ANALYZING AUSTIN'S MOBILITY PROJECTS

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Keywords:

Data analysis, visualizations, data engineering

Summary:

The VisionZero-Moped data analysis project will provide city workers a quick and easy way to determine the impact of the city's mobility projects. This can potentially help city planners more accurately implement projects that are likely to reduce crash incidents. The Austin Equity Analysis Zones project will give users a quick and reliable way to see how different areas across the city have progressed along different social, economic and demographic dimensions. This will potentially help planning initiatives, by allowing city resources to be guided towards areas which are lagging behind. A variety of **Python** libraries were used to accomplish these analyses, including, but not limited to pandas, geopandas, Plotly, matplotlib and dash.

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Data & Technology Services

City of Austin, TX – Transportation and Public Works Department

Charlie Henry - Data Scientist

coding it forward >

TRANSPORTATION PUBLIC WORKS

ARKADEEP BANDYOPADHYAY

The University of Chicago

Computational Analysis and Public Policy

PROJECTS

VisonZero-Moped Data analysis
Austin Equity Analysis Zones

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VISIONZERO-MOPED DATA ANALYSIS

- Measuring the impact of Austin's mobility projects on crashes.
  - Projects include bike lanes, intersection modifications, sidewalks, etc.
- Data sourced from two datasets hosted publicly by the host office:
  - **VisionZero**: Contains information on crashes, such as location, number of injuries and deaths.
  - **Moped**: Contains information on Austin's mobility projects, such as location, project type, completion date, etc.
- Used spatial join techniques to link crash incidents to mobility projects.

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VISIONZERO-MOPED DATA ANALYSIS

- Pre-Post Analysis
  - For each mobility project, aggregated crash data before and after completion.
  - Annualized statistics such as crash rate, injury rate, fatal crash rate and death rate were created for pre-, and post- project completion.
  - Checked the difference between the pre and post statistics to determine if the mobility projects had any impact on crash incidents.

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VISIONZERO-MOPED DATA ANALYSIS

- Caveats
  - Not a causal study.
  - Difficult to establish a counterfactual.
- Presentation
  - Created a web application using Python's Plotly Dash library.
  - Users have access to a data table, filters and a map to visualize the analysis.

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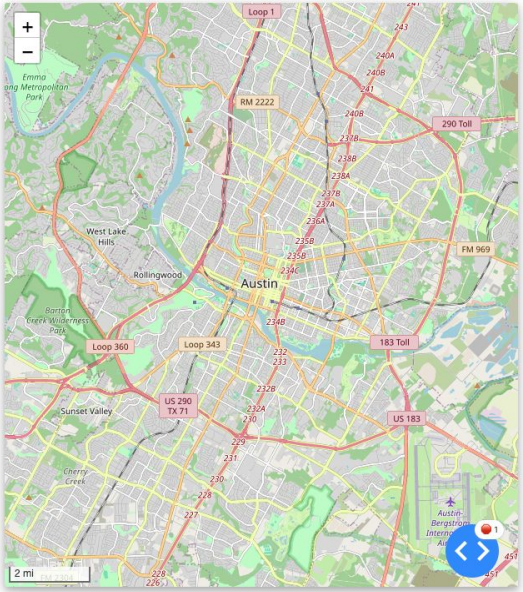
VISIONZERO-MOPED DATA ANALYSIS

VisionZero Moped Pre/Post Analysis

Project ID	Project Lead	Completion year	Component name	Component sub-type	Component work-type	Fatal crash
Select...	Select...	Select...	Select...	Select...	Select...	Select...

Project ID	Project Component ID	Project Lead	Project Name	Subtype	Work Types	Type
12 : East 7th Street & E...	16	COA ATD Arterial Mana...	Signal	Traffic	Modification	Sig
27 : AMD EXPOSITION ...	31	COA ATD Arterial Mana...	Signal	Traffic	Modification	Sig
35 : East 7th Street / W...	39	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
39 : PARMER LN / YAG...	43	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
41 : SOUTHWEST PKW...	45	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
42 : West Howard Lane...	46	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
43 : MC CALLEN PASS ...	47	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
44 : DECKER LN / CITY ...	48	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
45 : CESAR CHAVEZ S...	49	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
46 : AMD GRAND AVE...	50	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
49 : 1ST ST / MONROE ...	53	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
51 : ROBERT DEDMAN ...	55	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
52 : ROBERT DEDMAN ...	56	COA ATD Arterial Mana...	Signal	Traffic	New	Sig
54 : DESSAU RD / BRA...	58	COA ATD Arterial Mana...	Signal	Traffic	New	Sig

Page Size: 100 | 1 to 100 of 2,328 | Page 1 of 24



AUSTIN EQUITY ANALYSIS ZONES

- American Community Survey collects data on several social, economic and demographic variables, such as:
    - Household income, percentage on food stamps, percentage of people of color, percentage with disability, percentage of households without broadband access, etc.
- Create a consolidated vulnerability index by assigning a weight to each of these variables.
- Data consolidated by census tracts.
- Temporal data - 2019, 2020, 2021, 2022

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AUSTIN EQUITY ANALYSIS ZONES

- Analysis
  - How census tracts compare against each other.
  - How census tracts evolved over time.
  - Observe geographical trends.
- Presentation
  - Created a Plotly Dash web application to allow users to see different variables, across different time periods using drop down menus. A map was also included to help identify geographical trends.

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AUSTIN EQUITY ANALYSIS ZONES

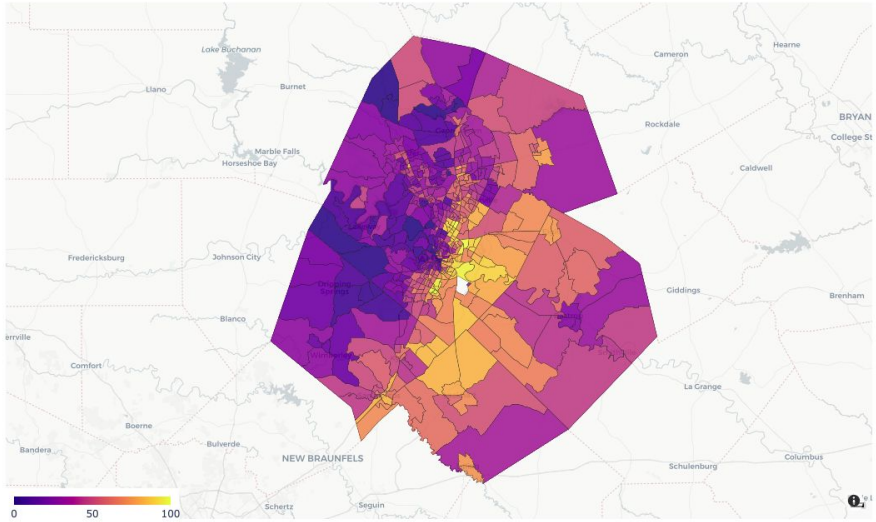
Equity Analysis Zones

Select Variable: Indexed Vulnerability

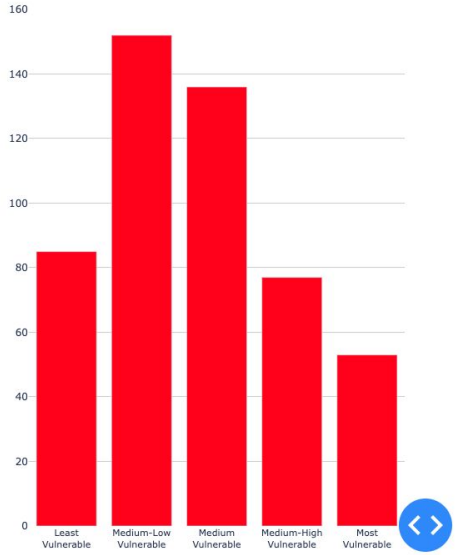
Select Dimension: Absolute

Select Year: 2019

Indexed Vulnerability
Absolute-2019



Census tracts by vulnerability index
2019



CONCLUSION

Acknowledgments