

An aerial photograph of the Atlanta city skyline, featuring numerous skyscrapers and modern buildings. A large, semi-transparent yellow diamond shape is overlaid on the left side of the image, covering approximately one-third of the total area.

# *Smart Communities Workshop*

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Carl DiSalvo & Thomas Lodato  
Georgia Institute of Technology

# *What is “smart”?*

# Predicting Fire Risk and Prioritizing Fire Inspections

An Open Source Framework developed by Data Science for Social Good, Atlanta

**Best Student Paper Award Winner** (runner-up) at the ACM Knowledge Discovery and Data Mining 2016 conference!

Highlighted by the National Fire Protection Association as a **best practice** in using data analytics to improve fire safety.



**FIREBIRD:** Predictive Modeling for Fire Inspections

## How It Works



Step 1: Gather data sets with relevant commercial property information.

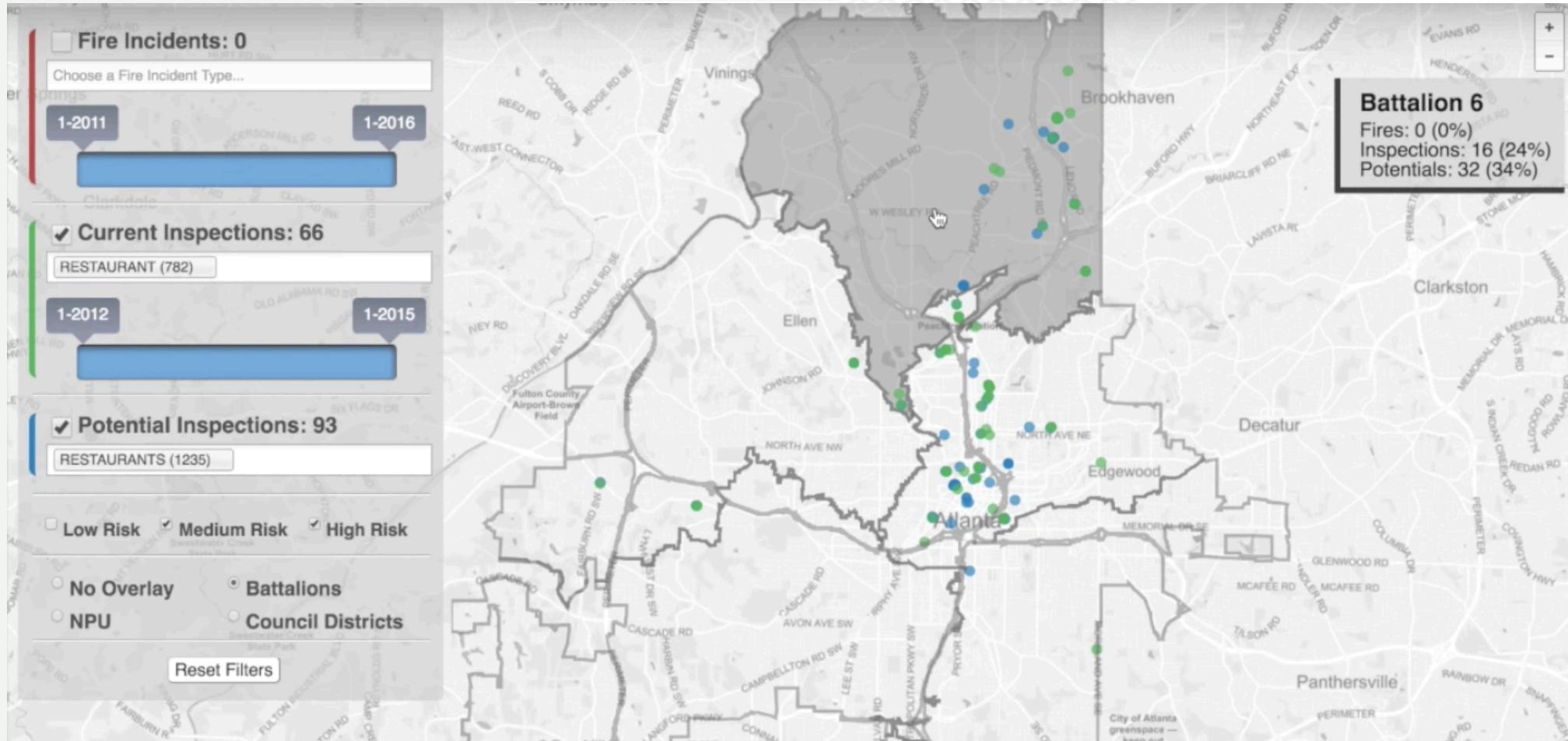
Step 2: Join those data sets by each property's location data to create the most complete set of property records.

Step 3: Discover new properties with the property types required for inspection by your Code of Ordinances.

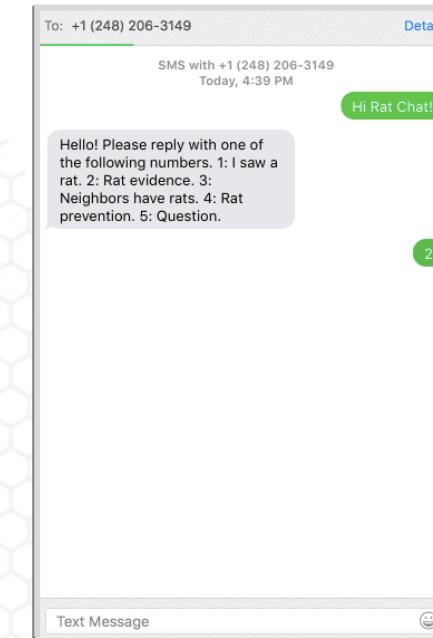
Step 4: Build a predictive risk model using historical fire incident data.

Step 5: Assign a risk score to properties, and visualize them on an interactive map.

**FIREBIRD:** Predictive Modeling for Fire Inspections



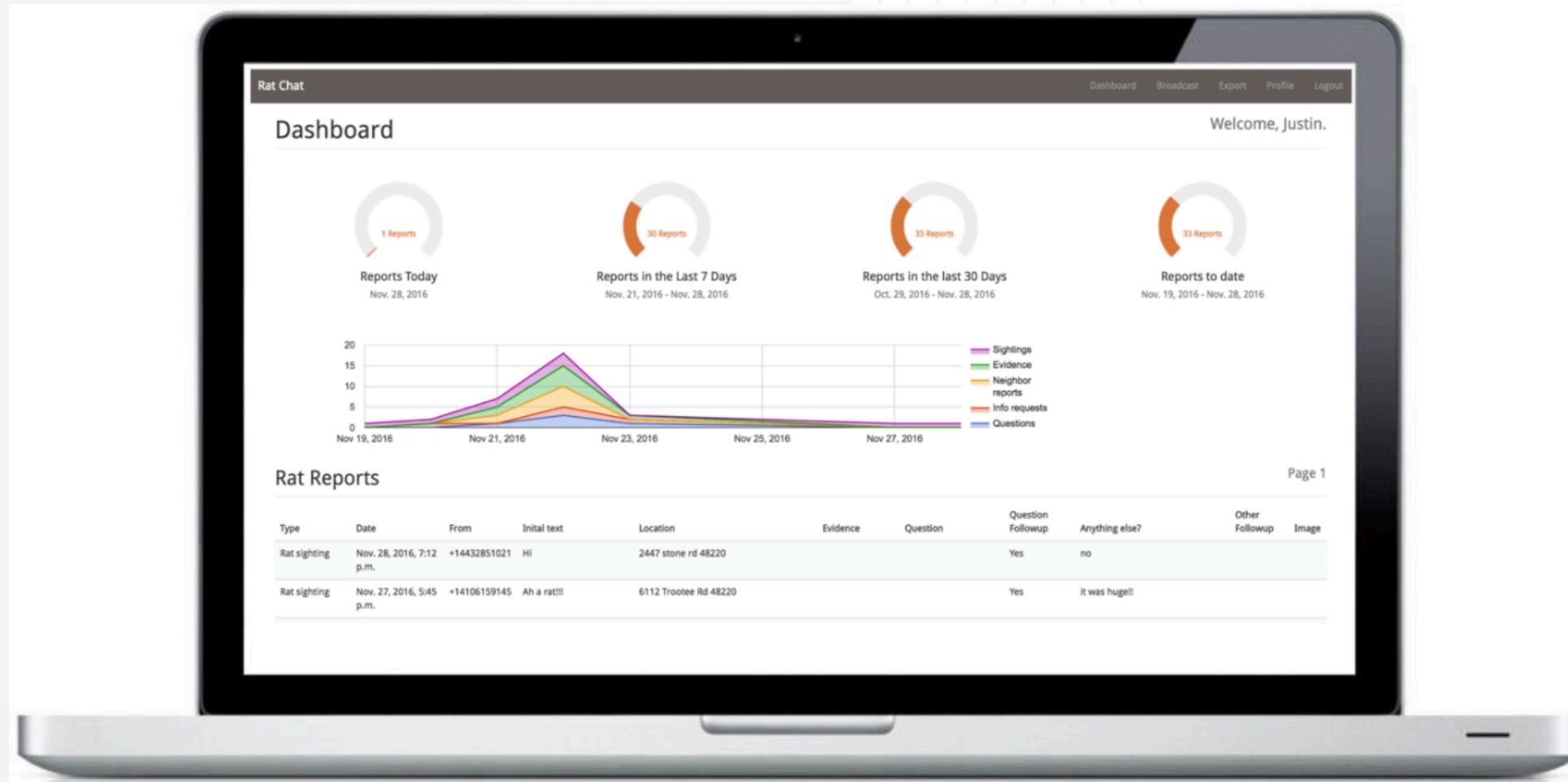
**FIREBIRD:** Predictive Modeling for Fire Inspections



**RAT CHAT:** Texting system for crowdsourcing rodent monitoring

To: +1 (248) 206-3149	Details	To: +1 (248) 206-3149	Details	To: +1 (248) 206-3149	Details
SMS with +1 (248) 206-3149 Today, 4:39 PM		SMS with +1 (248) 206-3149 Today, 4:39 PM		SMS with +1 (248) 206-3149 Today, 4:39 PM	
<b>Hi Rat Chat!</b>		<b>Hi Rat Chat!</b>		<b>Hi Rat Chat!</b>	
Hello! Please reply with one of the following numbers. 1: I saw a rat. 2: Rat evidence. 3: Neighbors have rats. 4: Rat prevention. 5: Question.	2	Hello! Please reply with one of the following numbers. 1: I saw a rat. 2: Rat evidence. 3: Neighbors have rats. 4: Rat prevention. 5: Question.	2	Hello! Please reply with one of the following numbers. 1: I saw a rat. 2: Rat evidence. 3: Neighbors have rats. 4: Rat prevention. 5: Question.	2
Oh no! What type of evidence did you see? Please reply with what you saw in the next 30 minutes. Examples: rat burrow.		A burrow!		Oh no! What type of evidence did you see? Please reply with what you saw in the next 30 minutes. Examples: rat burrow.	
Where did you see this evidence? Please reply with an exact address.		Where did you see this evidence? Please reply with an exact address.		331 Catherine St	
<b>Text Message</b>	😊	<b>Text Message</b>	😊	<b>Text Message</b>	😊

**RAT CHAT:** Texting system for crowdsourcing rodent monitoring



**RAT CHAT:** Texting system for crowdsourcing rodent monitoring

# A whiff of citizen engagement powers Pittsburgh's new air pollution app

A new tool from Carnegie Mellon University's CREATE Lab reports on poor air quality with help from a sensor almost everyone has: the human nose.



By [Jason Shueh](#)

JANUARY 16, 2017 5:25 PM

BIO ▾



**SMELL PGH:** Using phones to collect environmental data

Settings      **Smell PGH**

How does your air smell right now?

	1 Just fine!
	2 Barely noticeable
	3 Definitely noticeable
	4 It's getting pretty bad
	5 About as bad as it gets!

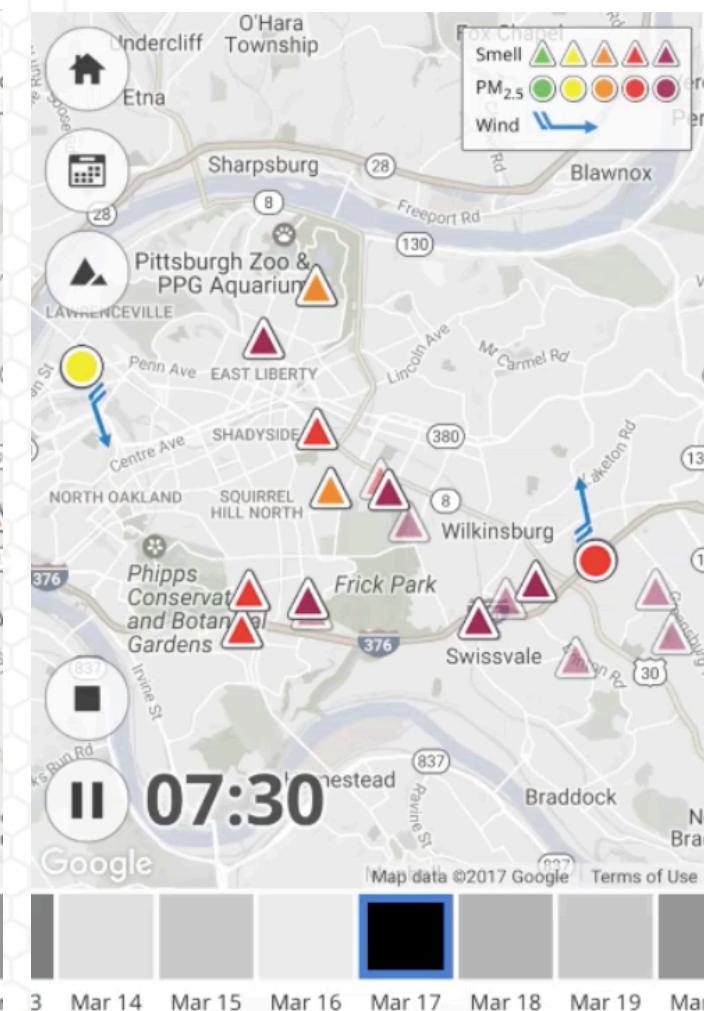
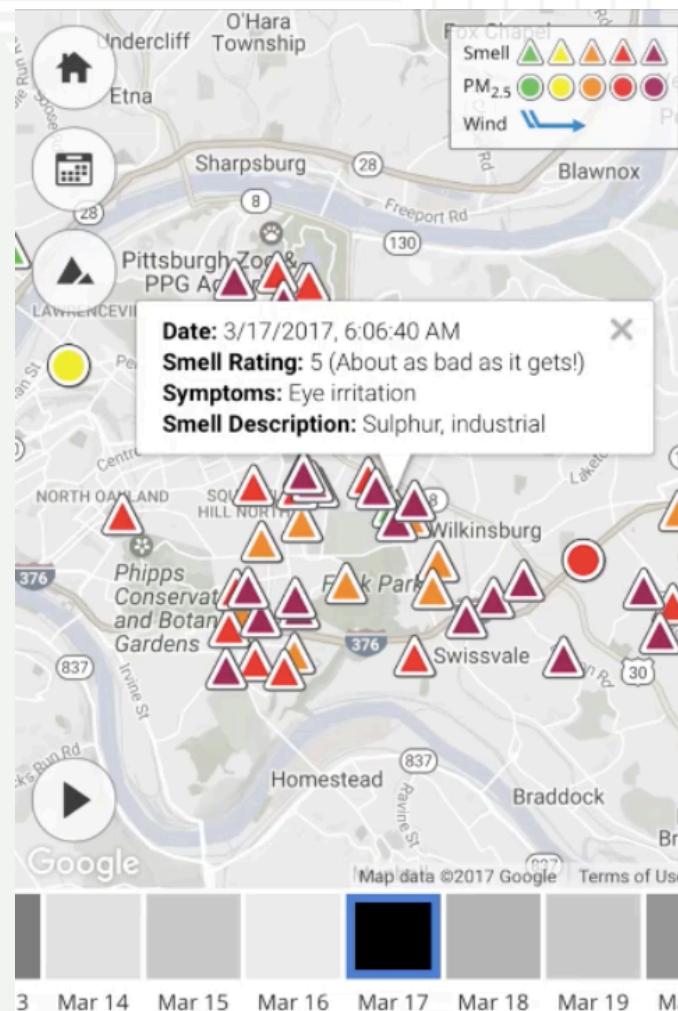
Describe the smell or source of odor  
 e.g. industrial, woodsmoke, rotten-eggs

Any symptoms linked to the odor?  
 e.g. headache, sore throat, eye irritation

Add a personal note to the Health Department

Map data ©2017 Google Terms of Use

Mar 14 Mar 15 Mar 16 Mar 17 Mar 18 Mar 19 Mar 20



**SMELL PGH:** Using phones to collect environmental data

*activity:*

***DEFINE + SPECIFY + PROPOSE***

# ***DEFINE + SPECIFY + PROPOSE***

**DEFINE** NAME: ..... ①-②-③

What is the challenge?

**DEFINE** NAME: ..... ①-②-③

Who is impacted by this challenge? Which citizens? Which parts of your local government? Which departments or agencies? Which businesses?

Who is impacted by this challenge? Who is impacted by this challenge? Who is impacted by this challenge?

What do you know? What sources inform your perception of your challenge? What data or information exists?

What would you like to know? What new sources could inform your perception? What data or information would be nice to have?

What is your current approach to the challenge? What is the current status of the challenge? Who and what are involved in addressing the challenge right now?

Who Evidence  
What Evidence  
Who Evidence  
What Evidence  
Who Evidence  
What Evidence  
Who Evidence  
What Evidence  
Who Evidence  
What Evidence



**SPECIFY** NAME: ..... ①-②-③

Restate the challenge & audience

What is the goal of addressing this challenge?

**SPECIFY** NAME: ..... ①-②-③

Restate the challenge & audience

What factors contribute to the challenge? Political? Social/Cultural? Economic? Educational/Informational? Environmental? Other?

What are the impacts of the challenge? Political? Social/Cultural? Economic? Educational/Informational? Environmental? Other?

Who Evidence  
What Evidence  
Who Evidence  
What Evidence  
Who Evidence  
What Evidence  
Who Evidence  
What Evidence  
Who Evidence  
What Evidence



**PROPOSE** NAME: ..... ①-②-③

Challenge One-sentence description of the challenge in terms of its audience

Goal(s) One-sentence description of what results from addressing the challenge

How will you address the challenge?

Solution Who are the beneficiaries? Who are the partners?

What needs to be procured? What data needs to be collected?

What skills or people are needed? How much money is needed?

Resources & Plan What is a success and how can it be measured?

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

20 min

20 min

20 min

## DEFINE

NAME: *John Smith*

1 2 3

What is the challenge?

*Out-of-control rodent infestation*

Who is impacted by this challenge?

Which citizens? Which parts of your local government?  
Which departments or agencies? Which businesses?

- 1. Residents in public housing*
- 2. Local restaurants worried about health code*
- 3. Animal control has too many requests, not enough time*

What do you know?

What sources inform your perception of your challenge?  
What data or information exists?

- 1. 311 complaints*
- 2. Animal control tracks data on activities*
- 3. Twitter messages*

Evidence  
What would you like to know?What new sources could inform your perception?  
What data or information would be nice to have?

*How many rats there actually are!  
All the complaints, reports, and tweets don't tell us  
much about what we are dealing with.*

What is your current approach to the challenge?

What is the current status of the challenge?  
Who and what are involved in addressing the challenge right now?

- 1. Animal control addressing issue through  
complaints through normal request system;*
- 2. Information campaign to businesses and residents  
about how to inhibit rat population*

SPECIFY

NAME: *John Smith*

1 2 3

Restate the challenge &amp; audience

***Rat infestation overwhelming animal control***

What is the goal of addressing this challenge?

Increase transparency/accountability? Decrease waste?  
Include more people? Generate new revenue? Other?

- 1. Reduce one-off calls to animal control***
- 2. Improve public health perception of our town***
- 3. Spur new restaurants opening in area***
- 4. More involvement from citizens***

What factors contribute to the challenge?

Political? Social/Cultural? Economic?  
Educational/Informational? Environmental? Other?

- 1. Lack of data/information about the extent of the infestation***
- 2. Animal control is short staffed due to budget cut***
- 3. Waste management currently short staffed due to three recent retirees (trash attracts rats!)***
- 4. Local officials struggle to justify with solid data***

What are the impacts of the challenge?

Political? Social/Cultural? Economic?  
Educational/Informational? Environmental? Other?

- 1. Conflicting reports about the rat population***
- 2. Restaurants threatening to move away from downtown***
- 3. Hospitals seen increased number of patients with rat-related illnesses (HPS, Leptospirosis)***

# PROPOSE

NAME: *John Smith*

1 2 3

## Challenge

One-sentence description of the challenge in terms of its audience

***Help animal control address rodent infestation***

## Goal(s)

One-sentence description of what results from addressing the challenge

***Reduce one-off calls related to rats***

## Solution

How will you address the challenge?

***Crowdsouce data collection of rat infestation using an app***

## Who are the beneficiaries?

***Animal control  
Local officials (budget)***

## Who are the partners?

***Animal control  
Local app shop***

## Resources & Plan

What needs to be procured?

***Don't know (not familiar with apps)***

What data needs to be collected?

***Where, when, and how many the rats exist***

What skills or people are needed?

***App developer  
GIS, Data Analysis***

How much money is needed?

***10-15k for app (?)  
75k for data analyst  
\*\*Grant Needed\*\****

What is a success and how can it be measured?

***Number of users and reports (estimate rat population); 50% reduction in rats by next year***



# ***DEFINE + SPECIFY + PROPOSE***

<b>DEFINE</b> Who  Evidence  What	<p>NAME: ..... (1) (2) (3)</p> <p>What is the challenge?</p> <p><b>DEFINE</b> NAME: ..... (1) (2) (3)</p> <p>Who What is the challenge?</p> <p><b>DEFINE</b> NAME: ..... (1) (2) (3)</p> <p>Who is impacted by this challenge? Which citizens? Which parts of your local government? Which departments or agencies? Which businesses?</p> <p>What do you know? What sources inform your perception of your challenge? What data or information exists?</p> <p>What would you like to know? What new sources could inform your perception? What data or information would be nice to have?</p> <p>What is your current approach to the challenge? What is the current status of the challenge? Who and what are involved in addressing the challenge right now?</p>
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20 min

<b>SPECIFY</b>	NAME: .....	(1) (2) (3)
Restate the challenge & audience		
What is the goal of addressing this challenge?		
<b>SPECIFY</b>	NAME: .....	(1) (2) (3)
Restate the challenge & audience		
What	What is the goal of addressing this challenge? Increase transparency/accountability? Decrease waste? Include more people? Generate new revenue? Other?	
What	What factors contribute to the challenge? Political? Social/Cultural? Economic? Educational/Informational? Environmental? Other?	
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20 min

<b>PROPOSE</b>	NAME: .....	(1)-(2)-(3)																				
Challenge	One-sentence description of the challenge in terms of its audience																					
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Jan	/	Feb	/	Mar	/	Apr	/	May	/	Jun	/	Jul	/	Aug	/	Sep	/	Oct	/	Nov	/	Dec

20 min

*Questions?*