

# Mobile Crime Scene Applications: An Evaluation of Their Use and Future Direction



FORENSIC SCIENCE

Miranda Davis, BS\*<sup>1</sup>; Sgt Steve Compton, BS<sup>2</sup>; Nadine Borovicka, MSFS<sup>1</sup>;  
Sgt Dave Castle, BS<sup>2</sup>; Catherine Rushton, MSFS<sup>1</sup>; Pamela Staton, PhD<sup>1</sup>

Marshall University Forensic Science Center<sup>1</sup>, Huntington WV; Huntington Police Department<sup>2</sup>, Huntington, WV



## Abstract

Following the release of the National Academy of Sciences' report: *Strengthening Forensic Science in the United States: A Path Forward*, the forensic community has been striving to make improvements and develop plans to follow the recommendations that it outlines. In the field of crime scene investigation, a new technology is emerging in order to bring standardization and speed to the discipline; mobile crime scene applications (apps) for tablets and smartphones. A qualitative evaluation of a mobile crime scene app's performance, considering defined criteria while documenting mock crime scenes was made. Experts were questioned regarding their current approaches to scene documentation and reporting, as well as their preferences and technological proficiencies. After recording mock crime scenes, the app was qualitatively assessed with respects to each established criteria.

It was recognized that while the app provided streamlining of case notes, many alterations and/or additions could be made to create the ideal crime scene documentation tool. Future studies with this app hope to analyze the use of this app in more real world settings and in the hands of working crime scene investigators. Also, there are many security concerns that fall into the realm of digital forensics and should be explored further. There are other app on the market which also claim to improve note-taking and documentation, and future studies hope to compare and contrast these apps with the one evaluated here.

## Introduction

In order to combat the time consuming and subjective nature of crime scene investigation – as encouraged by the NAS Report – new technologies are emerging including mobile crime scene apps. These apps are designed to assist the investigator with scene documentation, thereby decreasing time spent on-scene and increasing standardization across the field. It was determined that a successful new technology should meet the following criteria: **standardization, ease of learning and use, speed, and cost reduction.**

### Application Functions

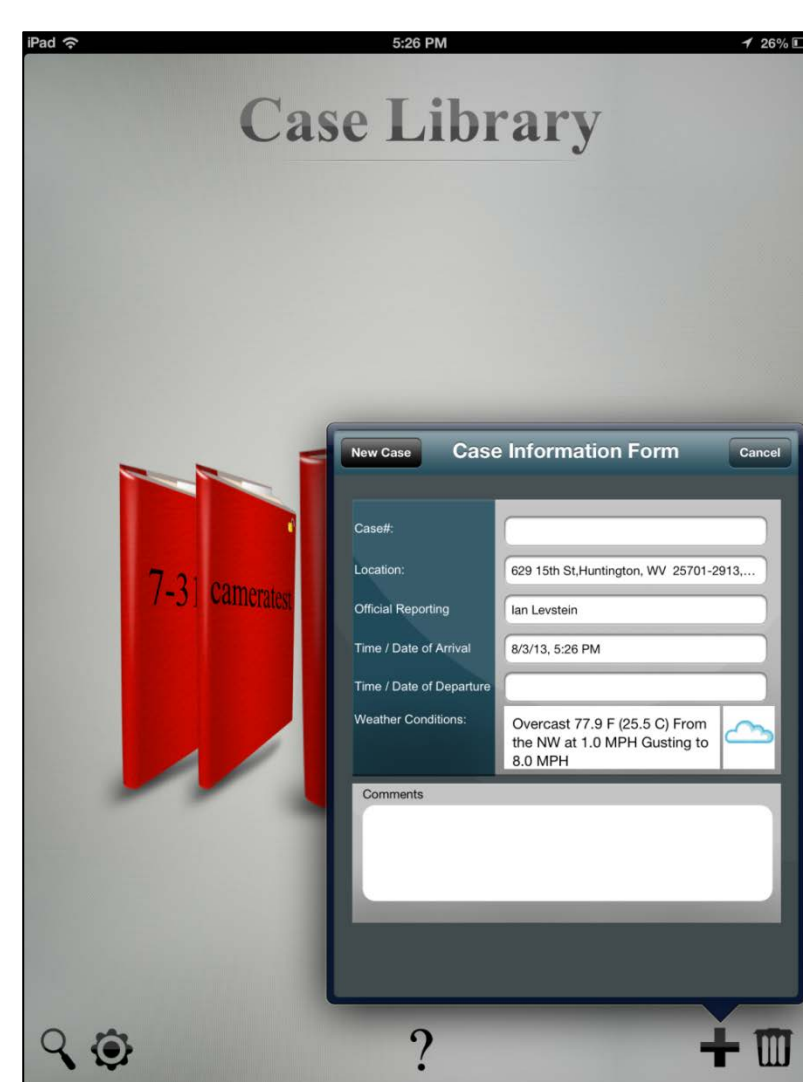


Fig 1. Screenshot of New Case Menu.

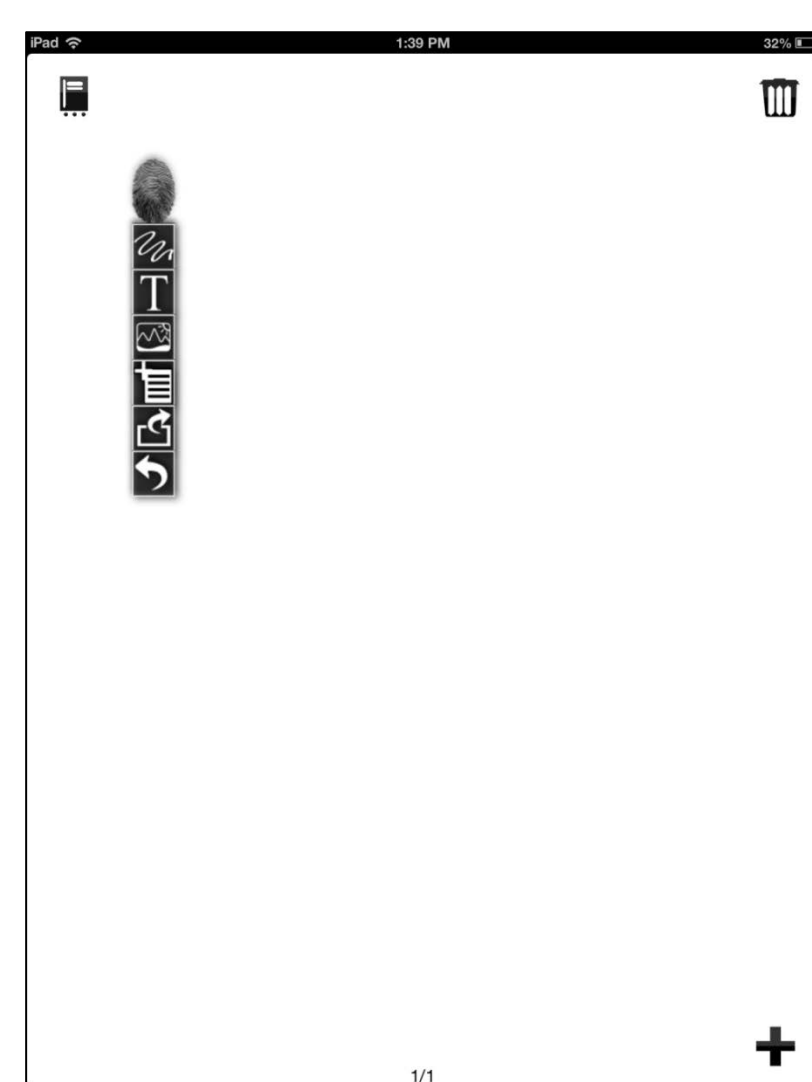


Fig 2. Screenshot of blank new case.

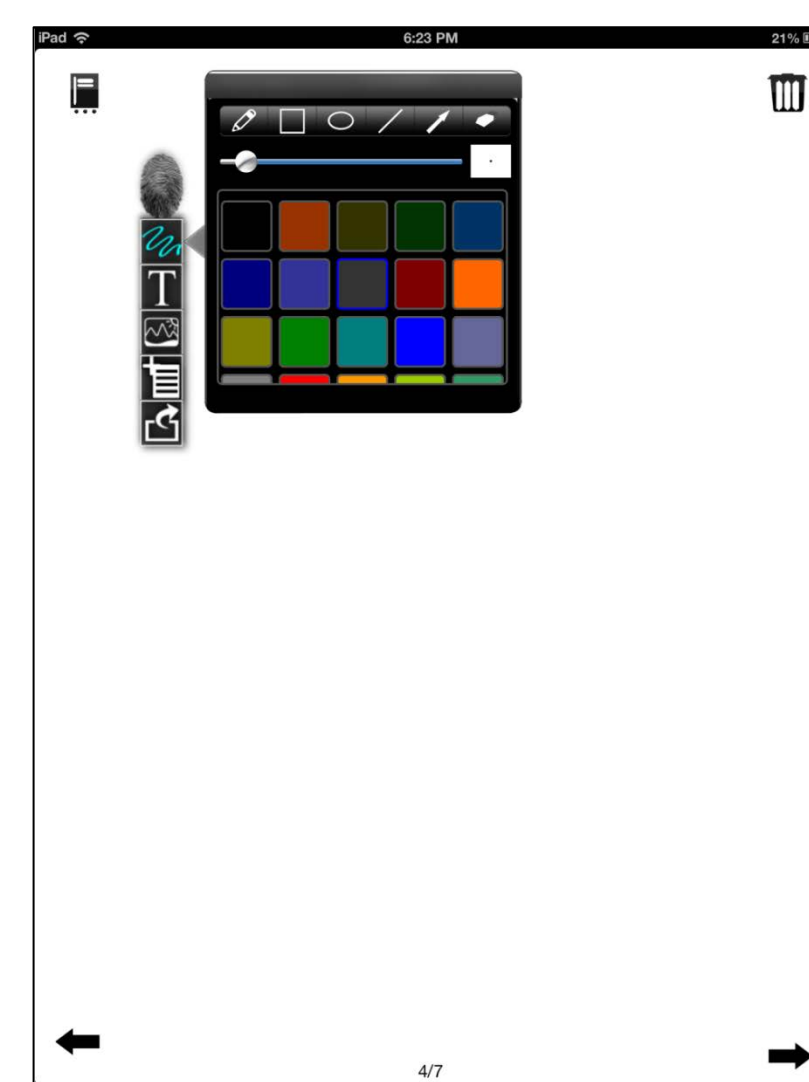


Fig 3. Screenshot of sketching tools menu.

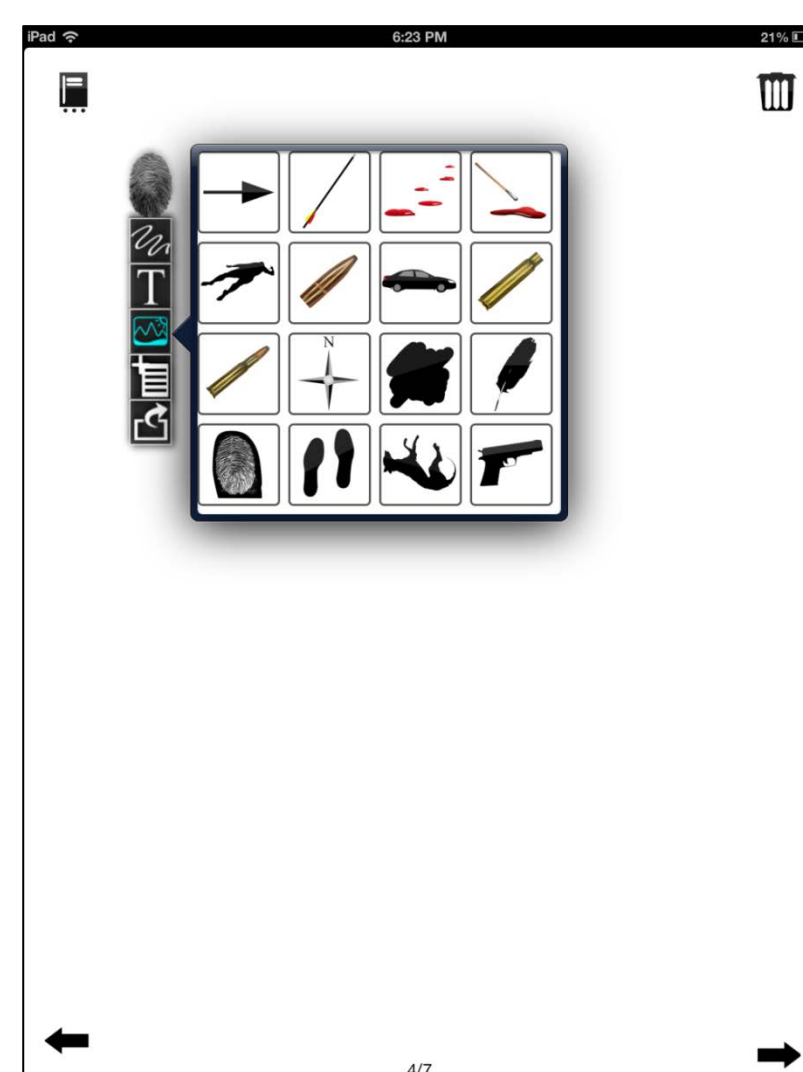


Fig 4. Screenshot of scene mapping images menu.

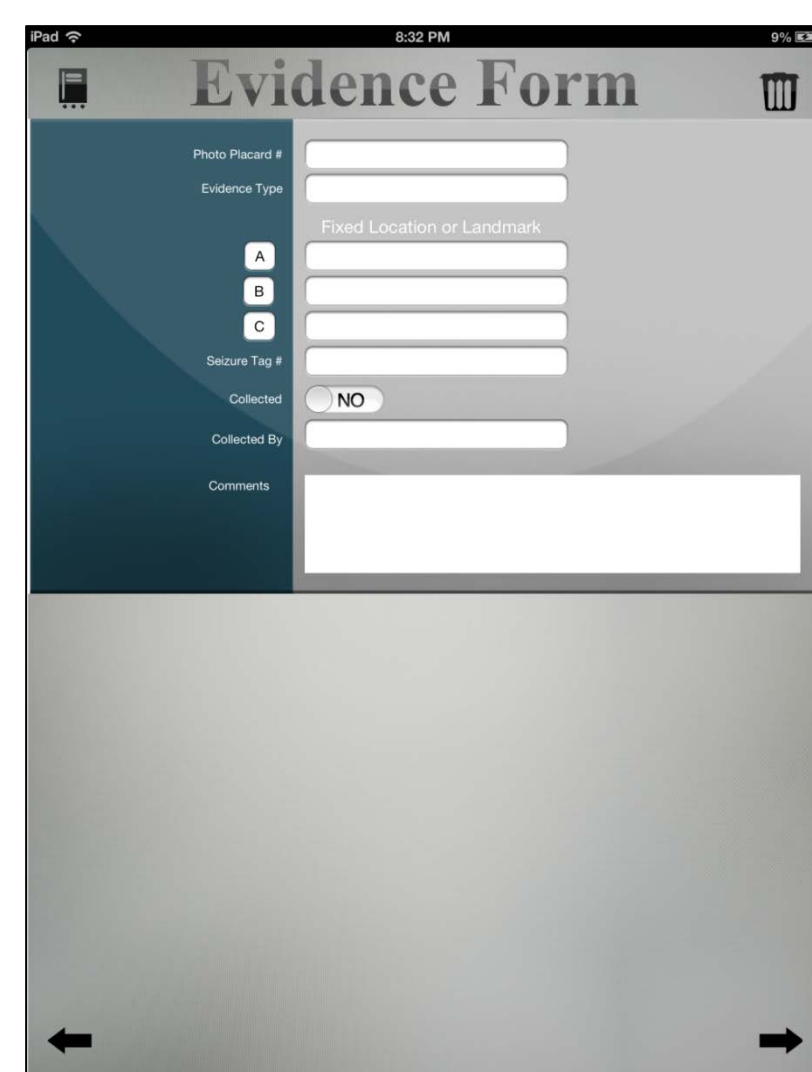


Fig 5. Screenshot of new evidence form.

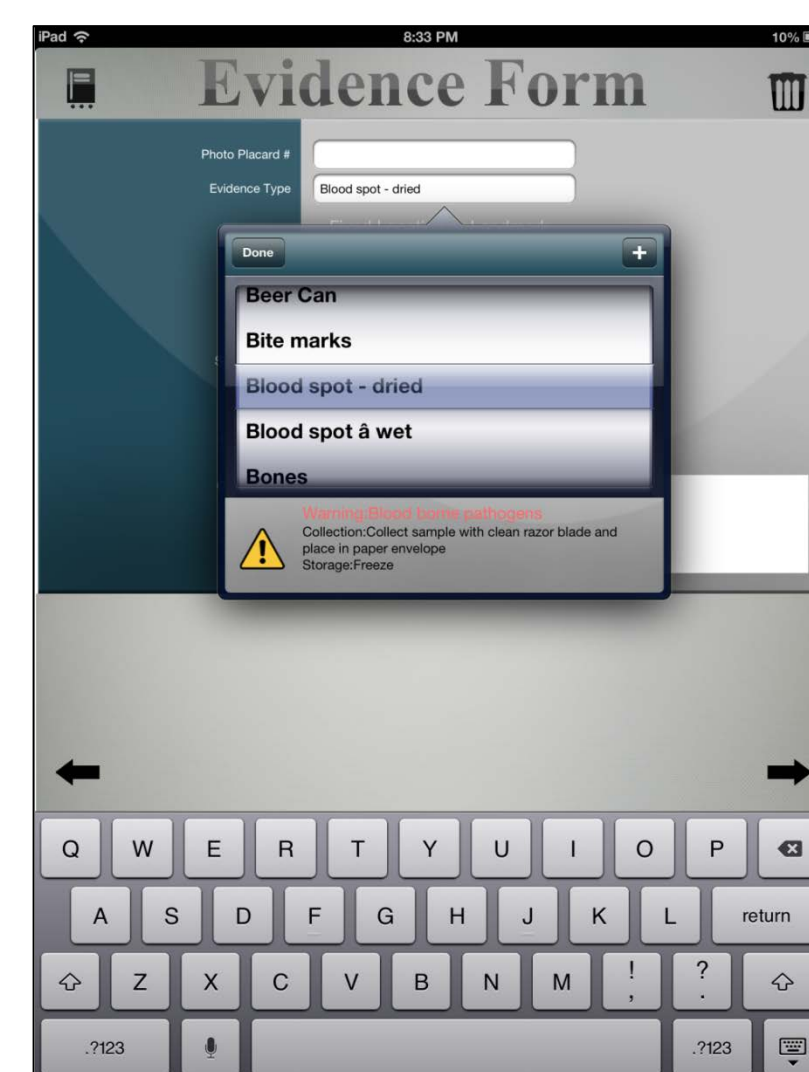


Fig 6. Screenshot of evidence collection methods.

## Materials and Methods

- The app was used to document several mock crime scenes to gain familiarity with the app and to provide a general evaluation of the app's performance. These scenes were all single room scenes with varying amounts of evidence and were set up by someone other than the author.
- Next, four scenes were documented and timed, once with the app, and once without, in alternating order, so that time spent on-scene could be compared. These scenes were set up and processed by the author, and contained 2 or 3 pieces of evidence each. No photography, searching, or collection was performed in these scenes; only note-taking, measurements, and sketching.

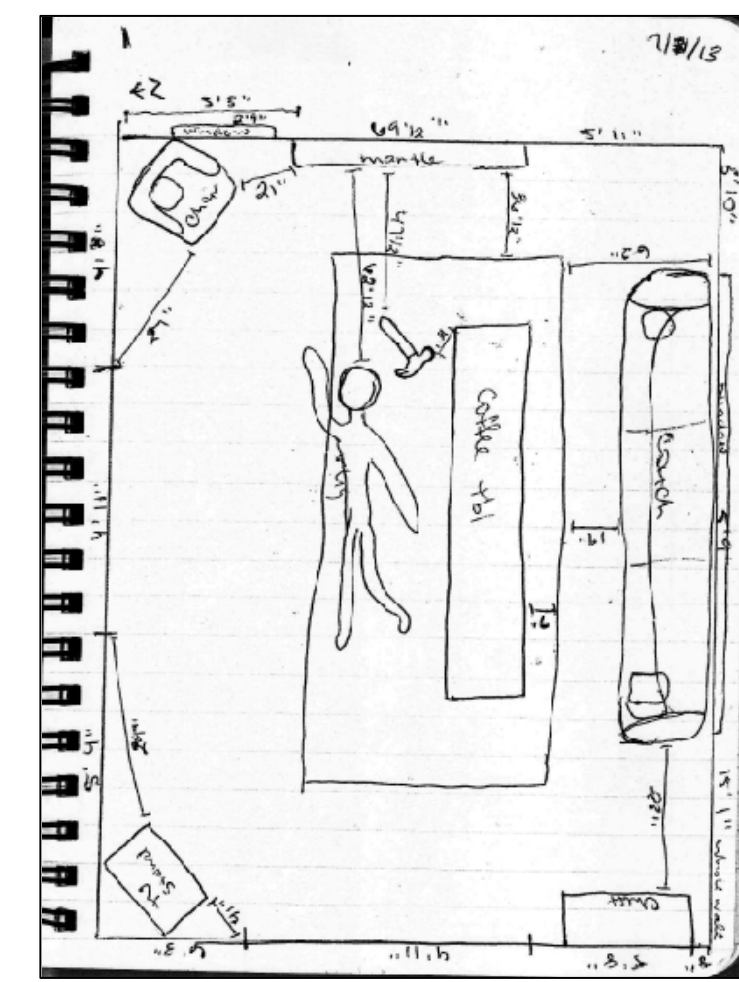


Fig 7. Sketch of mock crime scene using pen and paper.

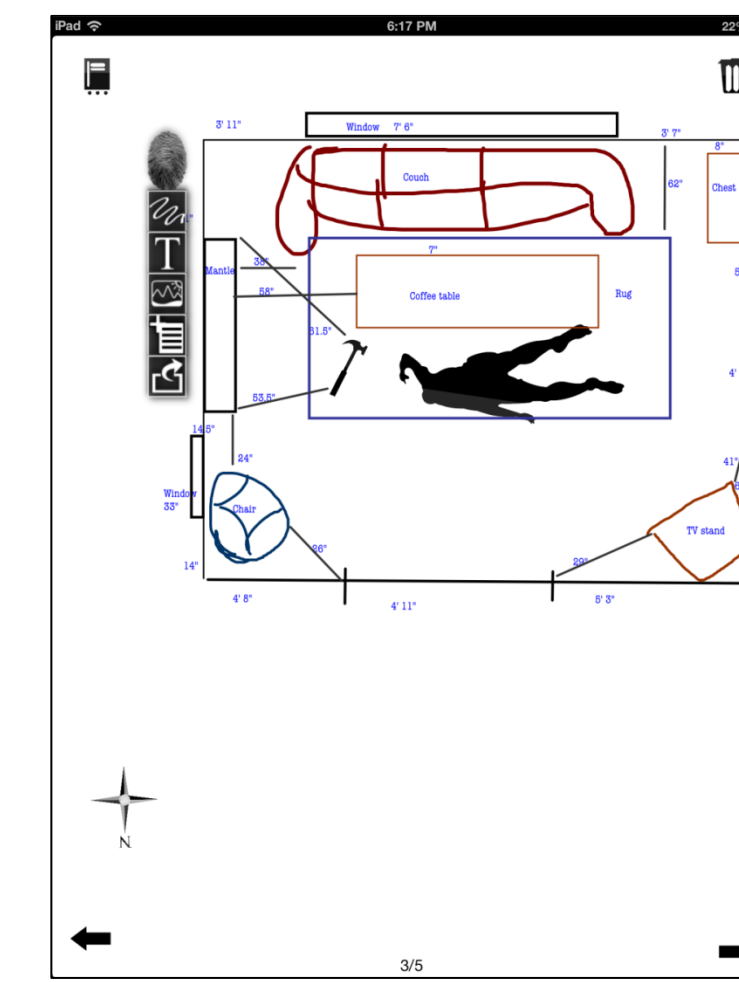


Fig 8. Sketch of mock crime scene using the crime scene app.

- To determine whether the tablet's camera would be able to replace digital single lens reflex (SLR) cameras, several comparison photos were taken in common conditions including low-lighting, depth of field considerations, and those requiring a macro lens.



Fig 9. Dark basement photographed using a Nikon D40 camera and painting with light technique.



Fig 10. Attempt at technique in the dark using tablet camera.

## Results and Conclusions

### Standardization

The app's PDF formatting and inclusion of chain of custody and property receipt forms streamline the look of case notes and the chain of custody process, which will save some time and therefore, money. The suggested evidence collection procedures will standardize how evidence is collected by all agencies using the app. Because the note-taking is free-form typing, the app does not do anything to standardize the way case notes are taken. It will, however, make notes more legible, especially for those with handwriting that is difficult to read.

### Ease of Learning and Use

The app itself is not entirely intuitive, but when an agency purchases the app, a representative from the company can give a tutorial via webcast. The pictures in the menu are mostly self-explanatory, and could be understood quickly by some trial and error. Anyone who owns and is familiar with using a tablet or smartphone should have little trouble becoming acquainted with the app.

### Cost

It was determined that it would cost \$629 (cost of tablet, data plan, and app) per investigator to implement this app. Depending on department protocols, this cost could be offset by the reduced time investigators spend on-scene when using the app.

## Results and Conclusions Continued

### Speed

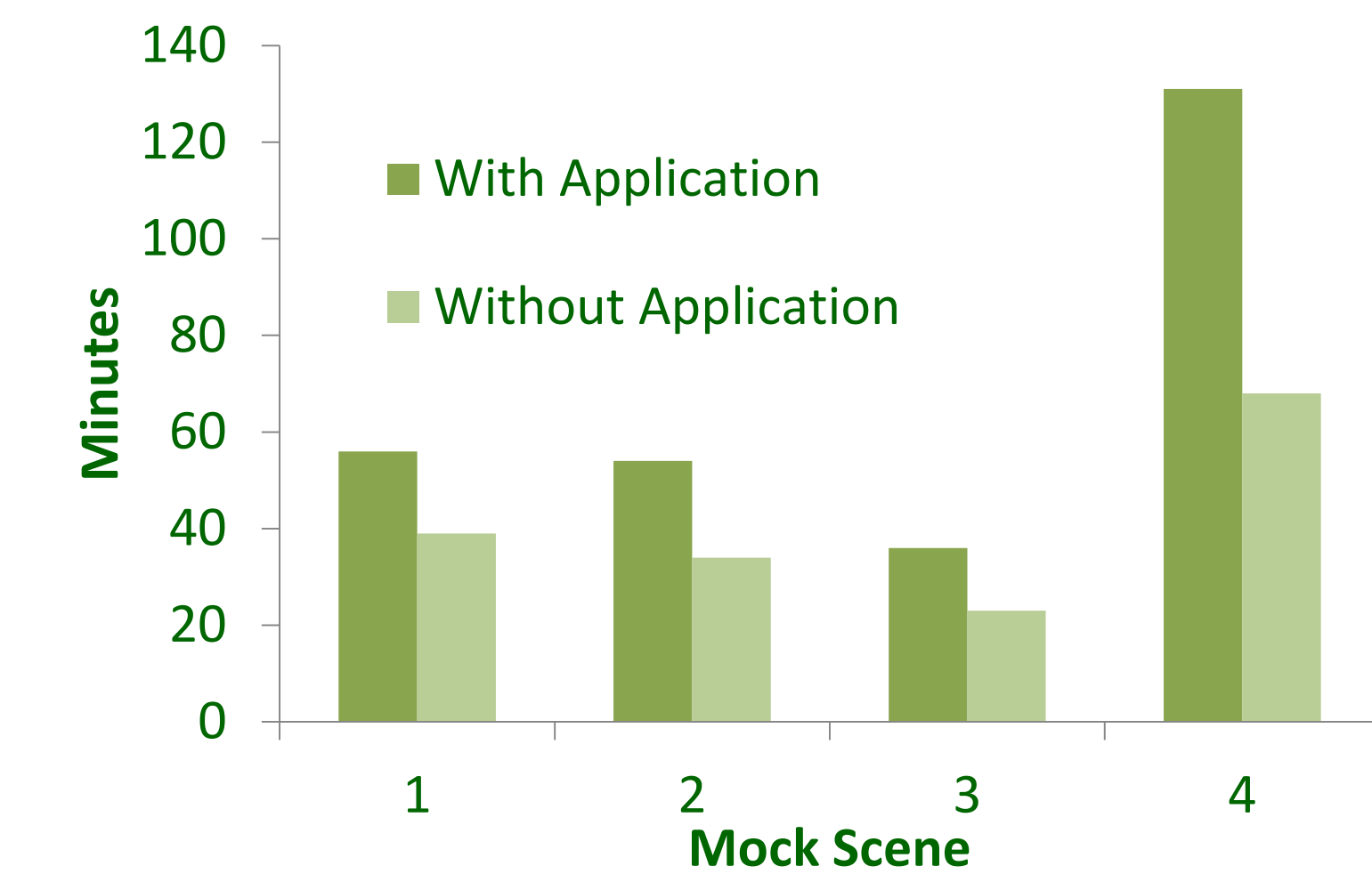


Fig 11. Comparison of time taken to document crime scenes with and without using the crime scene app.

Documentation of a crime scene took an average of **1.63 times longer** when using the app. However, this does not take into account the possibility of time saved down the line in the documentation process.

In its current state, the app will not supplant any existing field instruments, with the exception of paper and stencils. While incorporating photos in one's field notes is convenient, the tablet's camera could most likely not be substituted for the traditional digital single lens reflex cameras commonly used in crime scene investigation. If the department has to purchase the equipment and the app, then it may be cost prohibitive. However, if the app reduces the amount of time the crime scene investigator spends documenting a scene or entering data back at the office, then reduced labor costs may in time offset equipment costs. Without knowing the department's protocols and resources, it would be very difficult to say whether time could be saved in the long run. Ultimately, a department would need to perform their own evaluation of the app in order to determine if it would save them time or money.

## Future Research

Future studies should evaluate the app in more real life circumstances and in the hands of working professionals in the field. The authors plan to survey professionals and forensic science students to establish each group's technology proficiencies and preferences. This will help to predict how successfully crime scene apps may be accepted by investigators. It would also be useful to compare this app to the other crime scene apps on the market, in order to see if there is an app that meets all of the criteria mentioned in this paper. Research could be done to see if using a talk to text application would be faster than typing. Also more work with the app in different locations could determine the accuracy of the GPS function. Finally, there are many security concerns that should be investigated including data backup to the cloud and exporting case notes via email. The local police department does not currently have a policy regarding the sending of case material via email, but others may.

## References

National Academy of Sciences. *Strengthening Forensic Science in the United States: A Path Forward*. Committee on Identifying the Needs of the Forensic Sciences Community, National Research Council; 2009 Aug. Document No.: 228091

## Acknowledgements

The author thanks Nadine Borovicka, Catherine Rushton, Dr. Pamela Staton, and Sgt. Dave Castle for reviewing this paper, Ian Levstein for technical assistance, Sgt. Steve Compton for lending his expertise in crime scene investigation and photography, and for helping to brainstorm ideas for a app improvements, and Alex Kottoor and Kamil Salagan with Siamese Systems for providing assistance with troubleshooting and general questions regarding the app.