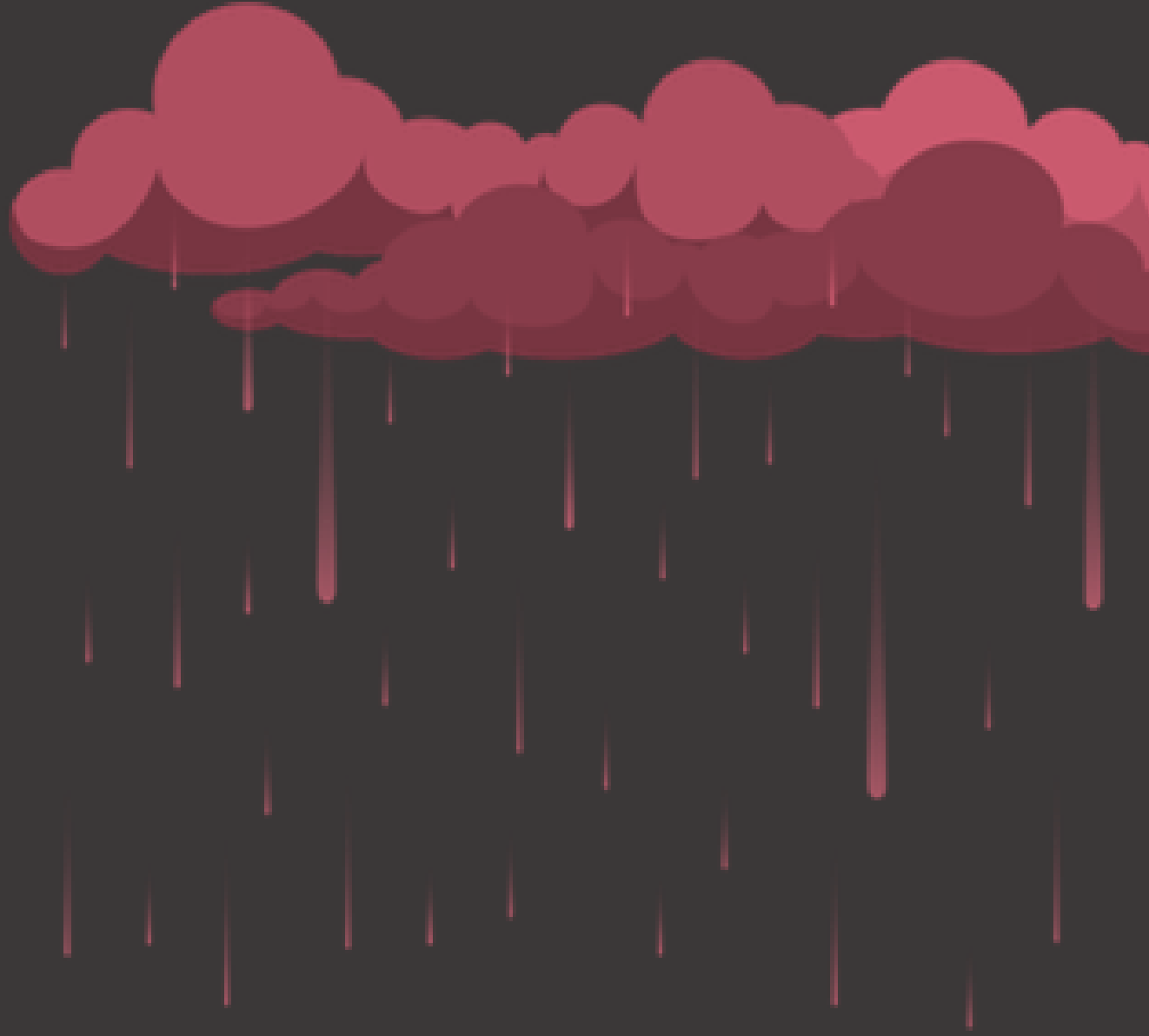
Team Catapult presents raasta

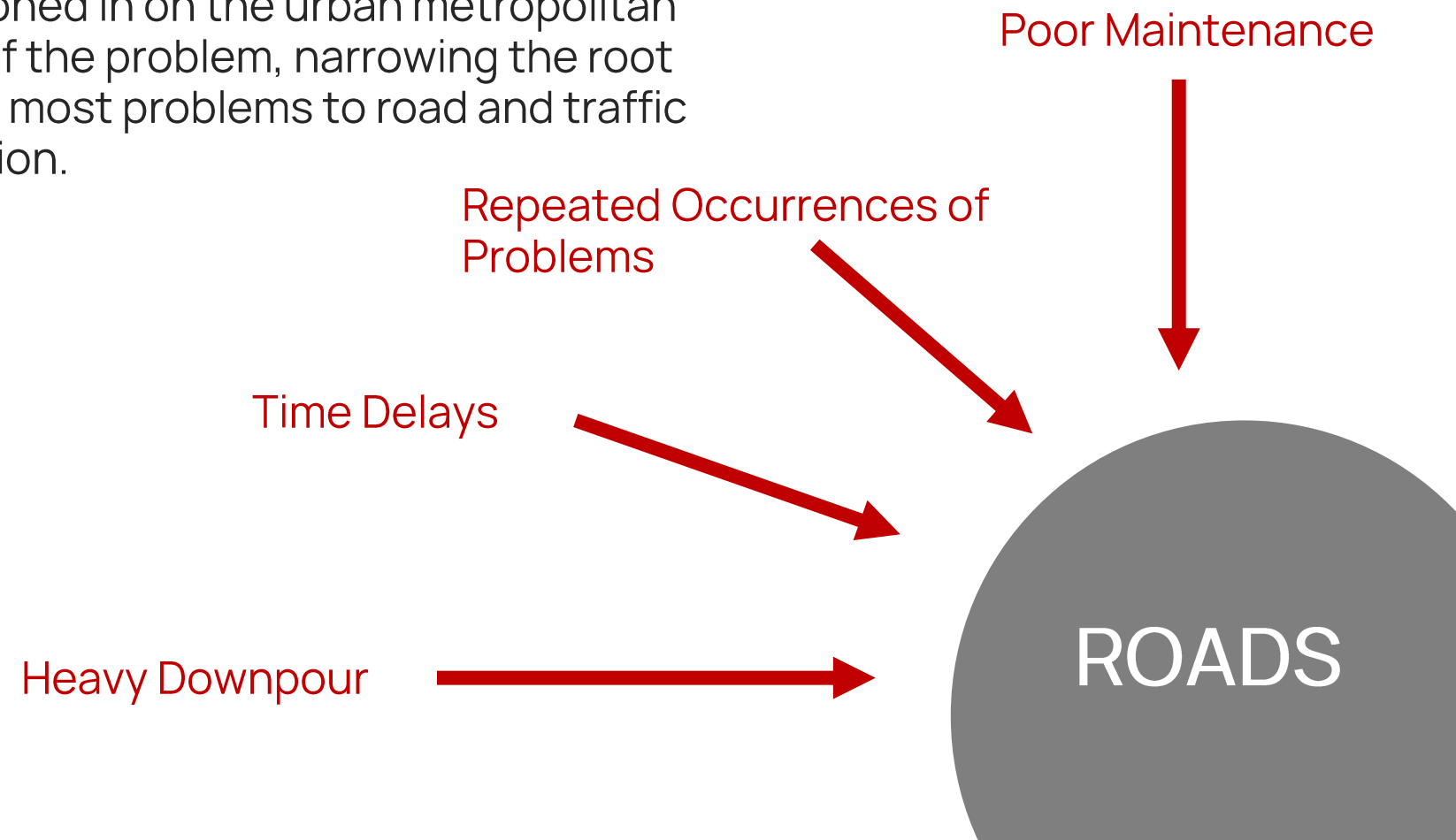


Our Assessment

Our Assessment

Choosing one particular aspect of the problem and determining what the problem entails.

We've honed in on the urban metropolitan aspect of the problem, narrowing the root cause of most problems to road and traffic congestion.

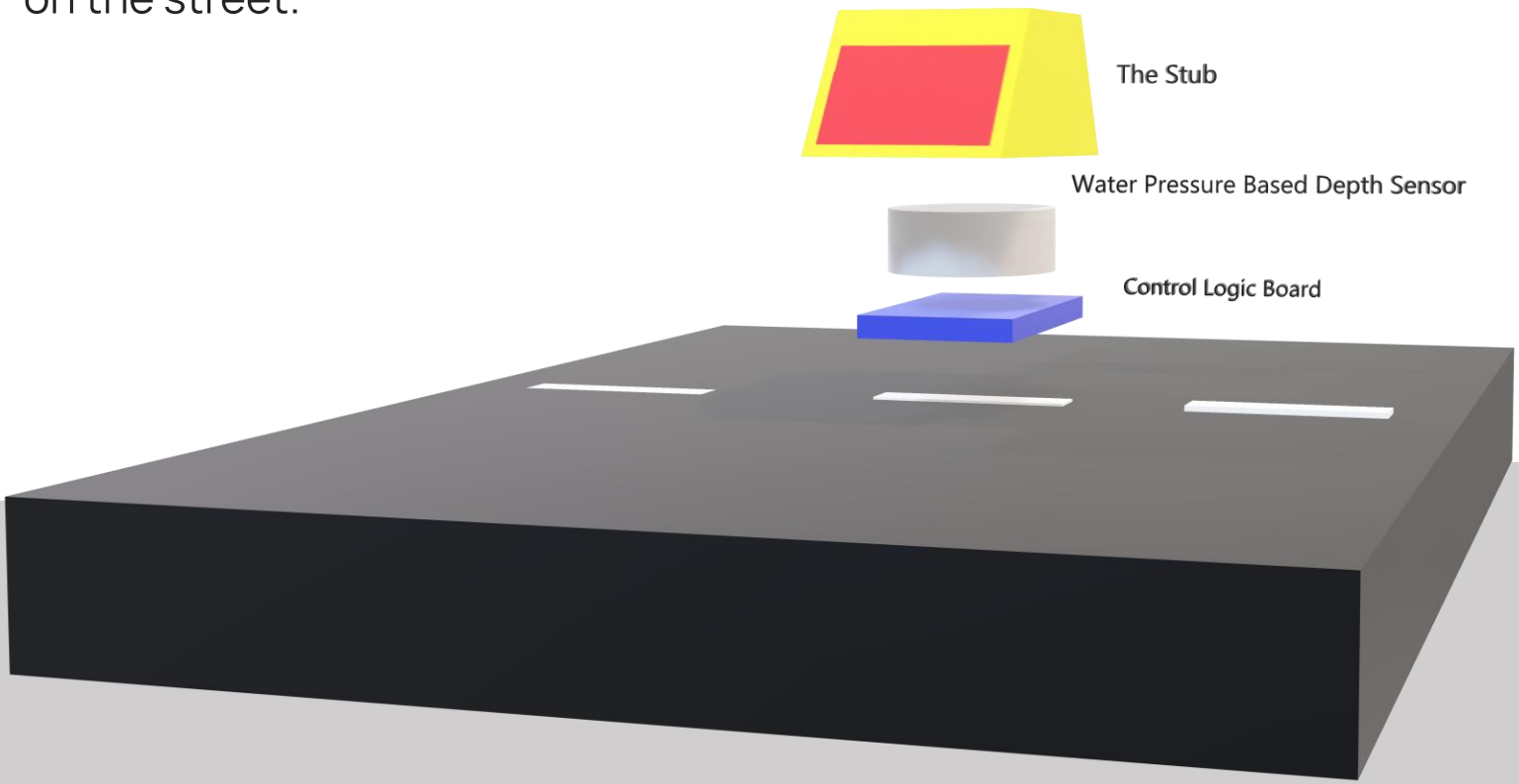



PRECAUTIONARY
REACTIONARY
EVOLUTIONARY

Precautionary with the cloud

The Street Reflector Stub Gets Smarter

Apart from reflecting light, it can now help track water depth levels on the street.



1 Water Depth

Using the grid of water depth readings, estimate the water level for the corresponding area

2 Water Runoff

See how the water level changes over time, calculating the rate of drainage in some sense

3 Downpour Measure

Use data from rainfall prediction metrics and meteorologists to gauge the rain intensity

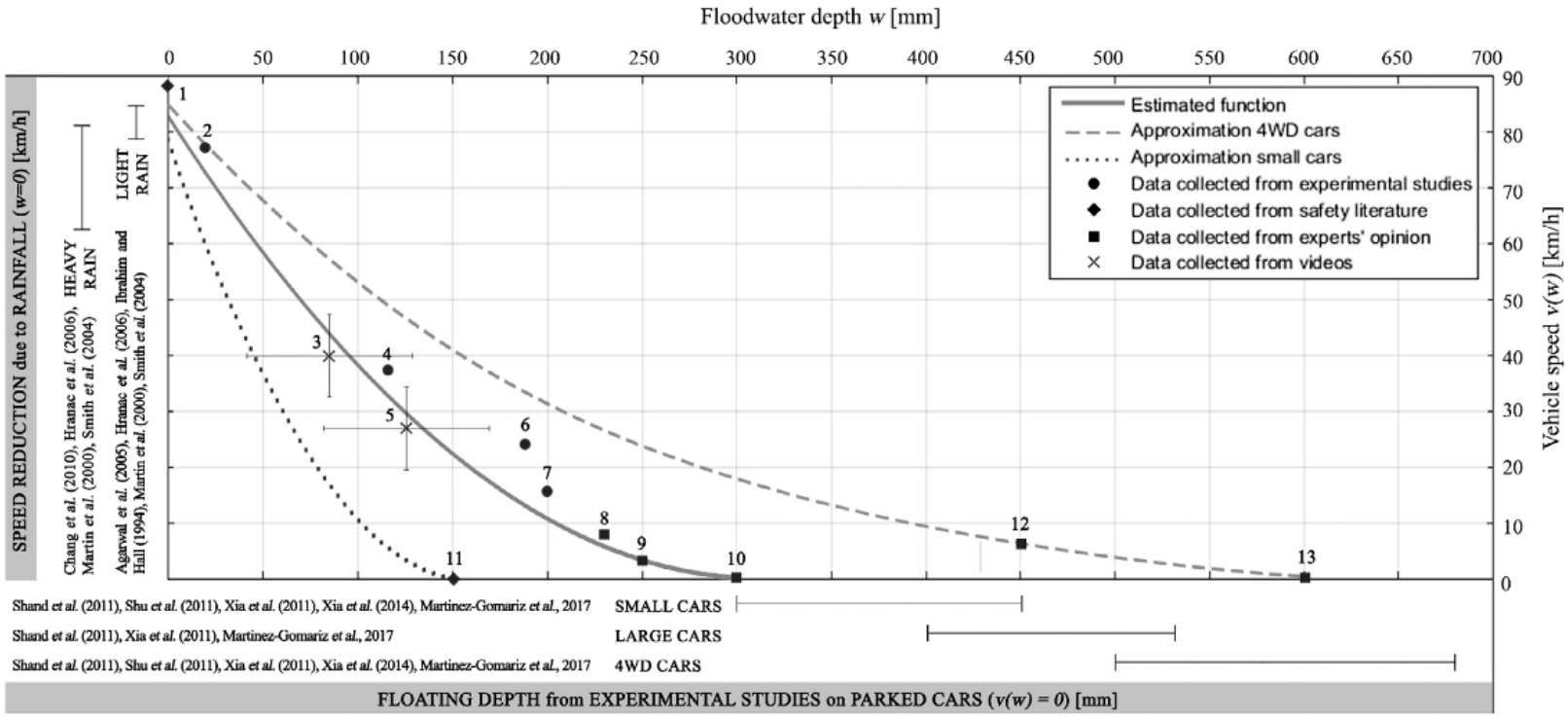
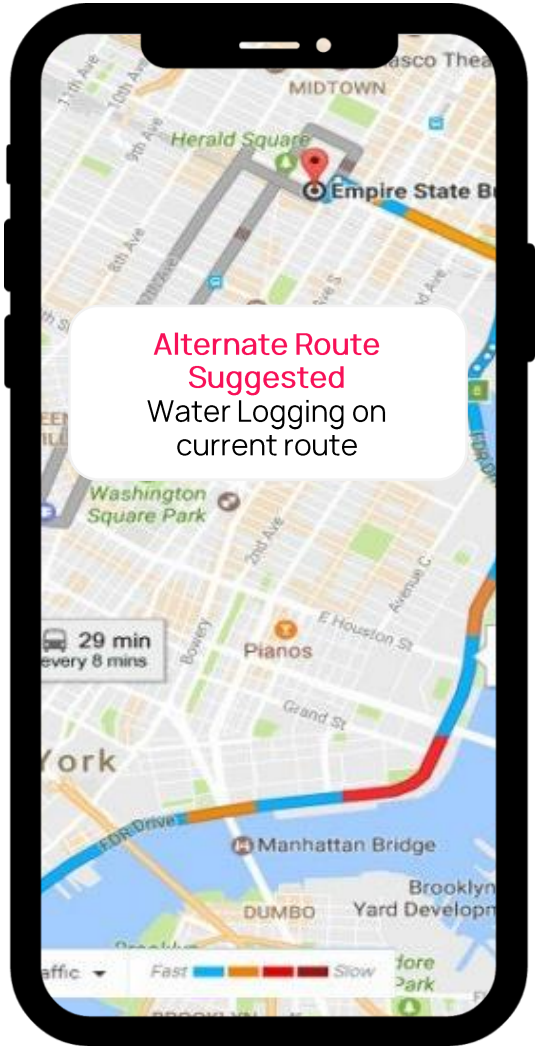


Fig. 2. The depth-disruption function that relates flood depth on a road with vehicle speed.



Real Time Traffic Data
+ Water Logging Data
= Better Route Guidance

Notification System and Real Time Data given to map providers give drivers a much better way to navigate.

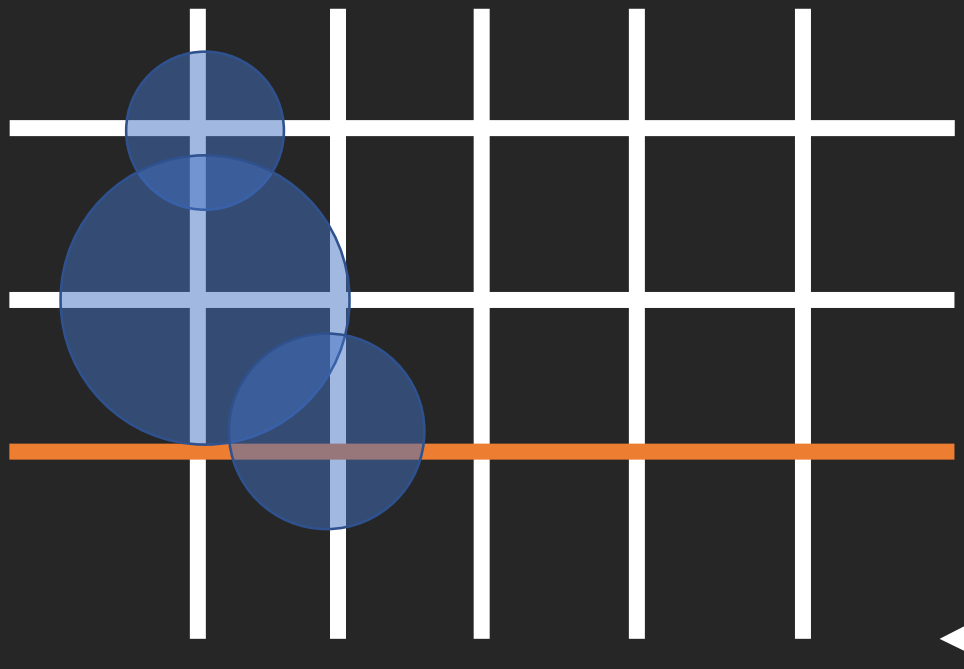
Predictive Nature can prevent accumulation at roads before the situation becomes nearly impossible to solve

Reactionary with Automated Decisions

Actively Controlling Traffic Using Data

Speed of a vehicle on a flooded road is inversely proportional to the height level of water

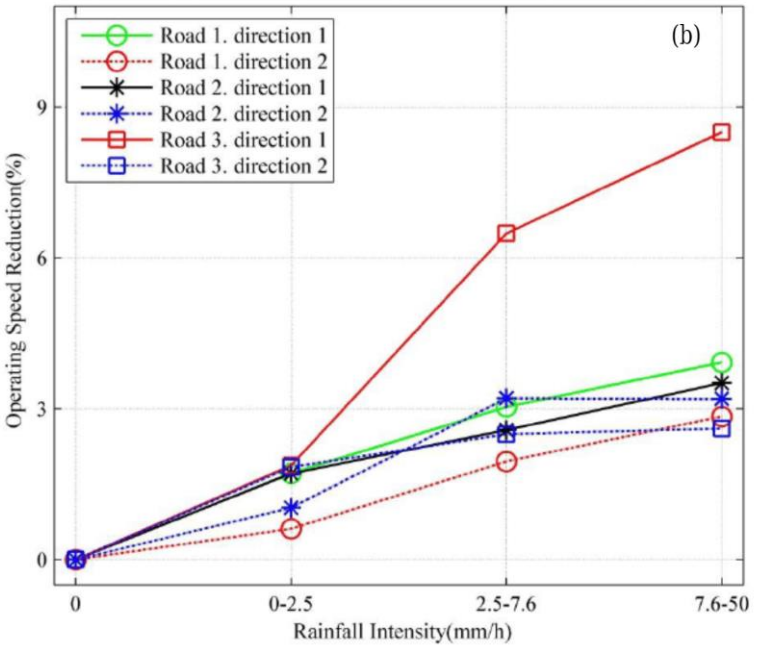
Clear roads that are water logged as much as possible, to prevent propagation effects

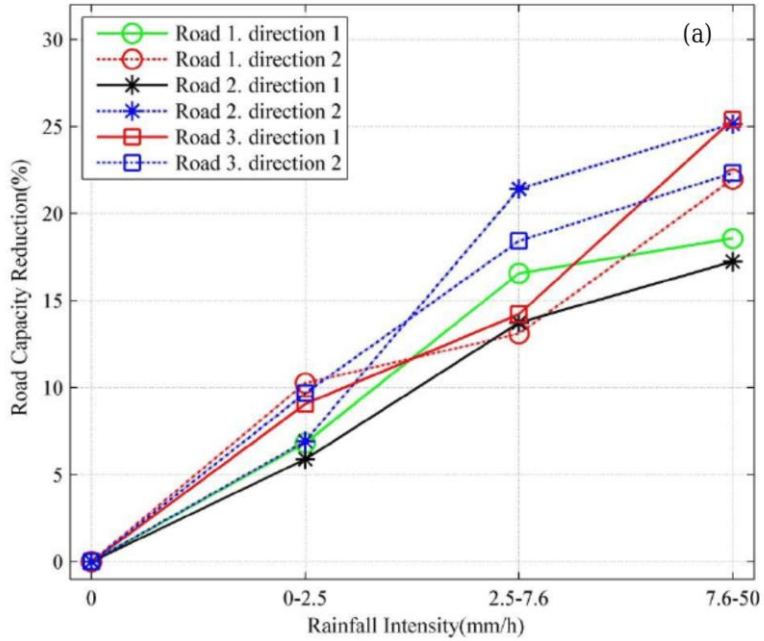


Data on Water Logging from sensors

Notice how some routes are better left avoided given the current state of water accumulation

Data on Congestion





Going Where The Police Cannot

Solves congestion at intersections without signals/guidance.

- Deployment to affected zone
- Computer Vision for Analytics
- Road Block Clearing Algorithm

Where to place the drones?

A demonstration based on real-time traffic data!

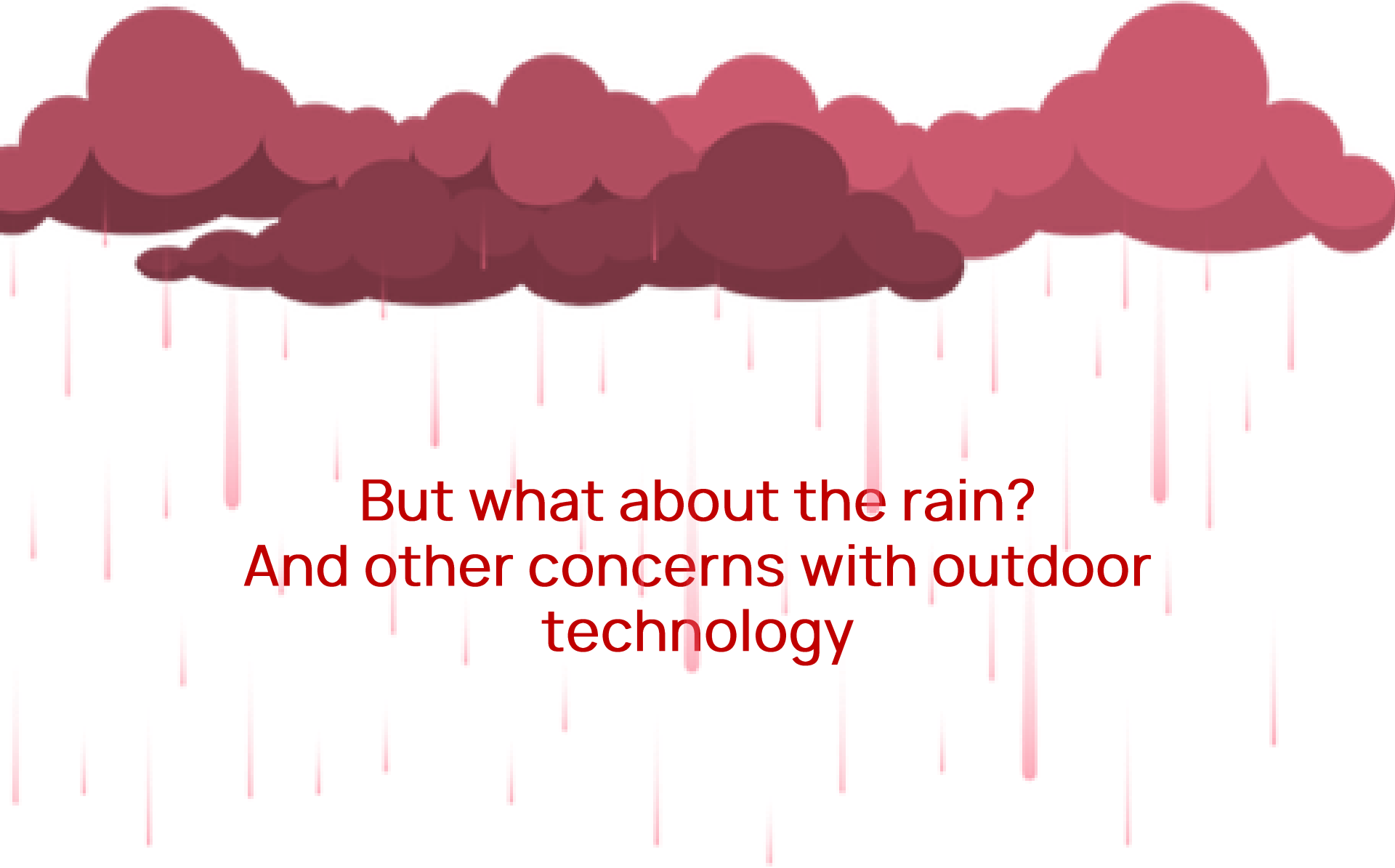
The Drone In Action

The Virtual Policeman

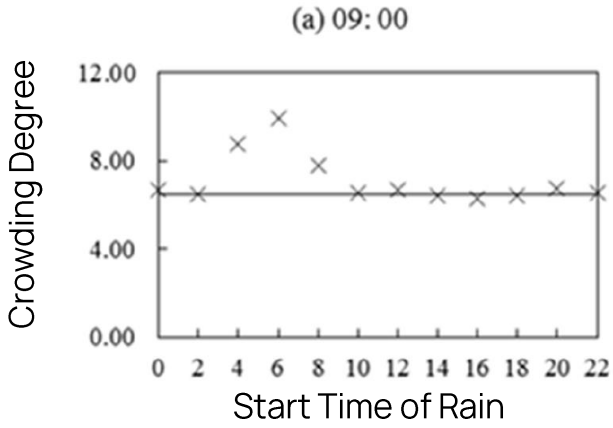
ps: strike a pose!

Adaptive signalization based on clustering vehicles into bubbles - analysing cluster flows, queue sizes, and traffic speed to determine optimal order of passage

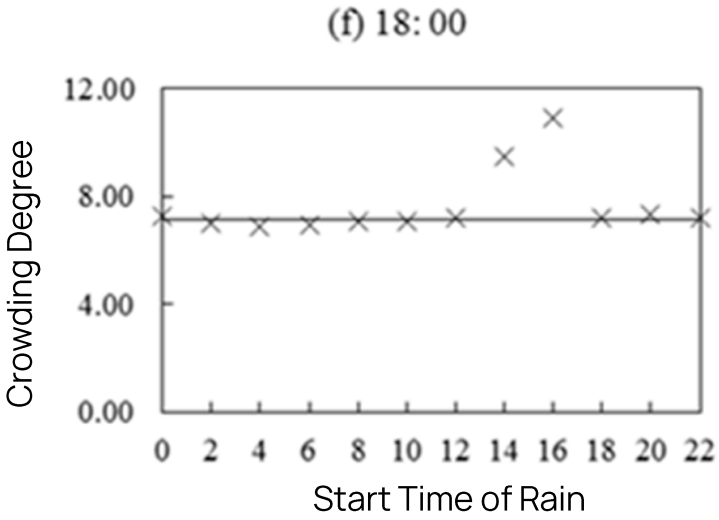
- *Citation: https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/asct_brochure.pdf*

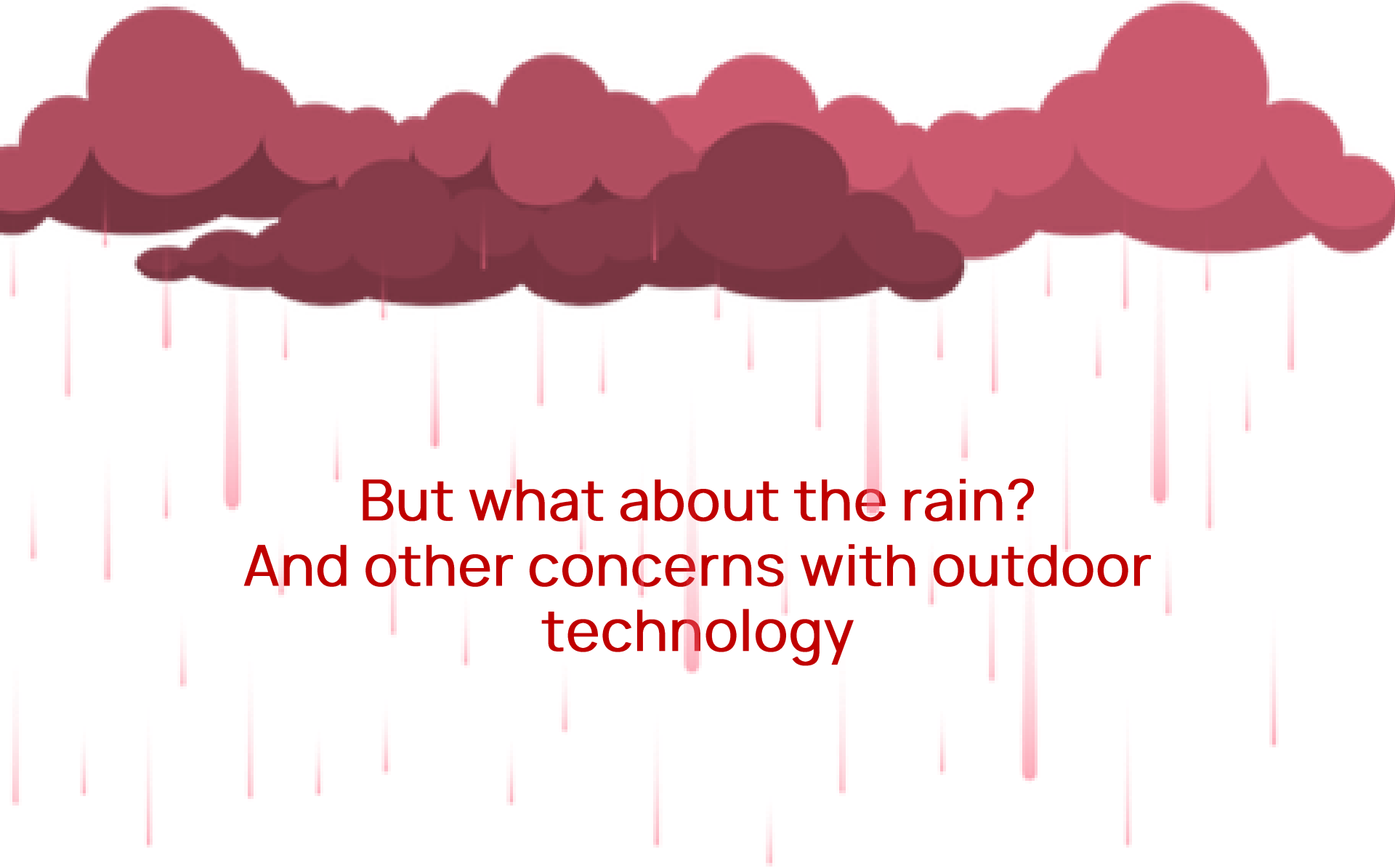


But what about the rain?
And other concerns with outdoor technology



'It was found that for most events, two-hour rainfall has a certain impact on traffic congestion over a five-hour period, with the greatest impact during the hour following the cessation of the rain.'
-Research by *Nanjing Normal University, China*





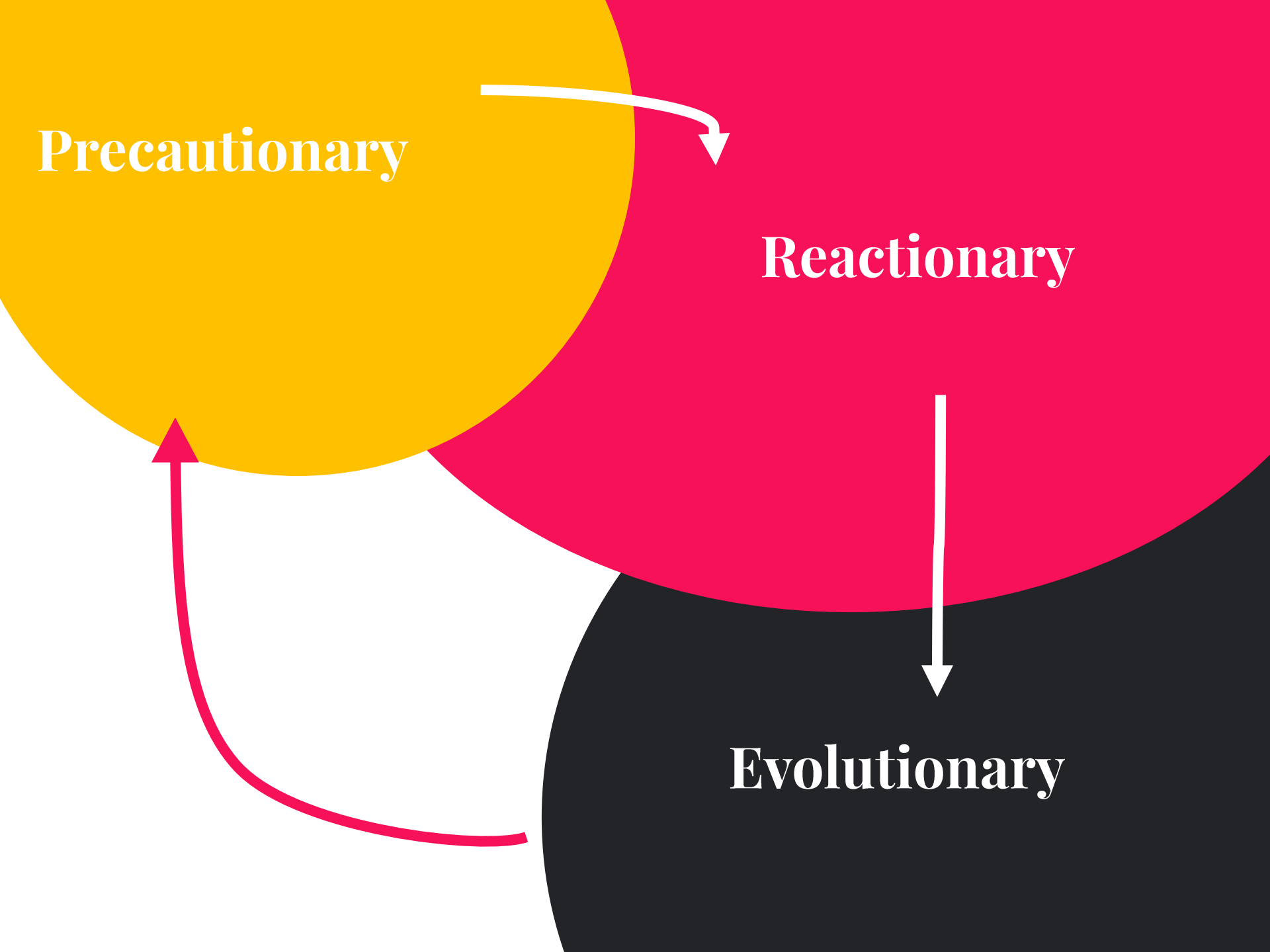
But what about the rain?
And other concerns with outdoor technology

Evolutionary with Machine Learning

Evolutionary & Previous Data Analysis

Machine learning using multivariate polynomial regression or any other supervised learning algorithm is common practice for predicting water accumulation and other problems in cities.

Topography, rainfall, and road & drainage infrastructure data from today's cities is used to train a machine learning model using supervised learning algorithm which can be used to predict how future cities will perform, given their plans.


Precautionary
Reactionary
Evolutionary

Thank You