

DASHBOARD PROJECT

Getting Climate Variables and Their
Impact on Critical Buildings



Getting Climate Variables and Their Impact on Critical Buildings

INTRODUCTION

Project Title: Dashboard for Getting Climate Variables and Their Impact on Critical Buildings

Competition: Higher Education Data Analysis Competition.

Objective: Analyze and visualize the impact of climate variables on critical buildings to facilitate decision-making for stakeholders in Hamilton, Ontario.

Key Outcome: Won the main competition with this innovative analysis and visualization approach.



Getting Climate Variables and Their Impact on Critical Buildings

PURPOSE OF THE DASHBOARD

Goal: Provide an interactive tool to analyze building characteristics and their relationship with climate variables.



Target Variable: Facility Condition Index (FCI Rating).



Getting Climate Variables and Their Impact on Critical Buildings

PURPOSE OF THE DASHBOARD

Influential Variables:

- Building age
- Location
- Facility type and size
- Climate data: Ice days, cold cycles, hours of sunlight, humidity, precipitation
- Two categorical variables: FCI criticality and human criticality

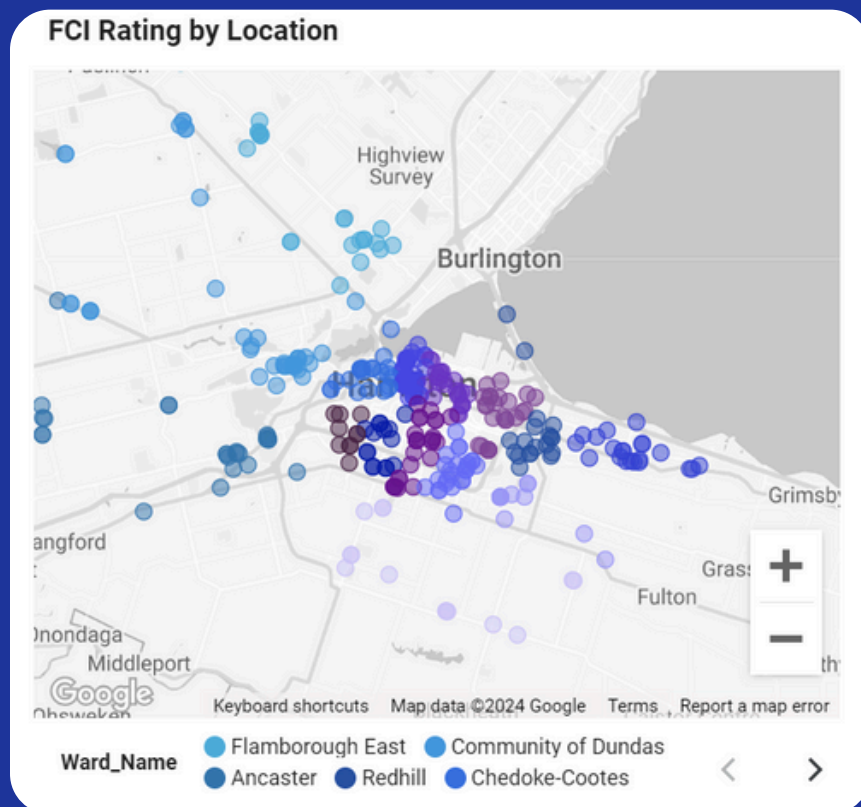


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VISUALS OVERVIEW

Visual 1 & 2: FCI Rating vs. Location

- Map (GeoJSON-based): Interactive visualization by wards (e.g., H13-2).
- Bar Chart: Comparative data across locations.



| ID... | Ward | Count | Avg. FCI Rating |
|-------|---------------------|-------|-----------------|
| 1 | Chedoke-Cootes | 52 | 0.13 |
| 2 | Downtown | 50 | 0.06 |
| 3 | Hamilton Centre | 37 | 0.15 |
| 4 | East Hamilton | 36 | 0.09 |
| 5 | Redhill | 22 | 0.04 |
| 6 | East Mountain | 38 | 0.11 |
| 7 | Central Mountain | 34 | 0.09 |
| 8 | West/Central Mou... | 18 | 0.06 |
| 9 | Upper Stoney Creek | 18 | 0.16 |
| 10 | Lower Stoney Creek | 23 | 0.09 |

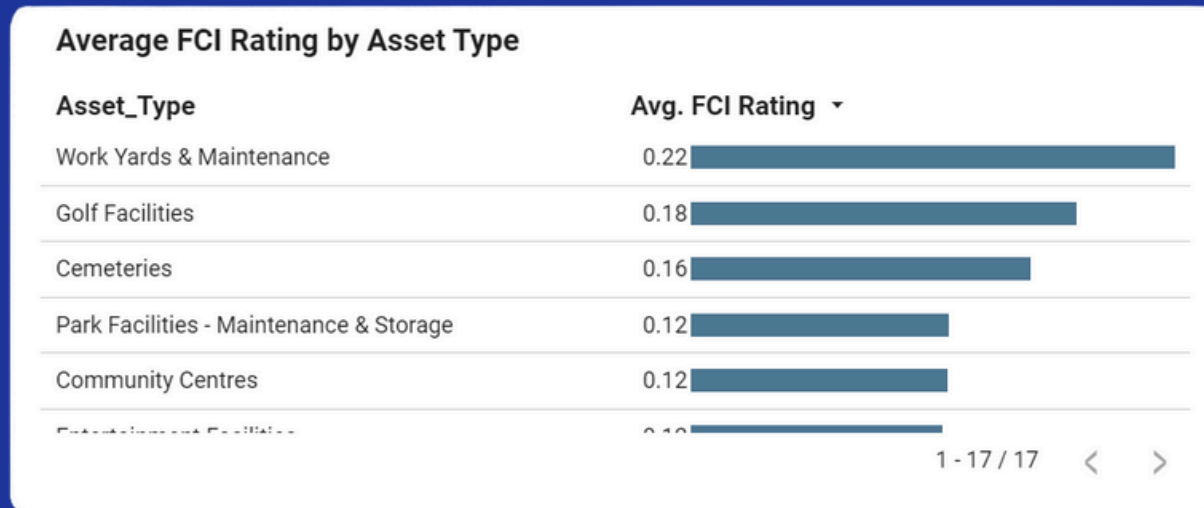
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VISUALS OVERVIEW

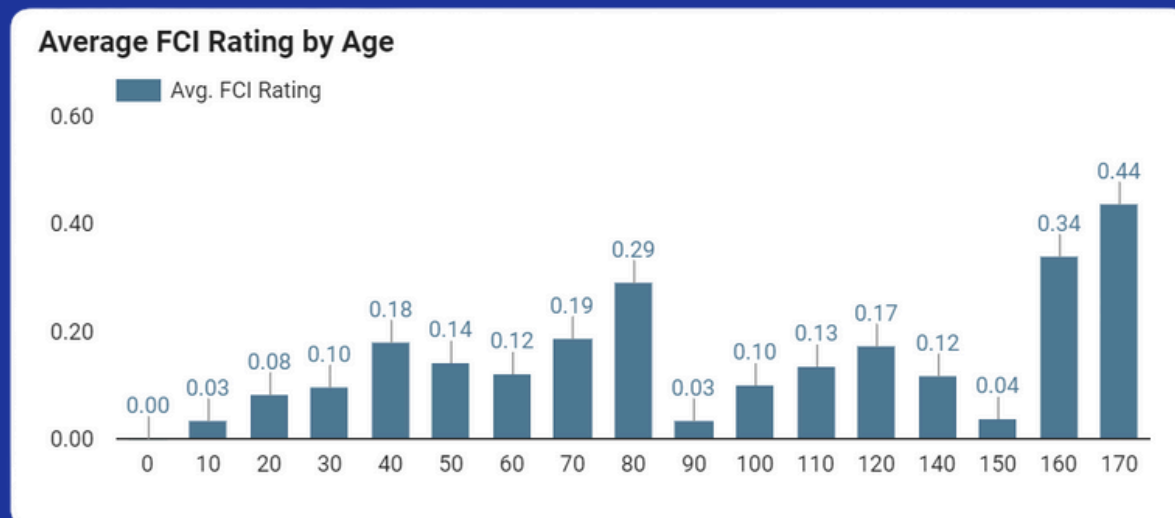
Visual 3: FCI Rating vs. Asset type

- Comparison of the impact of each asset type.



Visual 4: FCI Rating vs. Building Age

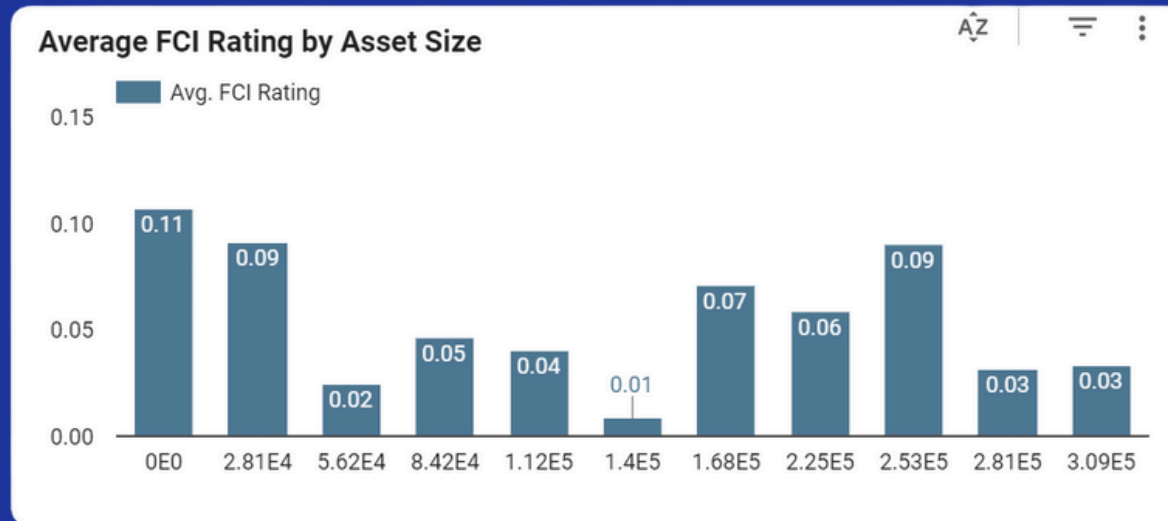
- Positive correlation identified up to 80 years, indicating potential refurbishments in older buildings.



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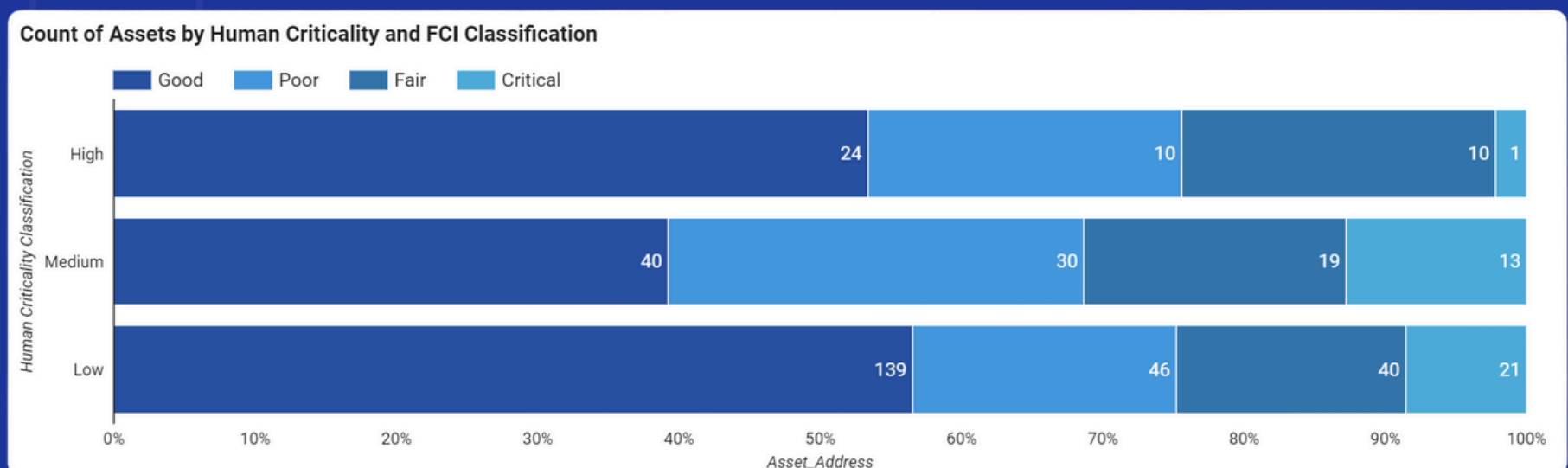
VISUALS OVERVIEW

Visual 5: FCI Rating vs. Asset Size



Visual 6: Number of Advisors by Human Criticality and FCI Classification

- Quick assessment of advisor distribution.



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VISUALS OVERVIEW

Visual 7: Table of Assets

- Displays climate data averages affecting each asset for detailed analysis.

Asset with Climate Data

| | Asset_Name ▾ | Asset_Type | Asset_Date_Built (...) | Age | Human_Criticality... | Precipitati... | Ice Days | Humidex | Freeze-Thaw c... | FCI Rating |
|-----|--------------------------|-----------------------------|------------------------|-----|----------------------|----------------|----------|---------|------------------|------------|
| 1. | Woolverton Park - Pav... | Park Facilities - Public... | 2014-01-02 | 10 | Low | 848.85 | 39.14 | 3.18 | 58.36 | 0.00 |
| 2. | Woodward Park - Was... | Park Facilities - Public... | 1999-01-02 | 25 | Low | 806.38 | 35.73 | 2.04 | 53.63 | 0.00 |
| 3. | Woodlands Park - Con... | Park Facilities - Public... | 1966-01-02 | 58 | Low | 809.65 | 44.53 | 1.08 | 60.69 | 0.01 |
| 4. | Woodland Cemetery ... | Cemeteries | 2021-11-08 | 3 | Low | 812.36 | 33.25 | 4.00 | 54.13 | 0.00 |
| 5. | Woodland Cemetery E... | Cemeteries | 1923-04-02 | 101 | Low | 806.51 | 45.57 | 1.15 | 61.55 | 0.14 |
| 6. | Woodland Cemetery ... | Cemeteries | 1925-05-25 | 99 | Low | 806.51 | 45.57 | 1.15 | 61.55 | 0.00 |
| 7. | Woodland Cemetery (...) | Cemeteries | 1985-01-02 | 39 | Low | 818.74 | 41.58 | 1.83 | 59.33 | 0.33 |
| 8. | Woodburn Ball Park (...) | Park Facilities - Public... | 1976-01-02 | 48 | Low | 846.87 | 47.16 | 1.12 | 59.12 | 0.08 |
| 9. | Woodburn / Centenni... | Community Centres | 1898-01-01 | 126 | Medium | 841.45 | 49.69 | 0.75 | 60.59 | 0.08 |
| 10. | Winona Seniors Club | Senior Centres | 1986-01-02 | 38 | High | 827.51 | 40.97 | 1.77 | 53.92 | 0.19 |
| 11. | Winona Scout Hall | Park Facilities - Public... | 1973-01-02 | 51 | Low | 821.94 | 43.06 | 1.40 | 55.13 | 0.06 |
| 12. | Winona Park - Storage | Park Facilities - Maint... | 1968-01-02 | 56 | Low | 825.14 | 46.08 | 1.47 | 58.98 | 0.00 |
| 13. | Winona Park - Picnic ... | Park Facilities - Public... | 2002-01-02 | 22 | Low | 838.45 | 39.24 | 2.61 | 55.83 | 0.00 |
| 14. | Winona Community C... | Community Centres | 1960-01-02 | 64 | Medium | 817.35 | 44.46 | 1.15 | 56.01 | 0.08 |
| 15. | William Schwenger P... | Park Facilities - Public... | 2017-11-20 | 7 | Low | 845.70 | 38.63 | 3.38 | 57.56 | 0.00 |
| 16. | William Mccullouch P... | Park Facilities - Maint... | 1998-01-02 | 26 | Low | 848.91 | 43.87 | 2.33 | 60.06 | 0.24 |
| 17. | William Mcculloch Pa... | Park Facilities - Public... | 1998-01-02 | 26 | Low | 848.91 | 43.87 | 2.33 | 60.06 | 0.01 |

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FINAL RESULT VIEW

<https://lookerstudio.google.com/u/0/reporting/79980d99-e80b-4ac2-a13d-9b6b119aa178/page/aFZtD>



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TOOLS AND TECHNOLOGIES USED

Looker Studio:

- Free, accessible platform for users with Google accounts.
- Promotes collaboration and democratized data insights.

 Looker Studio

BigQuery:

- Enhanced data processing and visual performance.
- Efficiently handled large datasets.

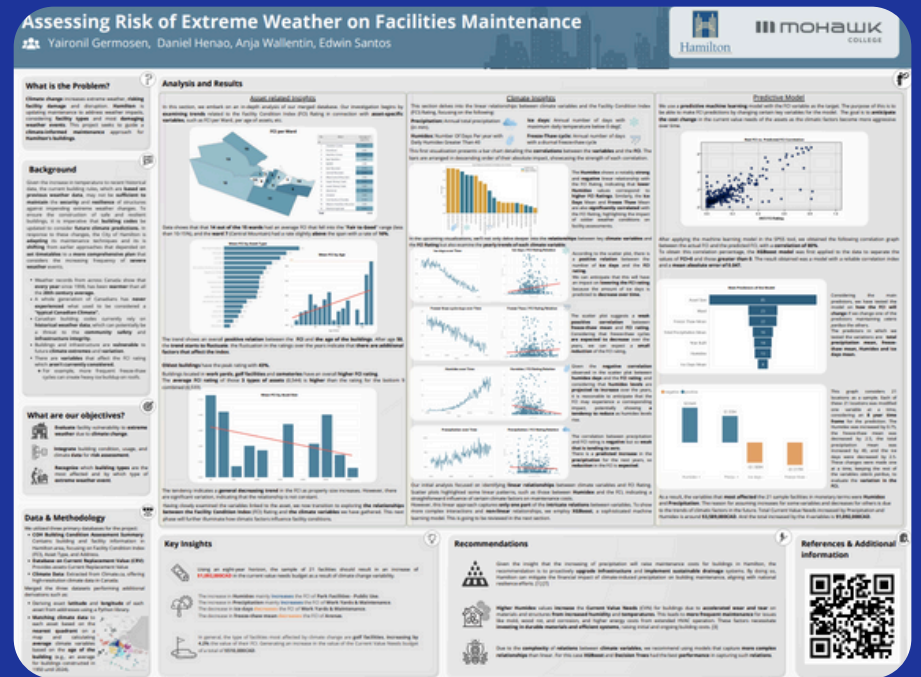


BigQuery

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ACHIEVEMENTS

- **Competition Recognition:** Won the primary competition due to the depth and clarity of the analysis.
- **Complementary Project:** Developed a poster summarizing the complete data analysis for broader dissemination.



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KEY TAKEAWAYS

- **Impactful Visualizations:** Provided stakeholders with actionable insights through interactive and accessible tools.
- **Practical Solutions:** Showcased the ability to use data to solve real-world infrastructure challenges.
- **Collaboration-Friendly:** Tools used facilitated team-based decision-making and wide usability.

