

The frequency and causes of sirens in Silver City NM: A Citizen Science Study

Kelly Hart, et al (2017, November)

Summary:

A year-long study by four Citizen Scientists, done in four stages, clearly shows that the sirens that we hear in Silver City have valid and reasonable causes relating to an emergency. On average we will hear eight (8) sirens a day. Medical emergencies are the most common reason for siren use (65% of the siren events had medical causes); emergency requests for police action are the second most common (14% were calls for police action due to some threat to life or property); motor vehicle accidents are the third highest reason (11% were related to motor vehicle accidents); calls related to domestic disturbances are the fourth highest cause (7% were related to domestic issues); while the lowest reason was fire response (3% were fire alarms).

Short report:

A Citizen Science Team is Formed

At a meeting of the Green Chamber of Commerce in the fall of 2016, members in the room commented how often they heard sirens in Silver City. The general consensus was there were “too many” sirens when compared to other places they had lived in the USA. An outcome of the discussion was that a Green Chamber member agreed to take the lead to conduct a Citizen Science study on the frequency and causes of sirens in Silver City, NM.

First Stage of Research – How Many *Potential* Siren Uses in a Day

In Grant County all law enforcement, fire, and ambulance calls and actions go through Central Dispatch. A data pull of a three-month period enabled the research team to count incidents that *might* have initiated use of a siren. Of course the data did not indicate *actual* use of siren, just potential use. There were, on average, 54 incidents per day where sirens could potentially be initiated. The researchers decided to drill deeper, and develop a protocol to link actually hearing sirens and Central Dispatch data.

Second Stage of Research -- Logging Sirens Heard

Two members of the Citizen Science team developed a protocol, and within a month a team of four were logging each siren heard in town. The team members lived in different areas of town, hence the data were comprehensive. Data logging took place over three months. The Citizen Scientists logged a total of 819 separate incidents of hearing sirens during that time. One Citizen Scientist with good data management skills analyzed the data and determined they had actually logged 652 discreet siren events. They considered any entry logged within plus or minus 4 minutes of the same time was likely the same event, and combined those, condensing the total number. The Citizen Scientists determined that *on average we may hear 8 sirens a day in Silver City*. The day with the greatest number logged was 21 and the day with the fewest was just one (1).

Third Stage of Research – Causes of Cross-Verified Heard Sirens

The Citizen Scientists sampled 19 events where all four of the team had recorded a siren, and requested coding and explanations of those events using Central Dispatch data. In 14 of the 19 incidents sirens were in response to medical emergencies (74%). Only 4 of the 19 incidents reported involved motor vehicles (21%), and these were responses to *vehicle crashes in the roadway, not routine traffic stops*. The one remaining event was a fire alarm. The team concluded all of these would have to be considered reasonable and valid reasons for emergency vehicles to be running their sirens.

Fourth Stage of Research – Causes of All Sirens

The Citizen Scientists developed another random sample of 54 events which, by the +/- 4 minute criteria, were recorded by only one person, so these did not include those previously analyzed. Dispatch records were examined and causes of siren use determined. They then decided to combine the two sets of statistics for an overall combination of 73 events, of which 71 were captured by Central Dispatch. This sample size of 71 is sufficient to be confident that overall trends have been established.

Final Results

The data analysis unambiguously shows that virtually all of the sirens that we hear in Silver City have clearly valid and reasonable causes that relate to some form of emergency. Our data showed that 65% of the siren events had

medical causes; 14% were calls for police action due to some threat to life or property; 11% were related motor vehicle accidents; 7% were related to domestic trouble; 3% were fire alarms. Only 2 siren events could not be matched to a Central Dispatch log. That small number could be due to error in logging, or could be any entity running a siren without having gone through Central Dispatch.

Qualitative Data as part of Explanation for Causes of Sirens

Socio-Economic Concerns: Demographics

There are some social demographics that might influence the frequency of emergency responses. One is that Silver City has a higher than average percentage of elderly (according to the 2010 census, 19% of our population is over 65, compared to 13% average in the state of NM). This increases the chances of the need for medical assistance. In fact nearly a quarter of all the events surveyed might be ascribed to problems often associated with aging, such as trouble breathing, heart attacks, falling or trouble walking.

Socio-Economic Concerns: Transportation and Medical Access

Another socio-economic reason or perception that might increase the number of ambulance calls is lack of, or not knowing of, transportation options. Some residents may view EMS as primary transportation to the hospital. Real or perceived problems with access to primary care for a multitude of reasons tend to drive up emergency room usage. A perception that might be part of ambulance use is the *incorrect assumption* that using EMS will get a person to the front of the line upon arrival at the ER.

Police Siren Use Policy

The Citizen Scientists first worked with the Silver City Police Chief to determine policy for police siren use, and found that *an emergency call for service which has the potential for loss of life or injury* will initiate lights and sirens. The Police Chief also noted an officer could sound a siren in a traffic stop where the violator does not see the approach of the unit from behind.

Many agencies travel highways 180 and 90 through Silver City

Silver City is the hub for the entire County and the Police Department is not the only agency to use the roadways here. Other agencies, any of which may run sirens, include the Grant County Sheriff's Office, the New Mexico State Police, Emergency Medical Services from the Silver City Fire Department and Gila Regional Ambulance Service. Additionally, volunteer fire departments responding as mutual aid to other areas may use those same roadways as might the Forest Service Law Enforcement.

There are Multiple Responders

The data show that most of the time there are multiple responders to an incident. Of the 71 incidents 32% had a single responder while 68% had multiple responders. The most frequent responders were the Gila Medical Center EMS Ambulance and the Silver City Fire Department Rescue Unit. Multiple emergency responders likely mean multiple sirens. This brings up the question of redundancy of response by various agencies to single requests for service. Is this always necessary, and does it contribute to the overall intensity of sirens that are heard throughout the town? Silver City Assistant Manager James Marshall sees this as an area where policies and protocol should be frequently reviewed and possibly changed to ensure proper response and responder discretion.

Possible Reduction in Sirens by Changes in Driver Communication and Decision-making

Another area where a reduction in the use of sirens might occur is within the protocol of when it is mandatory to sound them. Assistant Town Manager James Marshall postulates that improving communications for second and subsequent responding units may decrease both emergency traffic and siren use. He notes, "The Town has examined policies and is testing some adjustments to decrease the number of units responding to car accidents with injuries. At the same time we allowed the personnel the ability to assess the dispatch information, location and historical information to ensure we have the correct resources respond. We will continue to monitor responses and ensure that our policies and actions are consistent with current response needs."

Discussion

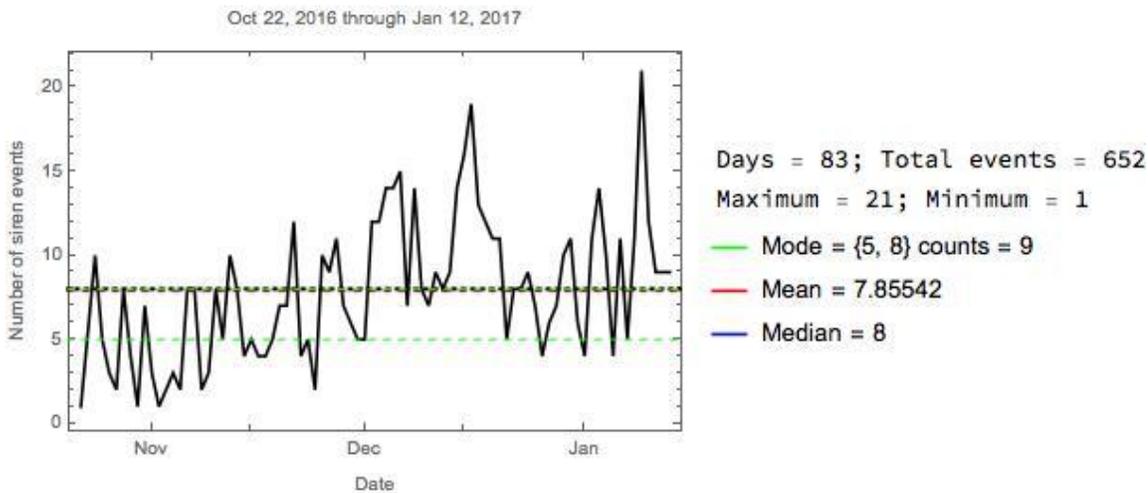
When the Green Chamber members started the conversation that led to this Citizen Science project, a number of those in the initial conversation expressed irritation by siren sounds. Some of those in the room expressed an opinion that hearing

so many sirens must be due to the police running them as a way to express power. This Citizen Science project to evaluate the use of sirens in Silver City has brought forth valid information to let people know some facts. First, yes, we citizens can expect to hear sirens, on average eight (8) a day. Second, those sirens are responses to medical emergencies or other life or property threatening events. We could find no evidence of sirens simply being run without a direct cause of an emergency situation.

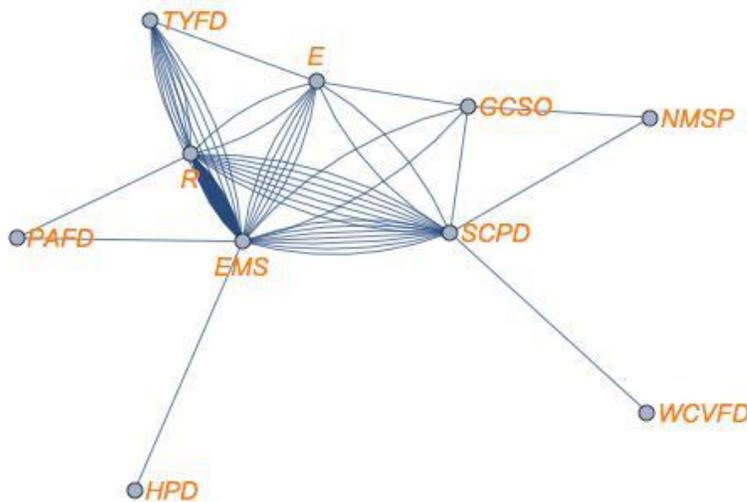
One of the researchers noted “I now have a very different attitude toward the sirens that I hear. Instead of immediately being offended and regarding the sound as an intrusion and a disturbance of the peace, I am now more likely to feel compassion for some unfortunate person in trouble and send a short prayer for resolution for whatever the problem is.”

The Citizen Science team - Kelly Hart, Rachelle Bergmann, Candace Breen Lee, and another who wishes to remain anonymous – acknowledges the help of Central Dispatch staff, and the Town of Silver City staff and officials for their assistance in the access to data, assistance in digging deeper into files, and departmental insights on this project.

This graph shows the summed siren events recorded per day of recording period



The graph below shows the connection between the responders. Each line between one responder and another is a time they responded to the same incident.



- Responders identified by Central Dispatch:
- E – Silver City Fire Department Engine
- R – Silver City Fire Department Rescue Unit
- EMS – Gila Medical Center EMS Ambulance
- GCSO Grant County Sheriff Office
- HPD – Hurley Police Department
- NMSP –New Mexico State Police
- PAFD – Pinos Altos Fire Department
- SCPD– Silver City Police Department
- TYFD – Tyrone Fire Department
- WCVFD– Whiskey Creek Volunteer Fire Department