Summer 2014

Electronic Monitoring Skills Building Seminar

Lesson Plans

Helping Agencies get the most from their EM Programs

The Electronic Monitoring Skills Building Seminar has been created to assist agencies who use or are planning to use EM technologies. It covers everything from planning your EM program to evaluating your program's performance…and all the steps in between.

CREATED AND PRESENTED BY

Correct Tech
Bringing New Technology to Corrections

TABLE OF CONTENTS

LESSON ONE: UNDERSTANDING THE TECHNOLOGY

Objective:

It is the objective of this training for the student to have a basic understanding of how electronic offender tracking technologies work, the nomenclature used to describe the workings of the technology and some new innovations on the horizon.

Equipment Basics

- Portable Tracking Device
  - GPS Unit
  - Cell Phone
- Ankle Tether
- GPS Satellites
- Cell Towers
- Monitoring Center
- Violation Reporting Devices
  - Cell Phones
  - Pagers
  - Faxes
  - E-Mail

Technology Basics

- Global Positioning System
  - Constellation of 24 Satellites
  - GPS Data Transmitted

Science of Triangulation, Time of Arrival and Angle of Arrival

Accuracy Enhancements

Nomenclature

One-Piece

Multi-Piece

Active

Data Center

Monitoring Center

Alert Center

Passive (Requires a Land Line)

Hybrid (Not Really a Classification)

Challenges of Using GPS with Offenders

Indoor Limitations

Signal Reflection/Concrete Canyons

Susceptible to Intentional Shielding

Tamper Vulnerabilities

Bracelet

Device

System

Undermining PO Confidence Schemes

Offender Tracking System Configurations

- Traditional Multi-Piece Configuration
  - Portable Tracking Device
  - Ankle Tether
    - Tamper Technologies
    - Attachment Methods
  - Advantages
  - Disadvantages
- One-Piece Configurations
  - Ankle Bracelet with self Contained Tracking Device
  - Advantages
    - Less to inventory
    - Less likely for offender to forget to take carry the tracking unit
    - More convenient for the offender
  - Disadvantages
    - More susceptible to shielding – Intentional or unintentional
    - Antenna placement

Emerging Technology

- Cell Tower Triangulation
- Public Safety Tower Triangulation
- Dead Reckoning
- WiFi/WiMax
- Next Generation GPS
- Galileo/Glonass/Compass

LESSON TWO: PLANNING AN EM BUDGET/FUNDING STRATEGIES

Objective: Students should be able to better understand the cost of operating an EM tracking program and receive some ideas on how the program can be funded.

Note: The following budgeting scenario is for illustrative purposes. Agencies' actual expenses may vary significantly. Careful planning is required to arrive at an accurate budget for agencies planning an offender tracking program.

Creating a budget for EM equipment

How many offenders will be monitored?

What type of monitoring will be done?

Cost of EM equipment is a small portion of the costs

Active - $3-$10/day per offender

Passive - $2-$7/day per offender

RF/House arrest - $1.50-$3.50/day per offender

Creating a budget for personnel

Fulltime program manager with benefits - $65,000 to $95,000

Officer salaries with benefits - $50,000 to $80,000/year per officer

Overtime for officers - $6,240/year based on $20/hr salary and 4 hrs OT/wk

Supervisor salaries - $65,000 to $85,000/year (one for every seven officers)

Clerical staff - $35,000 to $50,000/yr (one for every supervisor and administrator)

Training - $2,000/officer, supervisor and administrator

Creating a budget for other equipment and expenses

Cell phones - $720/yr per officer, supervisor and administrator

Vehicle leases - $3,600/yr per 2 officers, supervisor and administrator

Fuel costs - $2,400/yr per officer, supervisor and administrator

Office supplies - $1,000/yr per employee

Office space - $18/sq ft x 150 x number of employees

Furnishings - $1,500 start up (nonrecurring) x number of employees

Computers - $2,000 per employee

Additional detention costs (based on 5% of offenders incarcerated at $75/day)

Administrative overhead – approximately 5% of program costs

Budgeting Scenario (a total of 525 offenders with average of 25 in jail and PO caseloads of 25)

EM equipment $912.5 K (based on $5/day)

Staff required

Officers – 21

Supervisors – 3

Program Administrator - 1

Clerical - 4

Total staff - 29

Personnel costs

Officers' salaries - $1,365,000 (at $65,000/yr S+B)

Officer overtime - $131,040 (based on $20/hr wage)

Supervisors' salaries - $210,000 (based on $70,000/yr S+B)

Administrator - $80,000 S+B

Clerical salaries - $180,000 (at $45,000/yr S+B)

Training - $50,000 (25 employees x $2,000)

Total personnel costs- $2.016 M

Other equipment and expenses costs

Cell phones - $18,000

Vehicle leases - $52,200

Fuel - $34,800

Office supplies - $29,000

Office space - $78,300

Furnishings - $43,500

Computers - $58,000

Additional detention costs - $684,375 (25 offenders/day x $75)

Total other equipment and expenses - $998.2K

Program costs

Subtotal - $3.927 M

Administrative overhead (5%) - $196 K

Total program costs - $4.123 M

Cost per offender per year - $7,496.36

Cost per offender per day - $20.54

If budget is based on EM equipment lease alone - $3.21 million shortfall

Funding strategies

Legislature

Where most programming funding originates

Provide legislature with full and accurate program costs

Many vendors lobby legislators with low ball program costs

Maintain working relationship with members of the legislature

Federal Grants

Bureau of Justice Assistance

Occasionally available but should not be depended upon for budgeting

Offender pay

Many agencies ask offenders to pay for all or part of the equipment

Many legislators are told with offender pay, the program does not cost the agency

At best, you can expect the offenders to pay for about 15% - 20% of the costs

50% collection rate of $8 per day is typical

LESSON THREE: CONSIDERATIONS FOR EM POLICIES AND PROCEDURES

Objective: The student should understand the purpose of policies and procedures and be able to develop a well-written set of policies and procedures. The student will be exposed to a few suggestions for policies written specifically for EM programs.

Purpose of Policy and Procedure

To establish a uniform method of carrying out tasks that meet the mission of the agency

A single policy and procedure should address a specific area of the agency's operation

Agencies should not try to regulate each activity of its employees

- Stifles creativity
- Creates an uncomfortable working environment

Definitions

Policy: A statement conveying the values held by an agency about a specific topic

- It is a general statement, not a treatise on a given topic
- A policy statement is usually much shorter than a procedure
- Does not indicate how the policy will be specifically carried out

Procedure: Shows what steps an agency will take to meet the policy objective

- They should be detailed enough to clearly obtain the policy goal
- Should not be unnecessarily detailed
  - Should allow for varying circumstances that may arise
  - Do not force an employee to chose between effectiveness and procedures

General Issues

- Agencies use differing formats. There is no one proper format
- Why separate policies and procedures
  - A policy is an overriding value that is not likely to change
  - A policy will change as technology evolves or more efficient methods are learned
- Elements of a good policy and procedure set include:
  - A clear and concise header block to ensure a procedure communicates the purpose
  - Clearly delineate department responsibilities that identifies who does what
  - Key term definitions to reduce confusion
  - Measures of effectiveness to quantify outcomes
  - References to related documents to improve usability
  - Listing of applicable laws or regulations to communicate compliance
  - Detailed list of revisions to track edit history
  - Forms to ensure proper control and record keeping
  - Soft copies must be in a PDF or comparable format

Electronic Monitoring policies and procedures

- Policy considerations
  - The main objective of the EM program must be considered
    - Reduce prison overcrowding
    - Rehabilitate offenders
    - Break up criminal groups
    - Solve crimes committed by offenders

- The main objective should be incorporated into the policy statement

Procedure considerations

- Will it be a public document?
  - Consider not including a response protocol in the procedure
  - Offenders have access to policies on the web
- Will it be a non-public document?
  - May include more sensitive information
  - Available by subpoena
  - Can be available for viewing on agency's intranet system

Items to include

- Reference of laws granting authority to the program
- Participant selection criteria
- Assignment of duties
  - Program manager responsibilities
  - Supervisory responsibilities
  - Line staff responsibilities
- Reference to a response protocol
  - Response teams
  - Communications equipment assigned
- Cooperation agreements with outside agencies
- Quality control provisions
- Provisions for measuring program effectiveness
- Standardized forms to be used

Tools to use: EMRC

EM Resource Center has many donated sample policy and procedure documents

Internet has a number of helpful sites for developing effective Ps & Ps.

Classes offered at various training institutes

LESSON FOUR: SELECTING A VENDOR

Objective:

It is the objective of this training is for the student to learn how to select an EM vendor that will meet the needs of the agency.

Planning an RFP

Create a selection team of 4-5 technically savvy individuals who are familiar w/ EM

Review any legislative mandates that must be met

Interview supervisors and line staff for features preferred

Review the budget for equipment

Establish how many offenders will be tracked

Be familiar with the agency's procurement regulations

Create a draft document outlining the objectives of the RFP process

Writing an RFP

Resist the temptation to use a vendor provided template

Many sample RFPs are can be found at: https://emresourcecenter.nlectc.du.edu

At a minimum, include the following categories

- Introduction
  - State the objective to be accomplished
  - Post a "Schedule of Events"
- Submittal instructions
  - Required documents
  - Mailing Instructions

- Contact person
- Scope of Work
  - Specifically delineate what the bidder must do if selected
  - Delineate timeframes for accomplishing the work
- Proposal Evaluation Procedure
  - Disclose who will be doing the evaluation of proposals
  - Disclose the rating criteria with weights assigned to each criterion
  - Determine if equipment trials will be done
- Legal provisions
  - Define the term of the proposed contract including renewal options
  - Discuss the provisions for contract termination
  - Include any performance bond requirements
  - Include any federal compliance requirements (ADA, EEOC, etc.)
  - Include provisions for lost or stolen equipment.
  - Ask if vendor complies with NIJ Offender Tracking Standard

Suggested Wording

- Using “Shall” or “Should” statements:
  - “Shall” is used when a feature is absolutely required
  - “Should” is used when a feature is preferred, but not absolutely required
- Do not specify how something must be done, but what the results should be
  - There may be a number of ways to accomplish a specified outcome
  - For example, do not require, “an LCD display measuring ½” x 2” on PTU”
  - Instead, “a means for communicating with the offender on the PTU

Evaluating an RFP

Give much more weight to performance than cost

The following is suggested weight to give to evaluation criteria

Product Performance (45%),

Customer Service (15%),

References (15%),

Cost (15%), and

Software Friendliness (10%)

Training availability is a critical part of customer service

Consider an equipment trial from the top three bidders

Thoroughly interview the finalists' current customers (not just references)

Ask for disclosure of past and pending litigation against vendors

Ask for contracts lost during the past three years

Other Considerations

Does the equipment transition from active to passive mode?

Is traditional RF house arrest equipment available?

Are there rural areas without cell coverage?

What percentage of the units must be in use versus on the shelf?

Can the bidder compare location data points to crime scene locations?

Who will own the data?

Resist political pressure when selecting a vendor.

Keep good records of the process for possible vendor protests

After bid is received, ask for final and best offer of finalists.

LESSON FIVE: EVALUATING OFFENDER TRACKING EQUIPMENT

Objective: Students attending this session will understand the importance of testing equipment prior to selecting a vendor. The students will understand that product performance is just one factor to consider. The student will also learn that a methodical comparison of equipment on the market will help demonstrate which devices work best in their geographical areas. Finally, the students will learn to perform a large number of testing protocols, be able to interpret the results of the testing, and understand how to weigh the importance of each result in order to determine which device(s) perform well in their jurisdiction.

Factors to consider when selecting offender tracking equipment

- Cost
- Reputation of the vendor
- Customer support
- Software functionality
- Product performance
- Others?

This session is concerned with only product performance

- Disclaimer: Testing is not scientific and could possibly be misleading
- Head to head testing of multiple devices simultaneously provides most dependable results
- Obviously all relevant factors must be considered
- The product that performs the best may not be the best fit for your agency

Why test offender tracking equipment?

- Wide variety of features and capabilities now offered
- Equipment performs differently in different geographical areas
- Contributing factors for varying performance

    Cellular service availability

    Cellular carriers used

Landline options

Antennae orientation

Power conservation strategies

Topography

Heavy foliage

Presence of urban Canyons

Building materials used in area

- Testing protocols discussed will be relatively non-technical
- Some investment in time is needed
- Not all tests discussed may be required

Initial preparation

- Determine which cellular service provider(s) the equipment utilizes
- Obtain cellular coverage maps from the vendor
- Be sure testing site are in the coverage area (when applicable)
- Be sure batteries are fully charged
- Synchronize your watch to the vendor's software
- Obtain a copy of ***Testing Protocols for Offender Tracking Technologies*** workbook

The GPS acquisition time test

- Orienting a device is part of the enrollment process with all tracked offenders
- Slow acquisition times can be very frustrating
- Assisted GPS can provide ephemeral data to equipped devices to speed up acquisition
- Procedure

  - Read the manufacturer's instructions on how to allow the device to acquire GPS on its first use.
  - Record the time.

- Perform the GPS acquisition procedure.
- Each manufacturer's equipment will provide a method of notifying the user when GPS has been acquired. In order to make this test more standardized, the acquisition will be considered complete when the first location point is calculated.
- After acquisition has been completed, review the mapping portion of the vendor software, locate the first plotted point, and record the time associated with that point.
- Calculate the time difference between the time recorded at the beginning of the test with the time of the first recorded location point.

The baseline test

- Provides accuracy of tracking points under ideal conditions

- This data is compared to other test results in more challenging conditions

- Procedure

  - Select a site that is outside, in an open area (such as a meadow, park or a parking lot) and at least 300 feet away from any commercial structures that are taller than 50 feet in height.
  - The site should be away from nearby mountains, cliffs, heavily forested areas or any other obstruction that blocks a clear view of the sky beyond a 15 degree angle to the horizon.
  - Select a site that has a landmark (or intersection) that can be easily recognized from the satellite view of the mapping software that the vendor utilizes (i.e. Google Earth or Microsoft Earth). The selected site should be in an area the mapping software displays in high resolution.
  - Set the activated tracking device on a table (or other stand) so it is approximately 2.5 to 3.5 feet (two-piece unit) or six inches above the ground (one-piece unit) above the ground and oriented in a manner that is consistent with how the equipment will be worn or carried by the offender.
  - Record the starting time of the test.
  - Let the device collect data points for at least 45 minutes.
  - Note: Some two-piece devices will not collect GPS points while they are at rest. If this is the case, the tracking device should be worn by an evaluator while walking along a carefully planned route in an environment described above.
  - Record the time the test is concluded.
  - Retrieve the location data points with the vendor's software, using the satellite view, if available. Estimate and record the distance of each location data point from the actual location of the tracking device using the landmark that was selected. As an alternative to plotting every point, you may evaluate every 5th point or every 10th point. You should have no less than 20 points to evaluate.
  - Add all of the distances together and divide by the number of data points evaluated to establish an average.

- A "thrown point", for this purpose, will be defined as a data point that is beyond 100 times the average distance of the other points to the actual loaction. Thrown points should not be used when calculating the average. However, they should be documented, as excessive thrown points can be very problematic when tracking offenders.
- It is recommended that you repeat this procedure one hour later. The changing locations of the satellites in the sky can occasionally cause differing results.
- Average the findings of the two results to arrive at the tracking device's optimal accuracy expectation.

<u>The indoor residential tracking test</u>

- Offenders typically spend 12 or more hours each day at home

- Many devices may not work well in this common environment

- Monitor the interruption in GPS coverage while performing this test

- Procedure

  - Select a residence that is made of materials that is the most typical for your area. For example, if most residences are one story structures with 2"x 6" wood framing with a bricked exterior, locate a residence with these characteristics.
  - The selected residence should not be in a high rise, a mountainous area, a heavily wooded area or in a canyon unless a majority of the residences in the community are so situated.
  - Set the tracking device on a table 2.5 to 3.5 feet above the floor in a bedroom that has at least one window within 10 feet of the device. Choose a bedroom on the top floor of multiple story residences.
  - Record the starting time of the test.
  - Let the device collect data points for at least 45 minutes. A longer test period (i.e., 8-10 hours) will produce more definitive results. To get results the most representative results, allow as much time for this evaluation as possible.
  - Note: Some two-piece devices will not collect GPS points while they are at rest. If this is the case, the tracking device should be worn be an evaluator and the evaluator should remain in motion without moving far from the designated location.
  - Record the time the test is concluded.
  - Retrieve the location data points with the vendor's software, using the satellite view (aerial imagery) if available. Estimate and record the distance of each location data point from the actual location of the tracking device. Add all of the distances together and divide by the number of data points retrieved to establish an average. As an alternative to plotting every point, you may evaluate every 5th point or every 10th point. You should have no less than 20 points to evaluate.

- A "thrown point", for this purpose, will be defined as a data point that is beyond 100 times the average distance of the other points to the actual location. Thrown points should not be used when calculating the average. However, they should be documented, as excessive thrown points can be very problematic when tracking offenders.
- Repeat this procedure one hour later. The changing locations of the satellites in the sky can cause differing results.
- Average the findings of the two results to arrive at the tracking device's expected accuracy in a typical residential setting for the community in which the device was tested.
- You may repeat this procedure for other types of structures, such as mobile homes, high rises or adobe residences.

<u>The commercial building test</u>

- Offenders enter commercial buildings for schooling, counseling, employment and visits to your agency
- GPS signals often cannot penetrate these buildings
- It is not practical to have offenders avoid these locations
- Procedure
    - Follow the same procedure as in the Indoor Residential Test, but place the tracking device in one of the middle floors of a high rise office building with no direct line of sight to a window.
    - Average the error distances as was done in the previous tests. Do not be surprised if some devices fail to produce any location data points in this environment.
    - You may repeat this procedure in other commercial structures that are typical within the community that the equipment will be used.

<u>Urban canyon testing</u>

- Urban canyons are streets lined with tall commercial structures
- GPS signals can bounce off reflective surfaces
- Multipath affect
- Improved algorithms in some chip sets reduce false locations from being recorded

- Procedure

  - Set the tracking device to record location data points as frequently as possible.
  - Wear the equipment as recommended by the manufacturer.
  - Record the time your testing begins.
  - Walk up and down city streets for at least 30 minutes, selecting a route that contains many of the tallest buildings and large structures with reflective exteriors. Keep a record of your path and on which side of the street you walked.
  - Record the time your testing was completed.
  - While comparing the recorded path as generated by the tracking software, compare the accuracy against the device's optimal accuracy as measured in the Baseline Test.
  - Count the number of "thrown points" (if any) and compare that with the number that occurred during the Baseline Test.

Rural testing

- Nearly all jurisdictions include some rural areas

- Cellular coverage may be problematic

- Canyons, forested areas and waterways may cause location inaccuracies

- Procedure

  - Ask the vendor which cellular service(s) the tracking device uses.
  - Refer to the cellular coverage maps of the service used by the vendor. Make sure the maps are current.
  - Select a rural location were cellular service is not provided.
  - Drive to that location and remain for at least one hour.
  - If you have a cell phone that utilizes the same cellular service as the tracking device being tested, check the signal strength on your phone to confirm that service is unavailable.
  - If possible, access the vendor's monitoring website while in the rural area to determine if your presence in the rural area has been recorded.
  - Return and access the website and determine whether the location points have been saved and recorded upon returning to an area having cellular coverage.
  - Repeat this test in an area that has weak signal strength.

Vehicle tracking and breadcrumb trail tests

- When offenders drive or are passengers in vehicles, GPS signals could be shielded

- One –piece devices are more vulnerable because they are worn at the ankle

- Good time to measure tightness of tracking pattern (breadcrumb trail)

- It may be important for some agencies to have location points frequently plotted

- Procudure

    - Set the tracking device to record location data points as frequently as possible.
    - Record the starting time of the test.
    - Wearing the equipment as recommended by the vendor, drive a typical motor vehicle for at least 20 minutes in an area that does not have significant RF barriers (avoid mountain roads, heavily forested areas and urban canyons). Note: if the manufacturer's user guide does not provide information as to where a two-piece device should be positioned while in a vehicle, place the tracking device on the car seat.
    - Record the completion time of the test.
    - Compare the route as it was recorded by the vendor's software. Accuracy can be measured by how far left or right the recorded point is indicated relative to its actual path. If you are able to maintain a steady speed, check to see if the tracking points are evenly spaced. This will also provide a good indication of accuracy.
    - Take note of any significant errors in the recorded data points, including missing or thrown points.
    - Measure the quality of the breadcrumb trail by counting the number of location data points recorded and divide that by the number of minutes the equipment was tested. This will determine the maximum points per minute the equipment will record.

<u>The exclusion zone test</u>

- Keeping offenders away from exclusion zones is at the heart of offender tracking

- Playgrounds, schools, bars and victims' residences are common exclusion zones

- Procedure

    - Using the vendor provided software, create an exclusion zone that will be the target of this test.
    - If applicable, set the tolerance (the time a tracking device can remain in a restricted area without generating an alert) to zero minutes.
    - Print a copy of the map showing the precise borders of the restricted area. Note whether the zone can be defined by an oval, circle, rectangle, square or polygon.
    - Select a method of alert notification, (such as a page to be received by the evaluator).

- One the first trial, blatantly violate the restricted area by entering the center of the zone and staying there for at least five minutes.
- Record the start and finish time of this trial.
- On the second trial, attempt to avoid detection by driving a vehicle or walking through the outskirts of the zone without stopping. Stay in the zone less than one minute.
- Keeping in mind the data point collection rate as determined in the Breadcrumb Trail Test, see how long you can loiter within a zone without detection. **Note: Some systems download zone and schedule data into the tracking unit. These devices should send an alert to the monitoring station as soon as a zone is breached because the device will instantly know it is in a restricted area. Equipment that does not download data into the tracking device makes periodic location calculations and sends the data to the the monitoring center where a computer checks the location data against the offender's zone and schedule information. These systems can be more vulnerable to missing brief exclusion zone violations.**

<u>The inclusion zone test</u>

- Curfews are the most common use of inclusion zones

- Monitoring required attendance at school, counseling, work and day reporting

- Procedure

  - Using the vendor provided software, create an inclusion zone that will be the target of this test.
  - If applicable, set the tolerance (the time a tracking device can remain outside an inclusion area without generating an alert) to zero minutes.
  - Print a copy of the map showing the precise borders of the inclusion area. Note: the zone may be defined by an oval, circle, rectangle, square or polygon.
  - Select a method of alert notification, (such as a page to be received by the evaluator).
  - One the first trial, blatantly violate the inclusion area by leaving the area and staying away for at least fifteen minutes.
  - Record the start and finish time of this trial.
  - Repeat the procedure, but only remain outside of the inclusion zone for one minute.
  - Keeping in mind the datapoint collection rate as determined in the Breadcrumb Trail Test, see how long you can loiter outside the zone without detection. **Note: Some systems download zone and schedule data into the tracking unit. These devices should send an alert to the monitoring station as soon as a zone is breached because the device will instantly know it is outside an inclusion area. Equipment that does not download data into the tracking device makes periodic location calculations and sends the data to the the monitoring center**

where a computer checks the location data against the offender's zone and schedule information. These systems can be more vulnerable to missing zone violations.

Zone within a zone testing

- Most offenders are required to remain within a jurisdictional zone
- To monitor this, the jurisdictional area must be a large inclusion zone
- The are almost always inclusion and exclusion zones within the jurisdictional area
- Many vendors' equipment cannot monitor these zones within a zone
- Procedure
    - Set a jurisdictional inclusion zone around a large portion of a city.
    - Create an inclusion zone inside of the jurisdictional zone.
    - Create an exclusion zone inside of the jurisdictional zone.
    - Leave the smaller inclusion zone at a time that the schedule requires your presence there.
    - Arrive at the exclusion zone and remain for ten minutes.
    - Leave the large jurisdictional zone and return after ten minutes.
    - Review the alarms generated by the software to determine if they were properly generated.

The intentional shielding test

- Some offenders attempt to circumvent their supervision by shielding GPS signals
- This can be done with common household products like aluminum foil
- Offenders can potentially use technology to create an alibi
- Some vendors have developed countermeasures to detect such attempts
- Procedure
    - **Note: The optimal amount of shielding will block the relatively weak GPS signals from reaching the tracking device while allowing cellular communications and the RF link to the tether (of two-piece units) to continue to work. You may increase or decrease the amount of foil used to obtain this level of shielding.**

- Attempt to shield the tracking device's ability to receive GPS signals by placing two layers of aluminum foil completely around the tracking device. Make sure there are no tears or openings in the foil.
- Repeat the Exclusion and Inclusion Zone Testing protocols.
- Check the tracking points on the vendor software to determine how the shielding affected the systems ability to track the device.
- If you are testing a two-piece unit, note whether this shielding generated a "Bracelet Gone", "Communication Failure "or "Motion, No GPS" or alerts.
- If you are testing a one-piece device, note whether this shielding generated a "Communication Failure" and/or "No GPS" alerts. This test should be done while wearing the device.
- Equipment that produces only a "No GPS" alert may not be providing sufficient protection against intentional shielding. Typically, "No GPS" alerts happen many times each day as an offender legitimately enters and leaves buildings. You will not be able to differentiate between intentional and unintentional GPS shielding.
- After assessing how vulnerable your selected equipment is to intentional shielding, you should consider which applications may not be appropriate for your program (i.e. victim protection, monitoring drive by shooters, etc).

<u>The bracelet spoofing test</u>

- Some bracelet designs are vulnerable to spoofing

- Those with continuity or conductive straps may be most vulnerable

- Offenders may be able to remove a bracelet without triggering an alarm

- Even if visual inspect will reveal a tamper, the time of the tampering is not known

- Procedure

  - Using 12 or 14 gauge wire and four alligator clips, make 2 six inch jumpers with an alligator clip at each end.
  - While wearing a bracelet in a non-tamper state, attach an alligator clip of the first jumper to the top portion of bracelet strap approximately one inch from where the strap fastens to the transmitter. Make sure the teeth of the alligator clip have a tight grip on the strap. In a similar fashion attach the second alligator clip of the first jumper to the strap approximately one inch from the other side of the transmitter, also on the top portion of the bracelet strap.
  - Repeat the process with the second jumper, but place the alligator clips on the bottom potion of the bracelet strap directly below the first set.
  - Using a pair of scissors, cut the strap slowly, looking for any metal wires embedded within the strap. If a wire is found, remove one of the jumper wires and place both

alligator clips on the exposed wire and cut the strap between the clips. If there is no embedded wire, cut the strap completely through.
- Carefully, pull the cut strap apart using caution not to disturb the alligator clips and then remove the bracelet from your ankle.
- Check the vendor provided software to determine whether an alert was generated.
- **Note: Although this type of tamper will be obvious to a supervising officer upon visual inspection, the officer will not know when the tamper occurred. An offender could, for example, call the supervising officer well after the fact (but before a visual inspection) asking permission to remove the bracelet for a bogus medical emergency.**

<u>The bracelet water tightness test</u>

- Offenders can be told to avoid certain water sport activities

- Bracelet design should allow for normal bathing

- Some bracelets fail due to a lack of water tightness

- Procedure

  - This test is to be performed only with the consent of the vendor, as some vendors do not claim their bracelets (especially one-piece devices) are watertight.
  - If a swimming pool is available, submerge the bracelet in eight feet of water for one hour.
  - As an alternative, place the bracelet into a large plastic trash bin filled with water for three hours. The depth of the water should be at least 2 ½ to 3 feet. This is a much less demanding test than submerging the device in a swimming pool, but it does expose the bracelet to more water pressure than it encounters with typical bathing in a bathtub.
  - Remove the bracelet from the water.
  - Thoroughly dry the external surfaces of the bracelet with a towel.
  - If the bracelet is designed to be opened by field staff, inspect the interior of the bracelet for moisture. Specifically, look for moisture near battery connection points, fiber optic windows, or other tamper detection devices. Prolonged exposure to moisture may cause damage resulting in malfunctions occurring over time.
  - Continue with normal use and monitor whether the device is working properly

<u>The tracking device battery drain test</u>

- If a device discharges too quickly, tracking may be interrupted

- This test measures battery life under ideal conditions

- Real life conditions will likely result in shorter battery life

- This test should demonstrate a battery life of at least 18 hours

- You may want to perform the "communication failure test" with this one

- Procedure

    - Fully charge the tracking device.
    - If the time to report a "Communication Failure" is a programmable, set it to send an alert one hour after communication is lost.
    - If there is an adjustable setting for sending an alert for overdue communication, it should be set at one hour.
    - Conduct this test where cellular coverage is good.
    - Do not have any scheduled inclusion events and be sure the place of the testing is not in an exclusion zone.
    - Record the time of day when the fully charged tracking device is taken off the charger.
    - Record the time you (acting as the offender) received a warning for a low battery alert.
    - Record the time you (acting as the supervising officer) received an alert that the tracking device has a low battery.
    - Compare these two notification times. Does the offender have sufficient time to correct the situation so the supervising officer does not have to be notified if the offender rectifies the problem in a timely manner? Note: The software should have time stamped reports indicating when the warning alarms were sent to the offender wearing tracking device and to the supervising officer.
    - Record the time the device shuts down completely due to lack of power. The device should send a final notification to the monitoring center that indicates the time the device was shut down due to low power.
    - Compute the hours the device was operational before shutting down. Also, compute the length of time after the low battery alert was sent to the time of the final shut down.
    - The number of hours of battery operation should be at least 18 hours under these conditions. In normal operation, battery life will usually be shorter because the device will be reporting zone violations and other events that require additional battery power. Also, batteries that have been in service for an extended period often will have a shorter operational life between charges. Some batteries that that are repeatedly discharged and recharged (especially if the battery is never allowed to fully discharge) may develop "battery memory" problems that could significantly shortens the operational life of a battery.
    - It may be convenient to perform the Communication Failure Alert Test in conjunction with this testing protocol

The communication failure alert test

- When an active tracking device ceases to function, the officer must be alerted
- Malfunctioning equipment, vandalism, no cell coverage and/or a discharged battery
- A communication failure alert is usually the last warning an officer receives
- Procedure
    - Perform this test in conjunction with the Tracking Device Battery Drain Test
    - One circumstance which should generate a Communication Failure Alert is neglecting to charge a battery and allowing the tracking device to become nonfunctional.
    - After completing the Tracking Device Battery Drain Test, allow the device to remain off the charger in a completely discharged state for at least four hours.
    - During this time, the system should send an alert to the supervising officer that communication with the device is overdue
    - This may be the last alert an officer receives when an offender has disabled or abandoned his tracking equipment.

The alarm response time test

- When a serious violation occurs, the officer should be notified promptly
- The are many steps that occur before an officer is notified
- This test identifies the steps and measures the time between each one
- Procedure
    - Conduct this test in an area with good cellular coverage for both the tracking device and the supervising officer's portable communication device (they may utilize different cellular services).
    - While wearing a bracelet in a non-tamper state, cut the bracelet with a pair of scissors.
    - Record the time.
    - Record the time the tracking device warns the offender of the violation (if so designed).
    - Record the time the software indicates the tamper status was reported to the monitoring center.
    - Record the time the alert was received by the supervising officer's e-mail server.

- Record the time the alert was received by the supervising officer's portable communication device (pager, phone text message, or e-mail).
- Measure the time differential between the violation occurrence and the time the alert ultimately arrived at the officer's portable communication device.
- Repeat this test with exclusion and inclusion zone violations, keeping in mind that the system may have adjustable tolerances that create a delay before reporting these alerts.

<u>The tether battery drain test</u>

- It is important to know the life of the battery that powers the tether
- Because its lifespan is usually several months, it is not a practical test
- Battery life information should be obtained from other users of the equipment

<u>Nuisance alarms documentation</u>

- Nuisance alarms are unnecessary alerts that waste officers times
- The cause significant ill will toward the program
- Undermine the integrity of the program
- Frequent nuisance alarms observed during testing should be well documented
- The impact of these alarms on responding staff should be carefully considered

<u>Summary of testing results</u>

- Assign a numeric rating that represents your level of satisfaction for each test
- Assign a numeric weight that represents the level of importance for each test
- Record these ratings on the "Weighted Score Results Worksheet"
- Multiply the rating by the weight factor and record the result for each test
- Compare the total scores of each vendor's device tested

- The results will show which product performed best is your environment
- This is one important consideration in selecting a vendor for your program

LESSON SIX: EM PROGRAM OVERSIGHT

Objective: The students will have gained skills in overseeing an EM program, especially in the areas of: assigning program managers, managing the inventory, managing the offender location data, working with legislators and dealing with the media.

Assigning a program manager

Many agencies neglect having an EM program manager

To assure success, an EM manager must ensure:

EM objectives are met

Vendor contracts are made and adhered to

Policies and procedures are followed

Inventories are maintained

Response protocols are adhered to and revised as needed

Outcome measures are collected and reported

Top administrators are briefed

Media inquiries are addressed

Managing an EM inventory

Inventory control is a major point of dissension between agencies and vendors

Agencies claim to need inventory while vendors insist they have plenty

Vendors cannot make a profit unless their units are in service

A shelf inventory of 10% is common, but negotiable

Clarify whether shelf inventory is by site or agency-wide

Typically, higher unused inventory agreements result in higher daily rates

Causes of inventory problems

- Officers who horde units for future use
- Officers who fail to timely clean and reshelf units after use
- Leaving devices in car trunks, desks, etc
- Units still on inventory when shipped for repair
- Units placed on inventory as soon as shipped by the vendor

Solving inventory problems

- Obtain reports from vendor on assigned units with no activity
- Establish policies with timelines on assigning and restocking inventory
- Work out agreements with vendors regarding:
  - When items will be placed on and taken off the available inventory list
  - What shelf rate is allowable and how it is defined
- Create an assignment log if the vendor log provides insufficient data
- Use "drive by" units to find forgotten transmitters in desks and cars

<u>Managing offender location data</u>

Perhaps the least utilized and one of the most important assets is the location data

Data can be used for much more than monitoring inclusion and exclusion zones

- Information can be analyzed to:
  - Solve crimes
  - Identify criminal associations
  - Identify high crime areas
  - Developing GIS mapping

Some vendors offer data drilling services

- Crime Trax 3M Electronic Monitoring
- VeriTracks – S.T.O.P.

Crime Trax has indicated they will do data drilling with other vendor data

Contract with vendor should indicate who owns data so these options are available

Must work closely with law enforcement agencies

Often LE will pay for the reports as it benefits them primarily

Both LE and correctional agencies can receive crime correlation reports

Working with Legislators

Identify an administrator who will act as a legislative liaison

Get involved with the legislative process early

Many times legislators introduce bills with consulting with correctional agencies

Maintain a working relationship with legislators

When bills are drafted, ask that they keep your options open

Allow for active and passive tracking

Encourage legislators not to be overly influenced by any one particular vendor

Let legislator know of the operating costs beyond the leasing of equipment

Many vendors will only mention the costs they charge

EM can bankrupt an ill-funded agency

Keep expectations realistic

Give them regular feedback on program progress

Invite legislators into the field

Let them hear from line staff firsthand

Do not be reluctant to ask for supplemental funding to cover shortfalls

Dealing with the media

Do not wait until something bad happens

Provide a press release when the EM project is being initiated

Do not oversell the program's capabilities

Emphasize the equipment is just one of many tools

Create a media packet for EM stories before any incidents occur

Establish a media liaison or a PIO for coordinating all media responses and releases

Get the good stories to the media

- Solving a crime using crime scene correlation
- Locating and arresting a sexual predator lurking around a school

When something bad happens, be upfront, honest and do not be defensive

- Research all aspects of an incident before speaking to the media
- A cover up is worse than the initial story
- Minimizing a big event looks bad

LESSON SEVEN: SELECTING OFFENDER TRACKING PARTICIPANTS

Objective: It is the objective of this training to understand the capabilities and limitations of tracking equipment in order to select the most appropriate offenders for program participation.

Community Needs

Are there crime problems where tracking can be effective?

Crimes that are location specific are best for offender tracking applications

Legislative Requirement

Many states are told by their state laws which offenders must be tracked

Many laws require sex offender tracking

Encourage legislators to pass bills that give agencies discretion

Sex Offenders

Almost always, sex offenders control the location of their assaults

Sex offenses may not always be prevented by employing tracking technology

- No impact with on-line activities

Sex offenders are often very secretive and manipulative

Sex offender tracking does have some advantages

- Wearing a bracelet helps some offenders with self control
- Can help solve crimes after the fact
- Sex offenders are often able to pay for their tracking
- The community at large is demanding something be done

Other Appropriate Participants

- Habitual offenders may be more inclined to curtail criminal activity
  - Crime scene correlation works best with habitual offenders
- Offenders who associate with other criminals can be identified
  - Track “partners in crimes”, break up criminal enterprises
- Domestic violence/Victim “protection”
  - Use to enforce restraining orders
  - The victim can agree to be tracked
  - Creates a mobile exclusion zone around victim
- Drug traffickers
  - Location patterns can reveal trafficking locations
  - Location patterns can help identify suppliers
- Home/Commercial burglars
  - Can put a sudden stop to burglar activity
  - Crime scene correlation can easily identify tracked burglars reoffending
- Gang Intervention
  - California initiative
  - Place all supervised members of a gang on tracking
  - Review instances of gang association
  - Utilize mobile exclusion zones on each gang member
  - Service provider software must be capable of viewing multiple offenders

LESSON EIGHT: EM RESPONSE PROTOCOLS AND PERSONNEL MANAGEMENT

Objective: It is the objective of this class for students to understand the importance of establishing appropriate response protocols in their EM program. The student should also understand the costs associated with responding to EM alarms and should learn about strategies to reduce these costs.

The need to respond

- Learning of an EM violation creates a need to respond
  - Moral need to respond
  - Knowledge of alarms creates legal liability
  - Need to maintain public support
- A response protocol is the document that outlines how to respond

Underestimating the cost of an EM program

- Many agencies only consider equipment costs when planning a program
- Overtime of responding officers may cost many times the cost of the equipment
- One shift per five-day week vs. three shifts seven-days a week
  - A one shift operation covers 40 hours per week
  - Violations will occur 168 hours per week
- A program manager is usually required
  - Writing and editing policies and procedures
  - Auditing
  - Inventory control
  - Return defective equipment
- Administrative oversight costs

- Detention Costs
- Other overhead
  - Computers
  - Cell phones
  - Fuel
  - Furnishings
  - Office supplies

Underestimating the number of alarms

- An agency with 300 GPS units may have 1200-1500 daily alarms
- Most programs fail to plan for this volume
- Before a response protocol will work, unnecessary violations must be reduced

Strategies for reducing alarms

- Increasing time tolerances allows violations to clear themselves
  - A 10:00 PM curfew is not an alarm until 10:15 PM
  - Being at a bar for one minute is not a violation
- Relaxing exclusion zone areas to reduce violations
  - Instead of a 100 foot radius, try a 200 foot radius on some sites
  - Consider eliminating unnecessary exclusion zones
- Monitor battery life
  - Bracelet batteries going dead cause a large percentage of the violations
    - Causes unnecessary bracelet gone alarms
    - Program loses integrity
  - Schedule battery replacement (bracelet replacement) when it is convenient

- Tracking device batteries
  - Offenders do not comply with charging requirements
  - Older units have weaker batteries
- Consider having a replacement schedule for tracking devices

Planning a response protocol

- Consider what your agency's priorities are
- Consider what your employees are capable of performing
  - Tennessee reporting exhausted officers
  - Non-sustainable
- Consider your operating budget for overtime

Active versus Passive tracking

- Many agencies avoid overtime costs by utilizing next business day alarm notifications
- Passive advantages
  - Reduces daily lease cost by $4 to $7 per unit each day
  - Reduces need for some overtime
  - May be only practical method for one shift operations
  - Crime scene correlation is just as effective using passive tracking
- Passive disadvantages
  - Lack of instant consequences
  - No chance of intervening in a critical situation
  - Officers are overwhelmed with alarms each morning
  - There is a temptation to disregard alarms
  - Public expectations are not met
- Active advantages

- Immediate notification of alarms with timely consequences
- May be able to intervene in a critical situation
- Alarms do not "pile-up" and are taken more seriously
- Public expectations are better met

Active disadvantages

- Daily lease cost is higher
- Personnel costs are much higher
- Officer burnout
- In reality, it will do little to stop a crime in progress
- Diminishing returns – a high price to pay for a little more effectiveness

Legislative initiatives may predetermine what form of tracking is to be used

- If it is not too late, keep your agency options open
- If a required active program is not working, ask legislators for changes/funding

A mix of active and passive units is often most appropriate

- Develop strategies to identify those needing active
- An active tracking team approach can be used to share the load

Use law enforcement agencies to do after-hour responses to alarms

- They already have a 24-7 operation
- Allow them to help select offenders to be tracked
- Use the crime scene correlation software to help them solve crimes

<u>Elements of a successful response protocol</u>

Not all offenders have to be treated equally

- Lower risk offenders can be given higher tolerances

- Lower risk offenders can be given a lower response priority

Not all alarms should be treated equally

- Some alarms can always have a next day response
- Identify just a few alarms that require immediate responses
- Identify which alarms are “secondary” and which are “non-urgent”

Use a matrix approach for determining appropriate response

- On the left column show offender risk as “Highest”, “Moderate”’ and “Lower”
- On the bottom of the matrix show alarm priority in a similar fashion
  - The highest risk offenders with highest priority alarms get most attention
  - The lowest risk offenders with lowest priority alarms get least attention
- The matrix should contain at least three levels of alarms
  - Immediate response – Receives immediate priority
  - Secondary response – Addressed after Immediate responses are completed
  - Non-urgent response – Addressed the next business day
- Evaluate the practicality of your matrix and make adjustments as necessary

Create an Alert Center

- After hour alerts are problematic
- An agency run alert center can handle most after hour alerts without assigned officers’ assistance
- An agency run alert center can handle most after hour alerts without trained to address most, noncritical common situations
- Overtime savings can offset much of the cost of an alert center
- Prevents burnout and turnover

LESSON NINE: MEASURING OUTCOMES OF AN EM PROGRAM

Objective: It is the objective of this class to help the students understand the importance of measuring outcomes of their EM program and to comprehend the complexities and common mistakes made when trying to measure EM program outcomes.

Why measure outcomes?

Accountability of public funds expended

Lets the agency measure effectiveness - EBP

Helps decide on which programs to concentrate resources

Defining success: What does your agency want?

Many agencies go into EM programming without clearly defining objectives

Legislature required it so the agency complies

Other states are doing it so we need to keep up

Agencies feel a need to use cutting edge technology to be considered successful

What is the objective of the program?

Reduce incarceration rates?

Protect the community?

Respond to public concerns?

Rehabilitate the offender?

Catch offenders if they reoffend?

There is no correct answer – varies based on agencies' needs and expectations

Remember, you cannot measure success unless you clearly define objectives

Measuring EM outcomes is difficult

- Control groups may be difficult to define
  - Usually supervised at a lower level
  - Factoring out other variables is problematic
    - An exceptionally talented PO may skew results
    - A drug treatment program may have been the largest contributing factor
- Increased supervision results in knowing more about the offender
  - Discover violations otherwise that would be unknown
  - Adding more rules creates more opportunities for violations
- Results in increase number of arrests
  - New offenses may be discovered
  - Technical violations increase
- Conclusions can be made that added supervision drives offenders to more crime
- Some explain increased technical violations are the result of frustrated offenders

Knowing what you want to measure

- If the objective is catching offenders who commit crimes
  - Arrest rates should be expected to go up
  - This would be regarded as a positive outcome
- If the objective is to reduce recidivism and rehabilitate the offender
  - You hope arrests rates will go down
  - Technical violations and new crimes would hopefully both be reduced

What to expect

- An increase in the number of technical violations reported

An increase in the number of new crimes discovered

An increase in jail costs when used with typical caseloads

Some agencies use EM strictly as a diversion and may experience savings

An increase in solving crimes

Especially when used in conjunction with crime scene correlation software

An increase in offender accountability

A decrease in the actual number of crimes committed by the offender

Most crimes go undetected – Difficult to measure

Offenders may postpone many criminal acts until after EM supervision

Disappointment with citizens and public officials

Wrong expectations

Unintended consequences of the program

Not a panacea for criminal behavior

Measuring strategies

Make sure you measurements are consistent with your objectives

If EM is used for financial savings, measure costs

If EM is used for public safety measure arrests

Areas to consider measuring

Program costs

EM equipment

Salaries and benefits

Overtime

Overhead

Detention costs

Recidivism rates

Technical versus New Crimes

One, two and three or more year out recidivism incidents

Crimes solved through EM technology

Using your measurements

Share with legislatures

Internal evaluations for future funding

Share with the public

LESSON TEN: TESTIFYING IN COURT

Objective: To help the student anticipate the type of issues that are relevant to a hearing concerning offender tracking technology. The student will be taught to testify within their level of expertise. The student will also learn about admissibility of evidence, and handling cross examination, The student will recognize the importance of having sound policies and procedures as well as defendable response protocols.

Understanding the technology

The witness must understand the basic components of an offender tracking system.

- GPS satellites
- Ground stations
- Portable tracking device
- Cellular communications network
- Monitoring station
- Alert notification devices (i.e., pagers, text, e-mail, or cell phones)

The witness must understand alternative location techniques.

- AFLT
- Rosum technology
- Dead Reckoning
- Public safety network triangulation
- Cell tower identification

The witness must understand problems that impact location accuracy.

- Urban Canyons
- Multipath
- Thrown points

The witness must understand tampering techniques used by offenders.

- Intentional shielding
- Theft of replaceable parts
- GPS/cell phone jamming
- Undermining confidence

The witness must understand the different approaches used in tracking offenders.

- On-board processing
- Post collection processing
- Update rates of location information

Understanding the importance of policies and procedures

Sound, well-written policies and procedures must be in place

Delineation of responsibilities must be indicated

The objective of the program must be spelled out

Consideration should be given to confidential material

Each version of the policy must be available

Understanding the importance of response protocols

Protocols must clearly delineate what to do when something happens

You must understand time/zone tolerances that are set for certain violations

You must have a plan to combat complacency

There must be adequate program oversight

A program should have one administrator in charge of offender monitoring

Properly supervised programs have fewer circumstances that are problematic in court

The manager can develop a plan for managing the location data

The manager can be the main media contact person – If it is a big deal in the media it will be a big deal in court.

The manager will keep tabs on measuring the success of meeting program goals

Admissibility

Most tracking data is admissible in court

Just because it is admissible does not mean it is credible

An expert witness may be required to interpret data

Technological limitations should be disclosed

Burden of proof for probation and parole violations is lower

Courtroom Testimony

Do not testify beyond your level of expertise

It is OK to say "I don't know"

Acknowledge personal limitations

Let the facts speak for themselves

Do not get defensive

Provide your credentials

Mention your specific training

Years of experience

Your reputation means everything

Be detailed and precise in your language

Avoid superlatives or absolute language, such as:

- Never
- Always
- Best
- Worst

Testifying about GPS data

Show you followed policy

Discuss accuracy limitations

Discuss false alarms

Discuss how information is verified

Cross Examination

Relax, it is only a court case

Concede points when appropriate

Smile at over aggressive questioning

Prosecutor will rehabilitate your testimony