Bay Area Clean Water Agencies
Collection System Committee

Field Automation Practices

June 14, 2011

Notes from a Committee Discussion on June 2, 2011

Laptops and Information Access

Agencies have been using mobile technology to improve access to information in the field. In some cases, field crews have started carrying laptops in their trucks. Use of these laptops varies greatly among agencies, and even among applications. For example, some computer programs rely on wireless data transmission, while others may only use information stored directly on the local hard drive. In the second case, this information may be periodically updated or synched with agency databases. One agency representative pointed out that although there had originally been some resistance to using laptops in the field, crews' responses to the idea have improved significantly over time.

Benefits

- Laptops allow field crews to access interactive electronic maps, sometimes linked to databases, in the field.
- Users can access critical information that may otherwise be unavailable, especially at night (for example, history of line, work orders, photos, and addresses).
- Layers may be turned on and off as needed.
- USA information is available wirelessly.
- Older paper maps are sometimes not as accurate as electronic maps. GIS can provide a more accurate tool for locating system elements.
- Field crews can document details of work completed throughout the day, which are then uploaded directly to the agency's server or database.

Practical Considerations: Concerns, Solutions, and Tips

- In one case, a City's IT department did not have ability to implement the desired field technology, so the utility department had to hire their own consultant.
- It has been difficult in some cases to find laptops with hard drives big enough to store a complete collection of the agency's maps and related information.
- ArcGIS software is available that allows mobile access to the agency's GIS information.
- Changing field practices to use electronic systems is taking some time.
- Implementing new technologies costs money. For example, one agency representative reported that he had initially budgeted $50,000 to put new equipment in place, but other agencies indicated it would be more than that.

- Laptops left in trucks may be targeted for theft. In response, laptops and trucks may be equipped such that the laptops can be locked down.
- Crew members have to be careful not to get laptops wet when they have been working in the rain.
- There are some advantages to the old paper map systems. For example, it was easy for field crews to make note of edits that needed to be made to paper maps, or to make copies of maps quickly available to emergency workers to illustrate a problem. At least one agency representative reported that there was a small printer onboard the CCTV truck, which could be used to solve this problem.
- Data transmission must be fast and reliable in order to be useful, especially for SCADA.
- One local agency has set up their own local ultra high frequency (UHF) data transmission system, which has benefits related to reliability and independence, but does require some maintenance.
- It was suggested that microwave transmission might be a good alternative, but it is relatively expensive and there was some question about its ability to transmit data over long distances.
- iPads might be useful for taking pictures, sharing files and downloading data at the end of the data.

Questions Left Unanswered

- How often do the laptops have to be replaced?
- How much time does it take for field crew to enter information? Do these systems increase efficiency, or take crew time away from cleaning?
- Will the field crew neglect their work to surf the internet?

Wireless Sewer Flow Level Monitoring Equipment

Several agencies shared their experience with self-contained wireless level monitoring and data logging units. Agency representatives reported that several similar products are available from different companies, including SmartCover, Mission Float, US^3 and Ortech Controls.

Benefits

- These units have helped agencies prevent sanitary sewer overflows (SSOs) by sending out warning alarms.
- In one case, a high level alarm received from a unit located in a manhole 10 feet from a storm drain allowed the agency to prevent a Category 1 SSO.
- Another agency reported that 11 SmartCovers installed last year prevented 10 SSOs.
- The units can also sense when the manhole cover is being removed (although they do not differentiate between collection system workers and members of the public, unfortunately).

Practical Considerations: Concerns, Solutions, and Tips

- Expense is an issue. The units cost approximately $3,000 each to purchase, and an additional $300 per year to operate.

- Due to the cost, it is not practical to equip all manholes with this technology.
- Placement of the units may be prioritized (for example, based on proximity to streams).
- The units can also be moved. For example, they can be used for monitoring in problem areas, and then moved to another location once the problem has been fixed.
- SmartCovers reportedly do not reliably provide notification of batteries dying.
- One agency expressed general concerns with the US^3 product.

Additional Notes

- One local agency has hired a consultant to assist with preparation of an IT Master Plan.
- Problem areas and details may be identified on Google Earth before arriving on site.
- City of LA is using hand-held units that operate through the cell phone network for work orders and related information. The units are very durable. In addition, their trucks are tagged, so each one can be located and anyone in the network can see if a work order has been opened or closed at any time.