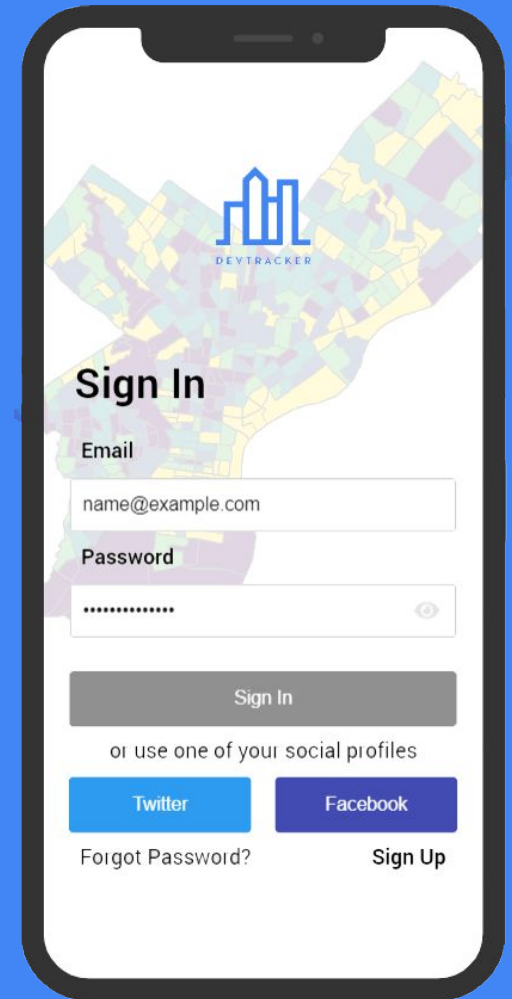


DevTracker: Forecasting Development Changes in Philadelphia

Roshini Ganesh
Samriddhi Khare

MUSA 508



Construction is one of the most polluting industries in Philadelphia.

The Office of Sustainability has been approached by the Department of Licenses and Inspections to make recommendations for incorporating green building standards to the current building code.

[Click to view Image Source](#)

Philly's next crop of city buildings will be greener under bill passed by Philly Council

Many new municipal buildings in Philadelphia will need to meet a higher standard of sustainability, under a bill City Council passed Thursday.



By [Sophia Schmidt](#) · December 9, 2021

Neighborhood Air Quality Data

The Department of Public Health is working to make it easier for residents to find information about air quality in Philadelphia neighborhoods. This page presents information about current neighborhoods of interest.

For more information about air quality throughout Philadelphia, please visit our [Air Quality webpage](#).

Nicetown

In Philadelphia's [Nicetown neighborhood](#), Air Management Services is especially concerned about two of the six common air pollutants: nitrogen dioxide (NO₂) and fine particulate matter (PM_{2.5}).

The Environmental Protection Agency (EPA) has defined the average annual acceptable standards for NO₂ and PM_{2.5} based on the

How Construction Contributes to Water Pollution

The impacts of the construction sector

Construction zones are a known source of [significant amounts of air pollution](#) — in addition to water, noise, and soil pollution — that can affect nearby homes, businesses, and residents.

Construction also generates a large amount of waste. In the U.K. alone, the construction sector uses over [400 million tons of material](#) per year.

Data from the United States shows that construction contributes significantly to pollution, including:

- [23% of air pollution](#)
- [40% of drinking water pollution](#)
- [50% of pollution related to climate change](#)
- 50% of the environmental pollution from landfills

2. Some permit decisions will consider background pollution, but not 'cumulative impacts'

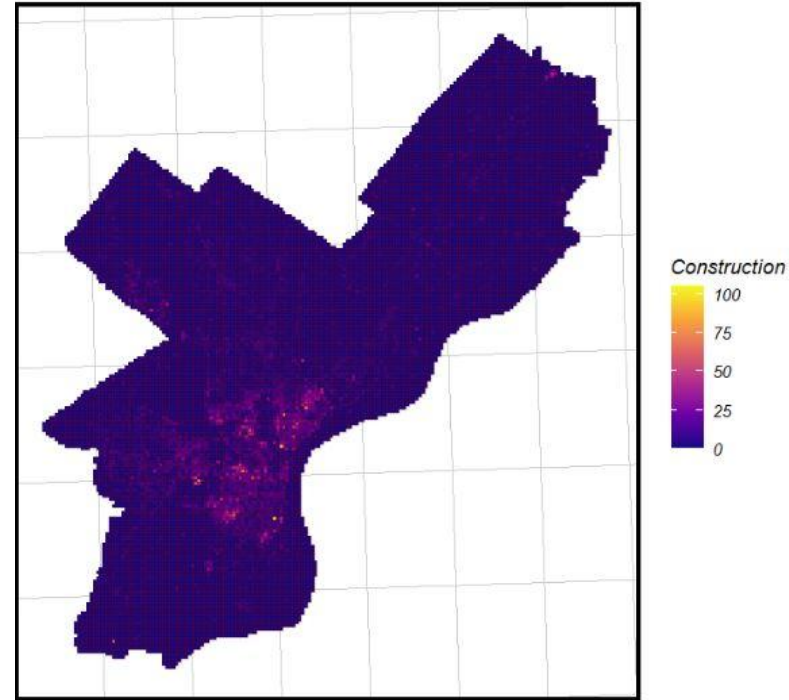
Currently, the city only considers emissions from a single facility when approving or rejecting its permit application.

Development patterns are not uniform across the city.

The Office of Sustainability could benefit from understanding past, current, and future development trends to propose context-based Green Building recommendations for different neighborhoods.

Construction Permits Joined to Fishnet

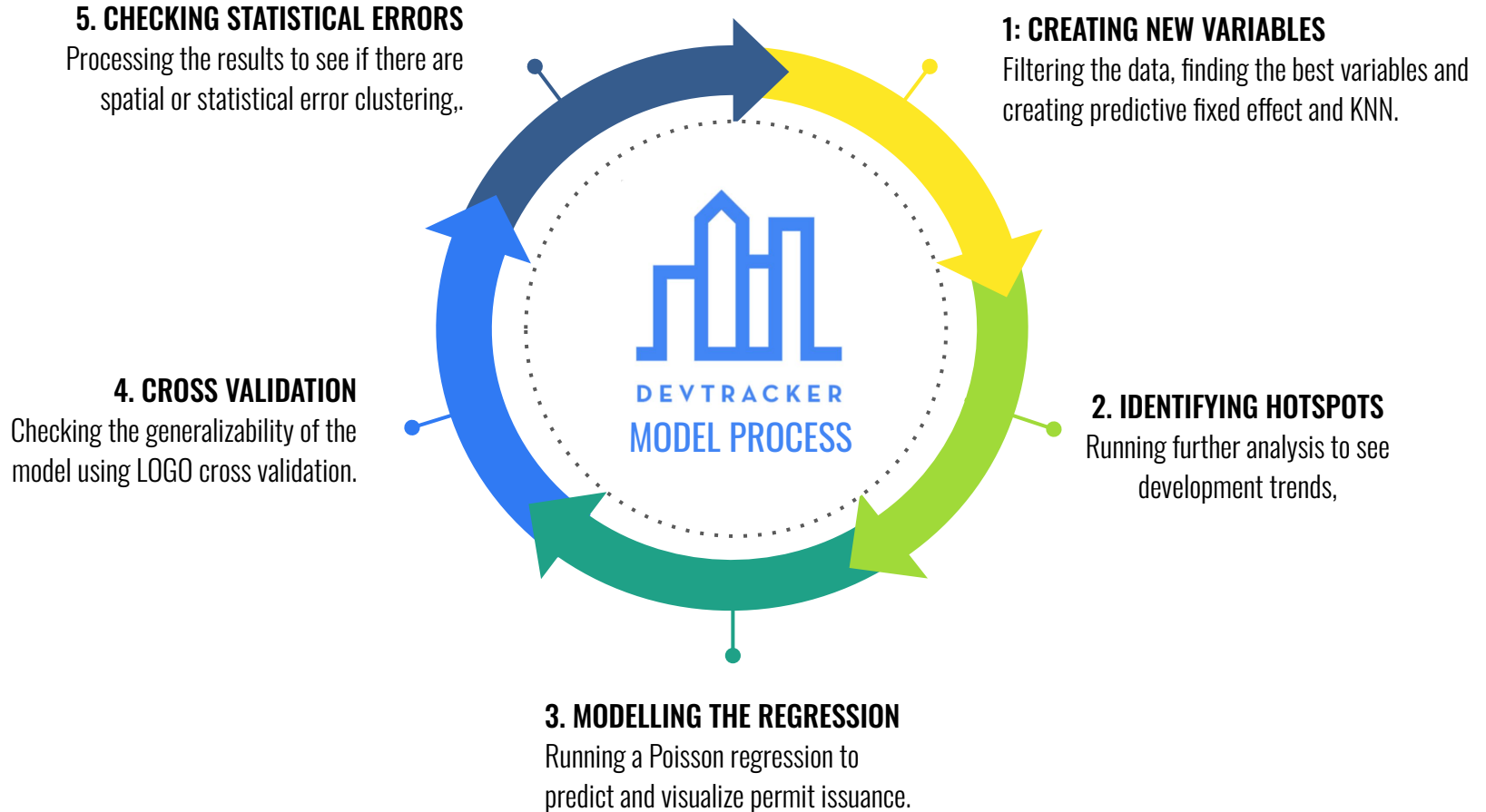
Philadelphia, PA



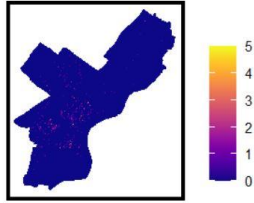


To analyze and forecast development trends:

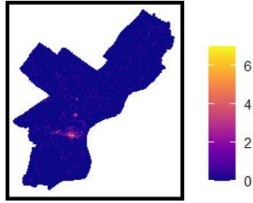
OOS has identified potential spatial, demographic, economic, and environmental parameters.



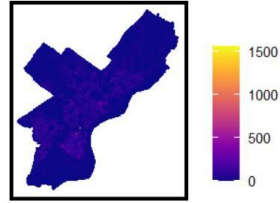
Affordable Housing



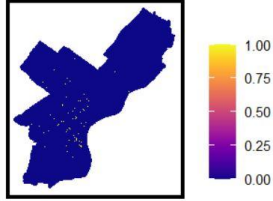
Building Performance



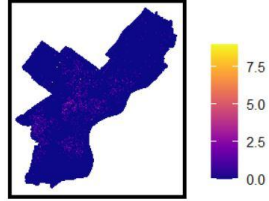
Business Licenses



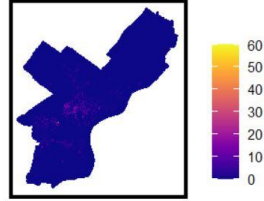
Green Spaces



Vacant Buildings



Vacant Land



Errors by LOGO-CV Regression

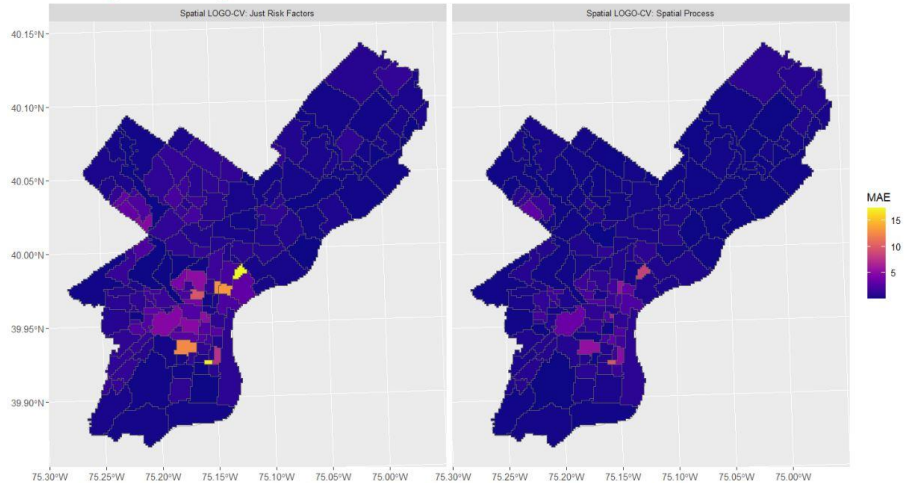
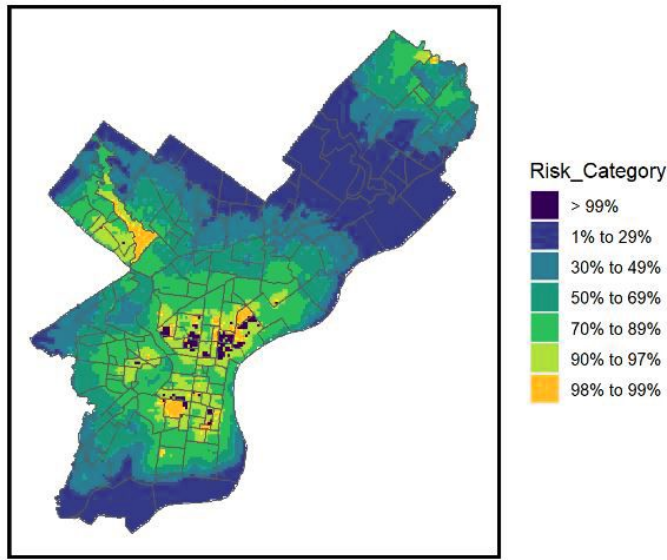


Figure 15

Initial analyses indicate:

- Correlations between predictions and spatial variables as well as home-ownership related demographic variables
- Lower MAE values through LOGO CV Spatial Process

New Construction Permit Predictions

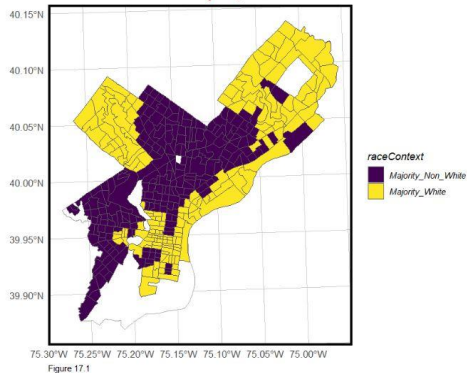


Model results indicate:

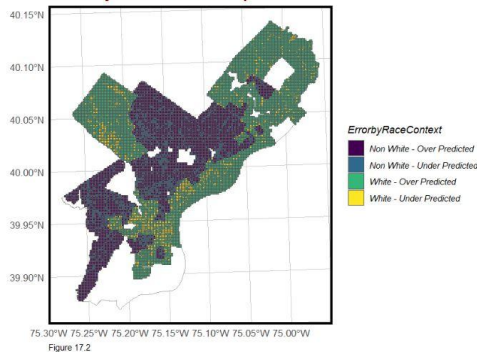
- Predictions for development are concentrated in areas near Northern Liberties Old Kensington, and Rittenhouse
- Model under-predicts in Non-White neighborhoods and over-predicts in White neighborhoods.

Error Variations in White vs Non White Areas

Race Context - Philadelphia, 2021

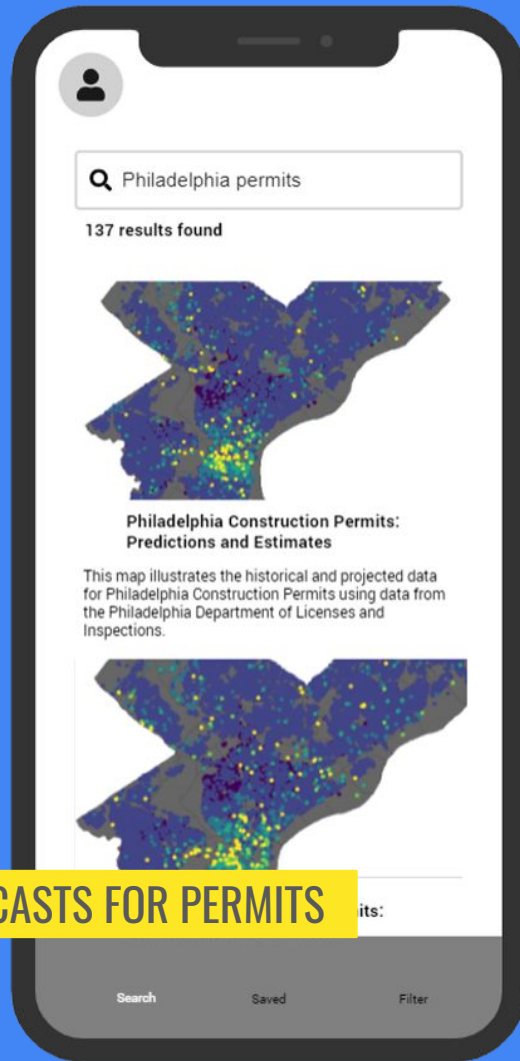


Errors by Race - LOGO CV Spatial



DevTracker: Forecasting Development Changes in Philadelphia

Our application can assist sustainability professionals by analyzing and predicting development trends across the city. DevTracker provides insight into socio-economic patterns and new construction.





Philadelphia Construction Permits: Predictions and Estimates

This map illustrates the historical and projected data for Philadelphia Construction Permits using data from the Philadelphia Department of Licenses and Inspections.

Year ▼ Permit Type ▼ Overlays ▼



VIEW

The projections have been made by our spatial analytics team at DevTracker using regression models. To get advanced results on projected data, press here.



Save



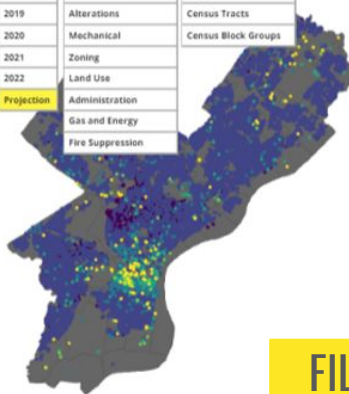
Share



Philadelphia Construction Permits: Predictions and Estimates

This map illustrates the historical and projected data for Philadelphia Construction Permits using data from the Philadelphia Department of Licenses and Inspections.

2017	Plumbing	City Council Districts
2018	Electrical	Neighborhoods
2019	Alterations	Census Tracts
2020	Mechanical	Census Block Groups
2021	Zoning	
2022	Land Use	
Projection	Administration	
	Gas and Energy	
	Fire Suppression	



FILTER

The projections have been made by our spatial analytics team at DevTracker using regression models. To get advanced results on projected data, press here.



Save



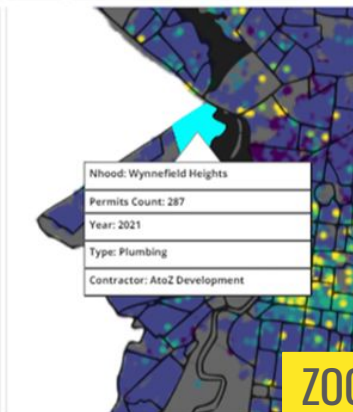
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Philadelphia Construction Permits: Predictions and Estimates

This map illustrates the historical and projected data for Philadelphia Construction Permits using data from the Philadelphia Department of Licenses and Inspections.

2021 ▼ Plumbing ▼ Neighborhoods ▼



ZOOM IN

Nhood: Wynnefield Heights

Permits Count: 287

Year: 2021

Type: Plumbing

Contractor: AtoZ Development

The projections have been made by our spatial analytics team at [COMPANY NAME] using regression models. To get advanced results on projected data, press here.

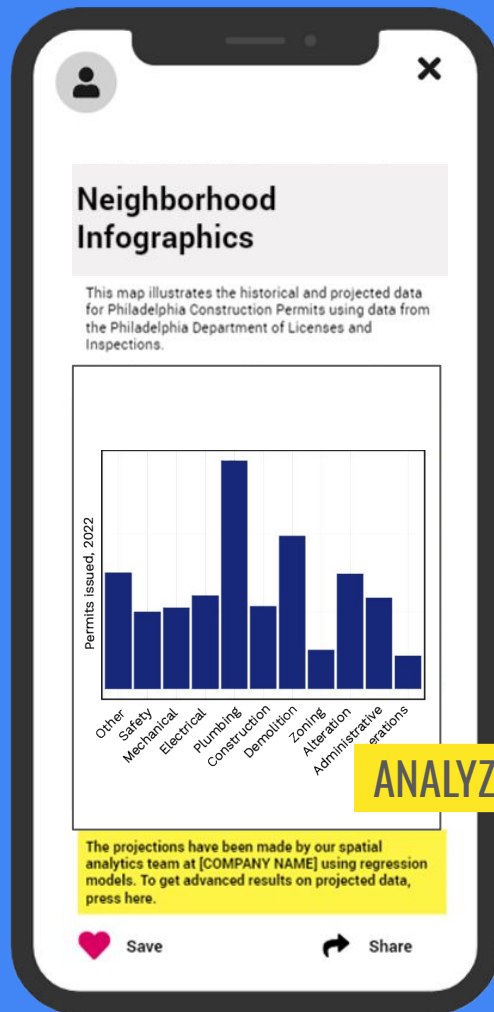
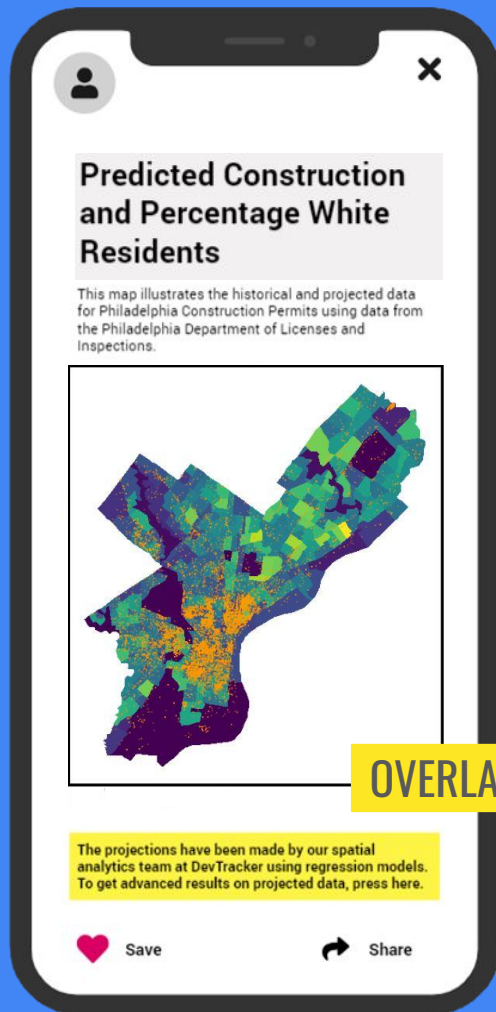


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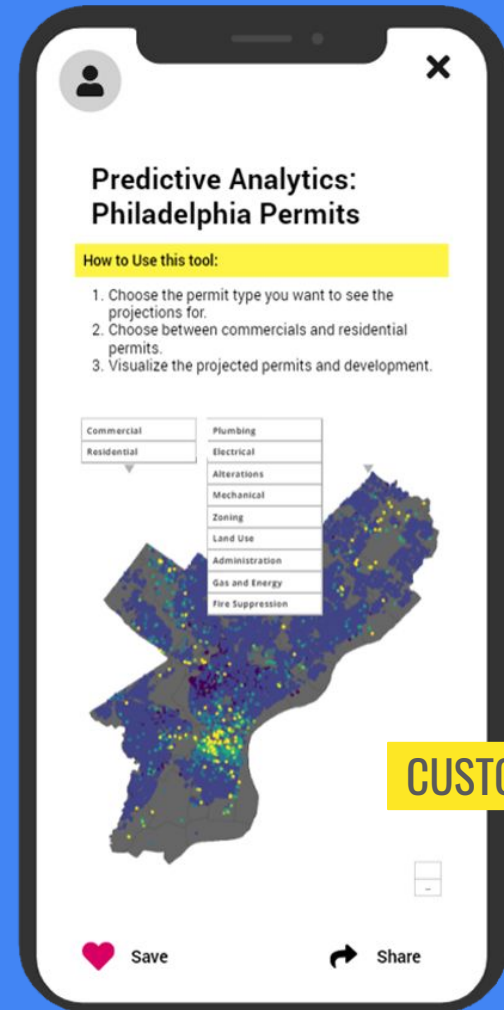
Share

Conduct in-depth
analyses of
neighborhood
patterns.



Make predictions specific to your needs

In this forecasting process, the app allows the decision maker to adjust forecasts based on the kind of permits ~ change the dependent variable 'y'.



Use Case #1 - Examining large scale permits issued in the city

- Construction
- Demolition
- Zoning

To propose neighborhood specific green building recommendations and industry specific strategies





Use Case #2 - Preparing Targeted Training Programs

- Plumbing
- Electrical
- Mechanical
- Alterations

To develop targeted Green Building Training Programs for contractors in Philadelphia that are working on these development projects