Document Title: Evaluability Assessment of Global Positioning System (GPS)-Dispatching in Law Enforcement

This report has not been published by the U.S. Department of Justice. To provide better customer service, NCJRS has made this federally funded evaluability assessment available electronically.

Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.
Evaluability Assessment of Global Positioning System (GPS)-Dispatching in Law Enforcement

Staff Contact: Brian Starr
Applications Developer
Sacramento Police Department
916–433–0407
bstarr@pd.cityofsacramento.org

NIJ Guidance

The National Institute of Justice (NIJ) has identified some key outcome variables and other parameters of interest for this technology, and has provided some guidance on possible evaluation designs. Applicants may depart from this guidance by providing an appropriate rationale.

The evaluability assessment identifies some key questions for outcome evaluations of these systems, and many of the methodological challenges. The assessment cites the advertised benefits of Global Positioning System (GPS)/Automated Vehicle Locator (AVL) systems at multiple places. It seems clear that graphically aided dispatch will afford differential benefits, depending on the nature of the call.

NIJ believes that these systems can be evaluated with reasonable rigor. Because of the “all or nothing” nature of implementing these systems, true experimental designs seem impractical. Pre-post designs seem feasible to implement despite possible differences in pre-post recordkeeping because dispatch systems have historically retained information about time and place of calls. Comparisons of response times and call outcomes to nearby police departments (without AVL dispatching) seem feasible as well.

NIJ sees the potential for secondary benefits for GPS/AVL dispatch and encourages applicants to consider how these benefits could be assessed during an evaluation.

- GPS/AVL systems produce positional logs that place patrol car locations for every minute of the month. Coupled with dispatch information about the time and place of calls, do these systems create new opportunities to optimize beat designs and patrol shifts?

- Training for dispatchers requires approximately 18 months. Given that dispatchers now see every car and its status graphically, can training requirements be reduced significantly?

Technology Summary: New computer-aided dispatch (CAD) systems are equipped with GPS capabilities that, when paired with GPS locators in patrol cars can provide a map of
the current locations of all active patrol cars. This can, in turn, be used to create automated dispatch recommendations based upon proximity.

**Scope of Evaluation:** An evaluation including statistical analysis of dispatches recorded in the CAD system over three time periods (before implementation, 6 months at the beginning of implementation, and thereafter) could show changes in response times to 911 calls. Prior to analysis, decisions should be made regarding the types of calls where response time is important. Furthermore, demonstrating a reduction in arrival times should be coupled with a demonstration of how a reduction in arrival times affects the quality of police responses such as by increasing arrests or reducing injury.

**Summary of Evaluability Assessment Activity:** Available documentation on GPS-based dispatching was reviewed and lengthy interviews were conducted with both NIJ experts and local law enforcement in Dallas, Texas; Newton, Massachusetts; Sacramento, California; and Seattle, Washington. In addition, a site visit was conducted at the Sacramento 911 Center to observe GPS dispatching in use.

**Finding:** An evaluation of dispatching response times during periods with the GPS/AVL and prior to implementation may show decreased response time to emergency calls and improved outcomes to high-priority calls for police assistance.

1. **Initial Screening**

**Background**

Within the past several years, automated vehicle locators that use global positioning satellite technology have become increasingly popular among law enforcement agencies across the country. Basic AVL technology is not new—navigational equipment that uses GPS systems are now commonplace in both commercial and military vehicles. Such systems, however, can provide special advantages to law enforcement officers, who can use them to improve the efficiency of their dispatching procedures (Teledesign Systems, Inc., 2002), to improve police tactical activities, and to increase officer safety.

Automated vehicle locators use a complex system of modems, GPS receivers, and digital communications systems that connect a vehicle to a particular base station (which, in the case of law enforcement agencies, may be a police precinct) to determine the precise location of that vehicle within a designated region (Teledesign Systems, Inc., 2002). Vehicle locator systems do this with the help of a GPS receiver that uses satellite technology to pinpoint the latitude, longitude, and speed of a vehicle. GPS receivers, which are installed in vehicles, operate by receiving information from at least three (but ideally 4) of 24 satellites that orbit the earth continuously. The satellites submit information about the target vehicle to a base station, which can then estimate the location of the vehicle with an accuracy of approximately 10 meters (Taylor, 2003). By tracking the vehicle and its speed, AVL systems can track a driver’s adherence to a route,
estimate a particular time of arrival between a vehicle’s current location and its desired endpoint, and reroute a vehicle to accommodate any roadblocks or other contingencies that may emerge (Geagan, Raad, and Lim, 2004).

What is the background/history of this technology?

Maturity (i.e., Lab prototype? Field rollout? Multiple generations/manufacturers?)
There exist multiple generations and manufacturers.

Time in the field?
Although GPS-based AVL technology has been widely available for several years, only recently have police precincts used it to provide more sophisticated proximity dispatching. The first uses of AVL technology by law enforcement agencies is not known, although several precincts have published accounts of their AVL systems online—including Sacramento, California; Collier County, Florida; and Newton, Massachusetts—each of which had AVL technology in use by 2004 (Sacramento Police Department, 2004; Baldus and Kim, date unknown; Geagan, Raad, and Lim, 2004).

Prevalence in the field? (Is site a first/early adopter?)
GPS/AVL has been built into almost all of the newly available computer-aided dispatching systems. These systems are being adopted when departments have the resources to upgrade their older systems, thus the adoption of GPS/AVL is currently scattered across the U.S. and is not yet widely prevalent.

What do we already know about technologies like these?
GPS-based AVL technology allows police precincts to refine their practice of proximity dispatching, in which particular patrol officers respond to a variety of police calls based on how near the officers are to the events in question. In the past, proximity dispatching relied on more rudimentary methods of tracking the location of patrol cars—either officers on patrol would call their dispatchers at particular time intervals to alert dispatchers of their locations, or dispatchers would send out a call through a wireless system that all officers could hear, allowing those in the nearby area to respond to the call (Baldus and Kim, date unknown). These older systems were more complicated and time consuming for both patrol officers and their dispatchers. GPS-based systems, however, allow call centers to dispatch the closest patrol units to a particular crime or incident, which can shave minutes off the amount of time it takes to arrive at a particular location (Geagan, Raad, and Lim, 2004).

GPS-based AVL technology provides precincts with numerous capabilities, including the ability of dispatchers to continuously track the precise location of patrol cars (instead of relying on the older system of periodic “checkins”); the access of patrol officers to continuously updated navigational data that includes information on destination locations, remaining distance to destinations, and direction to destinations; and the ability to provide database administrators with periodic or real-time data updates and error capturing (Baldus and Kim, date unknown). Error capturing is especially important in its
ability to allow dispatchers to enter data that records changes in traffic patterns and road blocks, each of which can stymie the ability of law enforcement to respond quickly to incidents. AVL systems also can provide officers in vehicles with aerial imagery maps that help them quickly locate addresses, intersections, or other coordinates on municipal maps (Baldus and Kim, date unknown; Teledesign Systems, Inc., 2002). AVL systems allow supervisors to improve tactics by coordinating responses that require the joint operation of multiple units. Finally, an AVL system can increase officer safety by providing the precise location of units when officers are incapacitated.

Which audience(s) would benefit from this evaluation?

- Police precincts
- Geographic information systems (GIS)-based AVL developers and manufacturers

Although NIJ is not in the business of aiding developers and manufacturers, the Sacramento police explained that technology development is slowed by developers and manufacturers misunderstanding police needs. Police and vendors would jointly benefit from an evaluation of GIS-based AVL in operation. Additionally, the Sacramento police explained that vendors, who are often excellent at engineering but not always so good at understanding police operations, largely conduct technology transfer from one agency to another. An evaluation focused on application would benefit technology transfer.

At what stage of adoption/implementation is the technology?

To observe the GPS-dispatching capabilities, we traveled to the new police dispatch center in Sacramento, California. The dispatch center has been using a system with GPS capabilities since January 2006. However, protocols on using the system have been developed more recently. All patrol car mobile data terminals have GPS capabilities. Dispatchers and supervisors (but not patrol officers) can see the positions of all cars. Automated dispatch recommendations are available to the dispatchers and must be used for all priority 1, 2, and 3 calls, such as violent crimes in progress and officers in pursuit. Officially there is full implementation, but staff is still warming to the technology and usage of automated dispatch recommendations varies.

What efficiencies or primary/secondary outcomes are expected?

Sketch the logic by which technology use should affect goals.
Is the technology well suited and appropriately specified given these goals?

The mapping technology alone will enable better localization of vehicles in the fleet. When this information is provided to dispatchers and supervisors it will lead to the following outcomes:
- Heightened ability to coordinate activities such as perimeter closure and approach of a crime scene with multiple vehicles.
- Location of known endangered officers or officers who do not respond.

In addition to these benefits from the mapping of patrol vehicle locations, automated dispatch recommendations have the potential to reduce response time to 911 calls. An outcome evaluation would presumably focus on reducing response time. A process evaluation would focus on tactical uses. An increase in officer safety is an important aspect of AVL systems, but this use is probably not amenable to either an outcome evaluation or a process evaluation because this use would be so rare.

Are there operational alternatives that could be used for comparison?

Current operational alternatives are not available for comparison within the Sacramento system. As a policy, all dispatchers are required to use the automated dispatch system for the highest priority calls. However, data from the time of adoption of the technology can be compared against data from previous years when appropriate confounding variables are taken into account.

Is the site interested in being evaluated?

The site is interested in being evaluated because little information is currently available on the benefits of this system, especially automated dispatch. If the technology is shown to be valuable, it may result in more willing acceptance among both patrol officers and dispatchers.

Is the site planning an evaluation?

The site is not currently planning an evaluation.

Data Sources

What data systems exist that would facilitate evaluation?

The computer-aided dispatch system keeps detailed records from the time of origin of a call until the a police officer arrives on the scene or the call is otherwise terminated. In a given year, the dispatch center receives between 25,000 and 40,000 high priority calls. Records from these calls can be made available to an evaluator. Further information on the outcome of these calls may be obtainable from the records management system (RMS). The RMS records case information after the dispatch center is no longer involved. Additional effort would be required to cross-match records from the RMS system to the CAD system.
What key data elements are contained in these systems?

The CAD system records several key data elements:

- Priority of call: only high-priority calls use automated dispatch.
- Automated dispatch: a separate item states whether automated dispatch was used;
- Location of call and ID of responding vehicle.
- Response time from origin of call to arrival of police.

After the CAD system closes a file it passes information to the RMS. The RMS will have additional information depending on the outcome such as whether an arrest was made.

Are there data to estimate unit costs of labor and capital?

GPS dispatching is a feature that is bundled with new CAD systems. It may be difficult to identify the cost of GPS dispatching alone; however, information on GPS units in cars and the CAD system can be identified.

Are there data for possible comparison technologies or other solutions?

Similar data is available for the CAD system before and after implementation of GPS-based automated dispatching. However, priority categories and in some cases beat numbers have changed during the same period so care must be taken to match data accordingly.

In general, how useful are the data systems to an impact evaluation?

The CAD database is an extremely rich source of data. The volume of calls the dispatch center intercepts allows for better statistical power even after breaking calls into smaller priority-based categories. Response time is recorded and is an important measure of the effectiveness of the system, even if the final outcome of the calls is not extracted from the RMS.

2. Site Visit Screening

The Intervention

Has the organization implemented a policy or training for the technology’s use?

Dispatchers receive extensive training in use of the CAD system including the GPS automated dispatch. To enforce the use of the automated dispatch system, the police department set a policy requiring dispatchers to use automated dispatch recommendations for all high priority calls. The CAD system records when the automated dispatch recommendation is made.
Who are the users?

There are two sets of users for the GPS dispatching system. The first is the dispatching center, which will have access to a map of the GPS location of all vehicles and the automated dispatching system. The second group is active patrol officers, particularly supervisors. Supervisors can access a real-time GPS map of vehicles on their mobile data terminal to better coordinate police action.

Who/what are the targets?

The targets, i.e., items that are tracked, consist of all marked and unmarked police vehicles. Vehicles are color coded on the map according to status (active on-call vs. available). GPS capability could be used in police radios to further localize officers who are not in their patrol cars, but Sacramento does not have this capability at this time.

Who/what gets excluded as a user or target?

Police vehicles that are not being used or that have been taken out of the fleet for maintenance do not broadcast their position. The GPS antennae may be sabotaged or obscured easily, but thus far Sacramento has had no problems with this behavior. The antennae may be obscured from satellite in other ways if, for example, the police car is on the lower levels of a parking garage. However, using latest location information, the vehicle could still be located quickly.

Have the characteristics of the user or target population changed over time?

The system has been in place for less than a year, so the user and target populations have not changed significantly. Currently only supervisors and dispatchers have access to the map of all vehicles, but regular patrol officers may have access to this map in the future.

What values/outcomes do users see/envision in the technology?

There are two components of the technology that each have their own benefits: the GPS map of all active vehicles and the automated dispatch system. The prime value that users see in the technology is in the GPS map of vehicle locations. With this map, supervisors are better able to coordinate group movements of vehicles such as perimeter closures. In addition to this there is a benefit to officer safety. Before the GPS system was in place, dispatchers and supervisors knew the location of a vehicle only when an officer radioed in to respond to a call. With the GPS map, an officer’s car can be located at any time, whether or not the officer is able to respond over the radio. While the officer may be outside of the car, the location of the car gives a much more localized point to begin a search.
The automated dispatch system has the potential to reduce response times to emergency calls. This potential has not been tested in Sacramento, although other systems (notably Ottawa, Canada) have done response time testing. It is unclear to what extent the automated system will provide useful information to a well-trained dispatcher. It should be noted that the automated dispatch system is only useful if it provides better assignments than a well-trained dispatcher. That is, if the automated dispatch produces the same recommendation as a trained dispatcher, there will be no observed benefit in response times.

What are the limitations/obstacles to using the technology?

Patrol cars must have GPS capability installed and the software to visualize the vehicle map in order to provide a benefit. All Sacramento police cars have GPS antennae and only supervisors’ cars have access to the map. Beyond the hardware requirements, the GPS system adds no burden to the patrolmen.

The automated dispatch system is still being refined and has some limitations. Currently the automated dispatch system provides recommendations based solely upon the latitude and longitude of vehicles. It is not linked into a driving time estimator, so it will always recommend the geographically closest vehicle, which is not necessarily the same as the vehicle which can arrive fastest. The system also does not take into account finer distinctions in patrol car status. Any patrol car may be reassigned if it is not already involved in a high priority call. Thus, an officer involved in a low priority call may be assigned over another available officer one minute further away.

What outcomes could be assessed? Using what measures?

The benefit of the GPS vehicle map to supervisors would be difficult to assess. Quantitative measures such as number of successful arrests are affected by many variables outside of successful perimeter containment. The benefit to supervisors in planning and the benefit in terms of officer safety may only have anecdotal evidence.

It seems reasonable to hypothesize that incorporating GPS/AVL technology into a CAD system would reduce response times for priority calls. An evaluator could test this hypothesis using CAD data. Several observations may be useful:

1. Response time is relatively unimportant for some calls for service. In fact, Sacramento dispatchers refuse to even dispatch a police car in response to some instances (such as traffic accidents) that do not involve injury. Response time is only relevant for priority calls. An evaluator should be able to determine if response time has decrease for those response calls.
2. However, quantifying the importance of a decrease in response times should be part of an evaluation. For example, the probability of an injury from a domestic dispute may decrease as response time decreases; the probability of apprehending a suspect in response to a silent alarm may increase with a decrease in response time. In contrast, the prospect of clearing a home burglary probably has nothing to do with the speed at which police arrive at the scene.

3. The benefit of a GPS automated dispatching system probably varies with environmental conditions. During times of the day when calls for assistance are relatively light, computer aided dispatching may contribute little to improving performance. The improvement may be limited to periods when use of police responses is most intense. Such periods may be situational and unanticipated; for example, there may be spells during which police resources are under unusually high demand, and at such times, the GPS automated dispatching may be most important.

4. As noted, supervisors have access to the AVL location system in Sacramento, and reportedly they use the system for tactical operations such as closing perimeters. We are unsure of the extent of such use. An evaluation could benefit from a qualitative description of the types of problems that cause police supervisors to coordinate the actions of multiple police cars. The description would include an account for the objectives of that coordination, such as capturing a suspect known to be on foot in the area. Once such events are described, they become in theory countable. If countable, then an evaluator could judge whether or not the use of GPS had improved responses.

The point of these comments is that the benefit of an AVL system may be situational. Quite possibly, a CAD system that is not equipped with GPS-based AVL technology could perform as well as a CAD system that is equipped with GPS-based AVL technology for routine operations. The value of the GPS-based AVL technology may be limited to certain situations. An evaluation based on mean response time may mislead regarding the value of a GPS-based AVL when extreme demands are placed on the system.

**Designing a Study**

Are there other operational environments for which the technology is well-suited?

What are the constraints in such environments?
A call for assistance might result in several possible public responses: dispatch of police, dispatch of ambulances, and the dispatch of fire-fighting equipment. There are important differences across these three responses. Police cars are typically on patrol, and a vehicle location system provides the advantage of tracking all on-duty cars so that the car that is the nearest to a requested call for service can be dispatched. Emergency equipment is more likely to be stationary, but nevertheless, ambulances and firefighting equipment are often dispatched while returning from a service call, and additionally equipment could be diverted from lower-priority calls to higher-priority calls.

In Sacramento, the call center receptionists receive calls for service and make separate referrals to police and fire/emergency equipment dispatchers. We did not investigate the latter use of GPS-based AVL technology.

Do the technology “events” permit randomly generated applications of the technology?

If not, can comparison samples be formed? With what difficulties? An evaluation based on random assignment seems unlikely. An evaluator would have to find a way to randomize both calls for service and police responses, using GPS-assisted dispatching for the “treatment” group and routine dispatching (CAD without GPS-assisted dispatching) for the “control group.” This seems impractical. A quasi-experiment is practical. There are three principal research questions.

One question is whether or not the outcome of a call for assistance is affected by police response time. The answer is not straightforward, however. There are several considerations:

1. The importance of quick response time probably varies with the nature of the call for service. For some service calls, the outcome might be judged by the arrest of a suspect, the identification of witnesses, or by securing evidence that would otherwise disappear. For other service calls, the outcome might be judged by preventing injury to a victim. For still other types of calls, the outcome might be judged by preventing injury to the police officers. An evaluator will need to develop a typology and specify a meaningful outcome for every element of that typology.

2. The relationship between response time and outcome is likely to be nonlinear. For domestic abuse calls, reducing the response time from 6 minutes to 4 minutes may make a material difference with respect to injury. In contrast, for domestic abuse, reducing the response time from 20 minutes to 18 minutes may be immaterial.
The above points are speculative, because with few exceptions, these topics have not been researched. Nevertheless, without understanding how response time is related to outcomes, there is little or no basis for placing a value on the ability of GPS-assisted dispatching to response time.

Having established that response time is worth reducing, the second question is whether GPS-assisted dispatching can reduce response time. This question might be answered with a simple design that divides time into three periods: pre-GPS-assisted dispatching, the first 6 months of using GPS-assisted dispatching, and thereafter. The 6-month time span is an estimate of time required to achieve a steady-state use of the new system. The true time might be longer or shorter. Again, there are some complications:

1. **This is a pre-post design, and for it to be valid, we must assume that nothing besides the implementation of the GPS-assisted CAD system has changed.** That assumption may be difficult to justify. At the least, we would require that the county had the same number of patrol cars and police and calls for service. If that assumption is unsustainable, then the evaluator must be prepared to introduce statistical controls.

2. **Identifying statistical controls is not trivial.** At the least, an evaluator would have to create a control variable that represents the availability of police responses when a call for service was received. When assessing the improvement of response times under the pre-GPS-assisted and post-GPS-assisted dispatching, the evaluator must be careful to compare response times under similar conditions.\(^1\) Additionally, it would be prudent to control for day of the week, time of the day, and weather—variables that affect travel times—when conducting the comparison.

3. **Dispatchers in Sacramento felt that they made decisions that were as good (and often better) than rule-driven dispatching based on event/car location.** If that is true, the utility of a GPS-assisted dispatching may be greatest when inordinate demands are placed on the police, because in such cases dispatchers may benefit most from automating their responses and the utility of a rule-driven system may be most apparent when police responses are most strained. This suggests that the control variable (discussed above) might be used as

---

\(^1\) Developing a suitable measure would be a major activity. At the time that the nth call for service is received by a dispatcher, the evaluator would have to determine how many vehicles could be dispatched to field the call, and how many vehicles could be diverted from lower-priority business. A more sophisticated variable could be constructed given deeper understanding of dispatch procedures and data availability (especially the likely proximity of the vehicle to the call for service).
an explanatory variable—that is, the “treatment effect” would depend on the relative demands placed on the system.

4. Reducing the average response time is probably not a useful metric. A GPS-assisted CAD system is likely to change the entire distribution of response times. If the relationship between response time and outcomes is nonlinear, then detecting a change in this distribution is especially important.

Sacramento police tell us that supervisors use the GPS system to inform tactical decisions. An evaluator might attempt to identify events where the GPS system has been used for this purpose. Qualitative analysis might be most informative. If events can be classified, then one might compare the outcomes pre-GPS and post-GPS availability.

How many times would the technology be applied in one year?

The use of the GPS-assisted CAD would be continuous. The use of the GPS system for tactical decisionmaking would be episodic, but we are uncertain of the frequency of use.

Will modest but statistically significant effect sizes be detectable given sample sizes?

Because we lack knowledge about the relationship between response time and outcomes, we have no good way of defining “modest.” Given the volume of calls for service (25,000–40,000 high priority calls), it is highly likely that an evaluator could detect a reduction in mean response time of less than one minute and even a reduction of a fraction of a minute. (We do not know the average responsive time in Sacramento, but we presume that it is roughly 6–8 minutes, so a 1-minute reduction would be large.) This is misleading, however. A reduction in response time is only important if it has a material effect on the outcome of the call for assistance, and this may be true for only a small proportion of calls for assistance.

How many units—if any—would have to be procured for an evaluation?

None if the evaluation were done in Sacramento.

What does a control/comparison group receive?

Routine patrol.

What kinds of data elements are available from existing data sources?

The dispatch data provide response times starting from when a call for assistance was received by the CAD center and ending with the arrival of a
police car at the scene. (The arrival time may be more complicated than this if the first car is not sufficient to deal with the problem.) The problem is that an evaluator would need to know more about the call. What was it about? What was its resolution? An evaluator would need to extract this information from the RMS.

What specific input, process, and outcome measures would they support?

The principal measure is the time from receipt of a call for assistance until a police unit arrives on the scene. Other measures would be important:

1. For domestic violence cases, and for other assaults, an outcome measure might be the use of an ambulance to transport a victim to the hospital. Obviously this measure misses many elements of harm that might be suffered by a victim, but we would expect that an effective police response would tend to reduce serious episodes of personal harm.

2. For some property crimes, a measure of success would be the arrest of a suspect; an additional measure would be the identification of a witness.

How complete are data records? (Attain samples if possible)

Although we did not acquire records from the dispatch center, we understand that they are complete. We did not independently review the RMS data.

Can user and/or target populations be followed over time?

This question is irrelevant for this evaluation.

Can the dosage of technology used be identified?

This question is irrelevant for this evaluation.

Can data systems help diagnose implementation problems?

This seems unlikely. In theory, it might be possible to observe the frequency with which dispatchers follow the rules for assigning police cars, because the dispatchers indicate whether or not they have followed the rules. We were told that the dispatchers have developed work-around procedures.

What threats to a sound evaluation are most likely to occur?

The evaluation rests importantly on an assumed equivalency between the pre- and post-periods. “Equivalency” means that police responses during the two
periods would provide the same response times in the absence of GPS-assisted CAD. There is not apparent way to test this assumption.

What changes is the site director willing to make to support the evaluation?

No changes appear to be necessary.

3. Overall

Would you recommend that the technology be evaluated? Why or why not?

An evaluator should be able to answer these questions: Does response time matter? For what types of calls for assistance? What is the relationship between response time and outcomes? The answers to these questions are at the heart of a cost-benefit analysis of any innovation that purports to reduce response time.

An evaluator will have more difficulty answering these questions: Does a GPS-assisted CAD system reduce response times? Under what conditions? The problem is a familiar one in quasi-experiments: How can we know the counterfactual when the GPS-assisted CAD system is universally employed? An evaluator would have to assume the equivalency of the pre and post periods, and this may be difficult if policing in Sacramento has changed in other ways.

Nevertheless, this is not an outrageous assumption because the pre and post periods are not distant in time. Furthermore, an evaluator could check for trends, and the evaluator could introduce controls for other police resources.

It is more difficult to see how an evaluator could perform an outcome evaluation of the tactical use of GPS. Furthermore, given that GPS is new in Sacramento, we would expect the tactical use to evolve with police experience. A descriptive study of tactical use would be useful.

What type of evaluation design would you recommend?

This is necessarily a pre-post test design. Statistical modeling seems necessary for answering the questions about the relationship between response time and outcomes and about the relationship between GPS-assisted CAD and response time.

References


