
Introduction to Crowdsourcing in Research

DLab Presentation, April 16, 2019

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Agenda

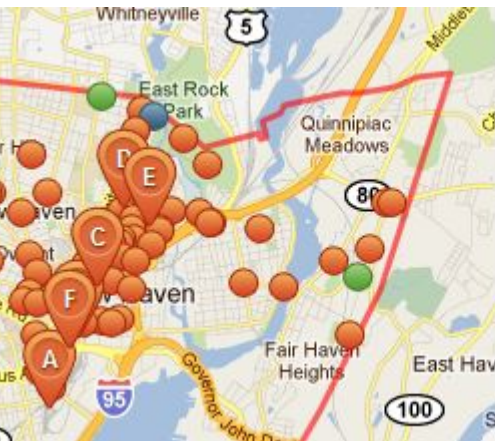
- Introduction to crowdsourcing
- Crowdsourcing uses
- Benefits and concerns
- Case study: crowdsourcing in transportation safety
- Discussion and crowdsourcing activities

Crowdsourcing

- uses collective knowledge to meet organizational or research-oriented goals
- is a bottom-up approach to meet top-down goals
- involves mutually beneficial outcomes
- is used to gather information, solve problems, generate and prioritize ideas, and complete tasks

Crowdsourcing Uses

- 1) Information Gathering
 - SeeClickFix
 - Ushahidi
 - online survey platforms







- C Streetlight out (1)**
258 Bradley St New Haven, CT
1 day ago - Fix it! - Share
- D Street light out (1)**
Whitney Ave & Canner St New Haven, CT
1 day ago - Fix it! - Share
- E street light not working properly (2)**
790 Orange St New Haven, CT

A screenshot of the Ushahidi Alpha website. The header includes the title "Ushahidi Alpha" and the tagline "Crowdsourcing crisis information." Navigation links for Home, Reports, Submit an Incident, Get Alerts, and How to Help are present. Below the header is a "MEDIA FILTER" section with tabs for REPORTS, NEWS, PICTURES, VIDEO, and ALL. A "CATEGORY FILTER" section on the right lists various incident types: RIOTS, DEATHS, PROPERTY LOSS, SEXUAL ASSAULT, INTERNALLY DISPLACED PEOPLE, GOVERNMENT FORCES, CIVILIANS, LOOTING, and PEACE EFFORTS. The main content area features a map of Kenya with numerous red circular markers of varying sizes indicating incident locations. At the bottom, there is a date range selector and a search bar.

Crowdsourcing Uses

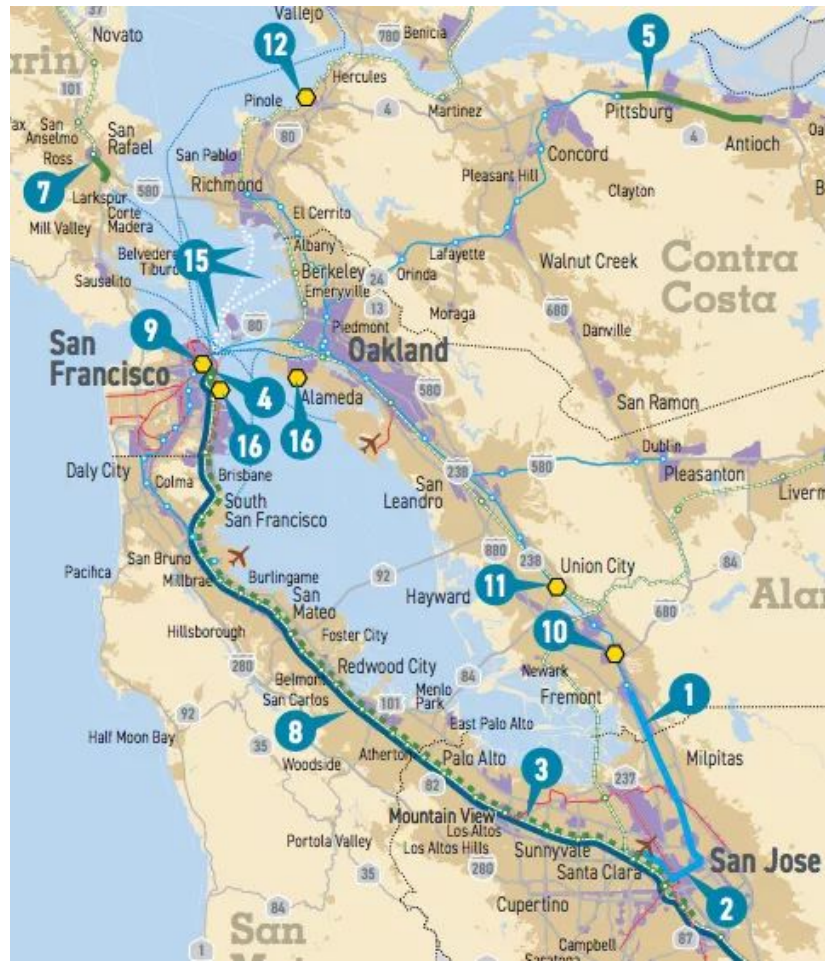
2) Empirical Problem Solving

- Innocentive
- GitHub

	<p>Novel Methods for Dehairing of Animal Hides</p> <p>Deadline: Jan 07 2019 23:59 EST Active Solvers: 63</p> <p>Tags: Chemistry, Engineering/Design, Physical Sciences, RTP</p> <p>+ View More</p>	<p>\$30,000 USD</p> <p>OPEN</p>
	<p>Maintaining Bacterial Viability in Ambient Dairy Products</p> <p>Deadline: Dec 01 2018 23:59 EST Active Solvers: 111</p> <p>Tags: Chemistry, Engineering/Design, Food/Agriculture, Life Sciences, Theoretical-IP Transfer</p> <p>+ View More</p>	<p>\$30,000 USD</p> <p>OPEN</p>
	<p>New Augmented Reality Solutions for the Energy Market</p> <p>Deadline: Dec 02 2018 23:59 EST</p> <p>Tags: Computer Science/Information Technology, Enel, Engineering/Design, Social Innovation, Ideation</p> <p>+ View More</p>	<p>\$20,000 USD</p> <p>OPEN</p>
	<p>Enel Open Innovability Challenge: Vegetation Growth Estimation</p> <p>Deadline: Jan 10 2019 23:59 EST</p> <p>Tags: Business/Entrepreneurship, Computer Science/Information Technology, Enel, Engineering/Design, Food/Agriculture, Physical Sciences, Social Innovation, eRFP</p> <p>+ View More</p>	<p>varies</p> <p>OPEN</p>

Crowdsourcing Uses

- 3) Idea generation, prioritization and decision-making
 - MTC's Transformational Projects



Crowdsourcing Uses

4) Tasking

- Amazon's Mechanical Turk
- Zooniverse

The screenshot shows the Amazon Mechanical Turk interface. At the top, there's a navigation bar with "Your Account", "HITS", and "Qualifications" buttons. Below that, a search bar contains "Find HITS containing youtube that pay at least \$". The main content area displays a list of HITs with the following details:

HIT Title	Requester	HIT Expiration Date	Reward	HITs Available
Survey about your healthcare-seeking behaviors	Omer Research Group	Apr 16, 2017 (3 weeks 4 days)	\$0.05	500
Find data in a financial statement	Data Quarterly	Mar 23, 2017 (1 day 8 hours)	\$0.08	10
Describe Images in Hindi	SLS-2	Mar 24, 2017 (2 days 9 hours)	\$0.15	3505
Find the address for these rental listings	VacationrentalAPI	Mar 23, 2017 (20 hours 1 minute)	\$3.00	121
Write a 75+ word summary of the article we provid:	Net Success Group	Mar 25, 2017 (3 days)	\$0.25	4

Crowdsourcing Issues

- Motivation
- Representativeness of participants
- Privacy and legality
- Misuse of the platform
- Critical mass
- Ethical issues, “crowdsploitation”

Planning out a Crowdsourcing Project

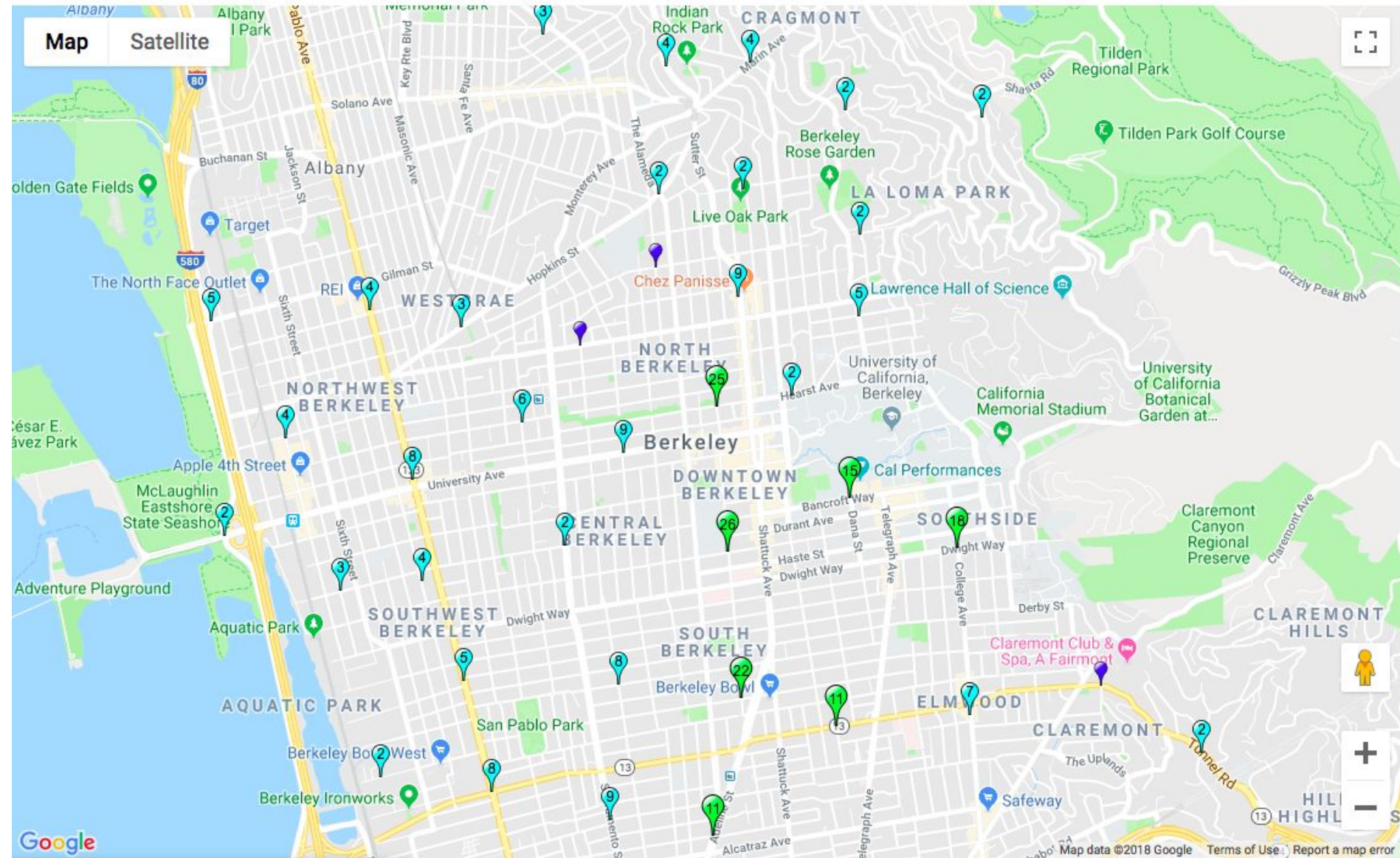
- What issue are you trying to address?
- Who can help you solve this problem? How will this group benefit from helping?
- What are the best ways for this group to be involved?
- How can you reach this group?

Crowdsourcing Tips

- Use a crowdsourced platform or dataset that already exists
- understand your crowd's motivations to (and not to) participate
- Recognize and reduce barriers to participation
- Communicate mutual benefits

Case Study: Crowdsourcing in Transportation

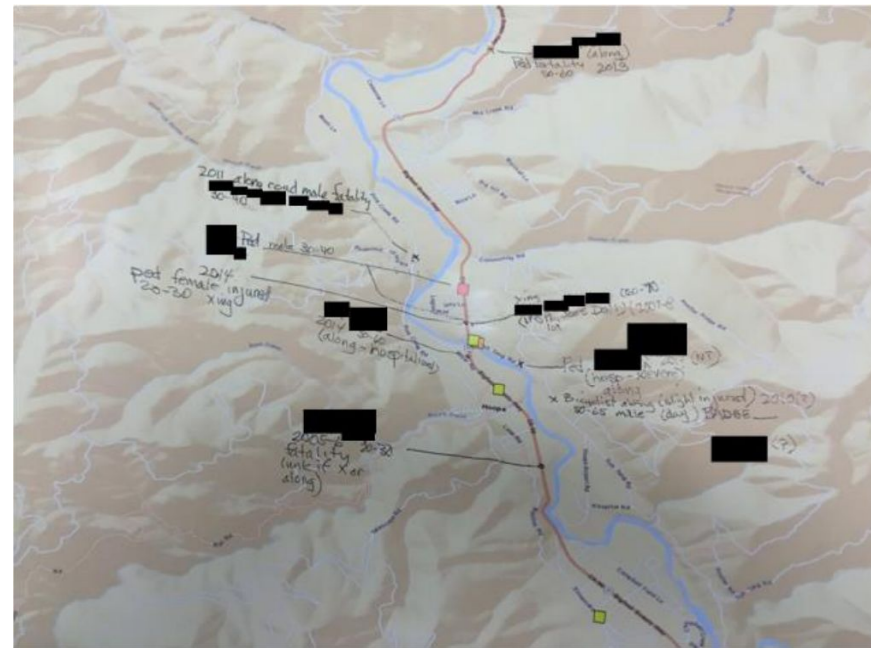
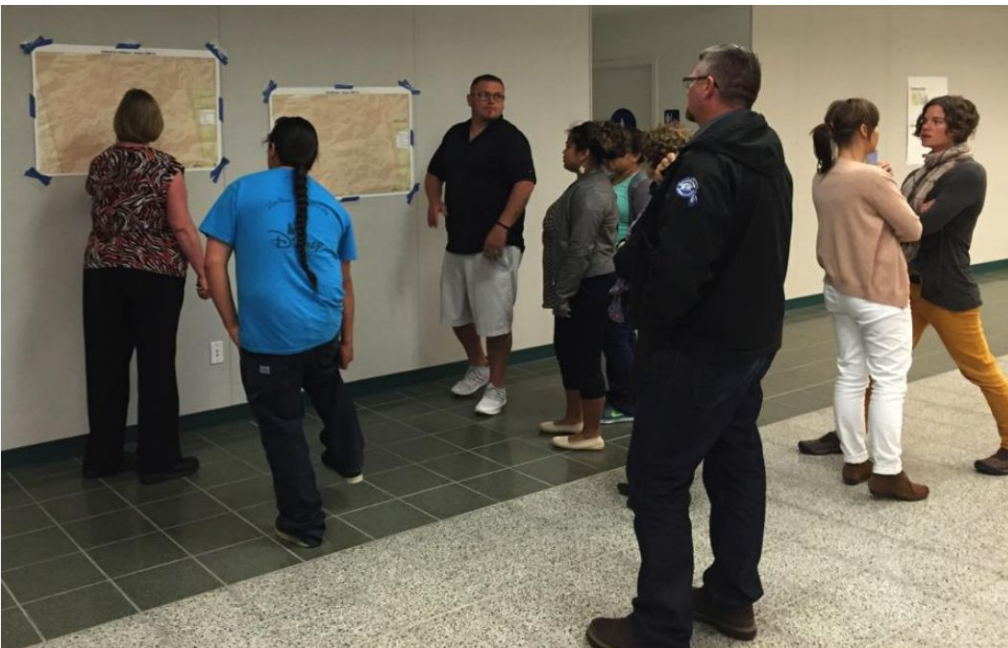
Police Reported Collisions



Local Knowledge

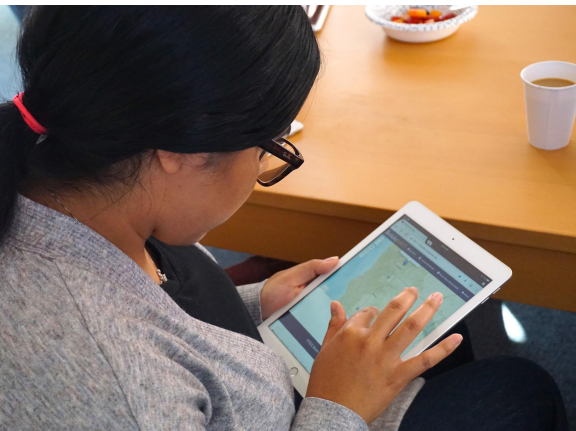


Collection of Local Knowledge



Street Story

- Street Story helps community groups and agencies collect and understand information that is important for transportation safety but is difficult to gather

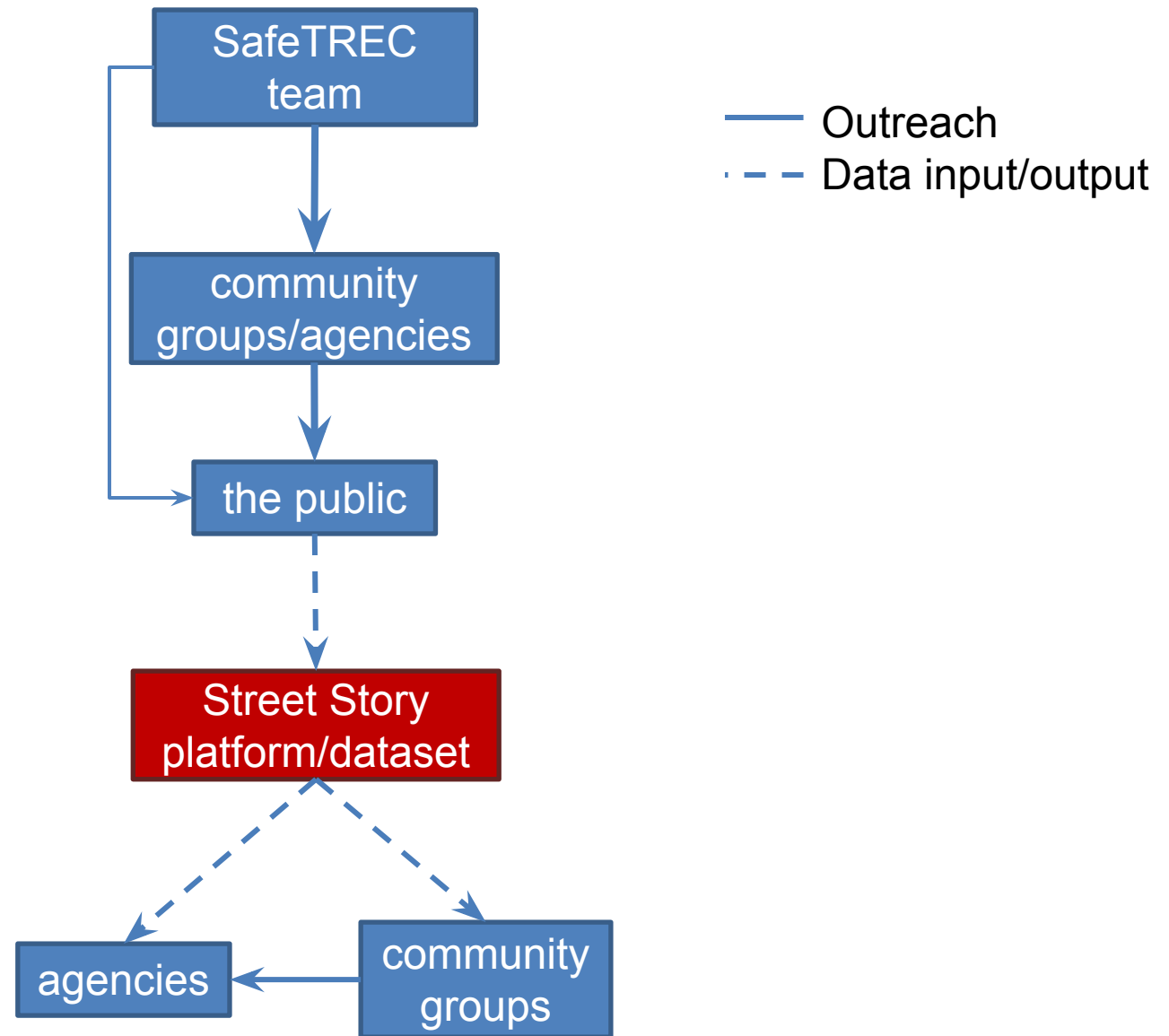


Designing the Street Story Program

- Interviews, focus groups, pilot testing

Key Partners	Key Activities	Value to Participants	Participant Relationships	Participant Segments
	Key Resources			
Cost			Revenue Streams	

Street Story Program Model

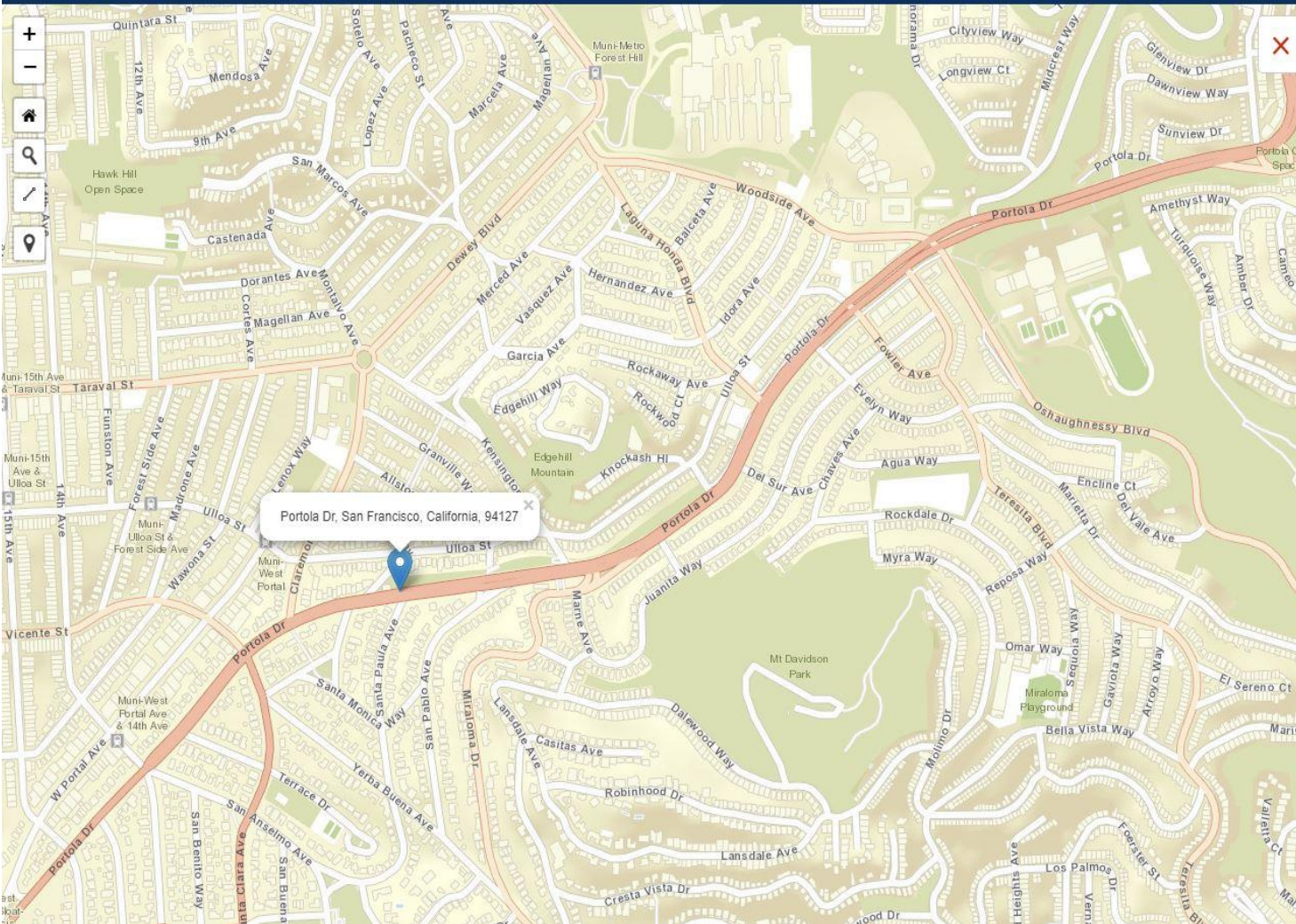


How to Report

<https://streetstory.berkeley.edu/>

Street Story | Give your input on safe streets
By SafeTREC, UC Berkeley

📍 Make Report 📊 See Data 📖 Resources 👤 Community Stories ⓘ About

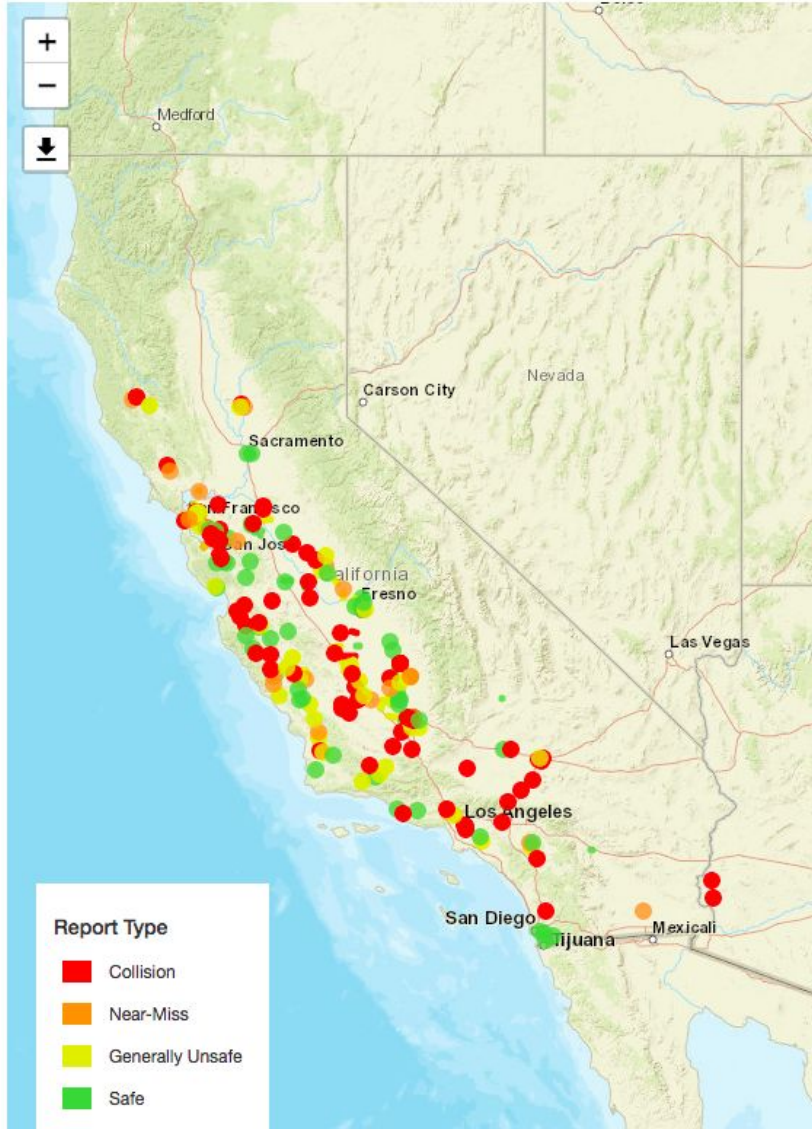


Portola Dr
San Francisco, California, 94127

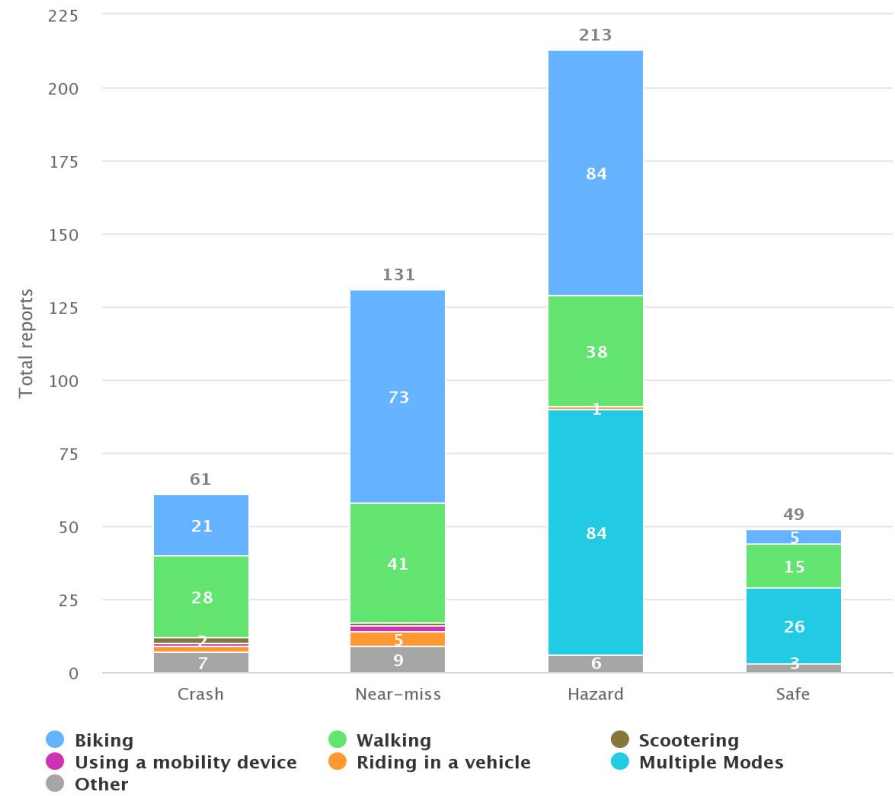
- Crash
- Near-miss
- Hazard
- Safe Place

Street Story Data

Report Map



Travel Modes Summary



Report Type	Count	Percent
Crash	61	13 %
Near-miss	131	29 %
Hazard	213	47 %
Safe	49	11 %
Total	454	

Street Story Data

Demographic Information

Gender	Count	Percent
Female	113	32 %
Male	171	49 %
Non Binary	2	1 %
No Response	63	18 %

Participation in community meeting	Count	Percent
Often (more than 5 times in the last 5 years)	74	21 %
Sometimes (1-5 times in the last 5 years)	107	31 %
Never	104	30 %
No Response	64	18 %

Race/Ethnicity	Count	Percent
American Indian/Alaska Native	7	2 %
Asian	33	9 %
Black/African American	6	2 %
Latino/Hispanic	29	8 %
Native Hawaiian/Pacific Islander	3	1 %
White	211	56 %
Other	27	7 %
No Response	62	16 %

Age	Count	Percent
18-25	21	6 %
26-64	237	68 %
65 years or older	14	4 %
No Response	77	22 %

Have disability	Count	Percent
Yes	5	1 %
No	149	43 %
No Response	195	56 %

Resident in area	Count	Percent
Yes	222	64 %
No	60	17 %
No Response	67	19 %

First time respondent	Count	Percent
Yes	265	76 %
No	84	24 %
No Response	0	0 %

Street Story Narratives

“This intersection experiences regular collisions. On several occasions a car has run up onto the sidewalk. There have been **numerous close calls** with pedestrians. Cars frequently run the red light at this intersection.”

Addressing Crowdsourcing Issues

- Motivation and mutual benefits
- Participant representativeness
- Privacy issues
- Misuse of the platform

Lessons Learned

1. Recognize when to collect data, and when to use existing sources
2. Understand participants' motivation and speak in a language that participants understand
3. Recognize the time it takes to build and maintain relationships

Resources

- UC Berkeley Coalition for Education & Outreach
- FieldScope - platform for hosting citizen science project data
<http://www.fieldscope.org>
- SciStarter - Where to find the citizen science projects and audiences <https://scistarter.org>
- Citizen science: crowdsourcing for research, Catherine Lichten et al., University of Cambridge (2018)
A Methodological Framework for Crowdsourcing in Research, Michael Keatinga and Robert D. Furberg, RTI International (2013)

Activity - Crowdsourcing Planning

Key Partners	Key Activities	Value to Participants	Participant Relationships	Participant Segments
	Key Resources			
Cost		Revenue Streams		

<p>Key Partners</p> <p>Current</p> <ul style="list-style-type: none"> -California Walks -CPBST program -focus cities network -OTS <p>Potential</p> <ul style="list-style-type: none"> -Active Transportation Resource Center -transportation consultants -public health community -MPOS, local agencies -bike/ped advisory commissions 	<p>Key Activities</p> <p>Production: produce a survey, database, graphs/tables/maps</p> <p>Problem-solving: technical assistance for community outreach</p> <p>Platform: updates, management</p> <p>Relationships: relationship building and maintenance with community groups and agencies</p>	<p>Value to Participants</p> <p>Community grps/agencies:</p> <ul style="list-style-type: none"> -Free technical assistance for community engagement for transportation safety (through survey tool, data analysis and reporting based on survey tool) -public information on community safety needs <p>The public:</p> <ul style="list-style-type: none"> -convenient, anonymous way to provide information about safety issues 	<p>Participant Relationships</p> <ul style="list-style-type: none"> a) Acquisition b) Retention <p>Community grps/agencies:</p> <ul style="list-style-type: none"> a) -CPBSTs -TIMS and SafeTREC media -conferences/workshops/webinars -word of mouth -direct outreach b) -SS newsletter -direct outreach, personal assistance -webinars, group assistance -co-creation (important part of building and sustaining database) <p>The public:</p> <ul style="list-style-type: none"> a) Through CS2, individually through media b) None 	<p>Participant Segments</p> <p>Primary: Community groups working on transportation safety</p> <p>Secondary: local gov't agencies</p> <p>Tertiary: the general public</p>
<p>Cost</p> <ul style="list-style-type: none"> -website maintenance, database management, staff salary, travel, materials 	<p>Revenue Streams</p> <ul style="list-style-type: none"> -grant funding 			

Key Resources

- website
- Existing relationships with community groups and agencies
- human resources: tech team, program management team

Channels (how to reach participant segments)

- Awareness: CPBSTs, newsletter, TIMS, other SafeTREC programs
- Evaluate whether to use SS: About explanation on website, SS updates
- Purchase: online
- Delivery: online, customer support

Activity - Street Story Reporting and Data

<https://streetstory.berkeley.edu/>

Street Story Give your input on safe streets
By SafeTREC, UC Berkeley

Make Report See Data Resources Community Stories About

Portola Dr, San Francisco, California, 94127

Portola Dr
San Francisco, California, 94127

Cancel Next

- Crash
- Near-miss
- Hazard
- Safe Place

Sources

- 1) [Crowdsourcing, by Daren C. Brabham \(2013\)](#)
- 2) [Crashes on and Near College Campuses: A Comparative Analysis of Pedestrian and Bicyclist Safety](#). Loukaitou-Sideris, Medury, et al. Journal of the American Planning Association Vol. 80, Iss. 3, 2014.
- 3) [Investigating the underreporting of pedestrian and bicycle safety crashes in and around university campuses-a crowdsourcing approach](#). Medury, Grembek, et al. Accident Analysis and Prevention, 2017.

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