



**Understanding and Solving the Problems that Non-Service Initialized  
Devices and Non-Emergency 911 Calls Cause for PSAPs, First  
Responders, and the Public**

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## Summary

Non-emergency 911 calls are a serious problem for Public Safety Answering Points (PSAPs). Determining the various sources of non-emergency 911 calls and their relative proportions to one another, and making informed, decisive policy decisions, will be crucial to adequately addressing this problem. While the promise of new Next-Generation 911 (NG911) technology may provide improved means for handling non-emergency call volume at PSAPs, developing a better grasp of the problem now may save significant time, money, and energy devoted to such efforts.

This paper begins with a discussion of the 911 “pocket dial” phenomenon and the problems that result from large influxes of non-emergency calls to PSAPs, followed by an examination of the various causes likely contributing to the high percentages of non-emergency 911 calls PSAPs receive, and an exploration of potential solutions aimed at combatting those causes. Additionally, this paper discusses the issues related to non-service initialized (NSI) devices, what actions can be taken to reduce the risk posed by the large number of NSI devices currently in circulation, and how these might impact the populations that depend on NSI devices to maintain access to emergency services.

The following factors may contribute to high non-emergency 911 call volume:

- **Handset design features that can increase the likelihood of inadvertent 911 calls**, including single-key emergency dialing and the requirement that carriers enable 911 calling from locked handsets.
- **Certain behaviors and attitudes of handset users and politicians may be contributing to the high non-emergency 911 calls burdening PSAPs**, including leaving keypads unlocked, letting small children play with handsets, pre-programming 911 into a favorites or speed dial setting, deliberate abuses of the 911 system and attacks against PSAPs, and political pressure to retain high “short call” totals to improve the appearance of emergency response times.
- **PSAPs may need increased or improved equipment and access to caller information** in order to keep pace with high call volume, locate callers, and distinguish between non-emergency and emergency 911 calls.
- **Lack of in-depth research and insufficient data preclude efficient, tailored solutions** because policymakers need to know the specific details underlying the problem of high non-emergency and hang-up call volume.
- **NSI devices in circulation and the requirement that carriers transmit these calls to PSAPs**, while valuable in providing 911 access for those who do not have carrier service, create a security risk for PSAPs due to PSAP operators’ limited ability to screen calls from these devices and the ease with which they can be used for nefarious purposes.

The following solutions may reduce the number of non-emergency calls PSAPs receive:

- **Design improvements and precautionary measures by handset manufacturers may make dialing 911 by accident more difficult,**

including disabling single-key 911 dialing features before shipping handsets, and preventing entry of 911 into favorites settings and speed-dial presets.

- **User interface best practices and consumer education may reduce non-emergency 911 calls** by providing mobile device users steps they can take to reduce the likelihood that they will accidentally dial 911, and public service announcements.
- **Increased resource allocation may be needed to help certain PSAPs** by providing funding to employ additional operators and to purchase and install more advanced equipment, in the event that high non-emergency call volume cannot be reduced without incurring the social harm cost of unacceptable limitations on the public's ability to place 911 calls with sufficient ease.
- **Rigorous research efforts into specific causes underlying the non-emergency 911 call problem may lead to more effective solutions** and reveal data regarding the relative proportions of various types of non-emergency calls PSAPs receive, improvements to handset design and 911 system technology aimed at curtailing inadvertent 911 calls, and strategies for increasing public awareness regarding the non-emergency 911 call problem.
- **State and federal regulation can reduce the ease with which NSI devices could be used for denial of service attacks**, while technical changes from carriers or PSAPs can allow greater screening of malicious calls from NSI devices.

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## Discussion

Reporters and regulators devote considerable attention to the problem to which they refer to, often imprecisely and generically, as 911 “pocket dialing.” However, pocket dials are just one of many factors that likely contribute to the high non-emergency 911 call volume that burdens PSAPs—a problem that not only persists, but appears to be growing. This paper describes in general the problem of high non-emergency 911 call volume, followed by a closer examination the individual factors that collectively cause it, including pocket dials and non-service-initialized devices, and ideas for approaching possible solutions.

In 2014, Federal Communications Commission (FCC) Commissioner Michael O’Reilly estimated that PSAPs in the U.S. receive 84 million inadvertent 911 calls every year, which would mean that roughly half of all 911 calls placed are accidental.<sup>1</sup> While Commissioner O’Reilly explained that he based this figure on his anecdotal experiences while visiting New York City and Anchorage emergency response centers, such a high estimate merits further analysis.<sup>2</sup>

Also known as “pocket dials” or “butt dials,” these inadvertent calls, in addition to other types of nuisance 911 calls, tie up PSAP operators who could otherwise be taking real emergency calls and delay the dispatch of first responders to real emergencies.<sup>3</sup> Commissioner O’Reilly has charged the FCC with doing something about the pocket dial problem, which wastes valuable resources, raises the costs associated with providing emergency services, and can diminish morale among 911 operators.<sup>4</sup>

However, questions about that solution, who else must take action in order to mitigate the problem, and what other factors must be taken into account in order to address the problem appropriately remain largely unanswered. For example:

- How many non-emergency 911 calls actually come from mobile devices in purses and pockets?
- How many are calls from people whose legitimate emergencies have rendered them unresponsive?
- How many are caused by errant user handset manipulation or voice command functionality?
- How many are the result of handset manufacturers or users programming 911 into a “speed dial” or “favorites” setting, making inadvertent 911 calls more likely to occur?
- How many come from multi-line telephone (MLTS) systems that require users to dial a “9” followed by a “1” before making outgoing calls?
- How many are dialed automatically by a computer, either due to some type of glitch or malevolent actor?

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<sup>1</sup> Julian Hattem, *FCC Commissioner Says Half of 911 Calls Are Pocket Dials*, The Hill (Oct. 15, 2014, 9:19 am EDT) <http://thehill.com/policy/technology/220797-millions-may-be-pocket-dialing-911-fcc-commissioner-warns> (last visited Nov. 21, 2016).

<sup>2</sup> *Id.*

<sup>3</sup> *Id.*

<sup>4</sup> *Id.*

- How many result from young children playing with their parents' cellphones, or old, disconnected handsets on which the emergency dialing function remains enabled?
- How many are pranks or otherwise placed for frivolous or malevolent purposes?
- Who is in a position to address any one of these given problems, by what means, and at what cost?

Cellphone customers who pocket-dial 911 are only one of many sources that may be contributing to the high percentage apparent non-emergency 911 calls PSAPs receive. For example, people letting small children play with cellphones and people calling to report actual emergencies that have incapacitated them from speaking to 911 operators or remaining on the line can resemble pocket dials from the perspective of PSAP operators. Other sources may include prank or phony 911 calls placed using NSI devices that PSAPs cannot trace or locate. Malicious actors can also cause handsets to repeatedly dial 911 by tricking users into unintentionally triggering hacks that initiate denial-of-service attacks simply by clicking on innocent-looking web links.<sup>5</sup> These parties can fashion such links to resemble a YouTube video or album playlist to entice handset users to click on them.<sup>6</sup>

#### **I. Several factors contribute to high non-emergency 911 call volume.**

The non-emergency 911 call problem that PSAPs face is complex and involves more than just the interaction between a handset and a 911 operator. Decisions by handset designers, manufacturers, and distributors, consumer attitudes and interactions with mobile (and wireline) devices, PSAPs, and 911 systems, the equipment and procedures that PSAPs have in place, and decisions by those charged with 911 oversight, can potentially increase the non-emergency call burden on PSAPs. In order to counteract the problem, it is important to understand the various factors that may be contributing to it. This section describes and explains some of these factors.

##### **A. Certain handset design features and manufacturer practices can increase the likelihood of inadvertent 911 calls being placed.**

Efforts by handset manufacturers and users to make dialing 911 faster and easier in the event of an emergency can make devices more prone to dialing 911 accidentally.<sup>7</sup> If a user assigns a single-key speed dial setting to call 911, the ease with which he or she might push that button accidentally and call 911 increases.<sup>8</sup> In the aggregate, this can

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<sup>5</sup> Dan Goodin, *iPhone Hack That Threatened Emergency 911 Systems Lands Teen in Jail*, Ars Technica (Oct. 28, 2016, 2:06 PM), <http://arstechnica.com/security/2016/10/teen-arrested-for-iphone-hack-that-threatened-emergency-911-system/> (last visited Nov. 21, 2016).

<sup>6</sup> Vanessa Medina, *Twitter Prank Hacks Phones, Calls 911 Multiple Times*, 7News (Oct. 26, 2016), <http://wsvn.com/news/local/twitter-prank-hacks-phones-calls-911-multiple-times/> (last visited Nov. 21, 2016).

<sup>7</sup> Federal Communications Commission Wireless Communications Bureau Staff Report: *Prevention of Unintentional 911 Calls*, CC Docket No. 94-102, DA 02-3413A1 (Dec. 11, 2011).

<sup>8</sup> *Id.*

lead to an influx pocket 911 calls, turning a good faith effort to increase safety into a potential hazard that can decrease access to emergency services.<sup>9</sup>

The FCC's Wireless Telecommunications Bureau investigated and took steps to rectify this problem in 2001 and 2002.<sup>10</sup> In collaboration with the National Emergency Number Association (NENA), the Bureau contacted all nationwide wireless carriers, including Nextel, Cingular, ALL TEL, Sprint PCS, Verizon, AT&T, and T-Mobile, to verify that their equipment vendors were not shipping mobile devices with a one-key emergency call shortcut enabled.<sup>11</sup> At the Bureau's urging, the carriers requested that vendors in the practice of shipping devices with this feature enabled cease doing so.<sup>12</sup>

Nevertheless, the fact that certain handsets on the market are designed to place a 911 call by simply pressing and holding a given number key (typically the "9" or the "1" key) for a few seconds (the "auto-dial 911" feature) may be leading to more harm from accidental 911 calls than the good resulting from the well-intentioned feature.<sup>13</sup> Additionally, consumers can still program 911 into presets or speed dial keys on handsets lacking the single-key 911 dialing feature, which may contribute to inadvertent 911 call totals.<sup>14</sup> Relatedly, some multi-line telephone systems (MLTS) still in use that require callers to key in a trunk access code, typically a 9, followed by 1 to make outgoing calls can lead to inadvertent 911 misdials.<sup>15</sup>

Cellphones in pockets and purses are not the only devices with design features that can make them prone to inadvertent 911 call dialing. As wearable technology proliferates onto the wireless market, features of devices such as the Apple Watch may also increase the likelihood of inadvertent 911 call placement.<sup>16</sup> For example, Apple will soon deploy an update to the Apple Watch that will enable it to place a 911 call simply by pressing and holding the side button or swiping the screen.<sup>17</sup> While such features are designed to increase the ease with which consumers can obtain assistance in the event of an actual emergency, they can also have the unintended consequence of significantly increasing the likelihood of accidental 911 calls being placed.

Some design flaws that increase the likelihood of inadvertent 911 calls have arisen as phone technology has evolved. Handsets on which the emergency dialer prompt is located too close to another frequently-used button such as a "home" button can

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<sup>9</sup> *Id.*

<sup>10</sup> *Id.*

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*

<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

<sup>15</sup> Andrew Dowd, *Mistake 911 Calls Strain Local Staff, Officials Say*, The Leader-Telegram (Eau Claire, Wisconsin) (LexisNexis News Archive) (Oct. 22, 2015).

<sup>16</sup> Neil Hughes, *Inside watchOS 3: Apple Watch's New 'Emergency SOS' Call Feature Could Save Your Life*, Apple Insider (Jul., 13, 2016), <http://appleinsider.com/articles/16/07/13/inside-watchos-3-apple-watches-new-emergency-sos-call-feature-could-save-your-life> (last visited Nov. 21, 2016).

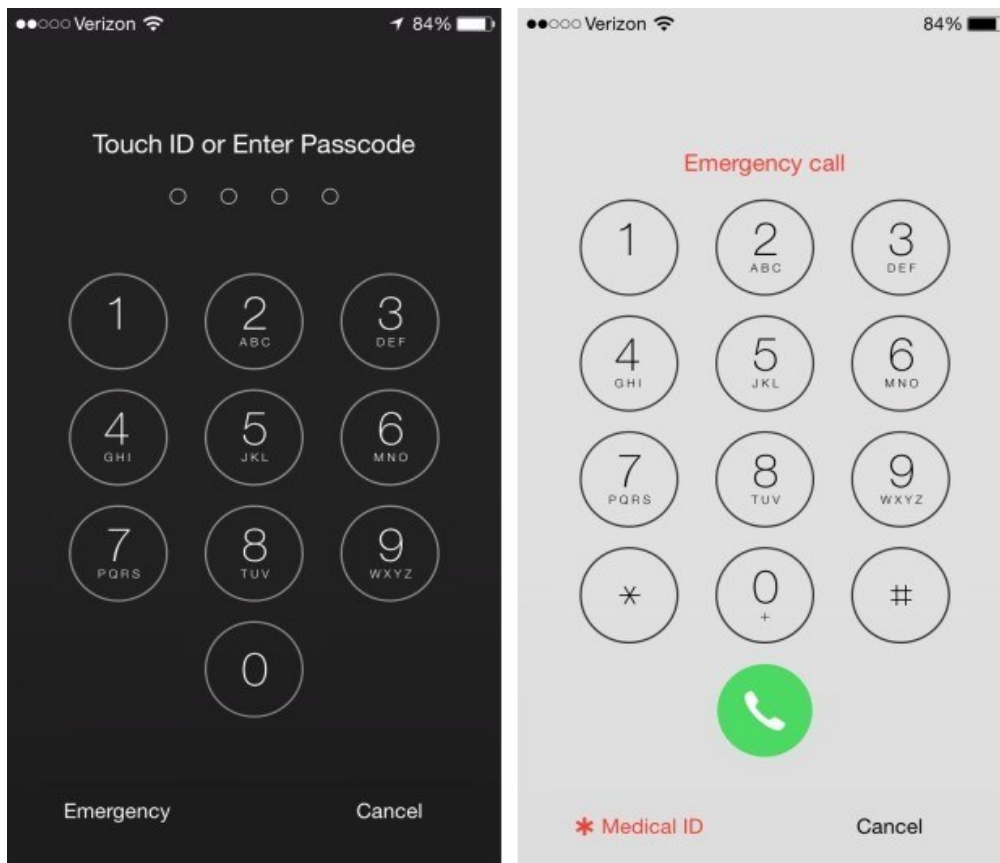
<sup>17</sup> *Id.*

increase the likelihood of inadvertent 911 calling.<sup>18</sup> This illustrates that efforts to enable a user to call 911 more easily during an emergency can also make it easier to call 911 by accident. Additionally, even if manufacturers later resolved such problems in designing newer handset models, the older handsets likely to produce inadvertent 911 calls may nevertheless remain in circulation.

Newer versions of the iPhone also have an emergency call feature that is relatively easy to trigger from the locked screen. As the images below depict, one can easily access the emergency dial keypad on an iPhone by tapping the word “emergency” at the bottom left corner of the lock screen (left) on a locked handset.<sup>19</sup> This will display the emergency call screen (right), and enable anyone to dial 911 on the handset even if it is locked. However, the emergency prompt on the locked screen would be relatively easy to press inadvertently, especially during the process of placing a locked iPhone into a pocket or purse. While one would still need to dial 9-1-1 and press send, the possibility exists that a user or a user’s child will trigger a non-emergency 911 call even with the iPhone still locked.

Locked Screen:

Emergency Screen:

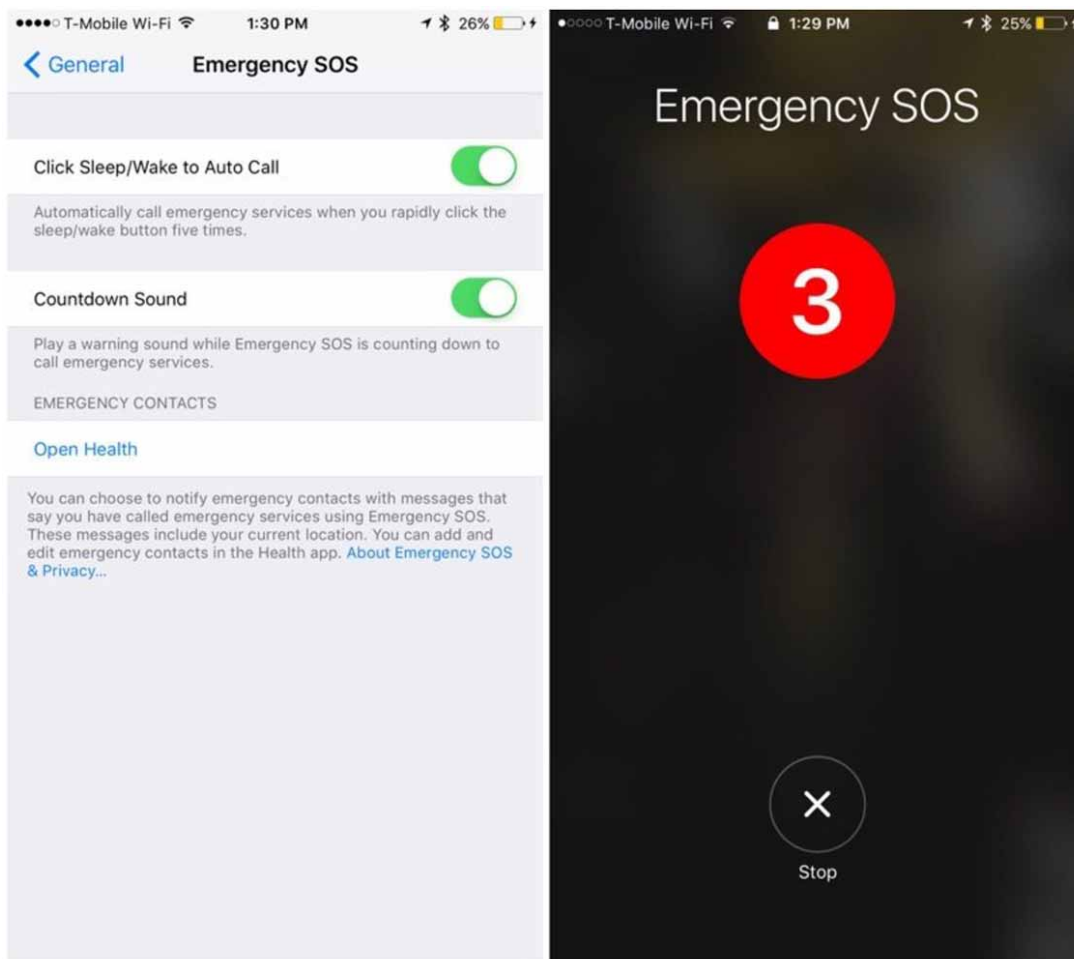


<sup>18</sup> 67srbell, Comment to *Too easy to accidentally call 911 from lock screen*, AndriodCentral (Jun. 7 2013), <http://forums.androidcentral.com/lg-optimus-g-pro/286677-too-easy-accidentally-call-911-lock-screen.html> (last visited Nov. 21, 2016).

<sup>19</sup> ios8updates.com, <http://ios8updates.com/wp-content/uploads/2014/10/Medical-ID.jpg> (last visited Nov. 21, 2016).



As handset manufacturers deploy software updates, new non-emergency 911 call issues can arise. The new Apple iOS 10.2 Beta 2 contains an SOS feature (see image below).<sup>20</sup> This feature enables iPhone users to trigger calls to emergency services automatically by pressing the power button five times.<sup>21</sup> While features like this can enable victims of emergencies to contact emergency services with greater ease, they might also make inadvertent calls to 911 centers more likely to occur.



<sup>20</sup> Mac Rumors, <http://cdn.macrumors.com/article-new/2016/11/emergencysos-800x707.jpg> (last visited Nov. 21, 2016).

<sup>21</sup> Juli Clover, *What's New in iOS 10.2 Beta 2: SOS Feature, Music Change, and New 'TV' App*, MacRumors (Nov. 7, 2016, 1:55 PM), <http://www.macrumors.com/2016/11/07/whats-new-in-ios-10-2-beta-2/> (last visited Nov. 21, 2016).

**B. The attitudes and behaviors of cellphone consumers and officials overseeing 911 systems may contribute to the problem of high inadvertent 911 call volume.**

In addition to handset design features, human attitudes and behaviors may contribute significantly to the problem of high non-emergency 911 call volume. Whether resulting from lack of awareness regarding the ease with which pocket 911 dialing can occur, lack of concern for the severe negative consequences to society that result from non-emergency 911 calls, struggles against incentives to deprioritize reducing the type of “short calls” inadvertent 911 dials cause, or a desire to engage in deliberate abuses of or attacks against PSAPs, the choices and practices of those who interact with PSAPs and technology capable of dialing 911 can amplify the negative effects of design flaws, increase the percentage of accidental calls their local PSAPs receive, or even present public safety hazards.

Cellphone users can place inadvertent 911 calls whether the devices are in their hands, pockets, purses, backpacks or gym bags, but failing to lock the keypad increases the likelihood of inadvertent calls.<sup>22</sup> Similarly, letting small children play with cellphones may contribute to high nonemergency 911 call totals. Whether or not the keypad is locked, and whether or not the device is service connected, any cellphone with battery power can place 911 calls. In fact, 911 is the only number a child can successfully call from a locked handset without having to unlock it first.

Inadvertent 911 calls are problematic for PSAPs and public safety in general, but people hanging up when they realize that they have dialed 911 by accident make the problem much worse. Whether someone accidentally dials 911, then realizes they did so and then hangs up, or is one of many callers attempting to report the same emergency and hangs up when they cannot get through (and often redials 911 immediately), or is a prank caller simply calling 911 and then hanging up for fun, the result is the same. The PSAP operator must spend time trying to get a response from the caller before the call disconnects, and then another PSAP operator must field the next call while the first is tied up. Additionally, protocol often dictates that PSAP operators follow up by calling back the number that hung up.<sup>23</sup>

Incentive problems might also contribute to the non-emergency 911 call problem.<sup>24</sup> Some city officials may be perversely incentivized to avoid addressing the inadvertent 911 call problem because high numbers of “short calls,” such as those which result from pocket dials, can make a county or city appear more efficient in its emergency response capability than it really is when calculated into its average response time.<sup>25</sup> Juan

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<sup>22</sup> Trevor Melanson, *Accidental Pocket Dialers Hang Up 911 Responders; Cellphones Run Amok in Pants, Purses and Backpacks Trigger False Alarms*, The Globe and Mail (Canada) (LexisNexis News Archive) (Jan. 8, 2011).

<sup>23</sup> Pat Reavy, *Pocket Dialing’ Has Consequences for 911 Dispatchers, Police*, Deseret Morning News (Salt Lake City) (LexisNexis News Archive) (Oct. 26, 2012).

<sup>24</sup> Juan Gonzales, *Kick in Pants: Accidental Cell Calls Plague 911*, New York Daily News (May 9, 2012, 3:00 AM), <http://www.nydailynews.com/new-york/city-flooded-4-million-inadvertent-911-calls-cell-phones-year-article-1.1074752> (last visited Nov. 21, 2016).

<sup>25</sup> *Id.*

Gonzales, reporter for the New York Daily News, strongly implied that this dynamic lowers the priority level that New York City officials assign to reducing the city's "short call" volume.<sup>26</sup> He wrote, "[t]he city has done nothing to reduce butt calls, but all those short-duration calls sure make overall 911 response times look good....The NYPD reported the 2010 System Average Total Talk Time was 1:08 minutes. Since the total number of calls received includes approximately 3.9 million short calls, utilizing this metric as currently calculated does not accurately reflect the NYPD's time spent on received and processed 9-1-1 calls." While this was an isolated example, the possibility of such a metric being used in other municipalities, particularly large ones like New York, and resulting in incentives at odds with an impetus or urgency to reduce non-emergency call volume, may merit consideration.

Some people also abuse the 911 system deliberately, either for the purposes of pranks, deliberately overwhelming PSAPs, or disabling public access to emergency services. Telephone denial of service (TDoS) attacks are deliberate attempts to disable PSAPs' communication with emergency callers and/or first responders.<sup>27</sup> SWATting is falsely reporting an emergency in the hope of triggering a response by a SWAT team to the location the perpetrator targets.<sup>28</sup> Less egregious abuses include calls to 911 for any reason other than to report an emergency that necessitates a response by police, firefighters, or emergency medical personnel, or people who allow their handsets to dial 911 repeatedly in a short amount of time in the absence of actual emergencies.<sup>29</sup>

### **C. Many PSAPs lack sufficient equipment and information.**

PSAP operators and administrators know that they get many calls each day during which the caller does not respond when asked "What is your emergency?" However, many PSAPs receive insufficient and/or delayed information accompanying incoming 911 calls, which can lead not only to slower, less efficient action by first responders, but also to a lack of useful data regarding the nature of 911 calls a given PSAP receives.<sup>30</sup> While determining exactly how many of the calls they receive are inadvertent is difficult, information PSAP personnel glean during incoming calls, upon playing back recorded calls, following mandatory follow-up call-backs, and from emergency responders upon their return from being dispatched to caller locations for investigation, can furnish them with clues as to whether particular calls were most likely placed inadvertently.<sup>31</sup> A PSAP operator can sometimes hear background noise, such people on the other end laughing,

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<sup>26</sup> *Id.*

<sup>27</sup> David Kahn, *Phony 911 Callers Shutting Down Critical Emergency Communications*, Fire Chief (LexisNexis News Archive) (Aug. 1, 2013).

<sup>28</sup> *Don't Make the Call: The New Phenomenon of 'Swatting'*, Federal Bureau of Investigation (Feb. 4, 2008), <https://archives.fbi.gov/archives/news/stories/2008/february/swatting020408> (last visited Nov. 21, 2016).

<sup>29</sup> Hattem, *supra* note 1.

<sup>30</sup> Glenn Bischoff, *Proposed 911 Data Program Could Be a Lifesaver*, Urgent Communications (LexisNexis News Archive) (Oct. 23, 2012).

<sup>31</sup> Mardee Roberts, *911 Answering Calls from Tight Pockets*, The Leaf-Chronicle (Clarksville, TN) (LexisNexis News Archive) (Apr. 21, 2001).

conversations between retail customers and a store cashiers, car radios, television commercials, or programming audio, etc., suggesting that there is no emergency, that the caller is unaware that she or he called 911, and that the caller cannot hear voice of the PSAP operator on the other end.<sup>32</sup> Other times, a PSAP operator might hear gunfire from a shooting range or military training facility, audio from scenes in an action or horror movie playing in a movie theatre or in someone's living room, or a child crying or screaming, that might make it seem as though there really is an emergency keeping the caller from responding, even though the call is only a pocket dial.<sup>33</sup>

PSAP operators can also mistake legitimate 911 calls for pocket dials.<sup>34</sup> Such an incident occurred in the summer of 2016, when a dying man dialed 911 and was unable to respond when the dispatcher (who receives a dozen such calls a day that are nearly always inadvertent/false alarms) asked about the man's emergency, said "hello" twice, and then hung up, not hearing the faint sounds he made while dying of heart disease (which were audible on the recording of the subsequently investigated call).<sup>35</sup> The operator was following the city's protocol, which permits 911 operators to hang up on and disregard calls when they cannot get a response from the caller.<sup>36</sup>

#### **D. Insufficient data precludes efficient, tailored solutions.**

Limited data is available regarding the large number of calls PSAPs receive that appear to originate from mobile devices in pockets and purses. Mobile devices generate the majority of inadvertent 911 calls, and the number of cell phones in circulation increases every year.<sup>37</sup> However, as discussed above, actual emergency calls and deliberate prank calls can be brief like pocket dials, and frequently result in PSAP operators needing to make follow-up calls when the caller fails to respond.<sup>38</sup> Thus, the assertion that half of the calls PSAPs receive are pocket dials may be an inaccurately broad generalization, and unless substantiated by thorough research and data, such simplistic analysis might be leading to premature and inefficient solutions.

Better understanding of the nature and specific sources of what appear to be non-emergency 911 calls, and their relative proportions to one another, may be required in order to tailor effective solutions. While pocket dials likely contribute significantly to the burden on PSAPs, some pocket dials are likely the result of mobile customer error or carelessness, and some may be the result of features of the handsets themselves that increase the likelihood of inadvertent 911 dialing. Calls that appear to PSAP operators to be pocket dials but actually are not may also contribute to higher reported pocket dial

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<sup>32</sup> *Id.*

<sup>33</sup> *Id.*

<sup>34</sup> Kate Seamons, *Man Dies After 911 Call Is Seen as Butt Dial*, Newser (July 13, 2016, 4:03 AM CDT), <http://static1-cdn.newser.com/story/228031/man-dies-after-911-call-is-seen-as-butt-dial.html> (last visited Nov. 21, 2016).

<sup>35</sup> *Id.*

<sup>36</sup> *Id.*

<sup>37</sup> Hugo Silveirinha Felix, *Have You Ever Butt-Dialed 911? Probably*, Gothamist/Newstex Web Blog (LexisNexis News Archive) (May 9, 2012).

<sup>38</sup> Nathan McAlone, *Butt Dials are Wreaking Havoc on Our 911 System*, The Business Insider (LexisNexis News Archive) (Oct. 15, 2015).

figures. Prank hang-up calls, especially from untraceable phones or to PSAPs with older or less sophisticated call identification setups, and calls by victims of medical emergencies that prevent them from speaking, are examples of such calls. Computer generated 911 dials, and 911 calls resulting from MLTS user error, might also resemble pocket dials to PSAPs lacking class of service indicator capability.

**E. Non-service-initialized (NSI) devices in circulation, and the requirement that carriers transmit these calls to PSAPs, strain emergency response resources.**

In 1996, the Federal Communications Commission (Commission) issued its E911 First Report and Order, which required covered carriers to transmit all 911 calls from wireless mobile handsets that transmit a code identification, without requiring any user or call validation or similar procedure. The Commission noted that user validation procedures, such as requiring a caller to provide credit card information, could be long and cumbersome, and that applying these procedures in emergencies could thus cause a dangerous delay or interruption of the 911 assistance process and, effectively, the denial of assistance in some cases. The Commission also required covered carriers to comply with PSAP requests for transmission of 911 calls made without code identification.

Even at the time of adoption of the NSI requirement, however, the Commission recognized that “there are disadvantages associated with requiring all 911 calls to be processed without regard to evidence that a call is emanating from an authorized user of some CMRS provider.”<sup>39</sup> The Commission acknowledged that “placing 911 calls from handsets without a code identification has significant drawbacks, including the fact that ANI and call back features may not be usable, and hoax and false alarm calls may be facilitated.”<sup>40</sup> The Commission concluded, however, that public safety organizations are in the best position to determine whether acceptance of calls without code identification would help or hinder their efforts.

In response to several petitions for reconsideration of the E911 First Report and Order, the Commission issued a stay of its rules and sought additional comment. On the basis of the updated record on reconsideration, in 1997 the Commission released its E911 First Memorandum Opinion and Order. In that order, the Commission determined that without applying validation procedures, then-present technology could not distinguish between code-identified and non-code-identified handsets. Accordingly, the E911 First Memorandum Opinion and Order required carriers to forward all 911 calls whether or not they transmit a code identification. The Commission also found that PSAPs should be able to “screen out or identify many types of fraudulent calls or those where call back is not possible”<sup>41</sup> and also expressed the hope that PSAPs could implement call back technology for NSI devices.

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<sup>39</sup> Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, *Report and Order and Further Notice of Proposed Rulemaking*, 11 FCC Rcd. 18676, 18696 ¶ 38 (1996) (*E911 First Report and Order*).

<sup>40</sup> *Id.*

<sup>41</sup> *E911 First Memorandum Opinion and Order*, 12 FCC Rcd. at 22684 ¶ 37

Since the adoption of the NSI requirement, the Commission has been aware of the continuing concern regarding fraudulent calls and the lack of call-back capabilities associated with NSI devices, and has taken various measures to address this issue:

- In 2002, the Commission required NSI handsets donated through carrier-sponsored programs, as well as newly manufactured “911-only” devices, to be programmed with the number 123-456-7890 as the “telephone number,” in order to alert PSAPs that call-back features were unavailable.
- The Commission also required that carriers complete any network programming necessary to deliver this programmed number to PSAPs. Later that year, the Commission clarified that its rules requiring carriers to forward all 911 calls to PSAPs did not preclude “carriers from blocking fraudulent 911 calls from non-service initialized phones pursuant to applicable state and local law enforcement procedures.”<sup>42</sup>
- The Commission added that “[w]here a PSAP has identified a handset that is transmitting fraudulent 911 calls and makes a request to a wireless carrier to block 911 calls from that handset in accordance with applicable state and local law enforcement procedures, the carrier's compliance does not constitute a violation of Section 20.18(b).”<sup>43</sup>

In its subsequent E911 Second Memorandum Opinion and Order, the Commission modified its rules to require that carrier-donated handsets and newly manufactured 911-only devices be programmed with the number “911,” followed by seven digits from the handset’s unique identifier, such as the Electronic Serial Number or International Mobile Station Equipment Identity. The Commission took this action to facilitate identification of individual NSI devices used to make fraudulent or harassing calls, finding it “highly probable” that this form of identification would enable a PSAP to identify a suspected device and work with carriers and law enforcement “to trace it and block further harassing calls from the device.” The Commission further stated that it would continue monitoring the nature and extent of problems associated with 911 service for NSI devices.

Fraudulent 911 calls from NSI devices continue to pose a major problem for PSAPs, imposing substantial costs while reducing their ability to respond to legitimate 911 calls. Data generated in 2006, from four different states, showed that as many as 3.5% and as few as less than 1% of 911 calls placed by NSI devices were legitimate calls relating to actual emergencies.<sup>44</sup> More recently, public safety advocates have provided additional evidence that the vast majority of 911 calls from NSI devices were not actual calls for help, and that these calls both wasted the limited resources of PSAPs and

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<sup>42</sup> FCC Clarifies that 911 Call-Forwarding Rule does not Preclude Wireless Carriers from Blocking Fraudulent 911 Calls from Non-Service Initialized Phones Pursuant to State and Local Law, CC Docket No. 94-102, *Public Notice*, 17 FCC Rcd. 21877 (2002) (*E911 Fraudulent Call-Blocking Public Notice*).

<sup>43</sup> *Id.* at 21878.

<sup>44</sup> *Notice of Inquiry*, 23 FCC Rcd. at 6102 ¶ 12; Petition at 10. The four states were Tennessee, Florida, Michigan, and Washington.

interfered with their ability to respond to legitimate emergency calls.<sup>45</sup> For example, North Carolina reported that between May 15, 2008 and June 15, 2008, PSAPs across the state received 159,129 calls from NSI devices, of which 132,885, or 83.51%, were non-emergency calls, and an additional 11,395, or 7.16%, were “malicious” non-emergency calls.<sup>46</sup>

Of particular concern to public safety officials is the concentration of NSI device calls placed from a small subset of users. California, for example, reported that between October 1, 2007 and May 15, 2008, PSAPs across the state reported 266 active repetitive callers who placed over 77,000 calls to 911, mainly using NSI devices. Of the 266 callers identified, 85 had placed 200 or more calls, and eight callers had made more than 1,000 calls.<sup>47</sup> Additionally, these calls can seriously drain the resources of a PSAP. Kentucky has indicated that “the time taken away from real emergency calls disposing of these [911 calls from NSI devices] seriously threatens the safety of any citizen in true need of service.”<sup>48</sup>

This concentration of malicious users implies that these are not merely inadvertent calls to 911, but a more intentional waste of PSAP resource. In particular, NENA is concerned that the growing availability of older smartphones poses a significant risk. With advanced capabilities and open application programming interfaces for many device functions, the availability of disused smartphones dramatically lowers the cost and other barriers to the implementation of Denial-of-Service attacks against PSAPs. For example, in one attack scenario, a malicious actor could gather a bundle of, say, 10 devices and program each of them to make repeated 911 calls at some specified time or place. While this type of attack could also be executed through VOIP, it requires less technical skill to simply program a speed dialer and press the call button on each device. For all but the largest PSAPs, this call volume would immediately exceed the capacity available to handle 911 calls, thus preventing legitimate calls from reaching the PSAP.<sup>49</sup>

However, advocates for populations reliant on NSI devices to maintain access to emergency services have urged the Commission to keep in mind that many NSI device users are elderly or poor and may lack the technological sophistication to understand they are operating an NSI device or that their NSI device could be unable to dial 911 even after a transition period that includes aggressive consumer outreach and education.<sup>50</sup> Additionally, they believe that in considering restricting access to 911 for even a discreet minority of the population, the Commission should ensure that there are no alternative solutions that could rectify the problem while preserving 911 access for legitimate users of NSI devices. In particular, they stress that if the universe of deployed NSI devices is large, and the number of individuals that use NSI devices to

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<sup>45</sup> Indiana Wireless 911 Advisory Board Comments, PS Docket 08-51 (filed June 1, 2008), at 3.

<sup>46</sup> North Carolina 911 Board Comments, PS Docket 08-51 (filed June 27, 2008), at 3.

<sup>47</sup> California Department of General Services Comments, PS Docket 08-51 (filed June 27, 2008), at 2.

<sup>48</sup> Kentucky Office of the 911 Coordinator Comments, PS Docket 08-51 (filed June 30, 2008), at 1.

<sup>49</sup> National Emergency Number Association Comments, PS Docket 08-51 (June 4, 2015), at 3.

<sup>50</sup> Mission Critical Partners Comments, PS Docket 08-51 (filed June 5, 2015), at 4.

fraudulently call 911 is small, the Commission should consider whether an alternative technology such as the throttling or blocking 911 calls from identified devices would be a more appropriate solution to the problem.

## **II. A range of minor and substantial changes may help to reduce high non-emergency 911 call volume.**

Examining the various causes that may be contributing to high non-emergency 911 call volume not only illuminates the scope of the problem, but also serves as a useful guide in tailoring solutions that may be effective in combatting it. Some solutions may require changes in the way manufacturers design, program and ship handsets or to the equipment PSAPs use. Others may require changes in the way lawmakers approach deliberate or egregiously negligent abuses of the 911 system, or to the incentive structure under which 911 oversight officials operate. Perhaps some of the most important and difficult solutions will require altering consumer behavior so as to reduce the likelihood of accidental 911 calls. This section explores solutions that may be helpful in understanding and mitigating the non-emergency 911 call problem.

### **A. Design improvements and precautionary measures by handset manufacturers may decrease chances of accidental 911 calls occurring.**

In 2002, wireless carriers asked manufacturers to refrain from sending new handsets to carriers with the auto-dial 911 feature activated, and the Cellular Telecommunications and Internet Association (CTIA) refused to certify handsets that have the auto-dial 911 feature pre-programmed.<sup>51</sup> By 2005, cellphone companies stopped building the auto-dial 911 function into handsets.<sup>52</sup> However, the few non-service-initiated devices remaining on the market that have this feature can still be used accidentally and deliberately to place wasteful 911 calls. Additionally, restricting manufacturers from pre-programming 911 into one-touch dial features cannot curb pocket dialing if consumers simply enable such pocket dial features after they take the handsets out of their packaging.

Perhaps consumers should be educated to follow the lead of handset manufacturers and avoid restoring the settings that make inadvertent 911 calls more likely to occur by programming 911 as a speed dial preset.<sup>53</sup> Perhaps manufacturers should cease to enable such functionality.

Further research will shed light on what shape such solutions might take, and how to preserve an appropriate balance between enabling people facing actual emergencies to call 911 without undue difficulty and limiting inadvertent 911 calls. Solutions to non-emergency calls that poor handset design cause may include recalls of older-model, pocket-dial susceptible devices, improved design features on new phones that lessen the likelihood of inadvertent 911 calls, better device tracking, or better call triage equipment

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<sup>51</sup> Federal Communications Commission Wireless Communications Bureau Staff Report: Prevention of Unintentional 911 Calls, CC Docket No. 94-102, DA 02-3413A1 (Dec. 11, 2011).

<sup>52</sup> Gerry Bellett, *Butt Calls' a Pain for Emergency Responders; 9-1-1 Dialed Hundreds of Times a Day by People Sitting on Cellphones*, Times Columnist (Victoria, BC) (Jul. 16, 2009) (LexisNexis News Archive).

<sup>53</sup> *Id.*



or procedures at PSAPs. However, we must better understand the problem we face before implementing solutions will become practicable.

**B. User interface best practices, consumer education, and penalties for egregious abuses of 911 systems may reduce non-emergency 911 calls.**

According to Commissioner O'Reilly, new laws and regulations cannot solve the pocket-dialing problem, but consumer education and public awareness campaigns can.<sup>54</sup> Financial and logistical enforcement difficulties may present obstacles to the efficacy of legislative or rule-based solutions to the pocket dial problem at the consumer level, because the minimal extent to which authorities can practicably enforce these solutions often limits their effectiveness. Additionally, inadvertent or unconscious behavior can be more difficult to deter than behavior based on deliberate, conscious choices.

While some legal solutions directed toward modifying the practices of handset manufacturers, wireless service providers, local authorities or even PSAPs themselves may help reduce non-emergency 911 calls, changes in consumer behavior may be necessary to fully address the non-emergency 911 call problem. Public education campaigns, such as public service announcements and other programs designed to focus public attention on social ills and encourage behavioral changes to counteract them, can have varying degrees of success. For instance, slogans such as "Arrive alive, don't drink and drive," and "Never shake a Baby" are widely known campaigns targeting public safety threats, but how effective have these been in curbing the behaviors they target? If very effective, would similar campaigns aimed at solving the inadvertent 911 call epidemic be similarly effective? If not, or if precisely quantifying the actual impact of such campaigns is impossible or impractical, then would the money that would be required to fund a cellphone safety best practices campaign be better diverted toward purchasing better caller-identifying equipment, improving or expanding facilities, or hiring additional operators for PSAPs?

In 2012, Winbourne Consulting expressed a sentiment Commissioner O'Reilly would later echo favoring public education over new laws to combat pocket 911 dialing.<sup>55</sup> In response to its findings regarding New York City's growing problem with pocket 911 dialing, Winbourne Consulting urged city hall to launch a public awareness campaign aimed at curbing accidental 911 calls and freeing up PSAP resources.<sup>56</sup> While that effort never materialized, and while funding, organizing, and launching such a public awareness campaign may be difficult or met with resistance, working toward some form of public education solution to the problem of non-emergency 911 call volume at the consumer level may be worthwhile.<sup>57</sup>

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<sup>54</sup> Hattem, *supra* note 1.

<sup>55</sup> Gonzales, *supra* note 24.

<sup>56</sup> *Id.*

<sup>57</sup> *Id.*

Many carriers have enclosed educational information on their websites, in their flyers and newsletters, and in their customers' monthly bills.<sup>58</sup> While paper phone bills are largely obsolete, the idea of a carrier dispensing by some other means information aimed at increasing customer awareness of issues surrounding non-emergency 911 calls may be worth exploring. Canadian authorities believe that education and advertising campaigns designed to increase awareness about the dangers of pocket dialing 911, and steps consumers can take to prevent it, may help.<sup>59</sup> The FCC has echoed this sentiment, advocating greater consumer education and ad campaigns (similar to those that have become popular in combatting drunk driving and texting while driving) aimed at making consumers aware of the dangers to the public associated with non-emergency 911 dialing and measures they can take to prevent it.<sup>60</sup> Not surprisingly, data on the efficacy of such campaigns is scarce prior to their implementation. To a certain extent, we may not know how well consumer education works to curb pocket dialing until we try it.

The FCC's primary recommendation for preventing accidental 911 calls from mobile devices, apart from disabling the auto-dial 911 feature, is simply locking their keypads.<sup>61</sup> To that end, the FCC has also undertaken educational measures in an attempt to induce consumers to be more careful, and to verify that their keypads are locked before returning their cellphones to their pockets or purses.<sup>62</sup> Has it worked? PSAPs are still inundated with what are assumed to be pocket dials, and handsets are designed to be capable of calling 911 with the keypad locked. This may be a classic example of a premature solution falling short of addressing a poorly understood problem. Conversely, the FCC's consumer education effort may be highly effective at targeting only a minor cause of pocket dialing, or may ultimately have a major impact on curbing future pocket dialing that is simply not yet realized. So far, this attempted solution has not significantly impacted the non-emergency 911 call problem plaguing PSAPs.

In the event we cannot completely eradicate pocket 911 dialing, or at least while we wait for such a solution or combination of solutions to arrive, methods for reducing the hazardous effects of pocket dialing that prove effective may be extremely valuable. One such method is encouraging callers to remain on the line after accidentally dialing 911 instead of hanging up right away. There is no penalty for calling 911 accidentally, and remaining on the line and letting the PSAP operator know that there is no emergency can greatly reduce the negative impact of an inadvertent 911 call.<sup>63</sup>

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<sup>58</sup> Federal Communications Commission Wireless Communications Bureau Staff Report: *Prevention of Unintentional 911 Calls*, CC Docket No. 94-102, DA 02-3413A1 (Dec. 11, 2011).

<sup>59</sup> Trevor Melanson, *Accidental Pocket Dialers Hang Up 911 Responders; Cellphones Run Amok in Pants, Purses and Backpacks Trigger False Alarms*, *The Globe and Mail* (Canada) (LexisNexis News Archive) (Jan. 8, 2011).

<sup>60</sup> Avery Estes & Haylie Szemplinski, *Harmful Consumer Wireless Behavior and Practices*, Federal Newsfeed, Official FCC Blog (LexisNexis News Archive) (Oct. 15, 2014).

<sup>61</sup> *Avoid Making Accidental 911 Calls on Your Wireless Phone*, Federal Communications Commission (Oct. 25, 2016), <https://www.fcc.gov/consumers/guides/avoid-accidental-911-calls-wireless-phones> (last visited Sep. 17, 2016).

<sup>62</sup> Reavy, *supra* note 23.

<sup>63</sup>*Id.*

PSAPs can also adopt text-back protocols for hang-up responses, which can reduce the time and resources PSAPs must devote to following up on calls that appear to have been placed inadvertently.<sup>64</sup> Instead of taking time to return a call that appears to have been a pocket dial, a PSAP operator can quickly send a text message requesting verification that the call was accidental, and the recipient can respond by text as to whether or not there is an emergency while the operator fields subsequent 911 calls.<sup>65</sup> In addition to saving time, this protocol may enable callers to provide details regarding their emergencies and trigger responder dispatch in situations where they are unable or afraid to speak. FCC Commissioner O'Reilly believes that texting people to let them know that their phones have accidentally dialed 911 might help curb pocket dialing without taking as much time and resources from PSAPs as call-backs require.<sup>66</sup> Additionally, according to the sheriff's department in Marion County, Indiana, 911 call centers that have used text back procedures have experienced significant time savings as a result.<sup>67</sup> Michigan's Smart911 system's text-back capability has also greatly reduced follow-up times for PSAP operators.<sup>68</sup>

With respect to the problem of children dialing 911 while playing with handsets, Vancouver Emergency Communication Centre (E-Comm) spokeswoman Jody Robertson has urged parents not to let children play with handsets, due to increased risk that an accidental 911 call will be placed as a result.<sup>69</sup> According to Ms. Robertson, if a parent does let a child play with a cellphone, that parent should at least make sure the battery is removed first.<sup>70</sup> Whether or not some kind of "cellphones capable of calling 911 are not toys" campaign would be an appropriate or effective measure, some type precautionary step adults can take before putting a device capable of placing an emergency call into a child's hands may be prudent.

All mobile phones, whether or not they are connected to provider networks, are required to be capable of placing a 911 call without being unlocked, such that anyone can call 911 from any mobile device even if it is locked.<sup>71</sup> The upshot of that public safety measure is that, on a locked cellphone, whether or not it is connected to a network, 911 is literally the only number that a child can successfully call, whether accidentally or deliberately. Some solution that takes this reality into account, so that PSAP operators can spend less time interacting with children playing with high-tech

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<sup>64</sup> *9-1-1 Call When You Can, Text When You Can't*, Tri-County Times (Fenton, Michigan) (Jul. 26, 2016) (LexisNexis News Archive).

<sup>65</sup> *Id.*

<sup>66</sup> *FCC Claims Butt Dialing Puts Aa Strain On 911 Emergency Services, Approximately 84 Million Calls A Year Accidental*, Hot Hardware (LexisNexis News Archive) (Oct. 19, 2014).

<sup>67</sup> *Initiative Aims to Increase; Awareness of 'Text-to-911'*, The Times (Noblesville, Indiana) (Aug. 11, 2016) (LexisNexis News Archive).

<sup>68</sup> JaeMi Pennington, *Michigan 9-1-1 Dispatch Centers Save Time, Money, Resources and Lives with Smart911*, PR Newswire (Dec. 17, 2015) (LexisNexis News Archive).

<sup>69</sup> Bellett, *supra* note 52..

<sup>70</sup> *Id.*

<sup>71</sup> Dave Lee, *'Butt dials' – a strain on US emergency systems*, BBC News (Oct. 5, 2015), <http://www.bbc.com/news/technology-34441043> (last visited Nov. 21, 2016).

toys and more time interacting with people in serious emergency situations might merit consideration.

Some states, including Tennessee and Georgia, have passed laws making deliberate, false 911 calls a crime.<sup>72</sup> While such laws and criminal penalties enforced against those who violate them do not necessarily address the problem of inadvertent 911 calls, they may curb other deliberate abuses of the 911 systems that bog down PSAPs such as SWATting and TDoS attacks. Additionally, criminal penalties may also be useful in curbing other, less malicious abuses, such as calling 911 to ask for directions or for some other non-emergency purpose, or for the owner of a particular number that reaches a particular threshold of repeated non-emergency 911 calls within a given period of time. Fining consumers whose numbers repeatedly call 911, either accidentally or deliberately, without reporting an actual emergency could incentivize greater caution among consumers, and offset some of the additional staffing and other costs to PSAPs to which inadvertent 911 calls contribute.<sup>73</sup> Perhaps a requirement by the FCC that Wireless carriers assist in the collection of such fines—i.e. by adding them to repeat offenders’ bills, and having them forward the revenue from those fines over to the PSAP that serves the repeat offenders’ billing areas, triggered at a certain threshold of non-emergency calls placed in the course of a month or a year—would be an approach worth consideration.

### **C. Technological solutions and increased resource allocations may help struggling PSAPs.**

Technologies that may help PSAPs respond more effectively to high non-emergency 911 call volume may be on the horizon, or may already be on the market and just not yet affordable for PSAPs that are relatively small or have especially limited funds. For example, in 2011, NENA undertook to promote the installation of “black boxes” at PSAPs increase the data available to 911 operators, which, for PSAPs that are too small, remote or underfunded for a Next Generation 911 upgrade, might be tremendously helpful, and could illuminate what percentage of incoming calls are actually pocket dials.<sup>74</sup>

Perhaps PSAPs simply don’t yet know about existing, affordable technological solutions to the problem. One example is the 911 Pocket Call Filter by Interalia, which disconnects pocket dials made to PSAPs while letting through legitimate emergency calls dialed in deliberately.<sup>75</sup> Installed at a local call agency, it uses advanced audio

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<sup>72</sup> Rob Low, *Bogus 911 Calls Clogging Dispatch Centers*, KDVR.com (posted May 15, 2015, 9:41 PM, updated 5:33 AM), <http://kdvr.com/2015/05/14/bogus-911-calls-clogging-dispatch-centers> (last visited Nov. 21, 2016).

<sup>73</sup> *Pocket Dials’ Have to Stop*, Toronto Star Newspapers, Ltd. (Milton Canadian Champion Editorial) (LexisNexis News Archive) (Jan. 17, 2012).

<sup>74</sup> Glenn Bischoff, *Proposed 911 Data Program Could Be a Lifesaver*, Urgent Communications (Oct. 23, 2012) (LexisNexis News Archive).

<sup>75</sup> Interalia 911 Pocket Call Filter Brochure, [http://www.interalia.com/doc/Solutions/INT3010\\_Interalia\\_911\\_Verification\\_Service\\_Brochure\\_November\\_2013\\_Brochure\\_FINAL\\_PR.pdf](http://www.interalia.com/doc/Solutions/INT3010_Interalia_911_Verification_Service_Brochure_November_2013_Brochure_FINAL_PR.pdf) (last visited Nov. 21, 2016).

detection technology which routes cell phone calls so that real emergency calls go through to operators and pocket calls don't.<sup>76</sup> If a 911 call is placed on a cell phone, the caller is instructed to press any button and to say anything, or alternatively to say the word "emergency."<sup>77</sup> If at that point no button is pressed and no audible sound is made, the call is disconnected. Otherwise it is routed to a 911 operator.<sup>78</sup>

Interalia claims that the system works with any callers regardless of the language they speak, and was implemented at a test PSAP in 2012 with great success—77,002 calls were routed to the filter and 24,974 of them were disconnected before having a chance to bog down the 911 operators.<sup>79</sup> While this device may not prove to be the ultimate solution to 911 pocket dialing, it provides an example of a way in which innovators have attempted to devise a technological solution to the problem of high non-emergency 911 call volume. Encouraging and facilitating the development of such innovations, whether aimed at improving upon such ideas or developing new ones, may ultimately yield significant, effective solutions if PSAPs are aware of and can access them.

It is possible that elevated non-emergency 911 call volume is the intractable result of aggregated policy decisions favoring maximum ease of 911 call placement. If efforts to reduce non-emergency 911 calling are met with unyielding resistance based on concerns that such efforts will unacceptably limit the ease of access by the public or certain of its subsets to emergency services, and the state of technology in light of such policies precludes significant reduction of non-emergency 911 call volume, all hope of relieving the resulting burden on PSAPs will not necessarily be lost as a result. Exploring increased PSAP funding options aimed at expanding and improving PSAP facilities and hiring more operators may be the best or only way to deal with the problem of high non-emergency 911 call volume in the event that it proves unamendable to alternative solutions.

**D. Rigorous research efforts into specific causes underlying the non-emergency 911 call problem may reveal effective solutions.**

Non-emergency 911 call volume figures are typically based on speculation and assumptions by overwhelmed PSAP operators and officials charged with overseeing the administration of 911 systems. In-depth studies aimed at diagnosing what the precise sources and causes of these "pocket dials" may be needed in order to answer some of the questions that remain unanswered regarding the causes of high non-emergency 911 call volume. While some studies have yielded useful data, many only describe and quantify the problem of non-emergency 911 calls and its magnitude rather than dissecting and attempting to solve it. For example, NENA reports that an estimated 25 to 70 percent of wireless 911 calls are unintentional, wasting thousands of hours PSAPs could otherwise spend fielding calls reporting real emergencies and expediting the

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<sup>76</sup> *Id.*

<sup>77</sup> *Id.*

<sup>78</sup> *Id.*

<sup>79</sup> *Id.*

process by which they dispatch first responders to help.<sup>80</sup> However, whereas the problem is well-documented, its specific causes, comprehensive data, and potential solutions are not.

Winbourne Consulting conducted a study that yielded some quality data regarding the non-emergency 911 call problem. The study revealed that emergency call centers in New York City receive approximately 4 million inadvertent 911 calls every year, and that number is growing in proportion to the increasing number of cell phones in circulation throughout the United States.<sup>81</sup> In 2012, the Valley Emergency Communications Center (VECC) in West Valley, Utah, the PSAP which serves 20 agencies including most of Salt Lake City's police and fire departments, reported that it received 301,730 911 calls between September 1, 2011 and October 1, 2012, of which over 80% came from cellphones.<sup>82</sup> Nearly 46% of those were either hang-ups, or calls on which operators were unable to get a response from a caller, and over 82% of those either resulted in dispatched officers reporting that they were false alarms or were made from phones dispatchers could not locate, roughly 17% were hang-ups that dispatchers were able to call back and verify were false alarms, and roughly 0.37% came from deactivated, untraceable handsets that dispatchers were unable to call back.<sup>83</sup> To put these figures into perspective, this PSAP, which receives an average of 774 calls per day, must field an average of 67 "pocket dials"—ones on which they could hear indications that the caller was unaware of having dialed 911—all before lunchtime.<sup>84</sup>

Additionally, the 911 director and an operator from the Douglas County PSAP in Nebraska estimate that about seven calls to the PSAP per hour are accidental 911 calls, and that the cost of dealing with them is about \$45,000 per year.<sup>85</sup> Importantly, each of these calls also takes away 45 -75 seconds of a dispatcher's time that could otherwise have been devoted to real emergencies.<sup>86</sup> Even PSAPs serving populations as small as that of Eagle County, Colorado are being inundated with 911 pocket dials, which accounted for 36 percent of its 2014 total 911 call volume.<sup>87</sup>

While studies such as these are helpful in certain respects, they are somewhat sporadic, inconsistent, and leave many questions unanswered that would be of great help in understanding and crafting solutions for the causes of high non-emergency 911 call volume problem. Perhaps the first step toward effectively devising and implementing solutions to the problem is performing coordinated, thorough research into the nature of this large percentage of calls inundating PSAPs, (generally written off as simply "pocket dials") that PSAP operators and administrators have in many cases

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<sup>80</sup> Federal Communications Commission Wireless Communications Bureau Staff Report: *Prevention of Unintentional 911 Calls*, CC Docket No. 94-102, DA 02-3413A1 (Dec 11, 2011).

<sup>81</sup> Gonzales, *supra* note 24.

<sup>82</sup> Reavy, *supra* note 23.

<sup>83</sup> *Id.*

<sup>84</sup> *Id.*

<sup>85</sup> Maggie O'Brien, *Pocket Dials' to 911 Waste Dispatchers' Time, Money; Rise in Accidental Calls Steals Precious Minutes from True Emergencies*, Omaha World-Herald (July 14, 2014) (LexisNexis News Archive).

<sup>86</sup> *Id.*

<sup>87</sup> Low, *supra* note 72.

simply come to expect and feel powerless to combat. Once more reliable data is available from a larger cross section of PSAPs, it may be possible to isolate and better understand the primary culprit(s), and to tailor efficient solutions toward the most pervasive, specific sources of non-emergency 911 calls, and those which can be addressed most inexpensively and expediently.

**E. State and federal regulation can reduce the ease with which NSI devices could be used for denial of service attacks.**

There are a variety of state and federal regulatory changes that could be made to address some of the issues with current NSI device policies. These changes address either the behavior of users, carriers, or both. First, the Commission could choose to implement its currently proposed rule which would end the mandate to carriers to carry NSI device calls. Secondly, the Commission could choose to require that carriers deliver more information with an NSI device call to allow better screening and blacklisting of malicious NSI devices. Finally, states can implement their own legislation to reduce the exposure that PSAPs have in their own states while waiting for the Commission to act.

**A Commission decision to end mandatory NSI device support** from carriers would be the broadest and most complete solution to NSI device calls. In particular, it would eliminate the ability of third party manufactures to continue to sell dedicated 911 devices that might otherwise escape attempts to reduce the volume of inadvertent or unintentional calls. This solution would also obviate the need for other regulatory action at the state level which would likely be implemented in a patchwork fashion that would leave users in some states with less access to 911 services.

However, this would create the largest burden on populations that depend on NSI devices to access emergency services.<sup>88</sup> Many advocates for these populations have argued that the public has come to rely on the fact that NSI devices are 911-capable, and that eliminating the call-forwarding requirement could lead to tragic results given this public reliance. CTIA, for example, stated that the public now has a “reasonable expectation that all wireless 911 calls will terminate at a PSAP.”<sup>89</sup> Additionally, this change would require a large public awareness campaign to educate the current legitimate users of NSI devices. This might prove particularly challenging given that the primary users of these devices are poor, elderly, and underserved populations that would be the hardest to reach with a public awareness campaign.

Furthermore, if the Commission chose to end mandatory NSI device call forwarding, it’s not clear that carriers would end the service. CTIA’s statement regarding consumer expectations would serve as a powerful incentive for carriers to continue forwarding NSI device calls or face departure to carriers that are willing to continue the service. The Commission might choose to block carriers from delivering and NSI device calls, but there are a small number of calls originating from initialized devices that cellular networks incorrectly identify as NSI device call. If the Commission does move forward on this rule, the final disposition of this issue would remain important.

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<sup>88</sup> Mission Critical Partners Comments, PS Docket 08-51 (filed June 5, 2015).

<sup>89</sup> CTIA Comments, PS Docket 08-51 (filed June 30, 2008), at 3.

Regardless, the proposed rule is presently on hold for further consideration and appears unlikely to progress before the end of the current administration.

**The Commission could also choose to mandate that carriers deliver metadata that better identifies particular NSI devices.** NENA has proposed this solution as an intermediate step that would assist PSAPs in mitigating their exposure to attacks through NSI devices while the Commission makes a final determination on whether or not it will phase out NSI device support.<sup>90</sup> However, there is no reason that this solution would have to be temporary, and it is possible that it would alleviate NSI device security risks without hampering those dependent on NSI device service.

This option would require that carriers monitor the International Mobile Equipment Identity (IMEI)/International Mobile Subscriber Identity (IMSI) of NSI devices making calls via their networks, and to identify devices which appear to be making suspiciously-large numbers of 9-1-1 calls. An IMEI is a number that identifies a specific mobile handset, and is distinct from an IMSI which is a unique identification associated with the specific subscriber identity module (SIM) card in a phone. The presence of these numbers would allow a blacklist of known bad handsets to be compiled and shared between PSAPs at national, state, and local levels.

While this solution avoids removing NSI devices as a source of emergency communications, it is unclear how effective a national plan like this would be. PSAP infrastructure varies between states and counties, and the ability to collect and implement a national blacklist would depend on the current level of each state's PSAP hardware. Also, unless the database was responsive enough to update in near real-time, this would not prevent a sophisticated adversary from acquiring new handsets just prior to launching an attack on a PSAP.

**Finally, individual states could choose to regulate NSI devices** independently of the Commission. This would allow a state to tailor its approach based on the technical capabilities of its own PSAPs and not have to reach a national interoperability standard between 50 states. The Commission has made it clear that requiring carriers to forward all 911 calls to PSAPs did not preclude “carriers from blocking fraudulent 911 calls from non-service initialized phones pursuant to applicable state and local law enforcement procedures.”<sup>91</sup> The Commission also added that “[w]here a PSAP has identified a handset that is transmitting fraudulent 911 calls and makes a request to a wireless carrier to block 911 calls from that handset in accordance with applicable state and local law enforcement procedures, the carrier's compliance does not constitute a violation of [the relevant Commission rule].”<sup>92</sup>

However, there is an understandable reluctance from carriers to actively participate in call blocking. Their concerns are primarily focused on the liability they can potentially

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<sup>90</sup> NENA Comments, PS Docket 08-51 (filed June 4, 2015), at 4.

<sup>91</sup> FCC Clarifies that 911 Call-Forwarding Rule does not Preclude Wireless Carriers from Blocking Fraudulent 911 Calls from Non-Service Initialized Phones Pursuant to State and Local Law, CC Docket No. 94-102, *Public Notice*, 17 FCC Rcd. 21877, 21878 (2002) (*E911 Fraudulent Call-Blocking Public Notice*).

<sup>92</sup> *Id.* at 21878.



incur from an erroneous block, and the large amount of resources they could potentially have to expend on implementing a system to review PSAP requests and the accompanying record of phone calls.<sup>93</sup> Despite this reluctance, Tennessee has created legislation to specifically address NSI device calls and has relieved carriers from liability regarding improperly blocked handsets.

Tennessee Code § 7-86-316 lays out a model for how states can individually attempt to discourage abuse of NSI devices.<sup>94</sup> Generally, this statute provides that contacting 911 for some purpose other than to report an emergency or an event that the person contacting 911 reasonably believes to be an emergency is a misdemeanor, and that aggravated nonemergency contact of 911 is contacting 911 where: an individual makes nonemergency contact to 911 in an offensively repetitious manner; the nonemergency contact of 911 creates a delay in the response to an emergency; or the nonemergency contact of 911 results in harm to person or property.

Additionally, the statute authorizes the emergency communications board to indefinitely divert repetitive harassing noninitialized 911 phone calls to an entity designated by the emergency communications board to receive such calls; provided, that the entity notifies the caller that the caller may contact the PSAP or district to request that it rescind its authorization to divert 911 calls from the caller's handset. The entity designated to receive diverted, harassing, noninitialized 911 phone calls is also granted immunity from liability for receiving and processing these calls.

The specific treatment of noninitialized calls appears to be unique to Tennessee. There are statutes that deal with the more general topic of false calls and hindering access to 911 systems that might be able to be applied by states with these already on the books. For example, N.H. Rev. Stat. § 106-H:13 makes it a misdemeanor to dial or otherwise cause 911 to be called for the purpose of making a false alarm or complaint, or to purposely report false information which could result in the dispatch of emergency services, and Ga. Code Ann., § 16-10-24.3 penalizes any person who verbally or physically obstructs, prevents, or hinders another person with intent to cause or allow physical harm or injury to another person from making or completing a 9-1-1 telephone call.

It is unclear how effective this law has been on the ground in Tennessee. This bill came into effect on April of 2012, and there is not a comprehensive study of the resulting impact since it was passed available at this time. Also, the language in the bill is permissive of blocking, but does not require that the procedure be used under any set conditions. This might have resulted in PSAPs being unwilling or unable to implement the controls that the statute enabled.

### **Conclusion**

Lack of quality information may be obstructing efforts to curb 911 nuisance calls in multiple respects. PSAP operators often lack sufficient information accompanying the various types of 911 calls they receive. There is often no response on the other end

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<sup>93</sup> Lynette Luna, *A Good Deed Gone Bad*, IWCE's Urgent Communications (Sep. 1, 2008), <http://urgentcomm.com/psap-mag/good-deed-gone-bad>.

<sup>94</sup> Tenn. Code Ann. § 7-86-316 (2016).

of the line to let them know whether it is an accidental or deliberate call, or whether or not follow-up or emergency response are necessary. Also, some PSAPs have equipment sufficient to furnish them with only the most basic information regarding the source of incoming 911 calls, and 911 calls from some devices are untraceable.

Furthermore, problems that relate specifically to NSI devices will likely remain a problem for the foreseeable future. These devices have been widely proliferated through well intentioned programs aimed at aiding disadvantaged populations, and sold commercially to users who wanted a backup “lifeline.” Given this proliferation and the lack of federal action on the subject, states should be prepared to move forward with their own solutions that work within the systems they currently have in place at their PSAPs, and that carriers are willing to support.

Technological advances such as NG911 system upgrades and FCC regulations on handset manufacturers may help reduce non-emergency 911 call volume. However, in order to best ensure that concerns regarding this problem guide those involved in the continued rollout of NG911, and to maximize the success of efforts to ensure that the obstacles that hampered the legacy 911 system follow it into obsolescence, developing better understanding of the individual causes underlying the non-emergency 911 call problem, and more decisive policy regarding the handling NSI devices, will be required.

Hopefully striking an appropriate balance between reducing non-emergency 911 calls and enabling people in need of emergency assistance to get help quickly and easily, will yield solutions that do not trade one harm for another, increase access to emergency services, and improve the efficacy of 911 systems. While eliminating non-emergency 911 calls entirely may be an unrealistic goal in light of the need to strike this balance, understanding the complex problem of high non-emergency 911 call volume is a crucial first step toward developing effective solutions. Access to more comprehensive, accurate data should enable policymakers, and other parties interested in improving 911 systems, to better understand the complex problems burdening PSAPs, and identifying which if any will be amenable to easy, fast, or inexpensive solutions and which are the primary culprits. This increased understanding should provide a solid foundation for exploring what combination of legislation, regulation, public education, technological innovation, will be most effective in unburdening PSAPs and improving the efficiency and speed of emergency response for people who truly need it.