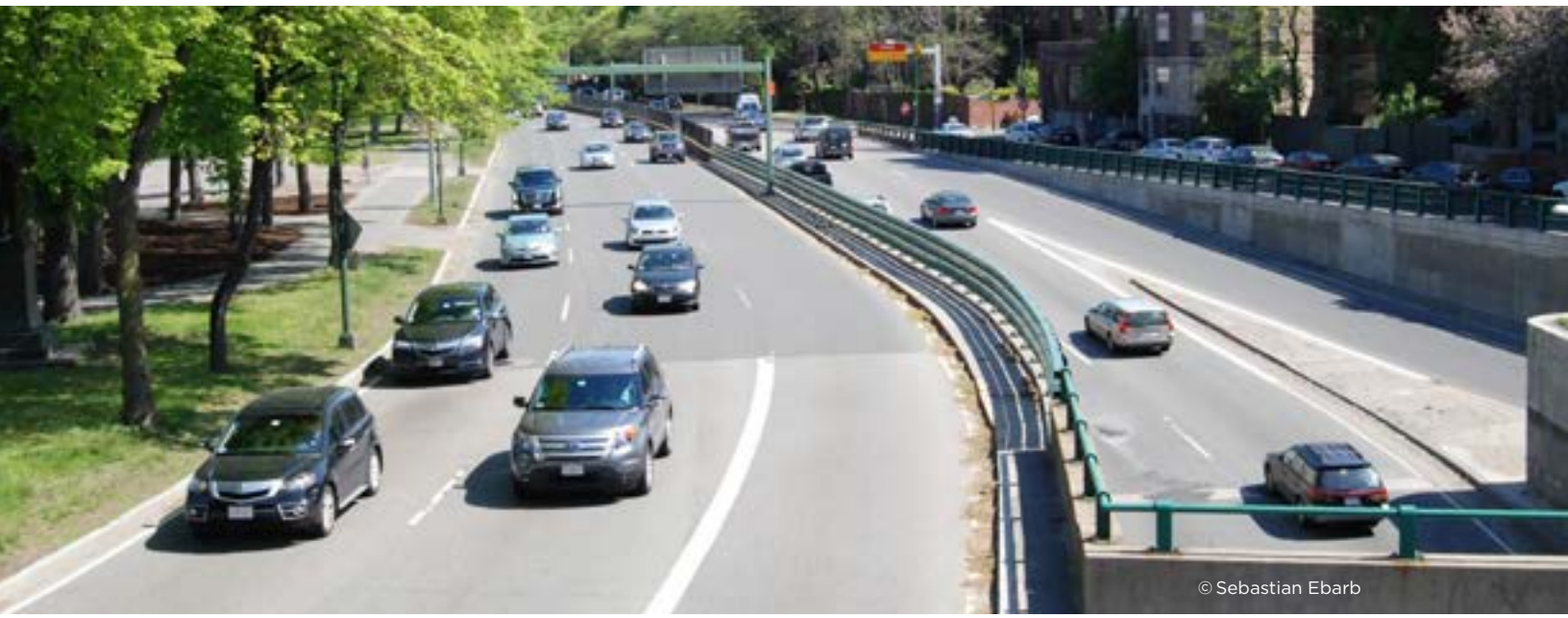
Boston's Safest Driver

An Engaged Cities Award case study created by Cities of Service in partnership with 2018 award finalist Boston, Massachusetts.

Executive Summary

Boston has a stubborn reputation as a city of bad drivers. With a high rate of collisions per capita, this has real consequences for road safety. City hall partnered with a private technology firm to develop an app called Boston's Safest Driver, which "gamifies" safe driving by turning the practice into a competition. The free app provides trip-by-trip driver feedback about safe and unsafe behavior behind the wheel, and the city orchestrated a public contest with rewards that enticed drivers to improve their habits. The app encouraged better driver behavior and gathered user-generated data that enhanced the city's ability to make targeted interventions around speed limits, reducing traffic, and road design.



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The Challenge

As one of the oldest cities in the U.S., Boston has narrow, winding streets dating back to the 17th century and few areas with an ordered street grid. That street pattern is not conducive to automobile traffic and is likely one contributing factor to Boston's driving behavior challenges.

The city and metro area have also grown considerably in population in recent years. Boston has added 100,000 residents since 2008, with a current population of 685,000, while the metro area has grown almost 6 percent since 2010 to a current population of 4.8 million. That growth has been driven by the education, medical, and technology sectors, which have drawn affluent residents likely to own private automobiles. From 2012 to 2017, the number of cars in Boston increased faster than the city's population.

Boston adopted a Vision Zero policy in 2015. Vision Zero is an international movement to set a goal of zero traffic deaths or serious collisions by 2030. Boston created a Vision Zero Task Force that includes representatives from different city departments such as transportation, police, fire, emergency medical, and public health. Stakeholders from outside city government in the pedestrian and cycling advocacy communities are also members. The task force focuses on the three Es: engineering, education, and enforcement. Thus far, initiatives have employed traditional public education techniques, such as a billboard warning against texting and driving.

Boston's bad driving is widely recognized in the city, though part of the challenge is that the average driver externalizes the problem and does not take responsibility.

"If you ask people if they are a bad driver, they say no, they are all uniquely qualified to drive in Boston," said Kristopher Carter of the Office of New Urban Mechanics, which helped design and implement Boston's Safest Driver.

According to the city's data dashboard, from 2015 to 2018 there were a yearly average of 783 pedestrian incidents, 413 cyclist incidents, and 3,122 motorist incidents that required emergency medical services. In 2017, the most recent year for which data is available, there were 14 traffic fatalities in Boston, down from 21 the previous year and 23 two years prior.

The annual Allstate America's Best Drivers Report has repeatedly confirmed that Bostonians rank among the worst drivers in the U.S. Every year since 2014, Boston has landed at 199 or 200 out of 200 of cities based on the frequency of collisions.

The Allstate report provided the Office of New Urban Mechanics with empirical ammunition to make the case that a stronger public campaign was needed to encourage better driver behavior, but certain traditional tools like lower speed limits have limited efficacy.

The city council lowered the base speed limit on city streets from 30 to 25 in 2017. A study by the Insurance Institute for Highway Safety found the move decreased driving above 35 mph by 29.3 percent. The city is considering further lowering the speed limit to 20 mph as is already the case in New York and Seattle, but photo enforcement of speeding is illegal in Massachusetts so enforcement would add to the workload of police officers.

"We felt like we needed to do something that was slightly different to at least call out the dangers of distracted driving and speeding," Carter said. "We had a hard time getting enforcement on speeding as the police had other priorities."

The Solution: Boston's Safest Driver

In December 2015, staff from the Office of New Urban Mechanics attended Transportation Nudges, a Boston University conference focused on innovative approaches to improving individual driver behavior, as well as encouraging safer cycling, walking, and public transit habits. One of the presenters was Hari Balakrishnan, CEO of Cambridge Mobile Telematics, a software company that develops mobile data sensing and smartphone telematics — monitoring vehicle behavior via the GPS embedded in smartphones — with the goal of encouraging better driver behavior in exchange for lower consumer insurance premiums.

The chance encounter with Balakrishnan offered a key partnership for city hall. "One of best telematics companies in the nation happens to be in our backyard," Carter said.

In early 2016, Balakrishnan made a proposal to the Vision Zero Task Force: using an app developed by Cambridge Telematics, give prizes to drivers rewarding them for safe behavior. The idea was intriguing, but there were legal considerations around the city government offering cash prizes to citizens. City staff were hesitant to offer monetary rewards for driving from the city at a time when city mobility policy was focused on encouraging people to take alternatives to private automobiles.

The Office of New Urban Mechanics decided to look for a fiscal underwriter for the project. The Allstate report was an integral part of the pitch to external partners. After inquiring with a dozen companies and meeting in person with five, the Office of New Urban Mechanics eventually struck a match with the Arbella Insurance Foundation.

The foundation was an ideal partner for two reasons. First, it was already familiar with Cambridge Mobile Telematics. Second, it had an existing safe-driving program called Distractology that focused on distracted driving. As a result, the funder aligned with the mission and even provided in-kind marketing for Boston's Safest Driver by deploying its Distractology trailer, a touring trailer in which people can learn about distracted driving through simulations at public events.

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>
> **KRISTOPHER CARTER, CO-CHAIR OF THE MAYOR'S OFFICE OF NEW URBAN MECHANICS**

Arbella Insurance Foundation donated $30,000 to fund Boston's Safest Driver. Cambridge Mobile Telematics developed the app for $6,000, a discounted price offered to a public sector client for a civic cause. Boston's Safest Driver was a slightly customized version of the company's flagship program DriveWell. In addition to different color themes and logo from DriveWell's standard user interface, Boston's Safest Driver was structured around a leaderboard that differed depending upon whether the driver was in the Boston or regional prize pool. Both variations showed the user's comparison to the overall competition pool as well as "friends" in the competition that one could select with the app. The Boston variation allowed users to

sort the leaderboard by neighborhood; the regional variation allowed users to sort by town. Different from DriveWell, Boston's Safest Driver also awarded users badges for trips without a car in order to align with City of Boston policy goals to reduce driving. These non-car trips also showed up on the main screen for each user.

In addition to the app cost, $10,000 was set aside for prize money. The rest was used to hire a sweepstakes vendor to write the rules and regulations and manage the contest, as well as for marketing and promotion of the app.

Once the deal was signed in May 2016, the Office of New Urban Mechanics set a target launch of September 2016. The app went public at the end of that month, with the contest running from October to December and a goal of 5,000 users.

4,623 people ultimately download the app and over 190,000 trips were logged. The users covered 101 communities across 180 ZIP codes. All 23 Boston neighborhoods covering 51 ZIP codes participated.

Citizen Story: Deirdre Manning

Deirdre Manning thought she was a good driver. She had never been involved in an accident or received a ticket in her life. But she was a busy mother with a demanding job, and was often on the phone while shuttling her 16-year-old daughter around Boston. When her daughter got her learner's permit, Deirdre realized she wasn't setting a good example. So she downloaded the Boston's Safest Driver app onto her phone to find how good she really was and which habits she should be passing on to her daughter.

She was surprised at first by some of the behaviors that reduced her score, like cornering too quickly. She began to pay a lot more attention to the subtly changing speed limits throughout the city, and she stopped texting while driving.

It was harder than she thought. "It was a humbling experience," she said. "I had to put my ego in the backseat and let other cars pass me." In 2017, Deirdre was awarded the prize for Boston's Safest Driver and she is now a better example for her daughter.

Nuts and Bolts: How It Works

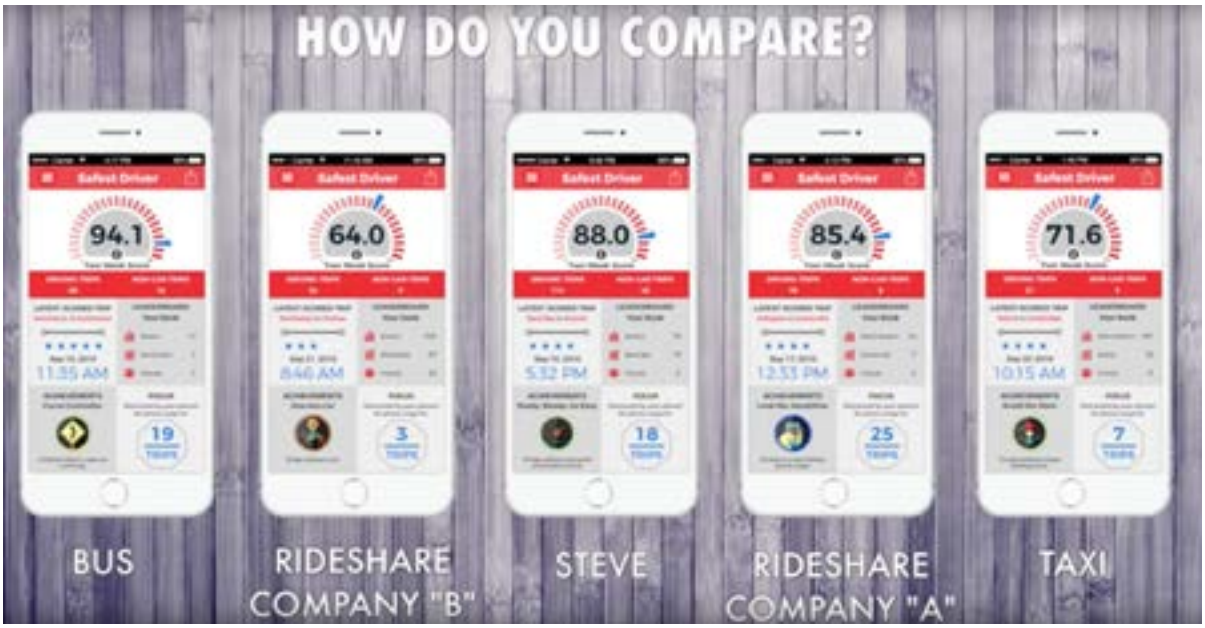
Boston's Safest Driver was available for download in the Apple Store and on Google Play. Users were encouraged to run the app in the background on their phone and the app would detect their mobility choice: by car, walking, biking, or transit. If by car, the app offered a trip report at the end of each journey with a score of 1 to 5 based on how well the user did on issues like speeding, hard braking, using a phone while driving, and taking corners too sharply. The leaderboard of competitors was updated daily in the app, but users only knew other users by their handles, not their real names.

"The trick was to never give a score so bad that people delete the app," Carter said. "We want them to think there is room for improvement, not that they are a lost cause."

In an effort to limit privacy concerns, users were only required to input their ZIP code to confirm they lived in the Boston area and their email address in order to be contacted if they won — no other demographic data was collected. Privacy concerns were a large part of the workload during the app development phase and nearly derailed the project.

"People are more reluctant to give data to government than to large corporations," Carter said. "We were particularly cognizant that we should hold ourselves to a really high standard, higher than private corporations, due to the consistent lack of trust between certain communities and government."

Nevertheless, the premise behind Boston's Safest Driver posed an obstacle.



Boston's Safest Driver Privacy Policy

The City values participants' privacy and has partnered with Cambridge Mobile Telematics (CMT) to ensure that data collected in this competition is anonymized within sixty (60) days after the competition ends and cannot be used for anything else. Driver scores and the data listed in the table above will be collected at the individual level by CMT but provided to the City in summarized reports at the ZIP code level. The email you supply will be used in conjunction with your score to identify weekly winners. The City receives email addresses for purposes of communication about this competition. For the purpose of contacting selected winners for prize distribution, those emails will be shared with our partner CFA promotions for the sole purpose of this project. CMT has its own privacy policy that governs the individual level data it collects during the competition.

"Imagine you are trying to get 670,000 city residents to download this app and then imagine you are a government that is going to track every single movement they make, where they are speeding, where they are taking turns too fast, and if they are playing with their phone," Carter said.

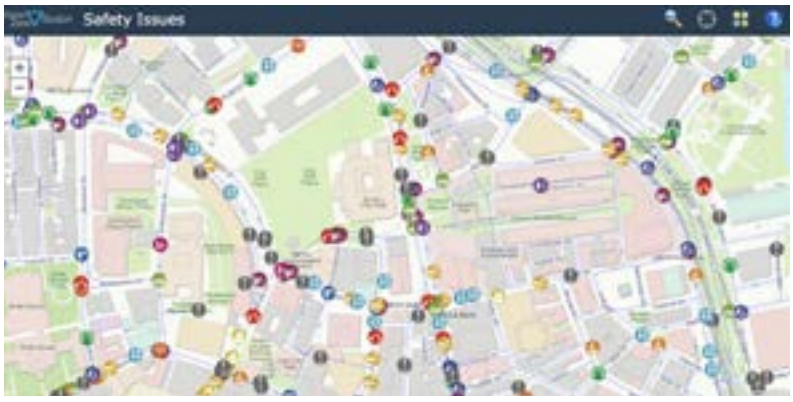
Boston has an open data policy, which made city ownership of the data a major risk to citizen trust as the data could be revealed under the Freedom of Information Act. "Our duty to the public was to offer a tool for self-reflection, not a tool for enforcement or embarrassment," Carter said.

The solution was for Cambridge Mobile Analytics to own the data with strict limits on how long it would exist. The privacy policy was written in plain English and reinforced in all public communications to promote the app.

Once ready for the public, city hall pursued a traditional rollout with a press release and a launch and event with Mayor Marty Walsh. The marketing budget paid for ads on billboards near train stations with high numbers of commuters who drove to the station, on buses, especially those that travel on highways, and in targeted social media ads. Local media provided extensive coverage as well. Stories about Boston's bad driving reputation are a perennial favorite for local media. One television news story about the app led to an immediate 1,000-person increase in app downloads.

During the 10-week contest, there were weekly drawings for the best driver, the newest driver to join the app, and those who most reduced their driving trips by taking other modes of transportation. The latter award was not part of the initial app design but added at the suggestion of cycling and pedestrian advocates who serve on the Vision Zero Task Force, which helped secure support from those stakeholders who traditionally do not favor public policies that promote private car use. The grand prize was given to the person with the best average during the final two weeks of the contest.

Boston's Vision Zero program already maintained a safety concerns map that layers user-reported hot spots of unsafe road conditions, like speeding, with police crash data and known potholes. Cambridge Mobile Telematics was able to add the Boston's Safest Driver data as another layer on the map, showing where drivers were most likely to speed or use their phone.



Data from the app was added to the city's safety concerns map, an existing online map that included police crash data and known potholes and allowed residents to report unsafe road conditions.

"The data from Boston's Safest Driver highlighted locations with 'bad driving behavior' that confirmed the importance of projects we are doing on Beacon Street, Melnea Cass Boulevard, and Commonwealth Avenue to reduce speed and improve safety," said Charlotte Fleetwood, senior transportation planner.

Most of the data confirmed what the city suspected about driving behavior: Drivers speed on highways and use their phones in areas with long traffic backups. There were some new insights, however, like the high number of drivers using their phones in the pedestrian-dense Back Bay neighborhood, which gave the city fresh concern about pedestrian safety.

Keys to Success

The app clearly demonstrated improved driving for users who regularly engaged the app. Among the top 25 percent of users, there was a 47 percent reduction in phone use and a 35 percent reduction in speeding.

Other cities have since deployed their own version of a safest driver competition. Seattle ran a two-month contest in late 2017, early 2018 with 4,100 participants. In that case, the municipality owns the data due to different privacy laws in Washington state. San Antonio injected $50,000 in prizes for its contest and saw a higher user base at 14,000.

Boston is preparing for a second round in spring 2019. The city has set a goal of 10,000 target users for a 12-week contest and will follow up with the user base through targeted voluntarily surveys to acquire more information about driving habits. The second round will award Boston's safest driver as well as least-distracted and pace car (closest to speed limit).

In order to reach those numbers, the city will hire a program manager and create an ad campaign that invites users of all modes of transportation, not just driving. The Office of New Urban Mechanics has also engaged 153 large employers who will serve as marketing partners. They will encourage employees to sign up and pit like-minded employers against each other, such as one hospital competing with another in a spirit of friendly competition. The hope is that word of mouth will continue to spur people to share the app with a coworker or family member against whom they wish to compete.

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"Boston's Safest Driver gamified safe driving," Carter said. "We saw the gamification of safe driving push adoption and change behavior."

The experience has led Carter to hypothesize what other civic actions could be gamified and tap into humans' innate healthy competitive instinct. "Could people get points for going to community meetings, voting, submitting 311 requests, registering their kid for school on time?" he asked.

"Government should act as a convener and help people," Carter said. "If you step back from this competition — we can convene people around a topic in a new, interesting, and fun way, and we can help people keep the streets safer. Those two things uniquely position a city or a state as opposed to an outside player like a nonprofit."

Citizen Story: Robert Majovski

In 2016, 39-year-old Robert Majovski, a software educator for genetic analysis tools, was crowned one of Boston's Safest Drivers — third best in the city. A resident of the family-friendly Roslindale neighborhood, Majovski has lived in Boston since 2012. He began driving more in 2014 as his commute changed and he became a parent with day-care drop-off and pickup duties.

Majovski drives a Honda Fit and has always considered himself a good driver. Majovski is not a user of wearable tech that tracks steps, sleep, or other habits, but the driving app tapped into an important issue for him.

"When it comes to driving I take it very seriously," he said. "I do a lot of driving in Boston and I wanted to prove it."

Majovski signed up at the onset of the program and had few privacy concerns. "I made the personal decision that tracking and competing was worth sharing that data with City of Boston," he said. "I did not have any concerns but I did have awareness that my driving habits and my start and stop locations were being tracked by an application that I was using." With no off-street parking, he already felt that his neighbors knew when he was home and when he wasn't so he didn't consider his travel habits very private to begin with.

"Everyone at an individual level makes a choice about how much data they want to share with the city," he said. "They should be given tools to make an educated decision, but it's super exciting to have the opportunity to easily participate when we feel educated."

Moreover, the city's role encouraged him to participate. "Having the city involved was a confidence booster for me," he said. "I like our city's administration and it felt good to me to share this info with them through the application. If it were just a private company, I may not have participated."

As someone who works in big data for genetic analysis, Majovski understood the value his data along with that of the other users could contribute to city analysis and

policymaking. He felt that signing up for the app was a type of civic action, although he does not participate in many other traditional civic activities. “It felt like an active participation in the city’s efforts to track and promote safe driving,” he said. “I felt a personal investment.”

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ROBERT MAJOVSKI

Once the contest was running, Majovski adapted quickly to limit his hard braking and sharp corners. He easily secured a perfect score every time and soon cultivated a desire to stay atop the leaderboard. “The gamification worked — I got hooked into the competitive component,” he said.

As a data professional, Majovski hopes for wider application of the methodology. “I’m excited to think about other areas that can make the city better whatever way they can,” he said. “Collecting good data is really hard, but if citizens can be empowered by framing it as a contest, it helps draw people in and raise awareness.”

As one of Boston’s safest drivers, he is eager to defend his title in round two and plans to encourage more people to take him on. “I need some more competition to make it interesting,” he said.

Cities of Service is an independent nonprofit organization that helps mayors and city leaders tap the knowledge, creativity, and service of citizens to solve public problems and create vibrant cities. We work with cities to build city-led, citizen-powered initiatives that target specific needs, achieve long-term and measurable outcomes, improve the quality of life for residents, and build stronger cities. Founded in 2009 by New York City Mayor Michael R. Bloomberg, Cities of Service supports a coalition of more than 250 cities, representing more than 73 million people across the Americas and Europe.

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THE ENGAGED CITIES AWARD

The Cities of Service Engaged Cities Award shines a light on cities that are collaborating with citizens to meet pressing local challenges in diverse and creative ways. Boston, Massachusetts was was one of ten finalists for the inaugural Engaged Cities Award in 2018.

Each year, Cities of Service recognizes cities that are effectively involving their citizens to do things like reduce community violence, produce better budgets, create safer streets, and build stronger communities. The strategies of the Engaged Cities Award winners and finalists are models for other cities around the world to learn from, adapt, and improve upon. Cities of Service works with winners and finalists to develop resources to share with other cities so they can implement similar programs in their own communities.