

DECREASING DISPATCH TIMES



CARBYNE

February 16, 2017, marked 49 years since the first 911 call was made in Haleyville, Alabama. Today, more than 240 million 911 calls are made every year, and the number is growing. Emergency responders across the United States are sent out to solve domestic abuses, robberies, shootings, thefts, and even the iconic cat stuck up a tree¹. Response times differ across the country but the average time from the initial phone call to emergency services arriving on the scene is between 6-10 minutes for critical incidences and 12-18 minutes for non-critical incidences². There are many different reasons that the response time varies so wildly, 3 minutes could very much be the difference between life and death, but emergency services are always finding ways to cut down on the time it takes for them to reach those in need.

This paper is a guide to identify the root cause of delayed dispatch and response times and examine potential solutions and opportunities for state and federal governments and agencies. It will show that simple upgrades in technology and services will not just cut down on the critical and non-critical responses but also improve resource allocation and save departments a significant amount of money.

HOW DELAYS OCCUR

There are any number of variables that contribute to a delayed emergency response time. Traffic, weather, understaffed dispatch centers and under-resourced emergency services are only a few things that often lead to a slower reaction from 911. Some of these, such as weather, cannot be avoided at all. Others, like traffic jams and road accidents, can be improved as GPS technology advances and crowd-sourcing becomes more popular. There are certain factors that contribute to increased response times that can be eliminated altogether. By eliminating these elements, dispatchers and emergency services could shave crucial minutes off their current response times. This white paper will not only examine these factors but will scrutinize how first responders internationally have implemented technology and services and have decreased their response time by up to 50%.

LOCATION, LOCATION, LOCATION

Currently, the biggest issue facing first responders is also one of the simplest. Emergency dispatchers can't locate callers. When someone from a landline calls 911, their calls are automatically routed to the Public Safety Answering Point (PSAP) where it is answered by a call taker or a dispatcher. The PSAP then displays the service address located with the phone number and, because the phone itself doesn't move, the dispatcher simply sends services to that location.

“Why” taxpayers must be thinking, “is it easier for me to get my pizza delivered to me than police or ambulance?”

Unfortunately, with the rising popularity of wireless cell phones, upwards of 80% of phone calls to 911 are made from cell phones³, the service address is often not the current location of the caller. Dispatchers then have two ways of trying to locate callers; triangulation of cell towers and asking the caller themselves. Cell tower triangulation, known as 'bidding,' despite what movies would have you think, is not an exact science. There are any number of variables that can contribute to a failed location such as how dispersed the towers are, how wide the area is that you're searching, geographical areas such as mountainous or hilly terrains, or human-made structures such as tall buildings⁴. **These failed triangulations mean that a caller's location could be anywhere from 10 feet off to several miles off.**

Dispatchers are trained, from their first day, to ask for the area that the caller is contacting them. This is the first question that dispatchers will ask as it allows them to gain a better understanding of the location should they be unable to trace the caller. Unfortunately, in the event of an emergency, many people are confused, in shock, in a rural area, or simply don't know where they are. For car crashes on highways, it's difficult to give a precise address, for large buildings, you still need to know what floor and what area of the floor you're on, or you just simply may be at a friend's house and not know the address at all. For kidnap victims, who may finally have access to a cell phone, they're certainly unable to provide their location down to a precise latitude and longitude.

The myth of 911 being able to locate you instantly stems from the fact that commercial businesses, such as Uber and Dominos, are not only able to find you in a heartbeat but also deliver you a cab or pizza. “Why” taxpayers must be thinking, “is it easier for me to get my pizza delivered to me than police or ambulance?”

Inability to locate callers is one of the most prominent aspects of increased response times. This, however, is provided that the caller is routed to the right 911 call center to begin with. In a speech to the Association of Public Safety Communication Officers (APCO), Jessica Rosenworcel, the Commissioner of the Federal Communication Commission recounted when she had recently been in Little Rock, Arkansas and called 911:

“In the city of Little Rock if you call 911 using your wireless phone in the corner of the 911 call center, your call will not get routed to Little Rock. Instead, it will be answered by a 911 call center in North Little Rock all the way on the other side of the Arkansas River.”⁵

The combination of county and city borders as well as inaccurate location tracking has meant that cell phone triangulation could send your 911 call to dispatchers who won’t even be able to locate you, even if you know your exact address. In the case of Shanell Anderson, who gave dispatchers the exact location of her crashed SUV as it was sinking to the bottom of the lake, emergency services couldn’t reach her in time because the call had been mistakenly routed to a neighboring dispatch center. On the harrowing 911 call you can hear Anderson give her exact position but operators were unable to locate her. By the time first responders arrived, she had died in her car⁶.

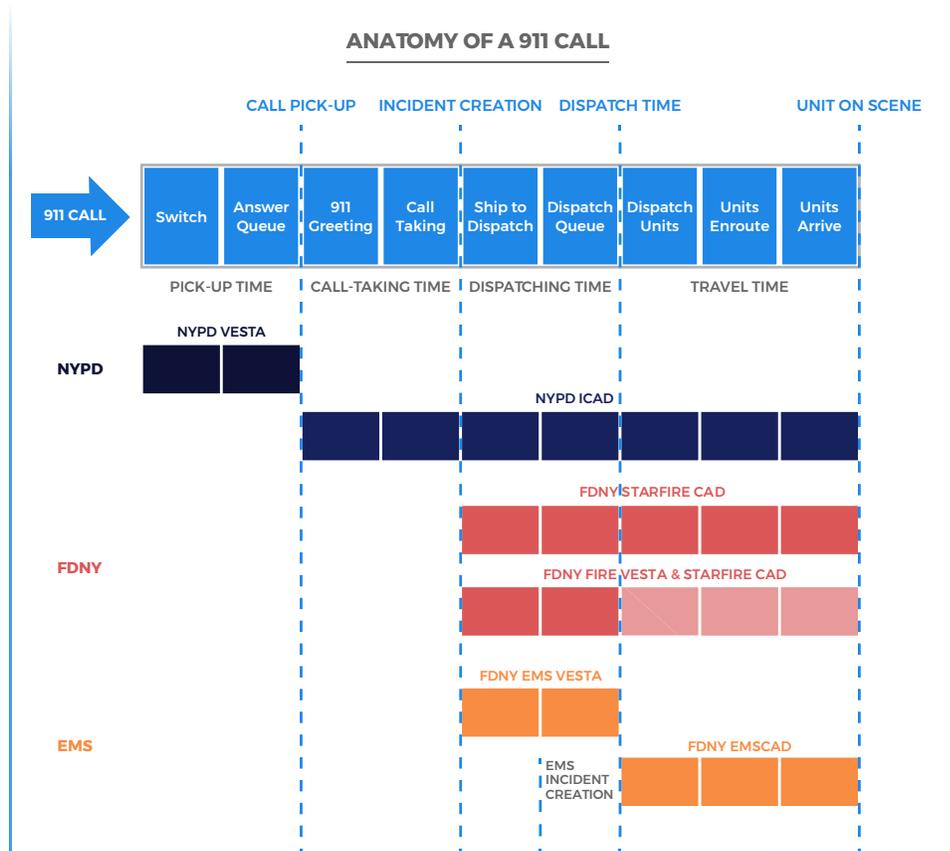
FIFO

First in, first out (FIFO). Whoever calls first gets answered. It’s been the basis of telephone systems since their inception, and while it may work for radio call-in shows, it is not practical for 911 emergency services.

As all 911 operators know, not every call is equal. In fact, there are significant differences between a mass casualty event and a car having been broken in to. The fact that both calls have the same priority means that 911 dispatchers are often spending their time dealing with non-emergency calls while critical situations are delayed. This also doesn’t account for prank calls that people make to 911 or those who consider it a service such as Pizza Hut or to buy over-the-counter medication and deliver it to their homes. There is also a significant amount of people who misdial 911, ‘butt dials’, and never intend to contact emergency services⁷. In fact, the Federal Communications Commission.(FCC) recently estimated that up to 50% of all calls made to 911 are accidental misdials. This means that between 80-90 million calls every year are pocket dials⁸.

Furthermore, what happens if 911 callers are all calling about the same emergency? If a crane collapses in the middle of a street or if there are bombings on the subway then 911 will be inundated with phone calls. Hundreds, even thousands, of phone calls to 911 often collapse phone networks in the wake of a mass casualty event⁹. These phone calls leave 911 with answering repeated requests even though units have already been mobilized in response.

These FIFO scenarios lead to a mounting strain on dispatcher resources and an increase in response time to critical



situations. Being able to prioritize calls, reject obvious misdials, and remove repeated emergency calls will not only significantly reduce the number of calls that a dispatcher listens to, but also free up resources that can be used across the jurisdiction. This will save authorities time, money, resources, and shave essential minutes off the response time of first responders.

THAT'S NOT AN EMERGENCY!

From a young age, we are taught that we should always call 911 in case of an emergency. Even if we're not sure if it's an emergency, it's better to be safe than sorry. Unfortunately, some people have taken that advice a little too literally. 911 has become the go-to number to call for anything people believe requires police or government assistance: a tree falling, burst water pipes, or graffiti across the walls. While these sorts of incidents are important to the jurisdiction, they are not necessarily considered an 'emergency'. Even criminal acts, such as a stolen car radio, may not be thought of as an emergency. If the suspect has left the scene of the crime long before anyone arrives then there is no need for police to rush over.

In 1997, the FCC mandated that there be a second toll-free phone number for non-emergency situations. This number, 311, began its slow roll-out throughout the United States and the results were immediate. A 2000 study of 311 adoption showed that calls to 911 dropped 50% during that time, that abandoned calls to 911 due to inability to reach an operator also dropped 50%, and that calls from dispatchers to police units in the field fell by 12%¹⁰. These remarkable statistics show that, when given the option, people will contact non-emergency services and free up 911 lines for actual emergencies.

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The introduction of a seamless 311 service also has several other benefits to both government and public safety agencies. As well as increasing citizen satisfaction rates, it creates a level of transparency between the government and their people. When the City of Sacramento unveiled a 311 service in 2009, they greatly simplified the process of citizen-government communications. Sacramento went from 9 different departments, all with different systems, budgets, and call centers to a single, unified, agency to deal with non-emergency services. The move allowed Sacramento to streamline budgets and resources and saved the city a significant amount of money as well as giving citizens a far more uniform experience in reporting

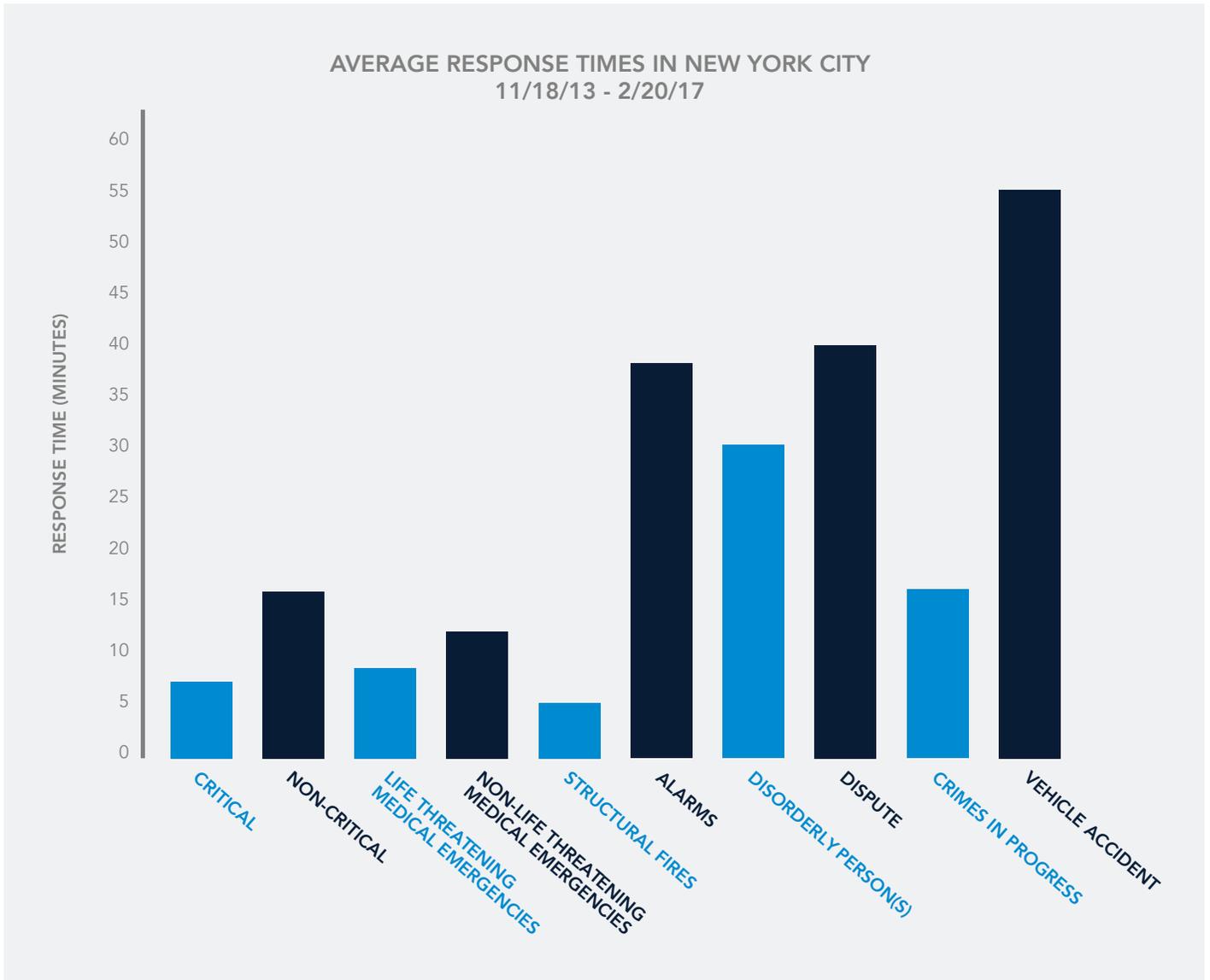
non-emergencies. An added benefit of the new 311 system was a massive influx of data about the state of the city. This gave lawmakers a better understanding of what ailed residents as well as where resources should be deployed so they can make the most impact. A coherent, single report also created a feeling of transparency between government and their constituents¹¹.

As more cities and counties implement 311 systems, they are seeing significantly reduced calls to 911 emergency services. Fewer calls to emergency services mean that wait and dispatch times are reduced across the board and resources can be more effectively allocated. The fact of the matter is that keeping dispatch times low is not just good for public perceptions of police and fire departments, but gives first responders those critical few minutes to respond to the scene.

FAST TIMES SAVE LIVES

If someone has been shot, stabbed, or is facing a potentially life-threatening situation, then first responders know that their response time is the difference between life and death. This means that being able to answer calls, collect information, assign resources, and avoid unnecessary distractions such as prank calls or pocket-dials will significantly reduce the time between a first responder and their charge.

The slow dispatch and response times are primarily due to outdated and antiquated technology, overburdened 911 dispatch centers, and incorrect calls to emergency services. Improvements in these areas are going to be the difference between life and death for thousands of people every year. But what sort of technology will help our struggling first responders? What will shave off those crucial minutes and put more criminals behind bars, more heart attack patients treated, more violent assaults stopped, and all in an easy to use, integrated system?



When dispatchers answer the phone, they are trained to ask the '6 W's'¹². These 6 W's are:

- Where
- What
- When
- Who
- Weapons
- Welfare

A dispatcher wants to know where you are, what is wrong, when the incident occurred, who the suspect is, if there were there any weapons involved, and if people are hurt. These are the crucial questions that a dispatcher needs to understand to assist people in trouble most effectively.

SOLVING THE SIX W'S

For the first time, there is finally a system that has proven to reduce response times, locate callers instantly, eliminate unintended emergency dials, all while giving dispatchers unprecedented intelligence on what exactly is happening at the scene.

Carbyne has solved all of these 6 W's and then some. With our seamlessly integrated end-to-end solution, we are the future of emergency and event reporting.

AN INTERNATIONAL SOLUTION

Carbyne debuted nationwide in Israel in April 2016 and the results were immediate. Magen David Adom, Israel's EMS, integrated Carbyne into their existing CAD systems and quickly discovered the power of Carbyne. For the first time, emergency dispatchers were able to determine a precise indoor and outdoor location from the second the call was answered. The dispatch call times dropped dramatically, from 2.5 minutes per call to just over a minute. This reduction in dispatch time, combined with new video-streaming capabilities, meant that medical personnel located and aided citizens in record times.

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WE CAN SEE YOU NOW

With Carbyne's state-of-the-art location sharing technology, it takes less than a second for the system to pinpoint the position of any caller. But they're not just going to know what building they're in but they'll know what floor, and even what room they're located. This means that first responders can alert building security ahead of time exactly where they need to go, saving crucial minutes that would normally be wasted when they first arrive on the scene. Our proprietary location algorithm uses a host of technologies to determine a user's location down to a 3ft radius. Cell signals, Wi-Fi, Bluetooth, even technologies such as smart TVs are drawn on to whittle down a user's position, so first responders don't have to search high and low for a caller.

Being able to locate a caller instantly will ensure that dispatchers can send out the closest units. No longer will standing in the 911 dispatch center establish your location as across the river, as occurred to the former FCC Commissioner, but instead it will find what building they're in, and that they're at the far wall. Hilariously terrifying anecdotes will soon be a thing of the past.

A PICTURE SAYS A THOUSAND WORDS; A VIDEO SAYS SO MUCH MORE

Alexander Graham Bell's telephone was revolutionary technology but we've leaped ahead over the past few years, and it's time for first responders to catch up. With carriers all unveiling new unlimited data plans¹³ and cell phone cameras being able to stream live video, it makes little sense that our interactions with emergency services are confined only to voice.

For dispatchers, every small nugget of information is a clue to resolving dangerous situations. Knowing exactly what sort of threat responding officers on the scene would be facing, how many potential victims there are, if the surrounding areas are free from various hazards, all of this contributes to the dispatcher being able to assign the right resources to every problem.

Imagine just how much intelligence can be ascertained from a video call? Dispatchers would instantly be able to identify how many responding units are needed, if an ambulance or fire truck should respond as well as police, or if SWAT teams are necessary. A dispatcher would have as much information as an on-the-ground commander the moment the call came through.

What if someone was suffering from a heart attack and CPR had to be administered? If it was a video call, the dispatcher could ensure that the correct medical steps and procedures were being followed while first responders were on the way.

Carbyne allows citizens to initiate video calls with both government services and first responders. The introduction of video calling between citizens and their emergency services is the greatest revolutionary leap for first responders

since the inception of 911. Being able to provide instantaneous locations, intelligence, and a greater understanding of which units to dispatch from the moment that someone makes a call to 911 significantly reduces the response time and critically allows commanders to quickly assign, or reassign resources on a case by case basis.

FIFO NO MORE

What if, before a call even reached the dispatcher, it could be ranked in order of importance? What if a shift supervisor could determine which calls needed immediate answering and others could perhaps wait for a few moments?

Carbyne's 'call prioritization' technology allows call takers to view the streaming video feed prior to answering the call. Video streaming means that obvious misdials, aka 'butt dials', can be easily disconnected if the operator sees a black screen. This simple addition of streaming video will save dispatchers from having to answer upwards of **90 million calls per year**. Furthermore, obvious prank calls will simply be met with a disconnection rather than wasting police time. The day of teens 'SWATting', prank calling the police and sending heavily armed officers to an apparent violent situation, will soon come to an end and the high price tag of finding perpetrators, estimated at around \$100,000 per call, will be a thing of the past¹⁴.

With Carbyne's call prioritization, dispatchers can ignore multiple calls from the same area. In the event of a mass casualty event dispatchers can see that citizens are reporting the same incident. Should a building catch fire or terrorists bomb a subway station, then each of the callers in the immediate vicinity can be sent a push notification thanking them for reporting it and reassuring them that emergency services are on the way. If they happen to be calling about a different incident, then Carbyne will be able to determine that they are calling back and will notify the dispatcher.

311 BUILT IN

What happens when citizens are presented with an opportunity to either make an emergency or a non-emergency call? Many find themselves questioning if they need a first responder or simply to report a loud party or overflowing fire hydrant.

By giving users the choice of emergency or non-emergency reporting in the same application, you begin to ease the burden on 911 dispatchers as fewer and fewer unnecessary calls are made. For those citizens who don't know to call, or don't know of, 311 services they become not only better informed of what assistances their government offers but they also do not need to call a second phone number. Having 311 built into the Carbyne app, and tied to Carbyne's end-to-end solution for both emergency and civil services, means that fewer calls are made to first responders and the response times and dispatcher resources are reduced across the board.

A RACE AGAINST TIME

Every dispatcher and first responder know that, when dealing with an emergency, every second counts. Turning down a street, the state of the traffic, and even the weather that day all contribute to how quickly emergency services can reach their destination. There are so many variables that are outside of the control of first responders, it is crucial for us to maximize the efficiency and reliability of all the elements that we can control. By implementing dependable location technology, reducing the number of misdials, repeat reports, and prank calls, and removing unnecessary non-emergency numbers, we can ensure that when first responders begin their race against the clock, they are doing so with all the advantages and weapons in their arsenal.

Carbyne is cost-effective, easy to deploy, and most importantly proven to succeed in cutting down dispatch times by up to 50%. Time is of the essence when lives are on the line, and by reducing the number of calls, prank calls, and increasing the reliability of location technology then lives will be saved.

Sources:

¹Police use red laser beam to coax cat stuck up tree down to safety <http://www.lovemeow.com/police-use-1717044033.html> (accessed 2/17/17)

²911 End to End Detail <http://www.nyc.gov/html/911reporting/html/reports/detail.shtml> (accessed 3/10/17)

³How cell phones are changing 911 <http://www.baltimoresun.com/news/maryland/crime/bs-md-911-cell-phones-20160206-story.html> (accessed 2/17/17)

⁴Cell phone triangulation accuracy is all over the map <http://searchengineland.com/cell-phone-triangulation-accuracy-is-all-over-the-map-14790> (accessed 2/17/17)

⁵Remarks of Commissioner Jessica Rosenworcel Federal Communications Commission, APCO International 80th Conference & Expo – August 6th, 2014 http://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0806/DOC-328698A1.pdf (accessed 2/17/17)

⁶911's Deadly Flaw: Lack of location data <http://www.usatoday.com/story/news/2015/02/22/cellphone-911-lack-location-data/23570499/> (accessed 2/17/17)

⁷Butt dials' straining 911 emergency systems <http://www.cnn.com/2015/10/05/living/butt-dialing-911-emergency-feat/> (accessed 2/20/17)

⁸Harmful consumer wireless behavior and practices <https://www.fcc.gov/news-events/blog/2014/10/14/harmful-consumer-wireless-behavior-and-practices> (accessed 2/20/17)

⁹Why is it so hard to make a phone call in emergency situations? <http://boingboing.net/2013/04/17/why-is-it-so-hard-to-make-a-ph.html#more-224850> (accessed 2/20/17)

¹⁰311 proves a valuable supplement to 911 service https://cops.usdoj.gov/pdf/311_Best_Practices.pdf (accessed 2/20/17)

¹¹City of Sacramento: A 311 Success Story <http://www.oracle.com/us/corporate/insight/insight-report-sacramento-311-171702.pdf> (accessed 2/20/17)

¹²How to call 911 (it's not as obvious as you think) <http://www.artofmanliness.com/2012/12/12/how-to-call-911-no-its-not-as-obvious-as-you-think/> (accessed 2/20/17)

¹³AT&T Undercuts Both Verizon and T-Mobile with New Unlimited Plan <https://www.cnet.com/news/at-t-undercuts-verizon-t-mobile-with-new-unlimited-plan/> (accessed 2/28/17)

¹⁴The Terror of Swatting: How the law is tracking down high-tech prank callers <https://www.theguardian.com/technology/2016/apr/15/swatting-law-teens-anonymous-prank-call-police> (accessed 2/21/17)

<http://www.nyc.gov/html/911reporting/html/anatomy/call.shtml>

<http://www.nyc.gov/html/911reporting/html/reports/detail.shtml>