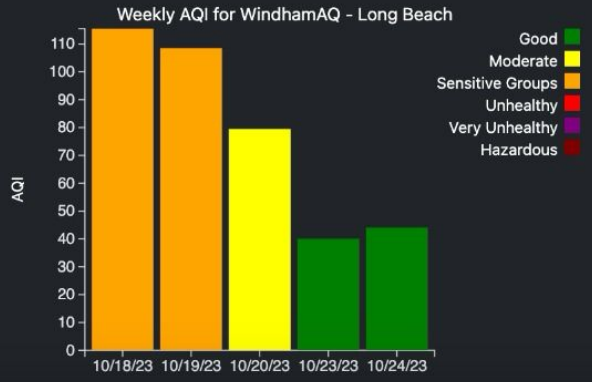
% time spent in different AQI ranges over past month at CCA 6th Fl Ocean Blvd and Hart AGL

Slide for weekly AQI values from 10/18 - 11/18. Click on any of dots to compare

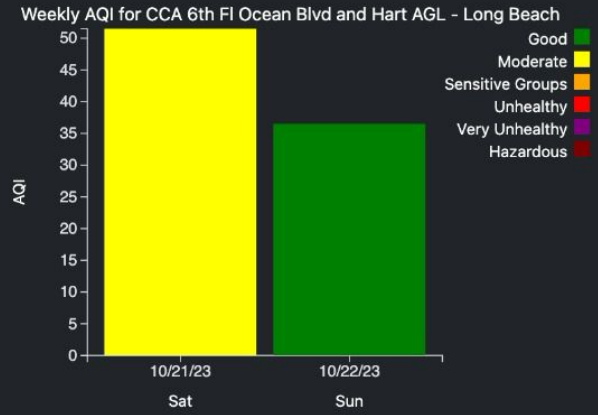
Weekday Weekend

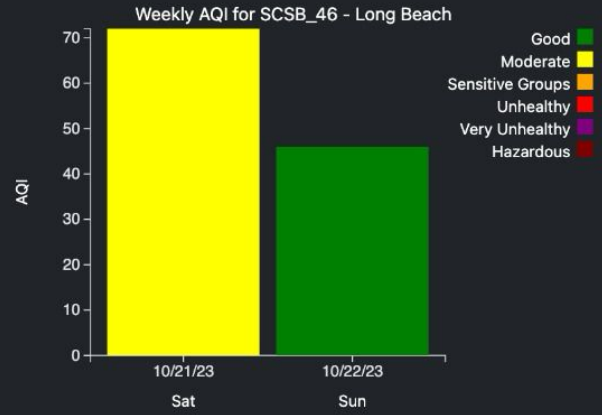


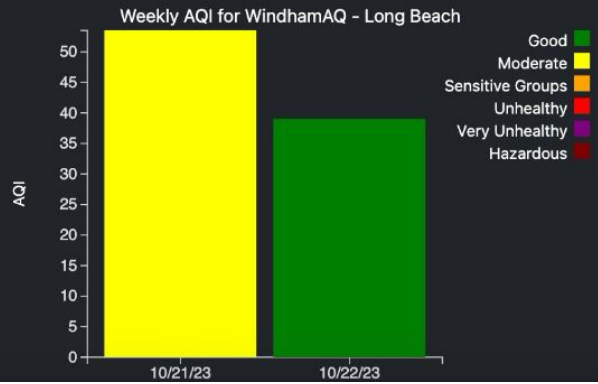




Weekday Weekend







AQI Dashboard

- AQI Analysis
- Climate Condition Analysis
- Traffic Analysis

AQI and Traffic Count Comparison

Select Location: longbeach

Select Sensor: CCA 6th Fl Ocean Blvd and Hart AGL

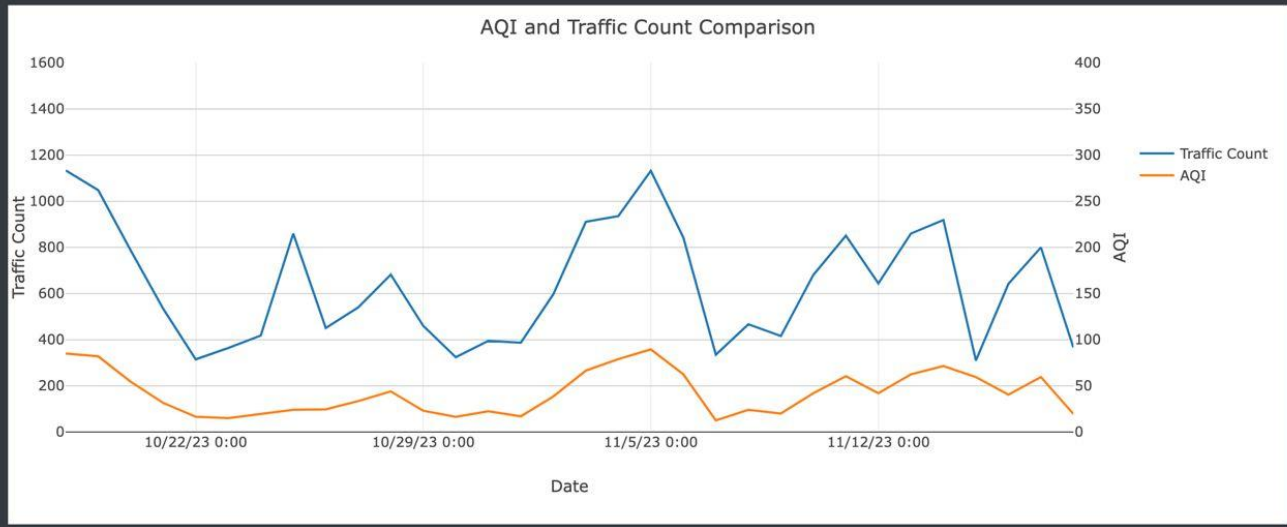


Chart Description: This chart compares the Air Quality Index (AQI) with Traffic Count over time. The Traffic Count values are machine count values taken from the nearest intersection to the sensor for that day.

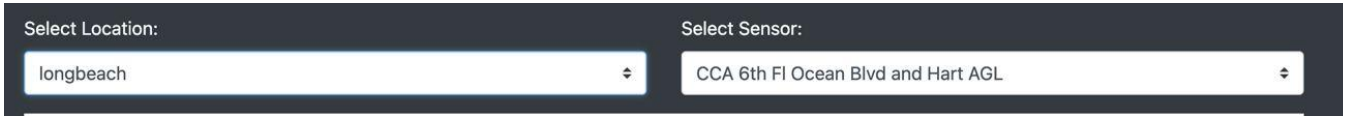
Correlation Coefficient: 0.89

Radar system complements air quality sensors by providing additional meteorological data.

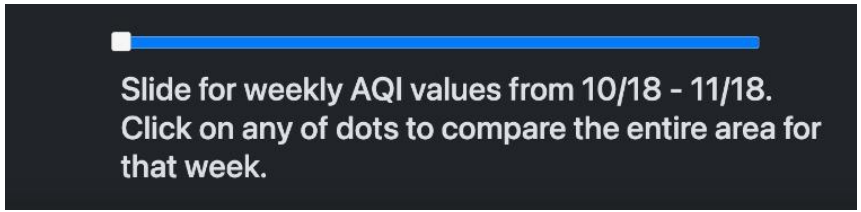
Implementing real-time data synchronization mechanisms ensures that both air quality and weather radar information are concurrently updated.

USER INTERACTION

- ***User-Centric Dropdown Menu:*** Straightforward Customization: The drop down menu serves as a central hub for users to customize their dashboard experience effortlessly.



- ***Map Slider Integration:***The map slider functionality is implemented using D3.js and Leaflet, allowing users to interactively explore air quality data over time.



FUTURE WORK

- Enhance the dashboard with real-time monitoring across a broader geographical area.
- Develop sophisticated algorithms for predicting future air quality trends.
- Introduce personalized dashboard settings and custom alerts based on individual user preferences and locations.

CONCLUSION

- The dashboard beckons users to explore its depths through interactive charts and real-time data updates
- The real-time data updates serve a practical purpose, allowing individuals, communities, and policymakers to make timely decisions based on the current air quality status.
- The dashboard thrives on user feedback, actively incorporating suggestions for improvements.
- In future, we will look forward to Enhanced User Interactivity, where users can expect personalized alert features, allowing them to set thresholds for specific air quality parameters.

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- Omar Sayah Alruwaili : Correlation Between Air Quality Index and Traffic Volume Using Internet of Things (IoT). Scholarship Repository @ Florida Tech (2020)
- Breeze-technologies.de.https://www.breeze-technologies.de/blog/traffic-air-quality-the-influence-of-mobility-on-urban-air-pollution/ . Traffic & Air Quality – The Influence of Mobility on Urban Air Pollution

THANKYOU