



VRNE Product Proposal

October, 2021



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Background

As children, our founders were influenced by the literature of Jules Verne. We hope our company's ethos reflects the creativity, adventure, and vision of his legacy.

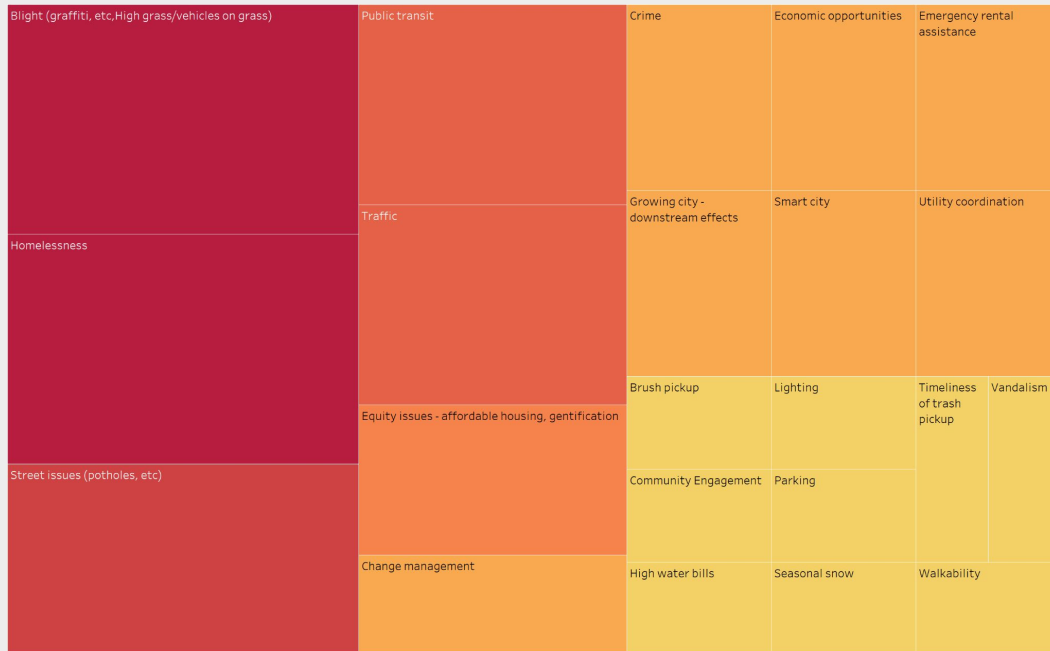
- Our team formed in 2020 with the goal of bringing the power of Data and AI to municipal governments
- Our goal is to enable government to efficiently steward public resources
- We leverage a diverse and complementary set of skills and professional experiences

Values

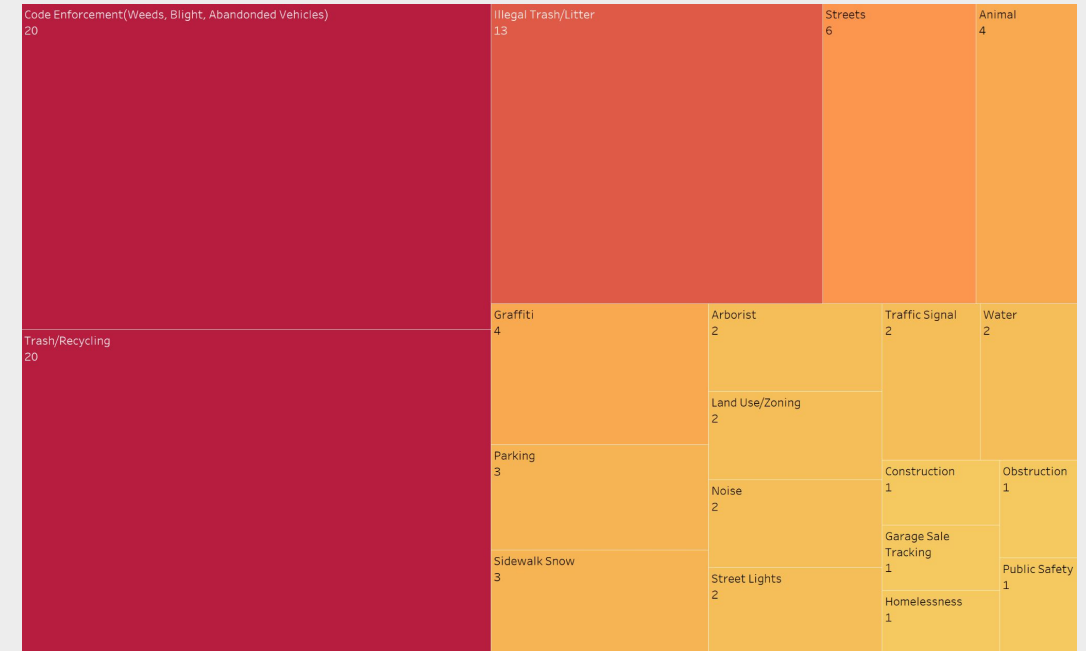
- Innovation should drive efficiency
- The transparent and ethical use of AI is a governing principle
- The community-informed and equitable application of new technology should benefit all

Research

Qualitative Priorities (13 Cities)



Quantitative Complaints (24 Cities)



Data Sourced from 311 through Open Data sites.

Problems

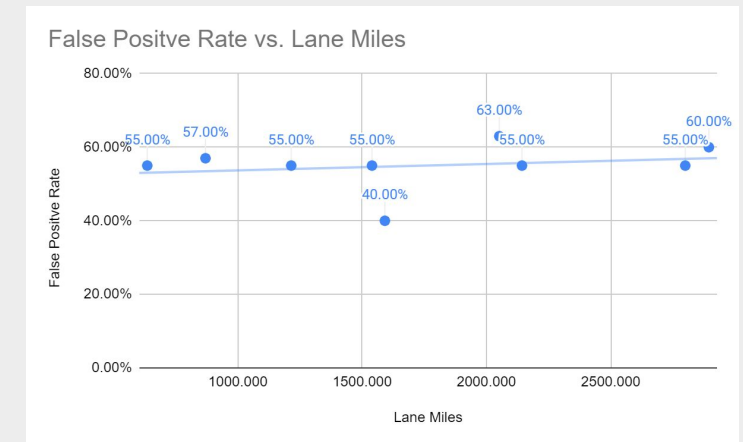
- City Code Enforcement have a false positive complaint rate of at least forty percent.
- City Engineering relies on data - at most once a year - to monitor street condition.
- Homelessness has seen recent growth.

B2G Problem

Municipal Resource Management

- Cities are required to respond and resolve community complaints.
- Unfortunately, most cities have a false positive rate of over 50%.
- This means most of the cases reviewed don't require an on site inspection.
- City ordinance only requires an inspection if there is an issue.

City	Lane Miles	Nuisance Count	Cost per Nuisance	Budget	False Positive Rate
Little Rock	869.920	12,239.00	\$17.51	\$214,324.00	57.00%
Dallas	2800.000	88,000.00	\$10.19	\$897,000.00	55.00%
Kansas City	2143.109	30,000.00	\$51.31	\$1,539,412.38	55.00%
Virginia Beach	1539.758	20,000.00	\$23.16	\$463,151.30	55.00%
Seattle	1214.781	5,000.00	\$87.53	\$437,634.91	55.00%
Boston	635.663	35,000.00	\$13.29	\$465,202.88	55.00%
Austin	2051.768	38,180.00	\$98.36	\$3,755,283.18	63.00%
Tulsa	1591.630	10,000.00	\$55	\$550,000.00	40.00%
OKC	2894.968	8,291.00	\$105	\$867,610.00	60.00%



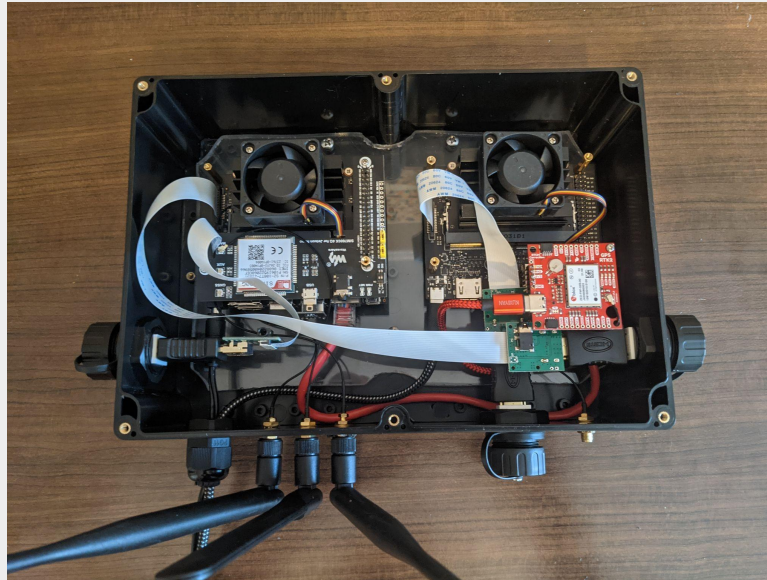
**Bolded text are estimates based on known false positive rates.



Solution

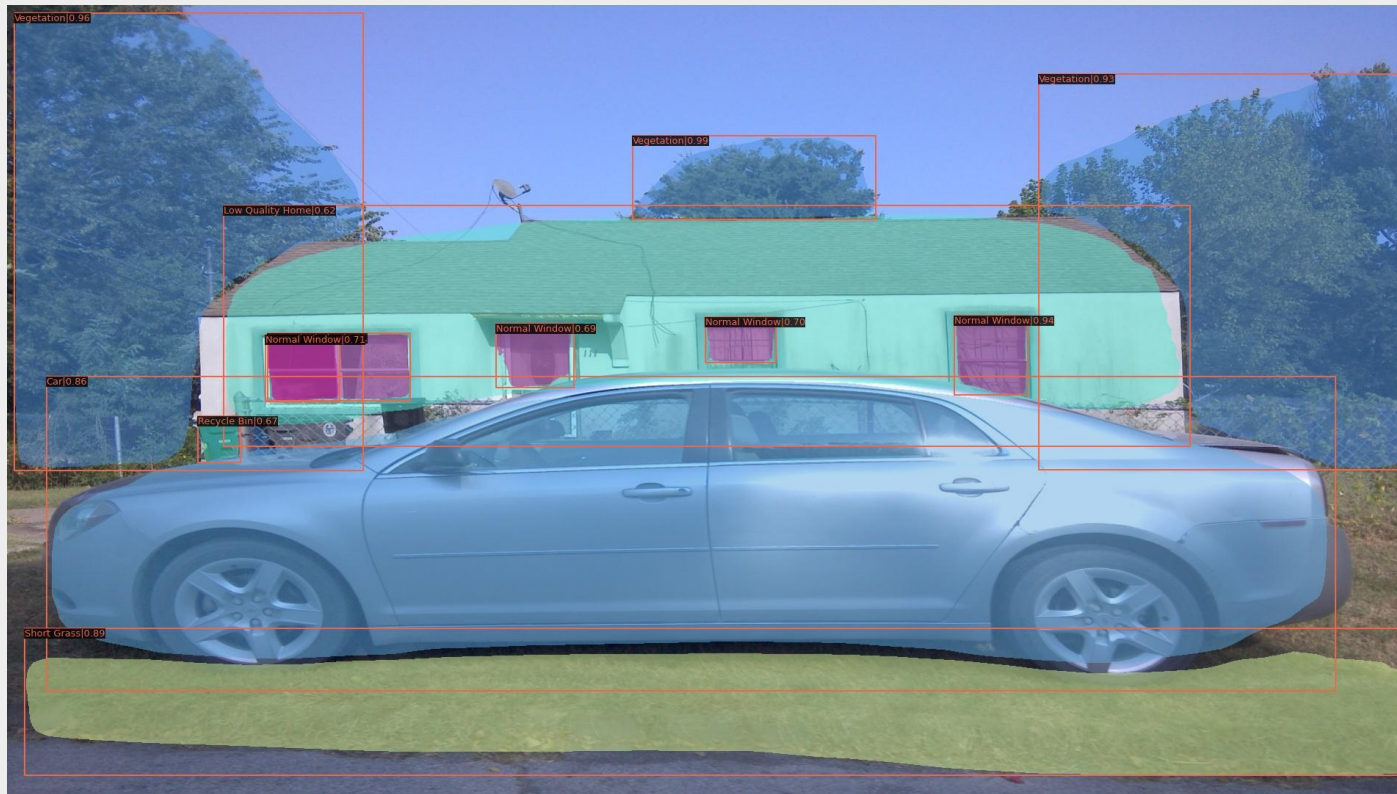
- VRNE combines open source mobile camera technology with proprietary algorithms to gather publicly available data.
- We then use machine learning and geospatial databases to compile and translate the data.
- Finally, we provide accurate, intuitive, secure, and reliable applications to streamline your processes.

Hardware



An example of a camera solution VRNE uses to collect publicly available data. Combining open source hardware such as HD cameras and precise GPS, and 3D printed parts allows VRNE to keep product quality high and costs low.

Algorithm Results



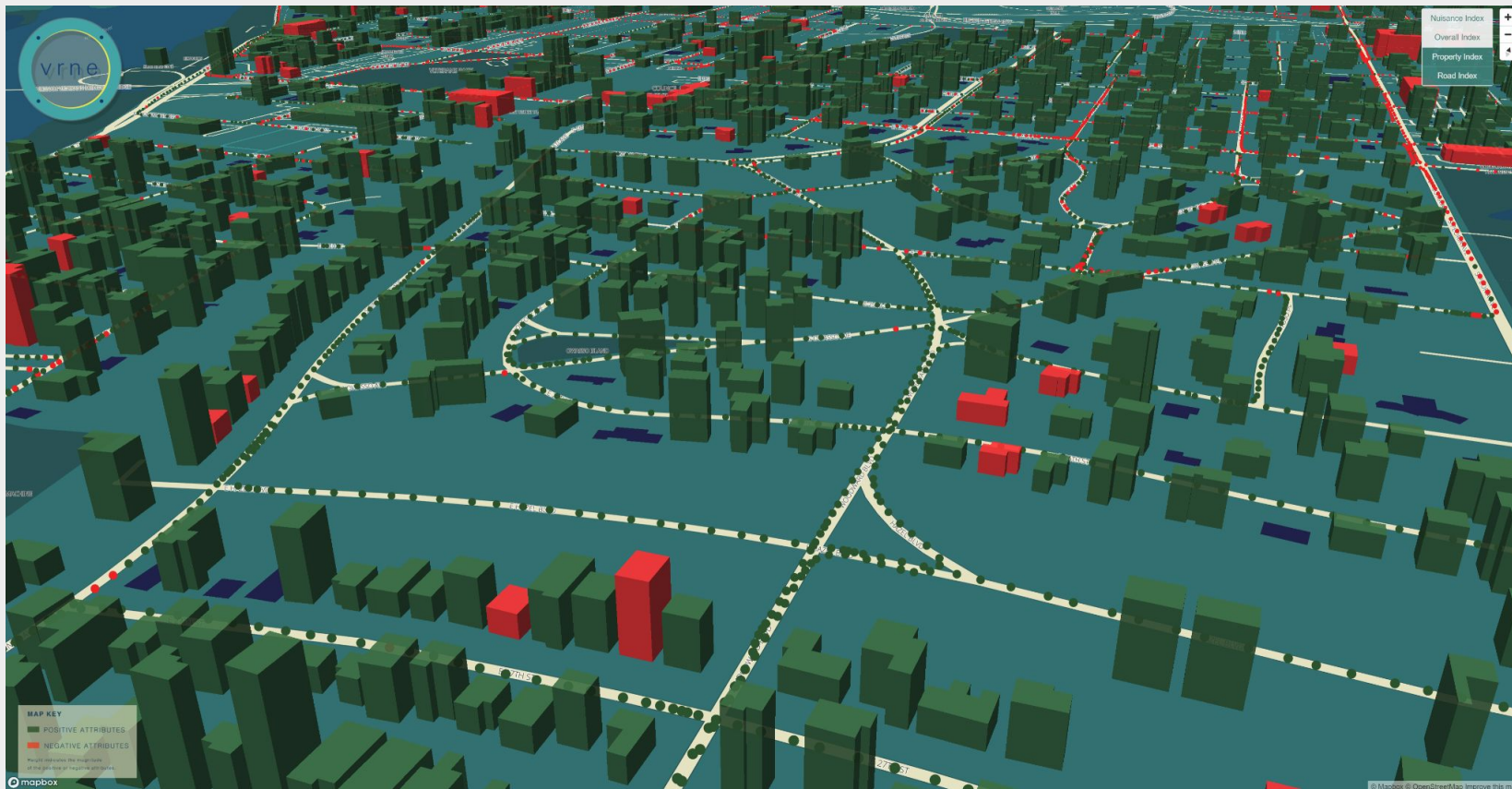
Using the proprietary techniques and models in a test case, VRNE algorithms were used to detect 32 indicators of neighborhood and home condition. In this photo it is detecting a low condition home and other construction indicators of a distressed home.

Algorithm Results (continued)



In this photo our model identifies pavement quality issues.

Algorithm Results: Public Map



The individual results can be compiled and accessed through an interactive map which enables the identification and assessment of neighborhood, district and city level trends



Dashboard / Application

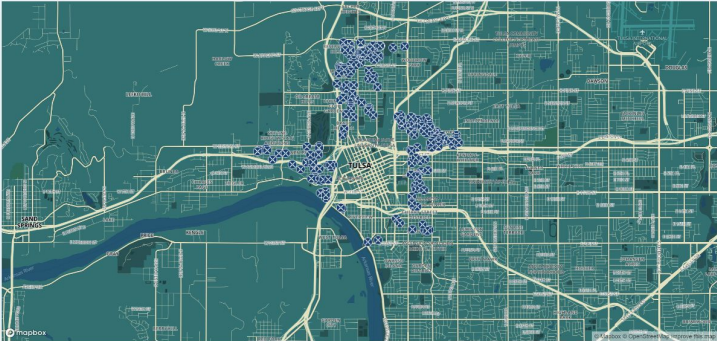
VRNE

Navigation

Dashboard


Review Tasks

Logout



Map of Tulsa showing nuisance locations marked with blue dots.

Nuisance Count by Census Tract



Census Tract	Nuisance Count
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
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88	0
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91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0

VRNE

Navigation

Dashboard

Review Tasks

Logout

My Tasks

Status:

Review:

Valid:

- Type Nuisance
Owner GRAHAM, THEMA L
Address 618 E KYLER ST N; 618; KYLER; TULSA
- Type Nuisance
Owner MAKAR, MARCUS
Address 1918 S BOSTON AV E; 1918; BOSTON; TULSA
- Type Nuisance
Owner HAWKINS, WILLIAM & SHAYLA
Address 520 E YOUNG PL N; 520; YOUNG; TULSA

Tasks
209

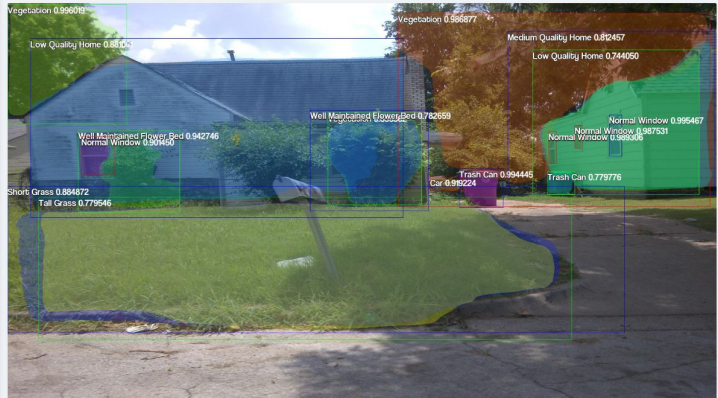
VRNE

Navigation

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Vegetation 0.99008
Low Quality Home 0.83103
Medium Quality Home 0.82457
Low Quality Home 0.744050
Well Maintained Flower Bed 0.942746
Normal Window 0.987631
Normal Window 0.988006
Short Grass 0.894672
Tall Grass 0.779546
Trash Can 0.994446
Trash Can 0.779776
Car 0.95224

My Tasks

Status:

Review:

Valid:

- Type Nuisance
Owner GRAHAM, THEMA L
Address 618 E KYLER ST N; 618; KYLER; TULSA
- Type Nuisance
Owner MAKAR, MARCUS
Address 1918 S BOSTON AV E; 1918; BOSTON; TULSA
- Type Nuisance
Owner HAWKINS, WILLIAM & SHAYLA
Address 520 E YOUNG PL N; 520; YOUNG; TULSA
- Type Nuisance
Owner ANDRONT, INVESTMENTS LLC
Address 535 E WOODROW PL N; 535; WOODROW; TULSA
- Type Nuisance
Owner ALLEN, ELMER AND CLEO AND
Address 549 E ZION ST N; 549; ZION; TULSA
- Type Nuisance
Owner CAIN, LORI DAWN AND
Address 1929 S CHEYENNE AV W; 1929; CHEYENNE; TULSA
- Type Nuisance
Owner MT PROPERTY LLC
Address 819 N OKMAGO AV E; 819; OKMAGO; TULSA
- Type Nuisance
Owner RAEFIELD, INC
Address 827 N NORFOLK AV E; 827; NORFOLK; TULSA
- Type Nuisance
Owner SOKOL TRUST
Address 215 W HASKELL ST N; 215; HASKELL; TULSA
- Type Nuisance

Our app allows a team to quickly review their tasks.



Solution: B2G

Municipal Resource Management

- Through our app, city employees can remotely review complaints.
- False positives can be identified digitally, savings significant time and resources.
- Instead of taking days to respond, a city can keep up with issues near real time, improving their customer service.
- In addition to the savings, our product covers 100% of a city's lane miles, ultimately improving the reach of a city.

City	Lane Miles	Nuisance Count	Cost per Nuisance	Budget	False Positive Rate	Road Analysis Cost	Potential Savings	Potential Savings w/ Road Analysis
Little Rock	869.920	12,239.00	\$17.51	\$214,324.00	57.00%	\$130,487.96	\$121,197.52	\$251,685.47
Dallas	2800.000	88,000.00	\$10.19	\$897,000.00	55.00%	\$420,000.00	\$493,350.00	\$913,350.00
Kansas City	2143.109	30,000.00	\$51.31	\$1,539,412.38	55.00%	\$321,466.35	\$815,888.56	\$1,137,354.91
Virginia Beach	1539.758	20,000.00	\$23.16	\$463,151.30	55.00%	\$230,963.70	\$208,418.09	\$439,381.79
Seattle	1214.781	5,000.00	\$87.53	\$437,634.91	55.00%	\$182,217.15	\$240,699.20	\$422,916.35
Boston	635.663	35,000.00	\$13.29	\$465,202.88	55.00%	\$95,349.41	\$246,557.53	\$341,906.93
Austin	2051.768	38,180.00	\$98.36	\$3,755,283.18	63.00%	\$307,765.20	\$2,350,543.67	\$2,658,308.87
Tulsa	1591.630	10,000.00	\$55	\$550,000.00	40.00%	\$238,744.50	\$220,000	\$458,744.50
OKC	2894.968	8,291.00	\$105	\$867,610.00	60.00%	\$434,245.20	\$520,566	\$954,811.20



Why now?

- Affordable Embedded Hardware
- Affordable Cloud Services
- Emerging Vision Research
- The emerging “Smart City”
- Ubiquitous Street View



Market Size

- 691 US cities with a population over 50k.
- Estimated 50M/year market



Competition

Competition

- Traditional 311 Software
- RoadAI
- hayden.ai

Advantages

- No AI companies focused on Code Enforcement
- Code enforcement justifies capturing data weekly/bi-weekly, much more frequent than competition.
- Our product encourage proactive maintenance.
- Multiple city needs are addressed by our product.



Business Model

Revenue Model

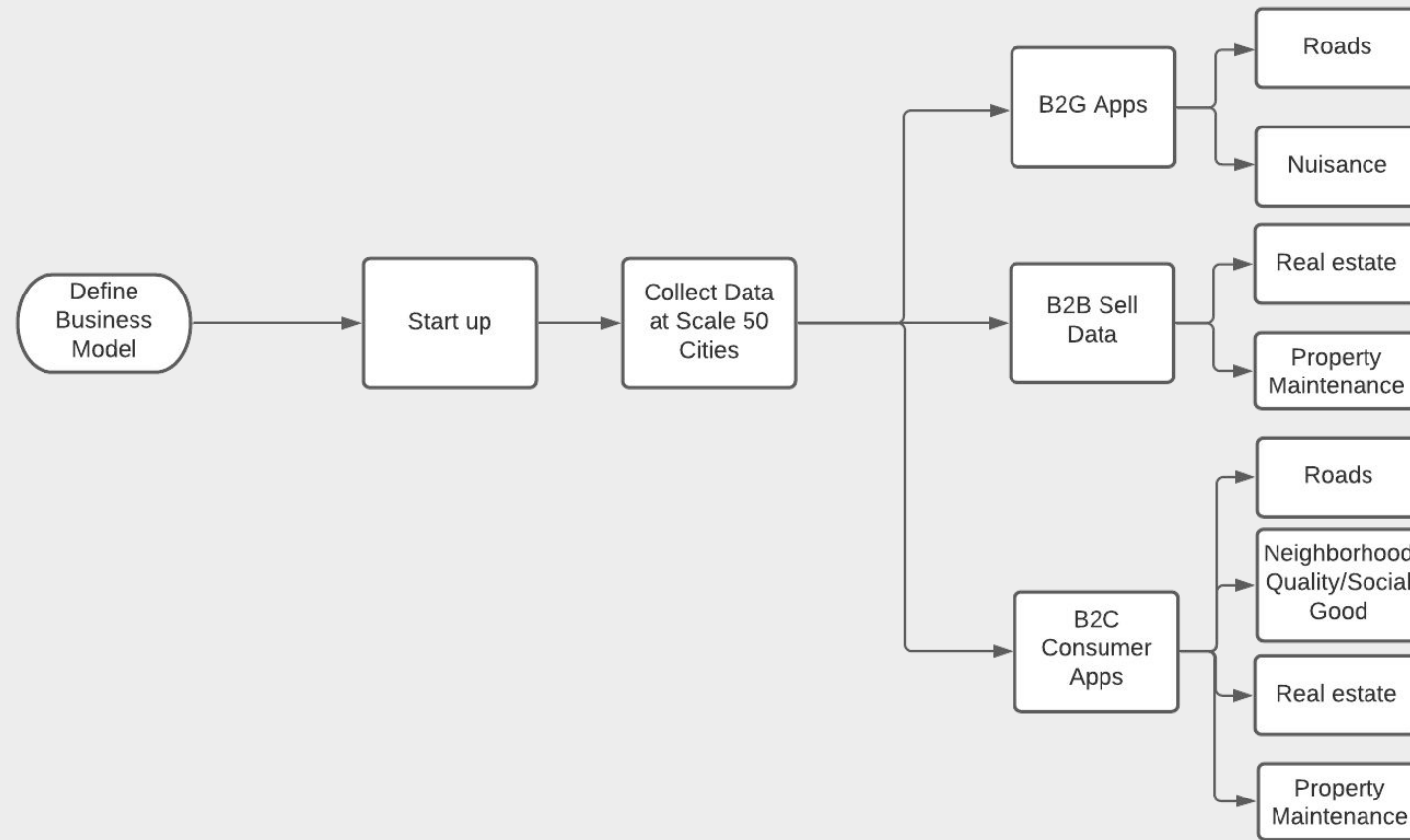
Subscription

Pricing

Depends on land area, frequency required, and number of drivers.

\$50k-\$300k/year

Product Roadmap



Team



Ben Harris

- *AI, Data, & Tech*
- Five years ML and AI experience
- Founder, Tulsa Data Science
- BS, Uni. of Oklahoma



Alexander Mansour

- *Science & Operations*
- Public Health Evaluation, Oregon Health and Science University
- MPH, Portland State University
- BS, Uni of Central Oklahoma



Josiah Shaw

- *Engineering*
- Ovintiv Inc., Devon Energy, OG&E
- PE, State of Oklahoma
- BS, Uni. of Oklahoma



Wesley Stringer

- *Visual Communications*
- Branding, Digital Asset Management, Photography Production
- Amazon, Calvin Klein
- BFA, Uni. of Oklahoma



Scott Nason

- *Business & Finance*
- Investment Banking, Tudor, Pickering, Holt & Co
- MA, Uni. of Chicago
- BA, Uni. of Oklahoma



Questions?