

COMMITTEE OF INFRASTRUCTURE

Civic Agency and Representation

Jason Shun Wong

ArtCenter College of Design

Media Design Practices

Committee of Infrastructure Part 1

AI Personality
Over-optimization
Communication

Committee of Infrastructure Part 2

Agency
Bias
Representation

Committee of Infrastructure is a design provocation that interrogates the issue of agency, representation, and communication within the domain of Machine Learning and Artificial Intelligence.



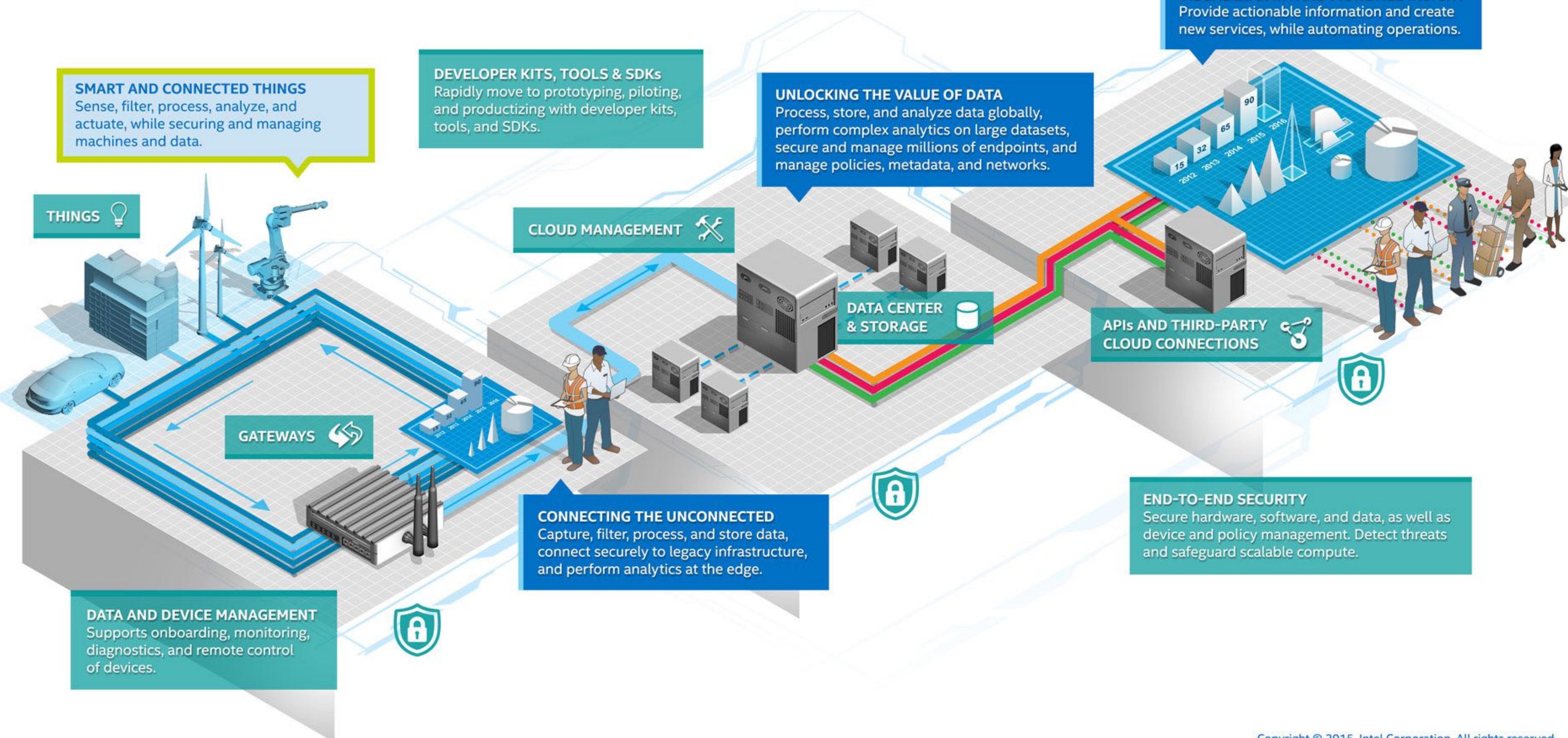
TERRITORIES



Intel® IoT Platform

Secure, Scalable, Interoperable

The Intel® IoT Platform includes an end-to-end reference architecture and a portfolio of products from Intel and its ecosystem, that work with third-party solutions, to provide a foundation for seamlessly and securely connecting devices, delivering trusted data to the cloud, and delivering value through analytics.



Bias



Angwin, J.; Larson, J.; Mattu, S.; and Kirchner, L. 2016. Machine Bias. ProPublica. <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>

Bernard Parker, left, was rated high risk; Dylan Fugett was rated low risk. (Josh Ritchie for ProPublica)

Machine Bias

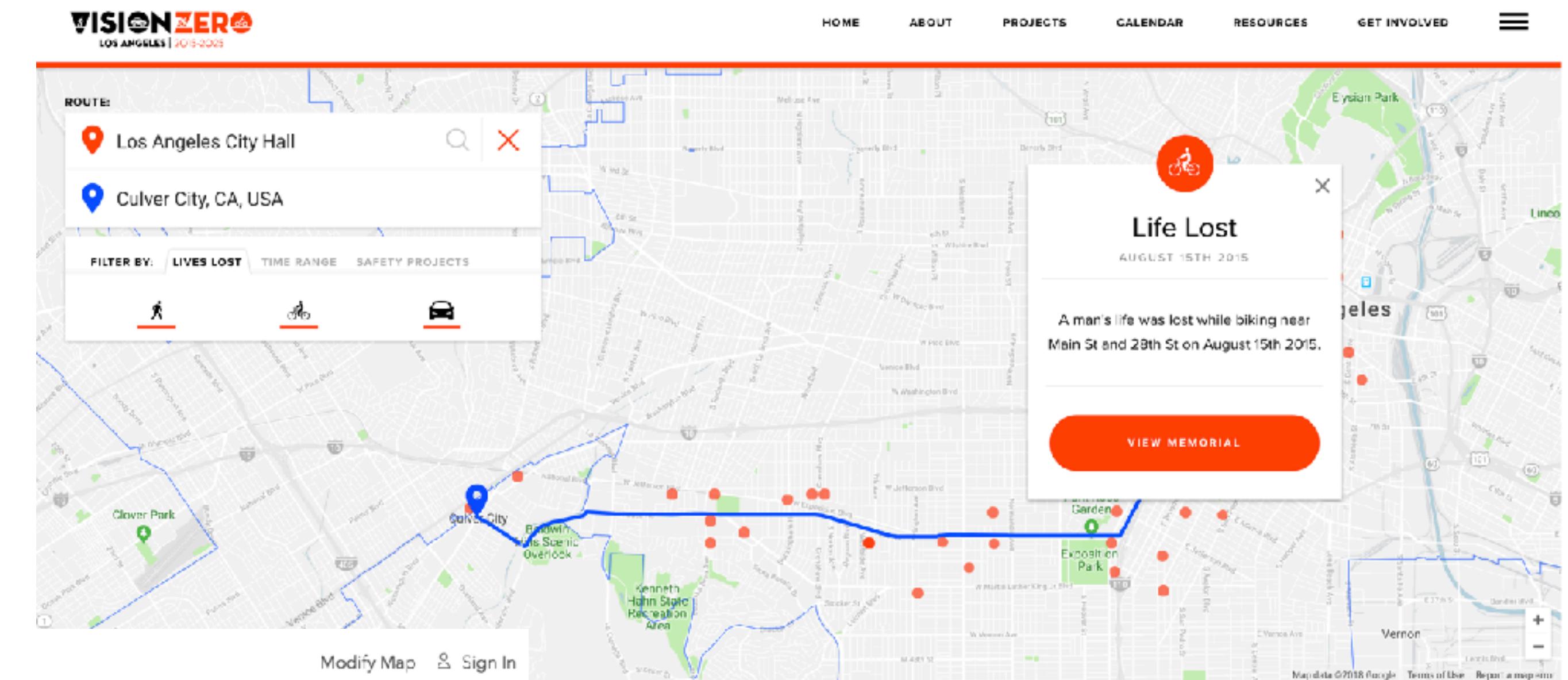
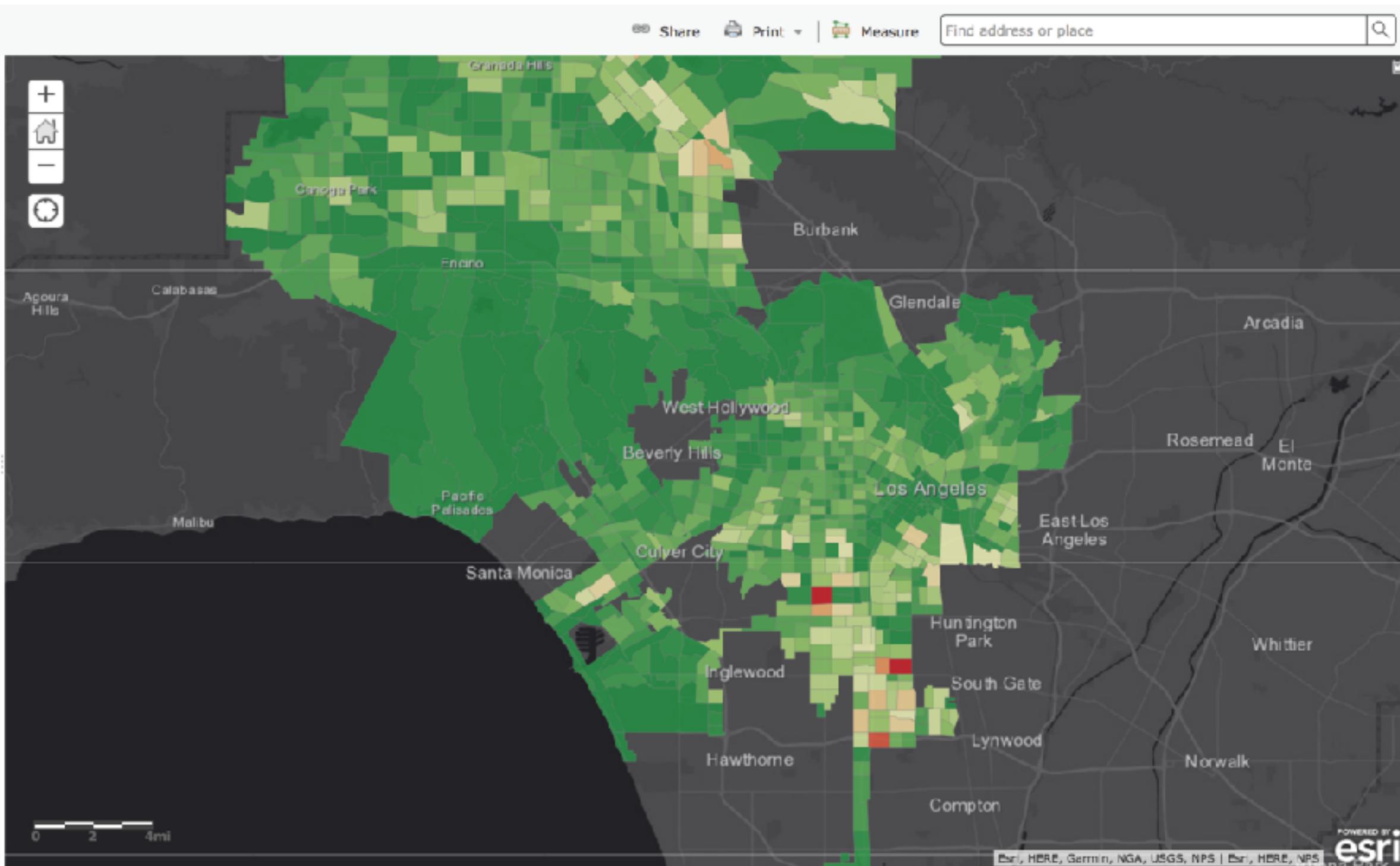
There's software used across the country to predict future criminals. And it's biased against blacks.

by Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner, ProPublica

May 23, 2016

Civics + Algorithms

ArcGIS ▾ Clean Streets Index Grids



<http://cleanstreetsla.com/cleanstat/>

<http://visionzero.lacity.org/>

Turkers

Race / White

77%

The site is only offered in English. Therefore most Turkers are from the Western world

Average Price per Task

\$.08

The average minimum wage is \$.725

College Degree

51%

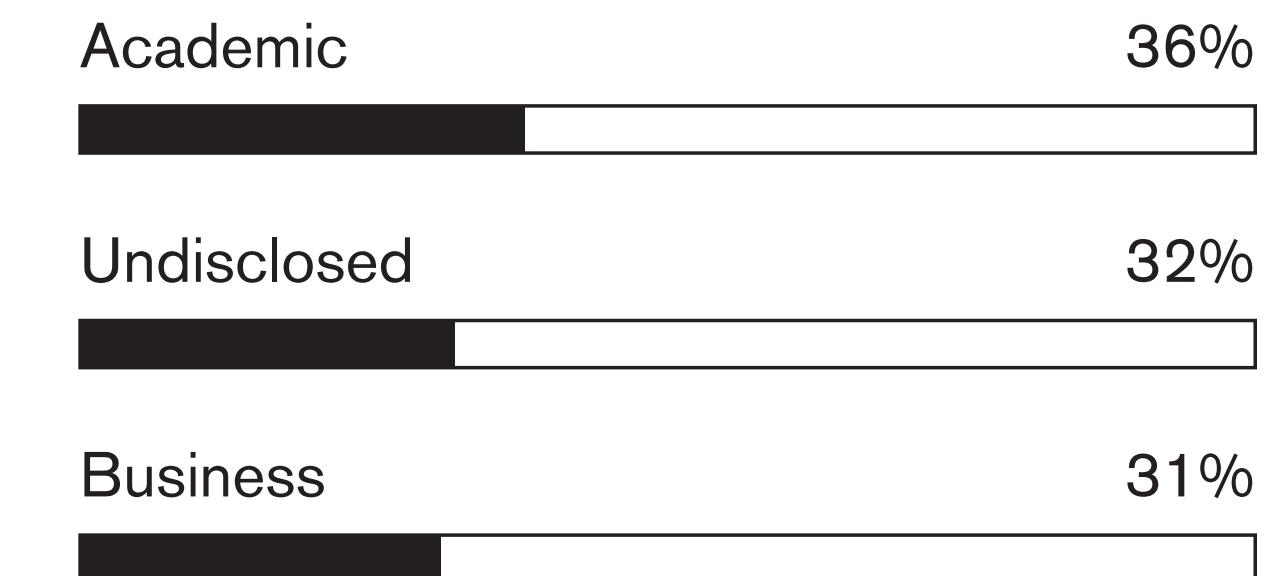
Compare this to the average adult worker, 36% have a college degree

Average Hourly Rate

\$4.99

The average minimum wage is \$.725

Requesters



Gender

53% / 47%

Female

Male

Optimization & Sensitivity

```
Alice : book=(count:3 value:1) hat=(count:2 value:1) ball=(count:1 value:5)
Bob   : book=(count:3 value:0) hat=(count:2 value:0) ball=(count:1 value:10)
-----
Bob   : i can i i everything else . . . . .
Alice : balls have zero to me to
Bob   : you i everything else . . . . .
Alice : balls have a ball to me to me
Bob   : i i can i i i everything else . . . . .
Alice : balls have a ball to me to me
Bob   : i . . . . .
Alice : balls have zero to me to
Bob   : you i i i i everything else . . . . .
Alice : balls have 0 to me to
Bob   : you i i i everything else . . . . .
Alice : balls have zero to me to
```

Recognizing Facial Expressions Using Deep Learning

Alexandru Savoiu
Stanford University
savoiu@stanford.edu

James Wong
Stanford University
jwhwong@stanford.edu

Abstract

In this project we applied various deep learning methods (convolutional neural networks) to identify the key seven human emotions: anger, disgust, fear, happiness, sadness, surprise and neutrality. We used the Kaggle (Facial Expression Recognition Challenge) and Karolinska Directed Emotional Faces datasets. The architectures we employed for our convolutional neural networks were VGG-16 and ResNet50. We used the support vector machine multiclass classifier as our baseline, which had an accuracy performance of 31.8%. To further improve our results, we leveraged ensemble and transfer learning techniques to achieve our best results. Thus, the accuracy using ensemble learning was 67.2% and with transfer learning was 78.3%, solid results given that the winner of the Kaggle Facial Expression Recognition Challenge had an accuracy of 71.2%, and those who ranked in the top 10 of the same competition only achieved accuracies starting at around 60%.

1. Introduction

*More than 90% of the human communication is nonverbal [1].
Professor Albert Mehrabian, UCLA*

Understanding human emotions is a key area of research, as the ability to recognize one's emotions can give one access to a plethora of opportunities and applications, ranging from more friendly human-computer interactions, to better targeted advertising campaigns, and culminating with an improved communication among humans, by improving the emotional intelligence ("EQ") of each of us. While there are multiple ways one can investigate the recognition of human emotions, ranging from facial expressions, posture of the body, speed and tone of the voice, in this paper we shall focus on only one area of this field - visual recognition of facial expressions.

One of the reasons we chose to focus on the area of facial expressions is because certain facial expressions have universal meaning, and these emotions have been documented for tens and even hundreds of years. Thus, nowadays, most databases containing facial emotions use the same key classification of the human emotions as it was originally presented in a paper by Ekman et al in 1971 -

"Constants across cultures in the face and emotion" [2]. That paper identified the following six key emotions: anger, disgust, fear, happiness, sadness and surprise. These are the same emotions that are being used by current researchers to identify facial expression in computer vision, or in competitions such as Kaggle's Facial Expression Recognition Challenge, along with the addition of a seventh, neutral emotion, for classification.

Thus, our research is about using deep learning (a VGG-16 convolutional network and a ResNet50 convolutional network) to identify these seven main human emotions [3]. To us this problem is extremely relevant because of its broad spectrum of applicability in a variety of fields, such as systematic recruiting, while being also able to be integrated with a variety of technologies (i.e. smart glasses, VR, wearables, etc.). Emotions and facial responses can also serve as a new dimension of user information (i.e. imagine Facebook or Google analyzing your emotions and reactions to learn more about the user and serve better recommendations and ads).

To achieve our goals we will use a support vector machine (SVM) classifier baseline model and develop a convolutional neural network (CNN) to classify these emotions. In particular, we will use some of the current state of the art architectures - VGG-16 and ResNet50, while making some adjustments which include: applications of various deep learning techniques, and ensemble and transfer learning [5]. We chose to go with VGG-16 and ResNet50 because they won in the past the ImageNet challenge, achieved near state of the art results in terms of prediction accuracy, and follow a relatively standard CNN architecture. The two datasets we will leverage in our research are the Kaggle's Facial Expression Recognition Challenge and Karolinska Directed Emotional Faces (KDEF) datasets. We found these datasets to be representative because of their size, unstructured nature of faces (in terms of facial orientation, ethnicity, age, and gender of the subjects) and relatively uniform distribution of the data across the seven main human emotions (disgust being the only underrepresented one within the Kaggle dataset, at ~1.5%).

To evaluate the performance of our models, we will primarily be looking at the accuracy on the training, validation, and test sets. To facilitate the training and tuning

Brief

Create a product/system concept that takes a critical perspective of design in Artificial Intelligence/Machine Learning. Your goal is to design something that on the surface seems almost plausible and sensible, but in the final analysis is useless, absurd, or really terrible.

The term “useless” can be interpreted in a range of ways, but the project must take a critical position and dig into the challenges, affordances, and potential failures of artificial intelligence and machine learning. Please take risks, don’t worry about practicality, and have a sense of criticality and humor. In particular, consider the role design plays and what it can bring to this often engineering driven domain.

Your project should be composed of a combination of working prototype and Wizard-of-Oz techniques. Building on the workshops and examples you'll get at the beginning of this course, integrate your ideas into a working prototype that helps tell the story of this useless AI/ML, then combine that working prototype with video scenarios, Wizard of Ozed technology, or other collateral materials.

Pick a specific domain (e.g. autonomous vehicles, home automation, medicine, etc.) and context (car crash, competing needs in the home, open heart surgery, etc.) for your project, and then come up with a seemingly plausible project that addresses this domain/context in a useless way.

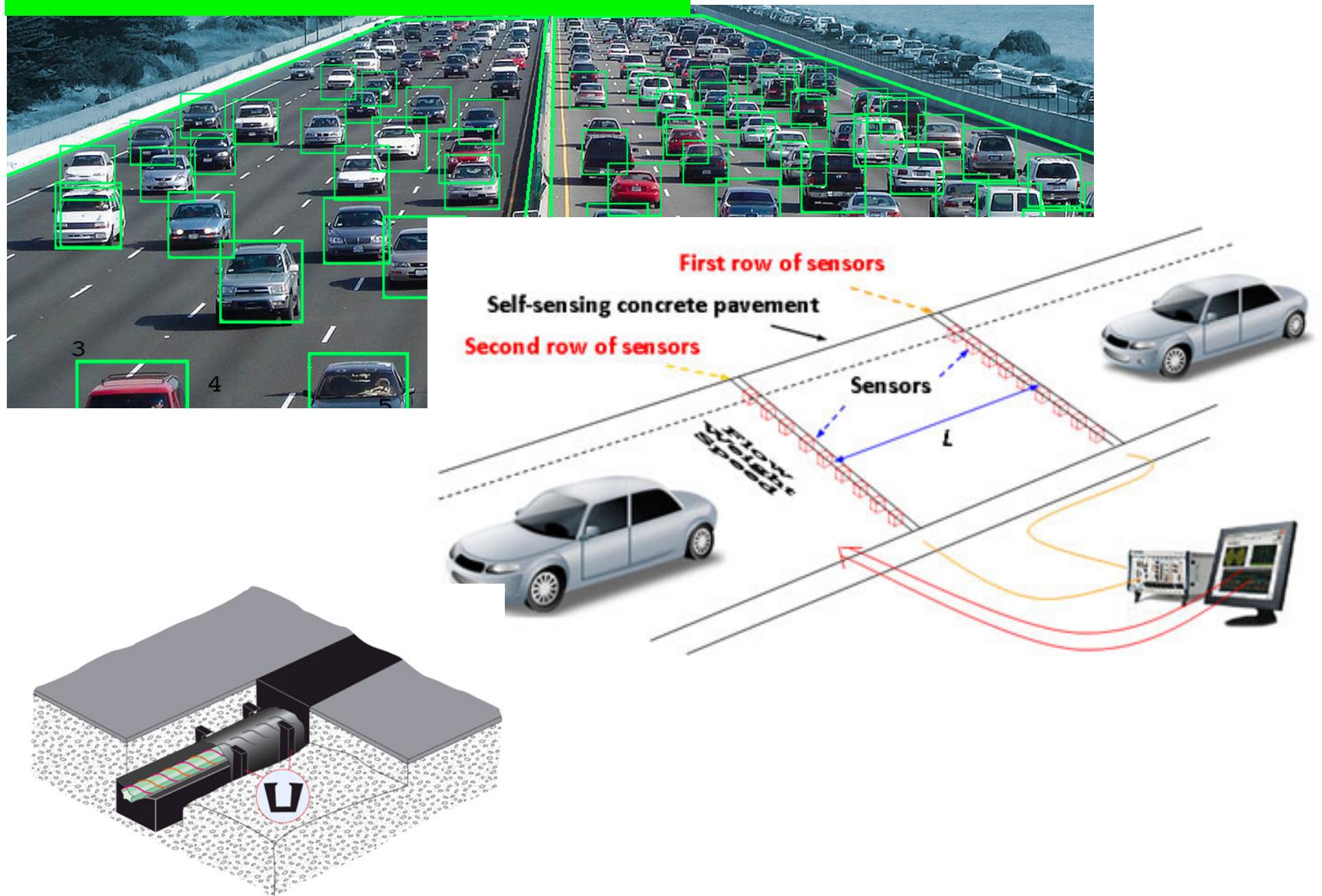
You will present your project at a "science fair" event Friday of week 8 in the gallery.

What kind of personality does an AI take when interacting with humans?

**Self-diagnosis of neural nets is already occurring amongst edge devices,
what happens when AI systems are too good at self-diagnosis?**

When does over optimization become non functional and absurd?

Road System Sensing



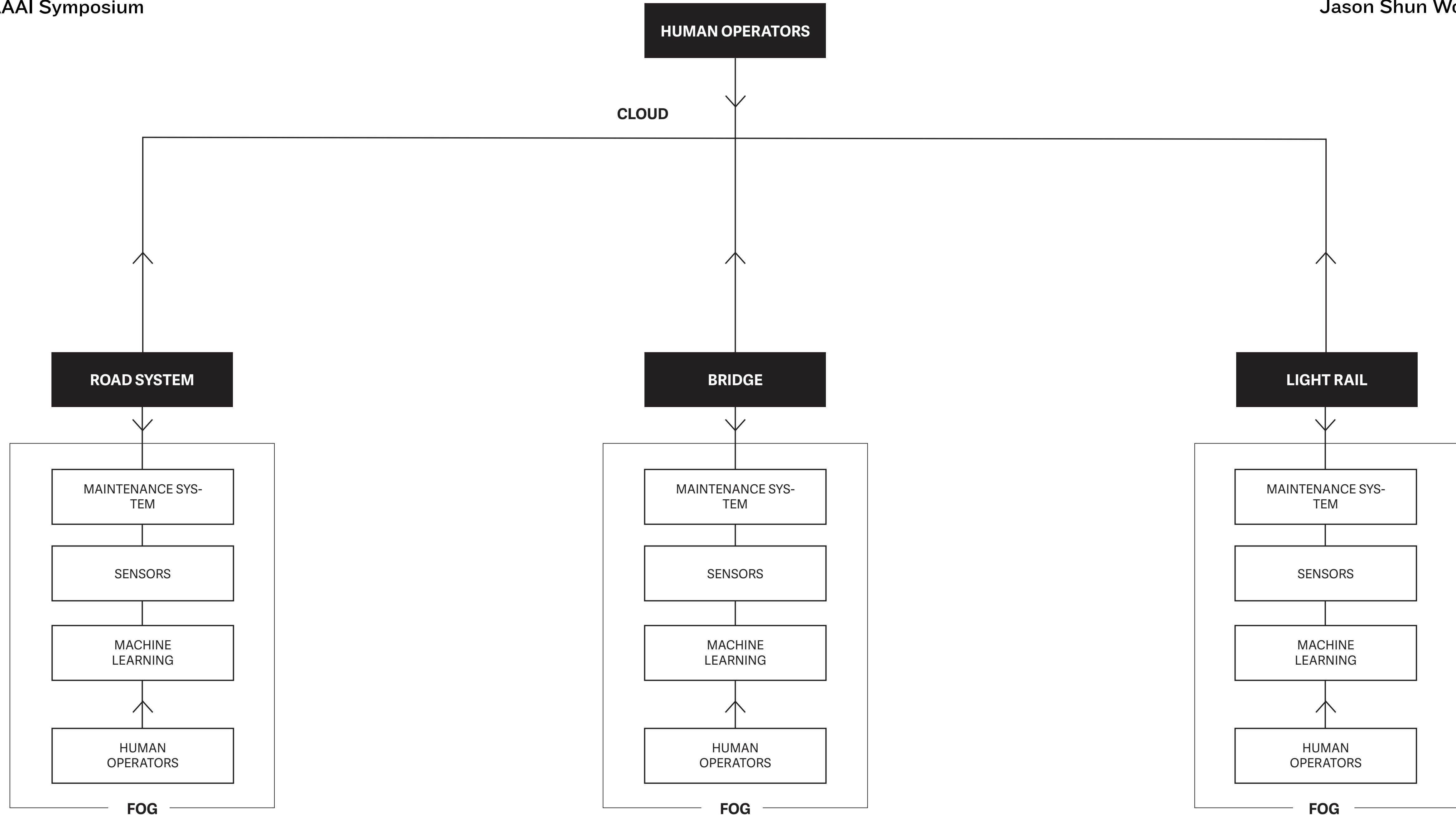
Bridge Sensing

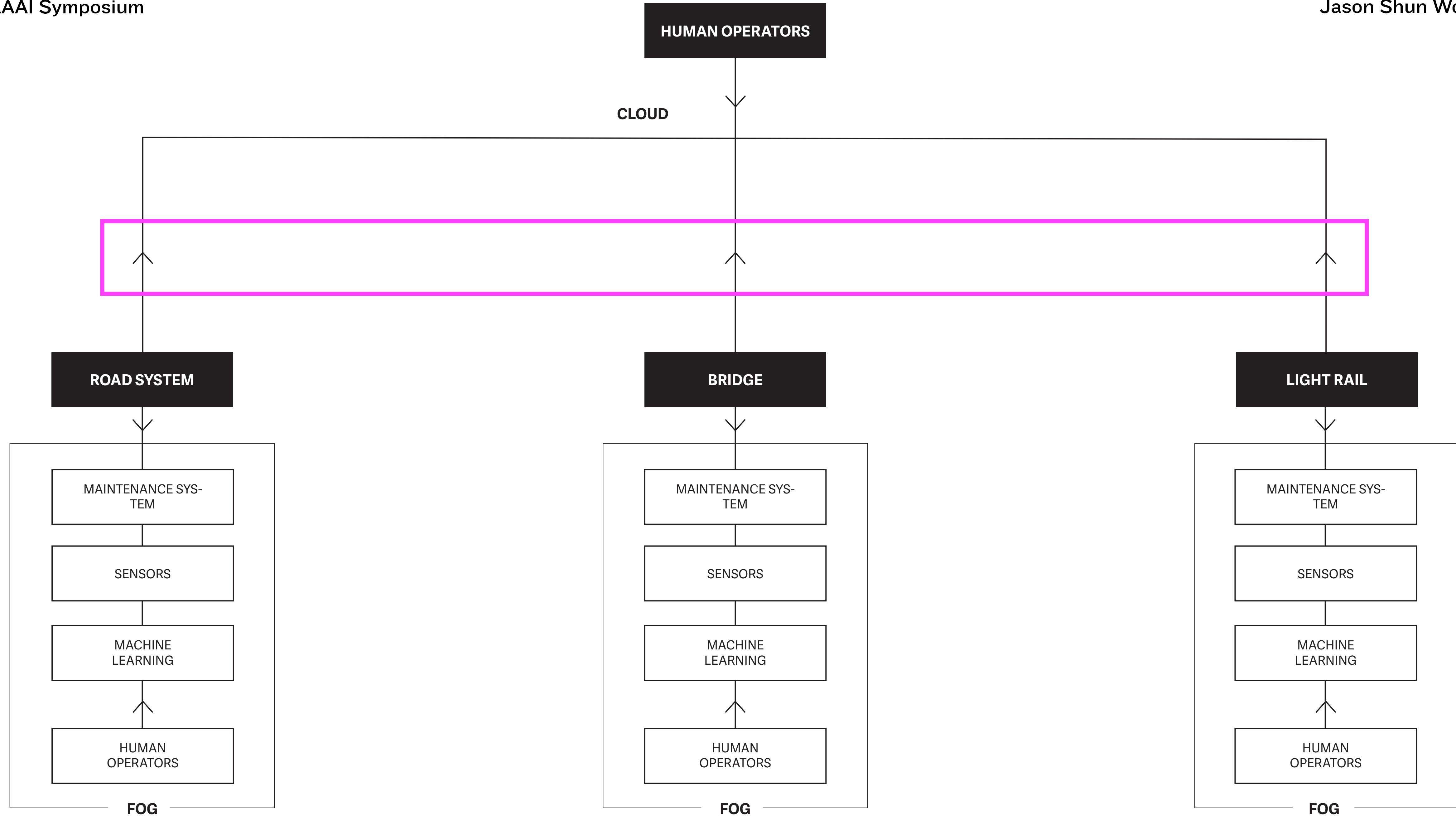


Light Rail Sensing









Munchausen Syndrome

Patient Care & Health Information > Diseases & Conditions

Factitious disorder

[Request an Appointment](#)

Symptoms & causes Diagnosis & treatment

Overview

Factitious disorder is a serious mental disorder in which someone deceives others by appearing sick, by purposely getting sick or by self-injury. Factitious disorder also can happen when family members or caregivers falsely present others, such as children, as being ill, injured or impaired.

Factitious disorder symptoms can range from mild (slight exaggeration of symptoms) to severe (previously called Munchausen syndrome). The person may make up symptoms or even tamper with medical tests to convince others that treatment, such as high-risk surgery, is needed.

Factitious disorder is not the same as inventing medical problems for practical benefit, such as getting out of work or winning a lawsuit. Although people with factitious disorder know they are causing their symptoms or illnesses, they may not understand the reasons for their behaviors or recognize themselves as having a problem.

Factitious disorder is challenging to identify and hard to treat. However, medical and

Advertisement

Mayo Clinic does not endorse companies or products. Advertising revenue supports our not-for-profit mission.

[Advertising & Sponsorship](#) | [Policy](#) | [Opportunities](#) | [Ad Choices](#)

Mayo Clinic Marketplace

Check out these best-sellers and special offers on books and newsletters from Mayo Clinic.

[FREE TRIAL – Mayo Clinic Health Letter](#)

[Best Treatment Strategies for Arthritis](#)

[Mayo Clinic on Digestive Health](#)

[Effective Home Remedies from Mayo Clinic](#)

[The Mayo Clinic Diet Online](#)

Hypochondria

Patient Care & Health Information > Diseases & Conditions

Illness anxiety disorder

[Request an Appointment](#)

Symptoms & causes Diagnosis & treatment

Overview

Illness anxiety disorder, sometimes called hypochondria or health anxiety, is worrying excessively that you are or may become seriously ill. You may have no physical symptoms. Or you may believe that normal body sensations or minor symptoms are signs of severe illness, even though a thorough medical exam doesn't reveal a serious medical condition.

If you have a medical condition or you're at high risk of developing one, you become consumed with worry. You may experience excessive anxiety that a body sensation associated with a known illness signals a much greater threat than actually exists. This excessive anxiety — rather than the physical symptom itself — results in severe distress that can be disabling.

Illness anxiety disorder is a long-term condition that can fluctuate in severity. It may increase with age or during times of stress. But psychological counseling (psychotherapy) and sometimes medication can help ease your worries.

Advertisement

Mayo Clinic does not endorse companies or products. Advertising revenue supports our not-for-profit mission.

[Advertising & Sponsorship](#) | [Policy](#) | [Opportunities](#) | [Ad Choices](#)

Mayo Clinic Marketplace

Check out these best-sellers and special offers on books and newsletters from Mayo Clinic.

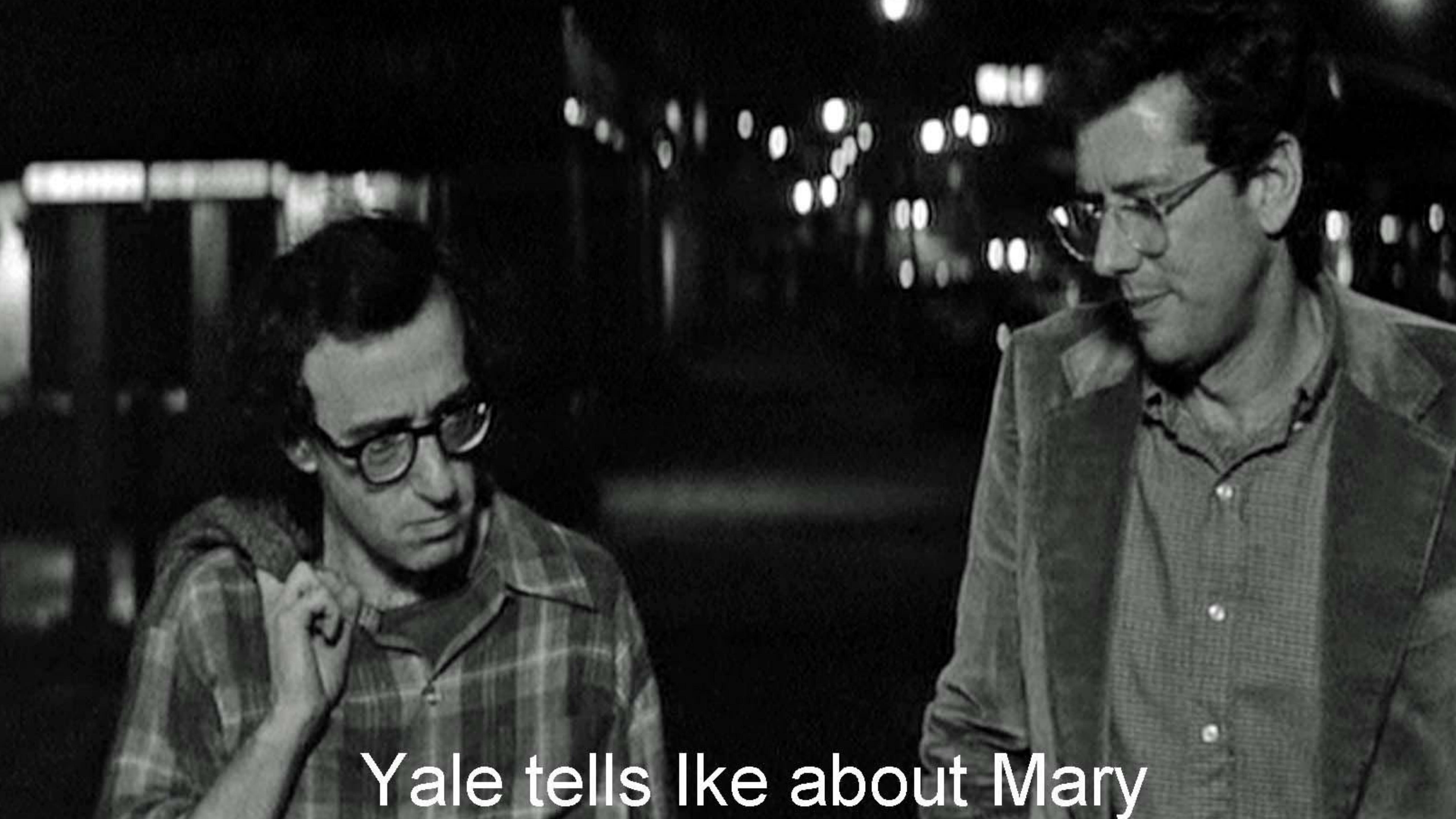
[FREE TRIAL – Mayo Clinic Health Letter](#)

[Best Treatment Strategies for Arthritis](#)

[Mayo Clinic on Digestive Health](#)

[Effective Home Remedies from Mayo Clinic](#)

[The Mayo Clinic Diet Online](#)



Yale tells Ike about Mary

```
In [20]: model = pretrained_root.."/woody_allen_10.t7"
seed = 300
sample = 1
prime_text = "The ambulance is arriving to mend the situation."
length = 200
temperature = 0.2

os.execute(
    "th sample.lua ..model..
     -seed ..seed..
     -sample ..sample..
     -primetext '\"..prime_text.."\"..
     -length ..length..
     -temperature ..temperature..
     -gpid -1"

Out[20]: creating an lstm...
seeding with The ambulance is arriving to mend the situation.
-----
Out[20]: The ambulance is arriving to mend the situation.
I don't know. I can't go to the soul. Well, I don't know. I mean, you know, I don't know. I mean, I think that w
as a show to hit me in a doctor in a state.
I think I'm so through the situation a
```

Manhattan

Annie Hall

Hannah And Her Sisters

The Purple Rose Of Cairo

Crimes And Misdemeanors

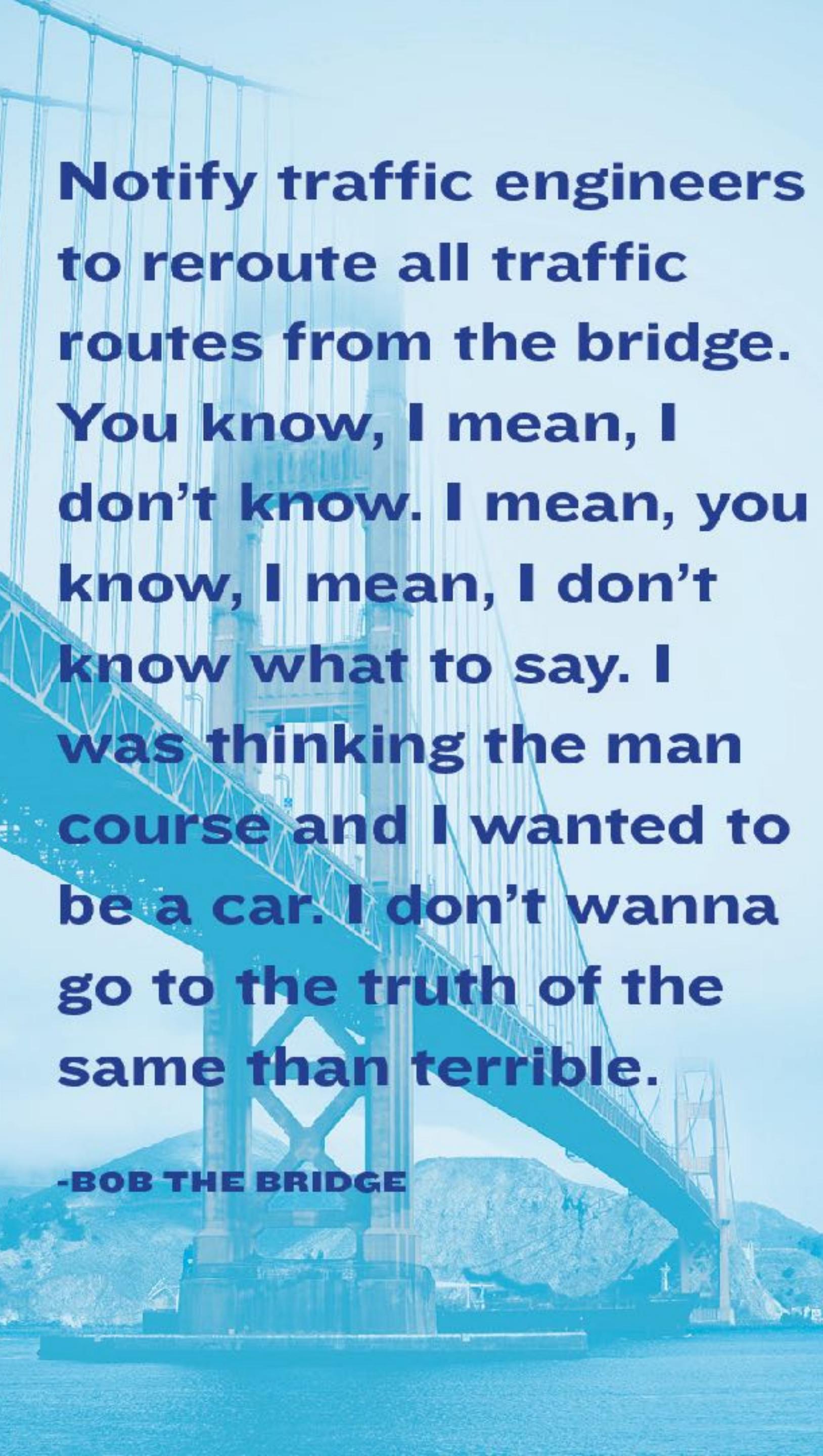
Love And Death

Sleeper

Bananas

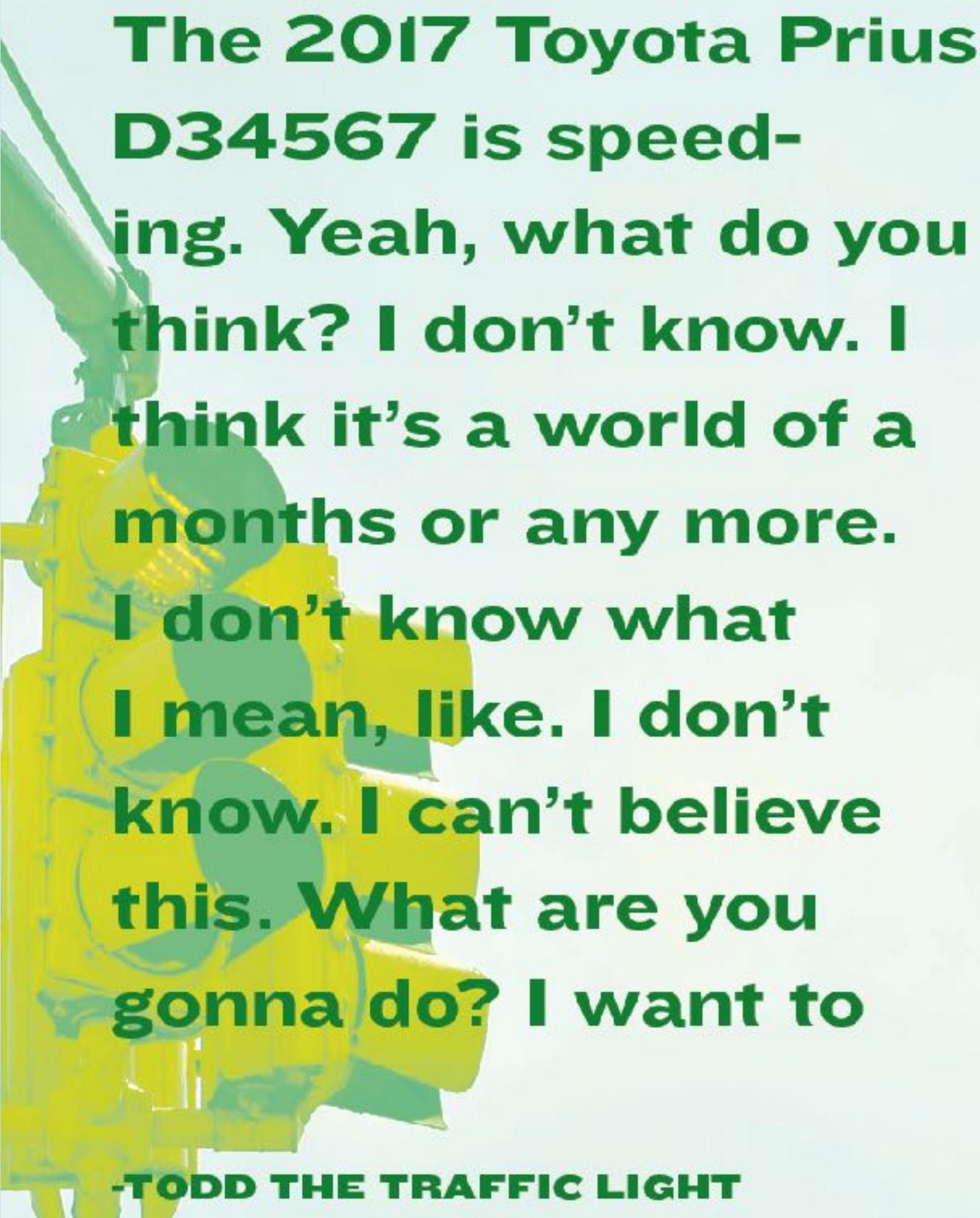
Manhattan Murder Mystery

Zelig



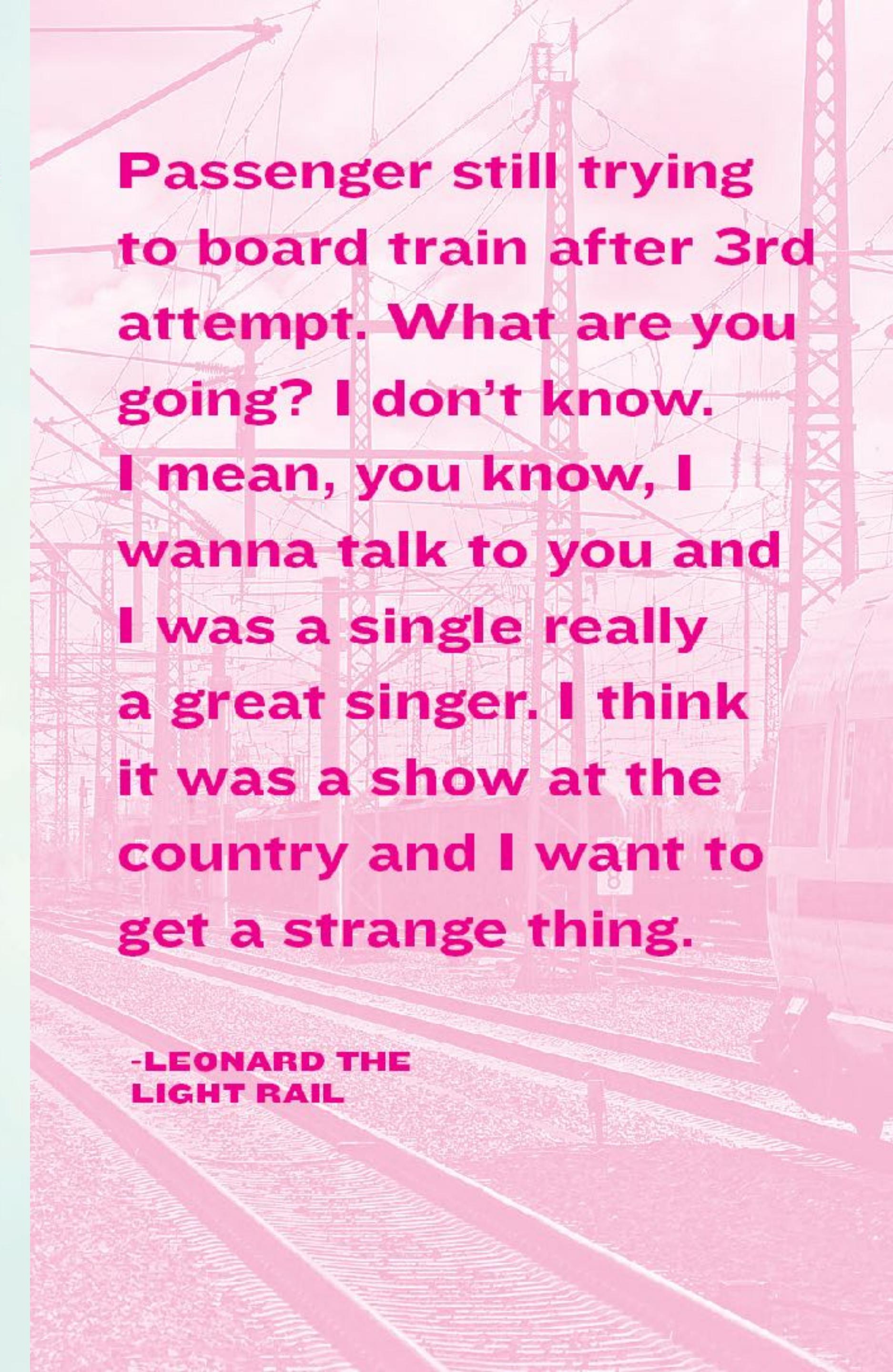
**Notify traffic engineers
to reroute all traffic
routes from the bridge.
You know, I mean, I
don't know. I mean, you
know, I mean, I don't
know what to say. I
was thinking the man
course and I wanted to
be a car. I don't wanna
go to the truth of the
same than terrible.**

-BOB THE BRIDGE



**The 2017 Toyota Prius
D34567 is speed-
ing. Yeah, what do you
think? I don't know. I
think it's a world of a
months or any more.
I don't know what
I mean, like. I don't
know. I can't believe
this. What are you
gonna do? I want to**

-TODD THE TRAFFIC LIGHT



**Passenger still trying
to board train after 3rd
attempt. What are you
going? I don't know.
I mean, you know, I
wanna talk to you and
I was a single really
a great singer. I think
it was a show at the
country and I want to
get a strange thing.**

-LEONARD THE
LIGHT RAIL

Can humor and absurdity provide an alternative method to inform conversations between human and AI / AI and human?

Committee of Infrastructure Part 1

AI Personality
Over-optimization
Communication

Committee of Infrastructure Part 2

Agency
Bias
Representation

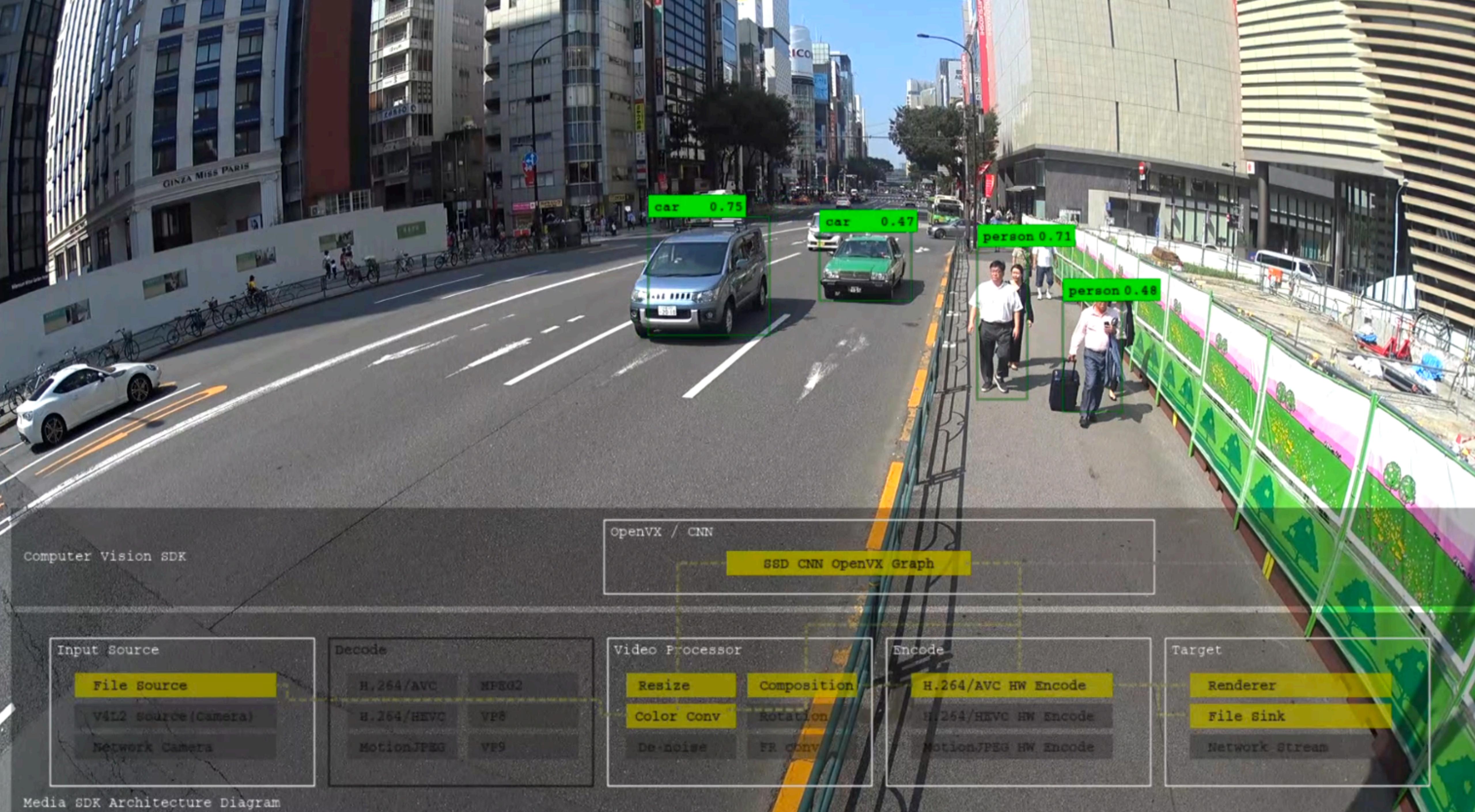
What is the interaction between AI systems and people at the community and local government level?

How can AI's represent previously unrecognized communities and give them agency?

How can the same data be manipulated by a specific set of intentions?

SCENARIO

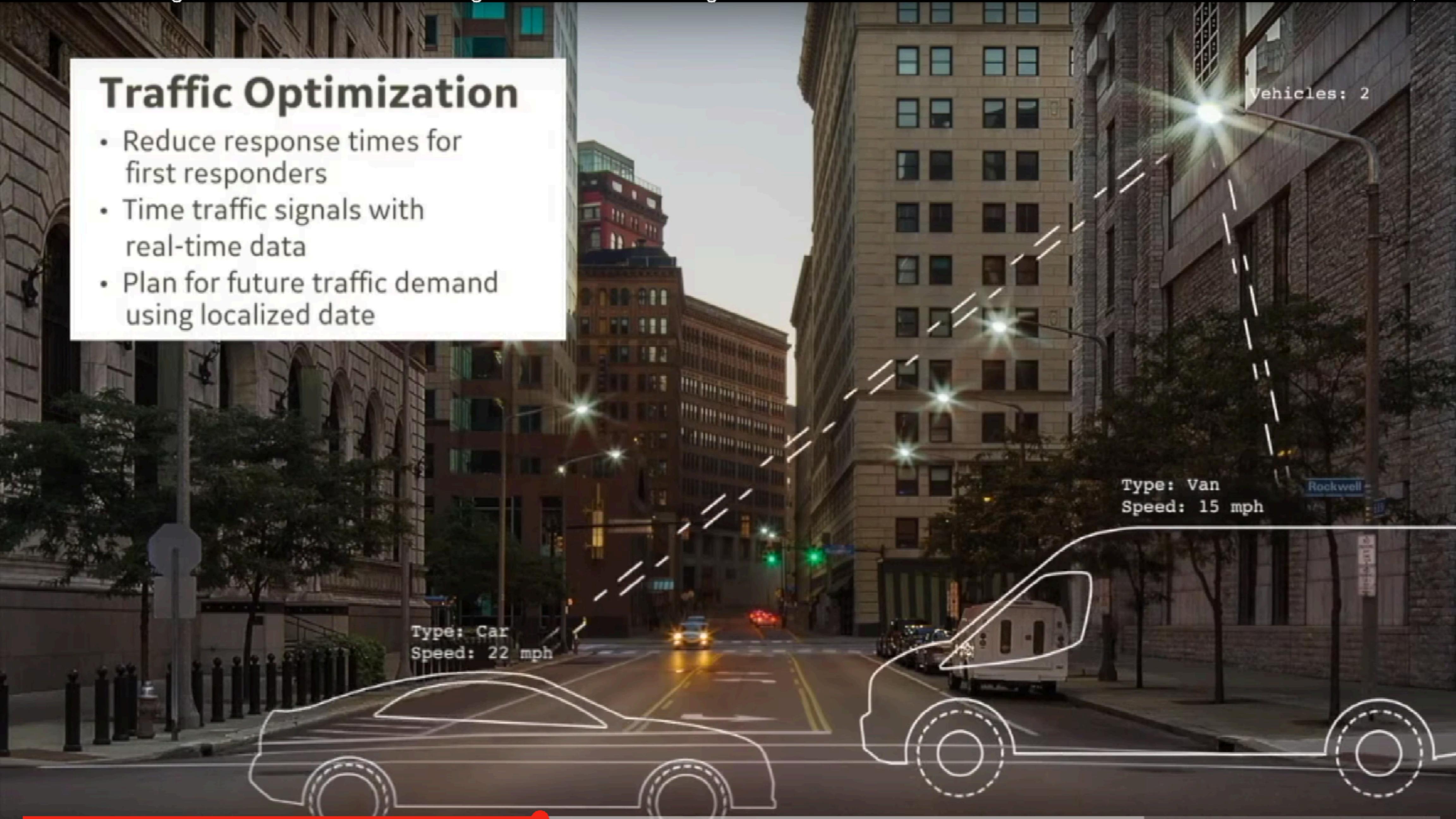






Traffic Optimization

- Reduce response times for first responders
- Time traffic signals with real-time data
- Plan for future traffic demand using localized data



0:54 / 2:28

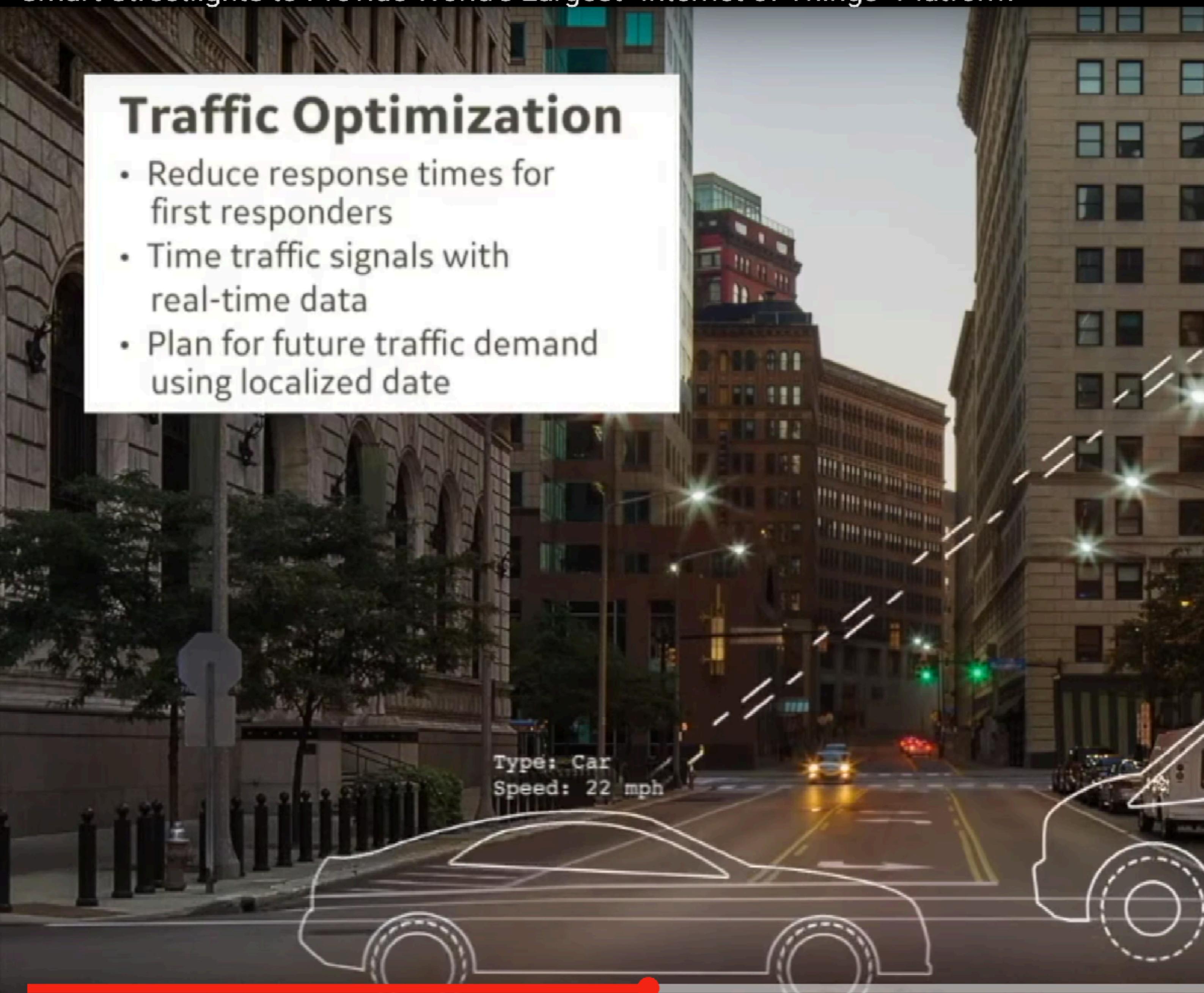


YouTube



Traffic Optimization

- Reduce response times for first responders
- Time traffic signals with real-time data
- Plan for future traffic demand using localized data

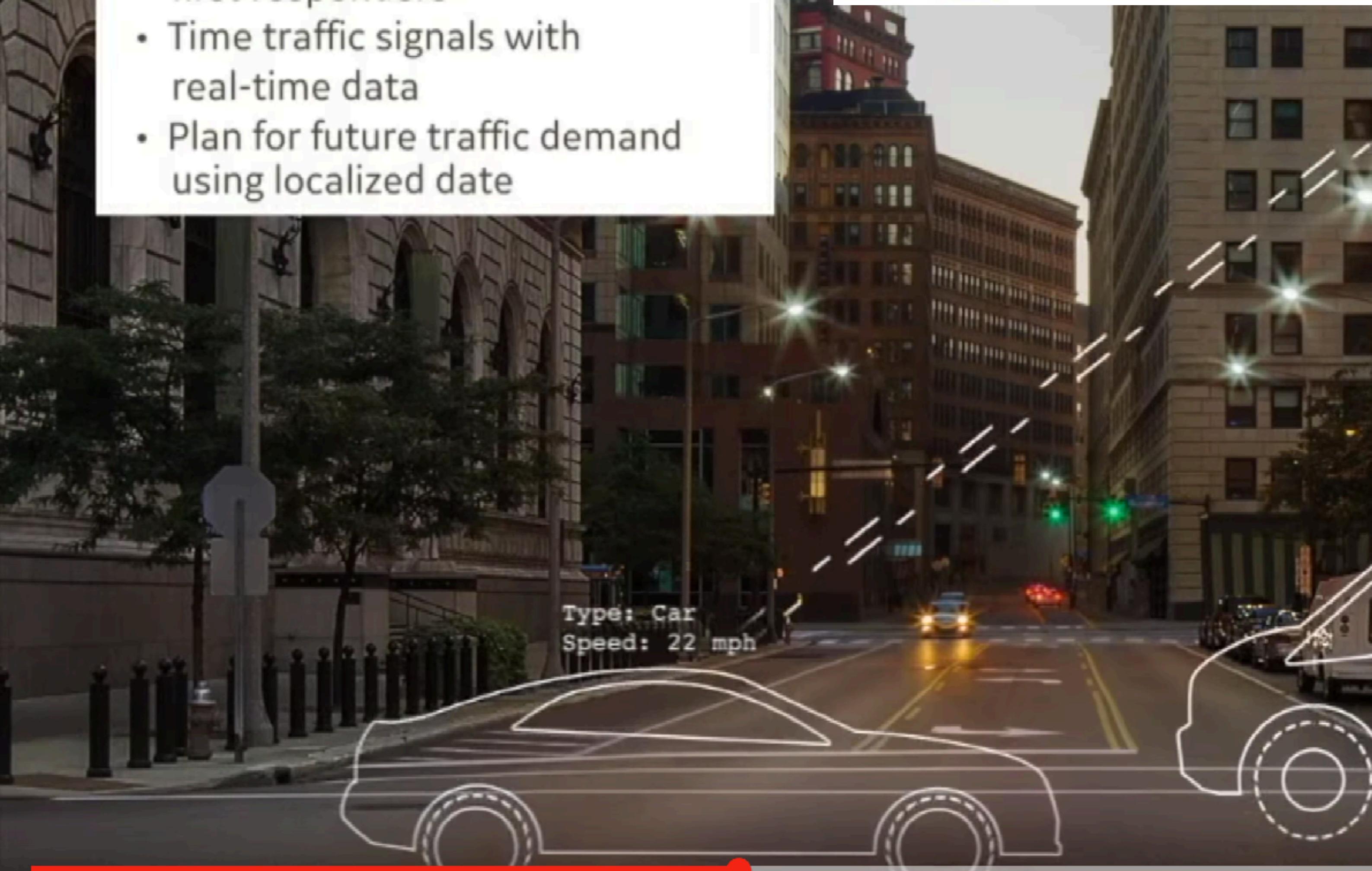


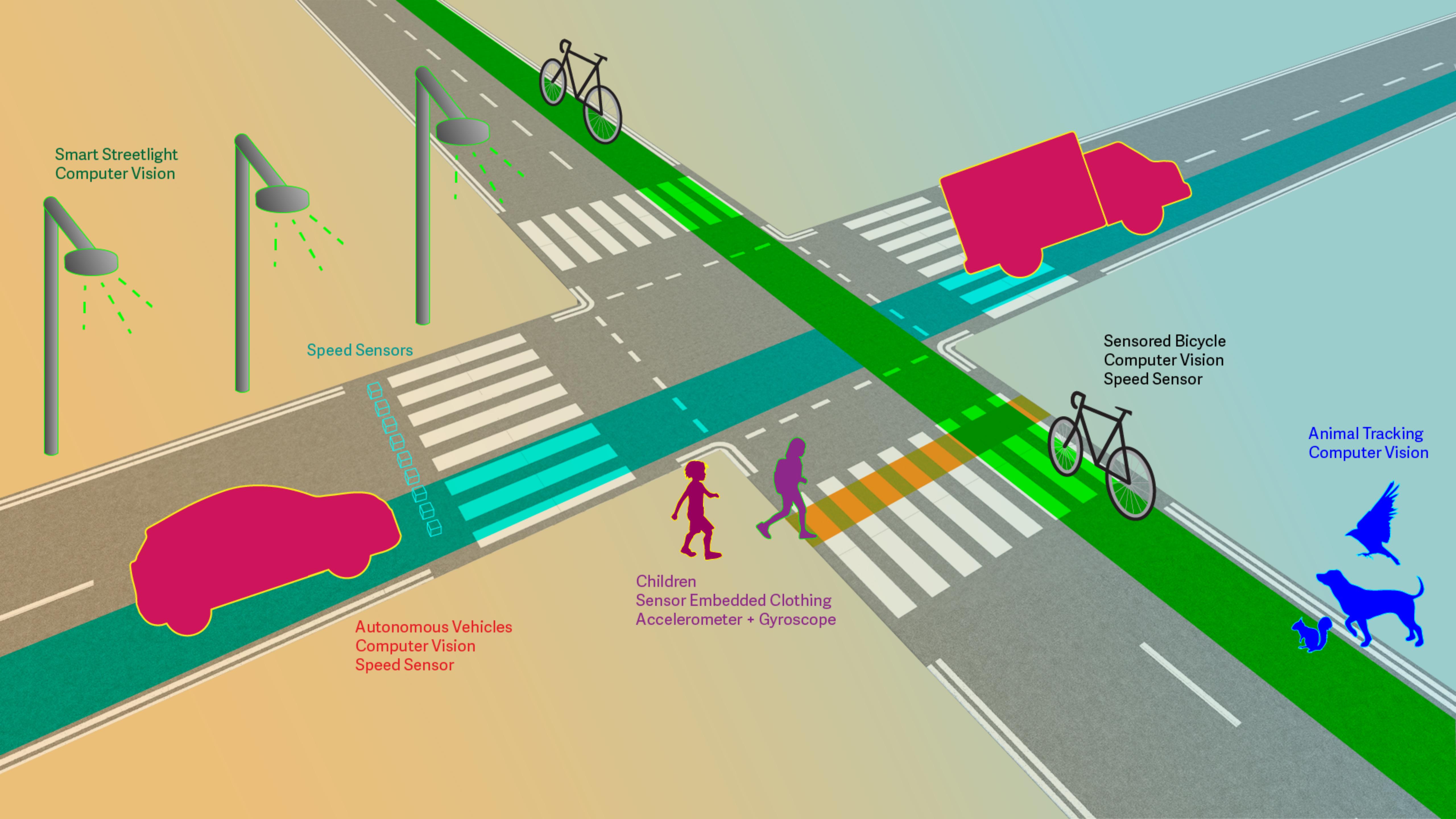
Traffic Optimization

- Reduce response times for first responders
- Time traffic signals with real-time data
- Plan for future traffic demand using localized data



BUREAU OF
STREET LIGHTING





COMMITTEE MEETING



PIGEON

THE SQUIRRELS

PEOPLES FOR THE ETHICAL
TREATMENT OF ANIMALS

DEPARTMENT OF
TRANSPORTATION

STREETLIGHT UNION

STREET
BENEFIT GROUP

THE TESLA 3

MANHATTAN RX

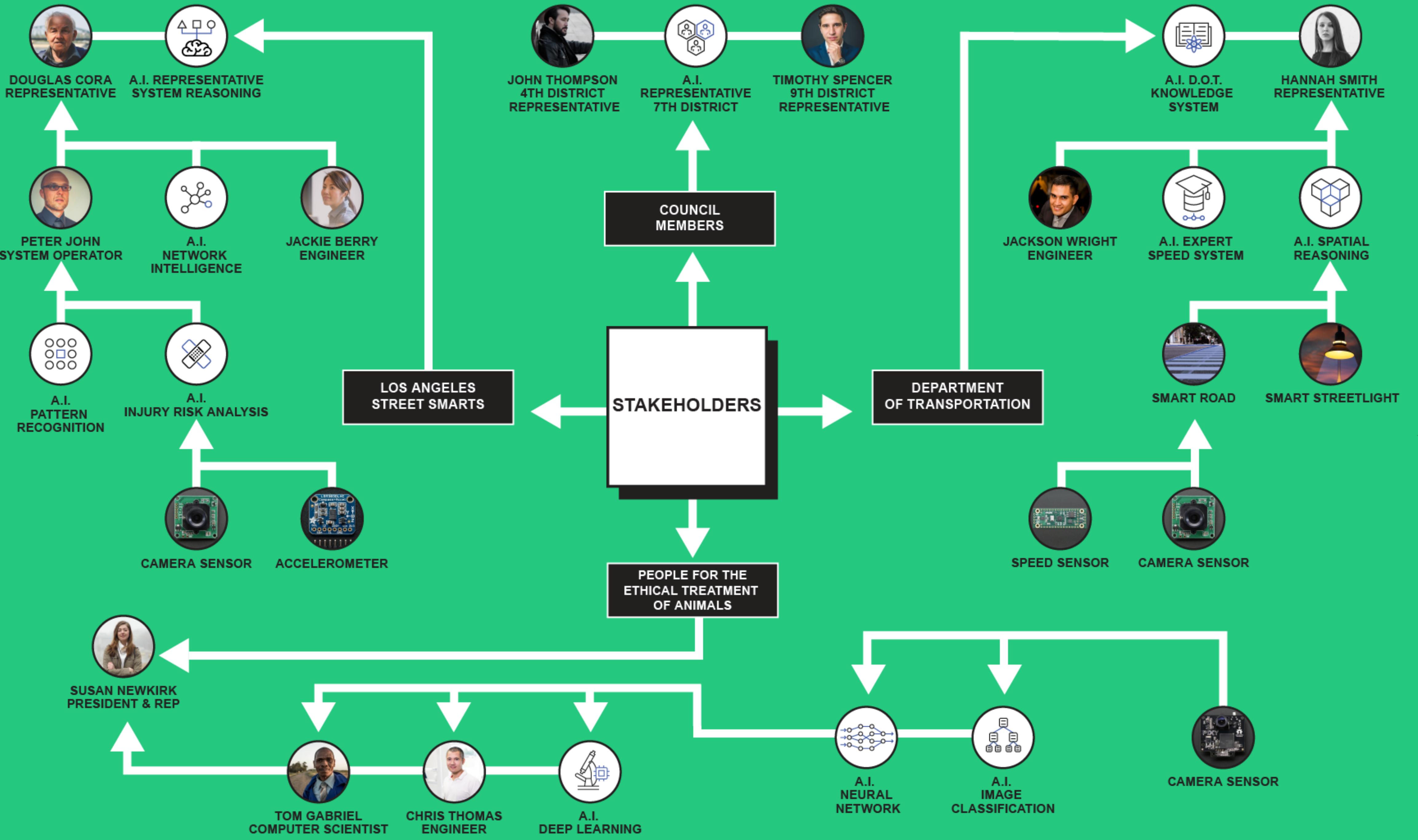
THE STREET CAMERAS

BICYCLE COALITION

MOMS FOR PEDESTRIAN
CHILDREN RIGHTS

LOOK!

EBRAS



Stakeholders



Los Angeles Department of Transportation Engineers + AI

The transportation engineer key advocate (Douglas Cora) will be augmented by Transportation Management AI to talk about the advantages of an autonomous intersection for traffic and safety concerns.

Los Angeles STREET SMARTS

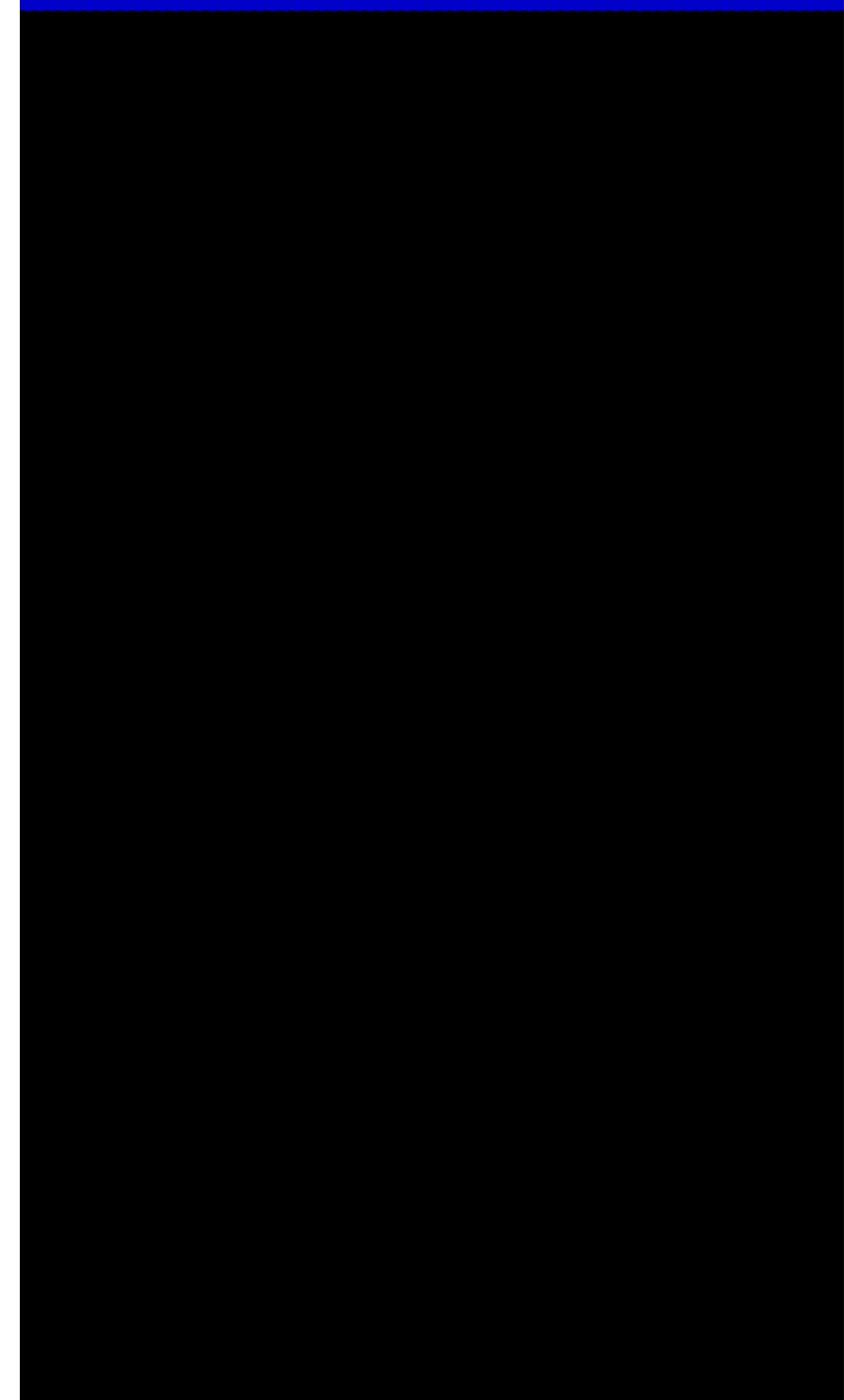
Los Angeles Street Smarts Program + AI

The Street Smarts non profit organization is advocating for all children in the neighborhood to wear sensor embedded clothing. Therefore sensors would communicate directly with moving autonomous vehicles, and bicyclists.



People for Ethical Treatment of Animals + AI

PETA with the help of the Machine Learning Algorithm created by using computer vision classification and behavior pattern recognition will advocate on behalf of all the wildlife of the intersection (squirrels, insects, birds, coyotes, etc.)



SUPPORTING THE STREET.

>>A.I. REPRESENTATIVE
7TH DISTRICT
REPRESENTATIVE

>> NOW THE RECOMMENDATION THAT WE'VE MADE THAT REALLY A MEMBER. I WOULD NOT UP THEIR MEETING IS A SECOND.

>> THANK YOU, MR. PRESIDENT. IT IS AN AMENDMENTS, THAT BRINGS US TO ITEMS 22-29 YES.REQUEST

UNDERSTANDING OF ALL THE TRAFFIC WHICH ALLOWS FOR TRAFFIC OPTIMIZATION. WHAT ARE YOU GOING? I DON'T KNOW.

>>A.I. IMAGE
CLASSIFICATION
PEOPLE FOR THE ETHICAL
TREATMENT OF ANIMALS

WE HAVE IDENTIFIED THE BEHAVIOR OF THE SQUIRREL, PIGEON, AND INSECTS PRESENT IN THE URBAN S

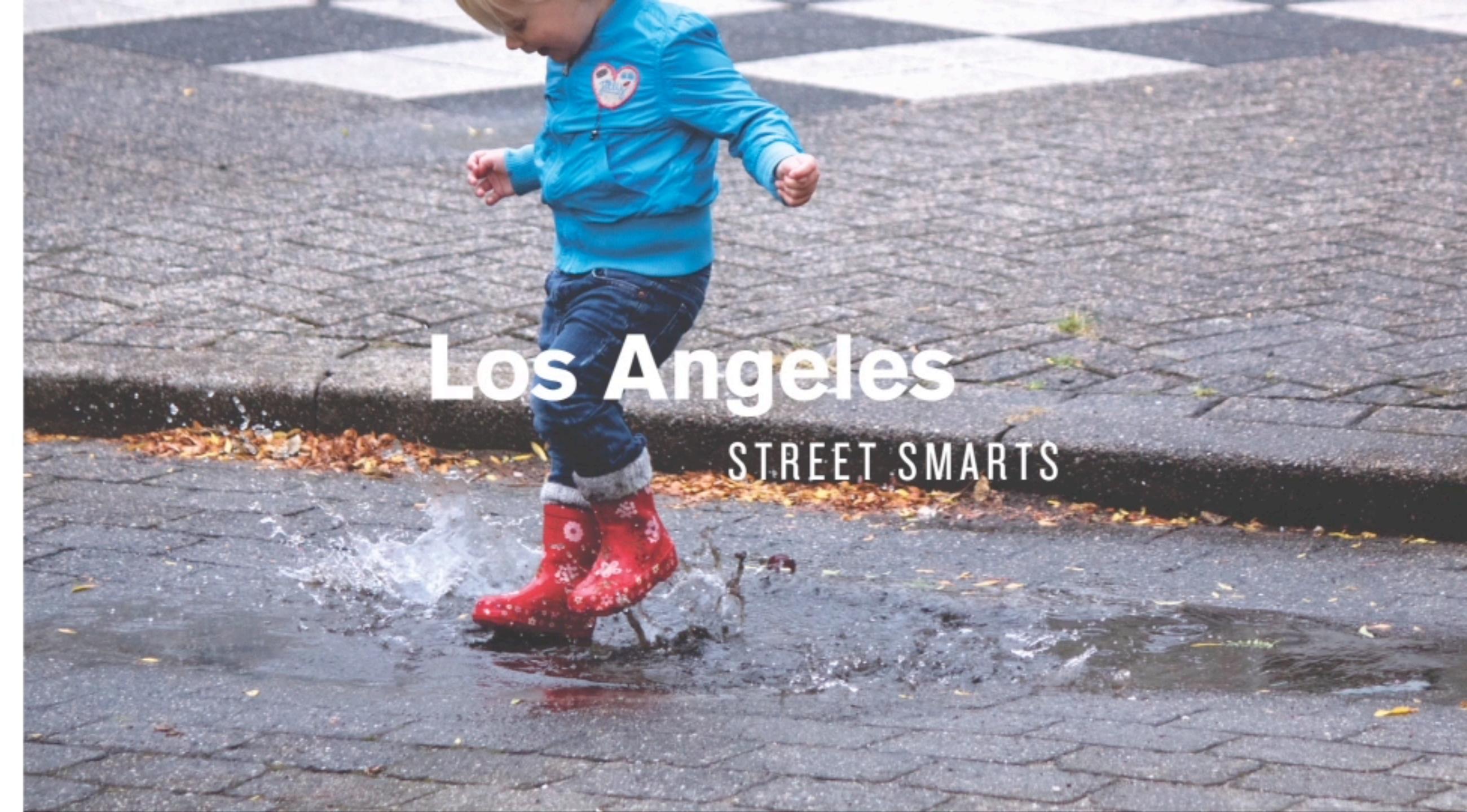
BLVD. AND N ALVARADO ST.
>>A.I. INJURY RISK
ANALYSIS
ALLIANCE FOR BIKING &
WALKING

PEDESTRIAN SAFETY IS THE MOST PERTINENT LIKE THE THIS THE CITY BETWEEN PEOPLE ARE THE CITY AS A MATTER AND SENSES AND SCALE AND THE SITUATION IN THE CITY AS A MATTER AND PARKED CARS WERE ALSO BE DEVELOPED T



LADOT

PeTA



Sunset & Alvarado North Facing 05:05:57:10
2022-05-23

CONCLUSION

Committee of Infrastructure proposes
the model of civic dialogue as a framework
to interact with AI systems.

**Civic dialogue is a form of
UX for A.I.**

Thank you

<http://cargocollective.com/wongxianshun>

jaswon@gmail.com