

# Point-in-Time Mobile Application

## A Guide for Using Mobile Applications for Point- in-Time Counts

Version: December 2016



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### What is the Point-In-Time Mobile Application?

The Point-In-Time (PIT) Mobile Application (app) is a mobile app that collected information needed for the 2015 Homeless PIT count. In December 2014, HUD released the PIT Mobile App as an optional tool to assist communities with facilitating an effective PIT count and to assess the interest in and perceived value of using mobile technology to enhance the PIT count experience.

HUD encourages the use of technology to ease the survey administration burden of the PIT count and to enhance its data analysis possibilities - a fundamental goal of the PIT Mobile App was to show that data electronically captured in real-time could improve the quality of the PIT count data. Results from use of the PIT Mobile App show that data collected through the Mobile App was more consistent and more easily integrated with Homeless Management Information System (HMIS) data for analysis and reporting, due to a decrease in data collection and entry errors common after a paper-based PIT count is completed. The use of the Mobile App facilitated faster and more accurate data collection by standardizing and limiting the survey response categories and reducing processing time on the backend. The PIT Mobile App also offered a new capability that allowed the PIT count data to be parsed by geographic locations such as neighborhoods, CoC geographic boundaries, school districts, high poverty and crime areas, and political districts. The PIT Mobile App captured the GPS location coordinates for each survey conducted to assist CoCs in understanding where within their community's unsheltered individuals and families are encountered, providing valuable information for deployment of services. Prior to the 2015 PIT count, few CoCs had used mobile technology in their PIT count process. This technology allows easier reporting capability and enhanced options for mapping where persons experiencing homelessness are sleeping, and visualizing the PIT count data.

The PIT Mobile App reflected the six 2015 model surveys published by HUD:

- Individual and Household Unsheltered surveys
- Individual and Household Observation surveys
- Individual and Household Sheltered surveys

The PIT Mobile App was only available from HUD for the 2015 count. In 2016, HUD purchased the copyright and source code and made it available as open source as a means to increase the prevalence of apps available for community use and to foster competition and improvement to the app platform.

### How Does the PIT Mobile App Work?

The 2015 PIT Mobile App was designed to operate on Android and iOS mobile devices and was downloadable from Google Play and the Apple's AppStore. There are three components to the 2015 app: the app itself, the Control Panel, and the data store.

#### ***The PIT Mobile App***

The app was used for collecting the survey information during the count. The app was free to download and install. The app required a User ID and password as well as the unique name of the CoC's survey region. Once logged in, the end user used a single click to open the appropriate survey. As the survey opened, the app identified the GPS position automatically and then users recorded question responses via a series of text fields and pop-up lists of valid response values. Surveys could be submitted immediately or saved as drafts for editing or later submission. The ability to save the surveys as drafts was particularly useful to PIT count efforts in rural areas where internet connectivity was not available. An internet connection was required for initial log-in to the

app as well as for survey submission. For household surveys, some data was automatically related to all persons in the household, saving valuable time during the surveying process and increasing the quality of the data. The app included some data validation components but allowed flexibility in survey completeness, particularly with unsheltered and observation surveys where full data collection may have been difficult to achieve.

### ***The Control Panel***

The Control Panel was the webpage-based site used to set up a CoC's survey region and to associate the region and users to the secure data store URL. A community designated PIT Count Administrator set up the survey region, including creating the unique count name for each CoC they were administering. While the Control Panel associated end users to the data store URL via the unique survey region code, the site did not provide user management capabilities. Users associated themselves to the correct survey region code in the PIT Mobile App itself. Once entered and a survey was completed and saved, the app made a call to the data store, directing the survey data transfer to the appropriate data store through a secure link. To ensure data security and privacy, all users of the app were required to authenticate their access via User IDs and passwords. A PIT Count Administrator could administer more than one count region for CoCs because each region was assigned a unique ID and each data store was separate for each CoC.

### ***The Data Store***

The data store was a backend database designed to receive the survey data from the PIT Mobile App. Submitted data did not rest with nor was transmitted to HUD or third parties associated with HUD – it remained in the local community's control. When a user in the field saved and submitted a survey, the record was automatically transferred to the community's data store and the client's survey information was removed from the mobile device. The data store required a locally obtained hosting solution with an SSL (Secure Socket Layer) certificate. SSL is the standard security technology for establishing an encrypted link between a web server and a browser. This link ensures that all data passed between the web server and browsers remain private. Most commonly, communities obtained their SSL certificates and hosting solution from GoDaddy or purchased a hosting solution that included the security certificate. For the 2015 beta test, HUD provided a data store template, full instructions on how to set up the data store, and provided direct assistance and testing to ensure a community's data store was operating properly and fully secured. Additionally, HUD assisted communities with linking a simple Google map to their data stores so that PIT Count Administrators could easily view survey collection locations during the count itself.

The PIT Mobile App was tested on iPhones using up to iOS version 8.0, Samsung phones running Android KitKat and Lollipop, and tablets running Android Honeycomb and Jellybean.

The PIT Mobile App used a mobile device's GPS functionality, cell tower triangulation, as well as Wi-Fi networks to identify and document latitude and longitude coordinates when a survey was opened. GPS functionality was accurate to within 10 yards 95% of the time, provided the mobile device's GPS had time to activate on iOS and high accuracy was enabled in Android. When a surveyor hesitated a few seconds on the location screen before advancing to the survey, the GPS coordinates were more accurate. The location services of the devices were tested in two different ways and occurred in rural and urban settings. Once a geo-location point was identified, it was pulled from the test data store and dropped into Google maps to see if the point matched where the survey was opened. Additionally, some testers collected and documented a second set of GPS coordinates when a survey was opened using an Android app called GPS Test. These coordinates were compared with the coordinates obtained by the PIT Mobile App to determine accuracy.

### ***Results of the 2015 PIT Mobile App Beta Test***

Forty-seven communities expressed interest in using the Mobile App for the 2015 PIT count; thirteen communities used it<sup>1</sup>. Community characteristics ranged from entire states to small communities. Record counts ranged from one to several hundred. All communities responding to follow-up indicated that they only used the app for unsheltered counting, relying on paper or the HMIS for sheltered counts.

Twelve of the thirteen communities that used the app stated they were likely or would definitely use the app for the 2016 count. The only community that wouldn't identified level of effort to get the data store set up as the reason.

All communities expressed that the app was "easy to use" but also expressed a desire to have access to the app much earlier in order to include training/testing in their PIT count planning processes. All communities stated that the training materials were useful and well done.

No communities reported that incentives were necessary for clients to agree to their information being collected via the Mobile App.

All communities stated that the process of setting up the data store was very difficult without assistance. None of the communities expressed a desire to create and/or set up data stores on their own. No communities attempted to create data stores on their own using the API document that was made publicly available.

HUD was able to verify that the app was used by approximately 89 people to count 101 unsheltered clients. However, these numbers are likely much higher as large communities that used the app, such as State of Rhode Island, State of New Hampshire, and City of Boston, did not provide information on how many records were collected through the app or how many surveyors actually used it.

Although communities responded positively to the geo-location aspect of the app, none articulated how they might use the information. At least one community used the functionality to determine whether a survey was conducted within the CoC's geographic boundaries by viewing the records on Google maps in real time as the count was conducted. They were able to interact with survey takers immediately if a GPS location appeared located outside the CoC's geographic boundary, improving their data quality. Another community indicated they might use the information to inform their planning process for the 2016 PIT count. Additional uses for the GPS location could be to match counts to political districts, identify encampments and hot spots, and to target service delivery and conduct enhanced outreach.

Overall, the reaction to the PIT Mobile App was positive. Several communities provided feedback for improvements. The most frequently requested improvements was the capacity to customize the app to capture custom information or to apply skip logic to questions to make the app shorter and easier for end users. A different community wanted the app to capture identifiable information and a consent so survey information could be matched to the HMIS data at a later date. For several years, this community has obtained written consent and identifiable data for their PIT count surveys, then integrate the information into their HMIS to assess client outcomes. The ability to manage users in the Control Panel was also popular.

Several communities asked that access to the app and training materials occur earlier in the year (no later than September).

### Community Operational Models:

Communities approached the use of the app in different ways.

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<sup>1</sup> The communities that used the app in 2015, that could be verified by HUD, are: State of Rhode Island, State of New Hampshire, Boston, MA; Cambridge, MA; Somerville, MA; Rockford, IL; Polk County, IA; Jefferson County, NY; St. Louis County, OH; Durham, NC; Central FL CoC; St. Johns County, FL; and Maricopa County, AZ.

Most communities simply downloaded the app to count surveyor mobile devices and incorporated its use into their existing count protocols – swapping paper for technology. They used the app to collect the information, then moved the data to other formats for reporting. Most of the communities did not utilize the app, data store, or data for any other purposes.

However, one community created a command center and the PIT Count Administrator viewed the data store and associated map as the count was being conducted to identify data quality issues. If a survey collection location was flagged as being outside the CoC geographic boundaries or other data quality issues were quickly identified, then the administrator was able to contact the surveyor immediately and data corrections could be accomplished while still engaged with the client.

One community split the responsibilities of the count team. One person was responsible for engaging the client and asking questions, another was responsible for providing services (blankets, sandwiches, first aid kits, etc.), and a third listened and used the Mobile App.

### Lessons Learned: Choosing A PIT Mobile App and Solution Provider

HUD conducted the beta test of the PIT Mobile App to identify lessons learned and best practices for communities around the use of a mobile app for the PIT count. This section outlines recommendations based on those lessons learned.

To date, all mobile apps for PIT count require the acquisition of an app as well as a solution provider to set up and maintain the associated functions and requirements, such as a data store, a Control Panel, a command center, training, support during the count, and any add-on functions, such as reporting, GIS mapping, data integration, and data analysis. HUD offers the following recommendations related to the acquisition of an app and related services.

#### Choosing a Mobile App

When selecting a mobile app, HUD recommends that the app:

- Is free to download and use.
- Requires user authentication.
- Is in compliance with all current HUD guidance on conducting a Point in Time count, including compliance with HUD model surveys and guidance on how to collect the data.
- Ensures that data is removed from personal devices after a survey is saved and that any data that remains on personal devices (such as unsubmitted surveys) are held in a secure state while on personal devices.
- Uses native code rather than accessing mobile device GPS location services through a third party software, such as PhoneGap. Native code apps have direct control of GPS functionality and may increase the accuracy and responsiveness of the GPS location resolution.
- Demonstrates interoperability with HMIS data, either through a data merge or reporting. Some app providers may offer PIT count reporting as an additional service. For the 2015 version of the app, sheltered PIT count data must be integrated with unsheltered data from the app by manually entering the sheltered count data into the app rather than being facilitated by a data upload from the HMIS. A good mobile PIT count solution will provide a method for the two data sources to be integrated electronically and with minimal effort.
- Has been tested on the types of devices count surveyors will be using. Ask the app provider for a list of the device models and operating system versions on which the app was successfully tested.

#### Choosing a PIT Mobile App Solution Provider

Solution providers may offer a wide range of services and capabilities. Below are suggested items to evaluate when choosing a provider. Look for a provider that:

- Can customize a full solution package to meet your needs, not just provide an app. Solution packages should include training, hosting options, support, and after-count follow up and reporting. If a potential solution provider does not provide a full solution package and more than one third party must be involved, ask them to demonstrate interoperability with other solution providers offering other components necessary to conduct the count, such as hosting or a third party data store.
- Is reputable and has a proven track record. Make sure they have a reputation for maintaining privacy and security and treating their customers well.
- Is cost effective. Compare the cost of using an app, including hosting, data storage, and reporting, with the cost of continuing to do the count manually.
- Guarantees the app, data store, end user and survey region management tools, and reporting interface are free from viruses and spyware.
- Will provide training and tools, such as at-a-glance materials with key operational processes and requirements, to enhance usability of the app during the count.
- Is transparent about the services they offer and how service components interact. App providers will likely offer additional services. A mobile Point in Time solution should include geo-location mapping of the survey GPS codes as part of the service. Look for a solution that fits your needs and offers a range of services, such as the ability for the data store to be hosted on and be accessible on your private servers.
- Encourages a legally binding contract for services with the community. Items in the contract may include, but are not limited to:
  - Data access and ownership
  - Provisions for privacy and security breaches
  - Listing and description of the services to be rendered
  - The period of performance for the services to be rendered
  - Data disposal provisions
  - Use of data provisions

### Recommendations for Integrating Mobile Apps into PIT Count Processes

HUD also identified lessons learned and emerging promising practices around the integration of mobile app technology into the PIT count processes. The following are recommendations for integrating a mobile app.

#### *60-90 Days Prior to the Count Date:*

1. Choose your solution provider.
2. Download and install the app.
3. Set up the data store.
4. Receive training on the app and the data store.
5. Test the data store thoroughly and consistently for at least two months before the count, using the same type of devices to be used by the count surveyors.
6. Test the app on the devices that will be used for the count. Provide the app to surveyors, provide training on the app, and run test counts using the app so that surveyors are familiar with it before the actual count.
7. Clear all test records from the data store prior to conducting the actual count.
8. If desired, establish location and protocols for a command center where a count administrator can view records as the surveys are submitted to the data store, to review and fix data quality issues.

#### *The Day before the Count:*

1. If using a command center, test the command center equipment and protocols to minimize glitches during the count.
2. Conduct another training on the app. Use this to test the data store again, then clean the test records out.

3. Remind survey team to ensure mobile devices are sufficiently charged. Supply back up batteries or mobile charging devices to surveyors who will be in rural settings.
4. Ensure that the designated count team has the app properly installed on their devices and have established user IDs and passwords. Ensure that all persons using the app have logged in and have access to the surveys (Wi-fi connectivity was required for initial log in for the 2015 app).
5. Review the questions in the survey with the surveyors.
6. Make sure surveyors are familiar with any guidance being provided by your local Point in Time Count Administrator/Manager.
7. Make sure surveyors know the boundaries of the geographic area(s) to which they are assigned.
8. Provide the survey team with a one- to two-page instruction tool on how to access and use the app that they can take with them into the field.
9. Review safety tips with survey team. Remember that mobile devices and data collection may be unwelcome to some homeless persons.

#### *The Day of the Count:*

1. Make sure survey team's mobile devices are sufficiently charged.
2. Review training materials, provide training and support for last minute survey team members.
3. Review safety tips with the survey team:
  - a. Be vigilant; Stay close with a count partner and in contact with other team members.
  - b. A mobile device is valuable – keep it protected and be discreet when using it.
  - c. Remember that mobile devices and data collection may be unwelcome to some homeless persons.
  - d. Have a contact number readily available in the event that you need assistance or backup.
4. If using, activate the command center where a count administrator can view the records as they come in, to improve data quality.

#### Acquiring the Open Source Code and Materials

HUD's intent in supporting the beta test of a PIT Mobile App was to assess the value of using mobile technology to enhance PIT count processes. As part of this effort, HUD purchased a non-exclusive license to a mobile app, provided development and enhancement support, created training materials and templates, and offered the app to communities free of charge for the 2015 count. Given the success experienced by the communities who used the app, HUD purchased the copyright and source code and made it available as open source. Software developers and enterprising communities with programming capacity are encouraged to access the source code and offer enhanced products and services to communities interested in using the mobile technology.

***The source code provided via open source is not a packaged app.*** Communities should not expect that the code can be downloaded and installed as an operating app. To transfer the open source code into an operating solution, programming skills will be required as well as knowledge related to the deployment of mobile apps, webpages, data transfer protocols, and database architecture. Communities needing assistance should consider participating in the PIT Mobile App Wiki and Issue Tracker discussion forum, found at the GitHub site.

#### Accessing the Source Code

HUD has made the source code available via the PIT Mobile App Open Source GitHub site, located [here](#) or at <https://github.com/hudpit?tab=repositories>, until December 31, 2018.

GitHub has instructions in their help files on how to download a repository.

## Authorized Activities and Required Copyright Notice of the Open Source PIT Mobile App Code

While anyone can access the open source PIT Mobile App code, there are several activities and requirements that interested parties will be required to accept as part of the access process.

- All new versions of the code must include a copy of the HUD MIT Open Source License, which acknowledges:
  - HUD is the originator and owner of the original copyright.
  - Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:
    - The copyright notice and permission notice shall be included in all copies or substantial portions of the Software.
    - The Software is provided "As Is", without warranty of any kind, express or implied, including but not limited to the warranties of merchantability, fitness for a particular purpose or non-infringement. In no event shall the authors or copyright holders be liable for any claim, damages or other liability, whether in an action of contract, tort or otherwise, arising from, out of or in connection with the software or the use or other dealings in the software.
- Other than the HUD MIT Open Source License, no other reference can be made to or implied that HUD is an interested or liable party for any improvements or derivative works coming from the publication of the source code as open source.
- Other than the HUD MIT Open Source License, no derivative works, including in marketing and training materials, may reference HUD in any manner, including the use of HUD's name, logos or derivatives thereof.

## PIT Mobile App Wiki and Issue Tracker

Programmers accessing the code are encouraged to consider participating in the PIT Mobile App Wiki and Issue Tracker discussion forum, as part of true open source activities. The Wiki and Issue Tracker is available via a link from the PIT Mobile App Open Source GitHub site. The Wiki and Issue Tracker are not managed or monitored by HUD and all AAQs related to PIT Mobile Apps received by HUD through the HUD Exchange are automatically directed to the Wiki and Issue Tracker forum for community discussion and support, including technical questions on how to access and download the source code and related documents.