INSTITUTIONAL CONCERNS REGARDING THE IMPLEMENTATION OF STATE MANAGED SERVICE PATROLS

by

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Prepared for
CVEN 689
Advanced Surface Transportation Systems

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August 1994

SUMMARY

A freeway service patrol consists of a team of specially trained drivers who cover a particular area looking for incidents. An incident may include spilled cargo, a stalled vehicle, an accident, etc. The overall objective of a service patrol is to help stranded motorists and keep traffic moving. By performing these functions, a service patrol can improve the traffic operations in any area.

Perhaps the most notable benefit of service patrols is in the area of incident management. For most minor incidents, a patrol can perform all of the functions of incident management (i.e., detect, verify, and remove an incident), therefore, greatly reducing the incident duration. This, in turn, reduces the delay to the stranded motorists and any other travellers in the vicinity of the incident. Service patrols not only provide benefits to the motorists but also to State Departments of Transportation, local Police Departments, and other emergency teams.

This report discusses the benefits of service patrols along with the associated costs and other operational issues. The three objectives of this study were as follows: (1) perform a synthesis of state operated service patrols in various parts of the United States; (2) summarize the costs and benefits associated with service patrols; and
(3) develop procedures to aid in the implementation of future service patrols. These objectives were met by performing an extensive literature review, and by conducting case studies of service patrols in the United States. The case studies involved only those service patrols which were sponsored and/or operated by a public agency. Patrols completely managed by the private sector were not addressed.

From the findings of this study, the following recommendations were made for anyone wanting to start a service patrol.

1. Visit existing programs. Learning from other people's successes and mistakes will save time and money in the long run.

2. Start small and gain public support first. It is easier to acquire funding for a smaller program than it is a larger one. Starting small also allows time to determine if the operation provides the maximum benefits or if changes need to be made. It requires less time and money to change an operation when it is still small.

3. Publicize the available services. Teach the public about the benefits of the service patrol and how to use it. The benefits of the patrol go wasted if the public does not know about the program or how to use it.

4. Provide cooperation and coordination among those agencies involved. If an operation is composed of multiple agencies, it is essential to define the roles that each role will play.

5. Oppose current push by private towing companies to pass federal legislation which would make ISTEA funds available only to service patrols operated by the private sector. This legislation has recently been passed by the U.S. House, but has not yet been considered by

the Senate. To battle such restrictions, every state must take a position on opposing this legislation, and defeat it in the Senate.

After the patrol is organized and ready for operation, there are a few things that must be done to ensure the success of the program. These include the following: pre-plan for various types of incidents; set up an emergency telephone line to allow the public to report any incidents; continue the public awareness campaign; and listen to the feedback from the patrollers in the field (they know the most about the day-to-day operations and may have the best ideas for improvements).

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INTRODUCTION

A freeway service patrol, or motorist assistance patrol, consists of a team of specially trained drivers who cover a particular area looking for incidents. An incident may be defined as an accident, disabled vehicle, spilled cargo, etc. The overall objective of a service patrol is to help stranded motorists and keep traffic moving. An advantage of service patrols is that they can detect, verify, and help remove an incident, therefore minimizing the incident duration time. By keeping the interruption of freeway traffic flow to a minimum, delay, congestion and the chance for secondary accidents are reduced. A good service patrol can be a vital part of an incident management program.

Problem Statement

Even though there are several benefits of service patrols, it is sometimes difficult to determine the best techniques to begin a service patrol operation (13,15,17,19,22,23,25). Lack of funding is frequently a problem because of the limited budgets of most states. Operational issues that must be addressed before starting a patrol include selecting the highways to be patrolled, determining the size of the patrol fleet and operating staff, deciding which agencies will be involved in operating the patrol, and so on. Another concern is the recent push by private towing companies to get federal legislation passed which would make ISTEA (Intermodal Surface Transportation Efficiency Act) funds available only to privately owned service patrols, and not to state operated service patrols. It seems that many of these towing companies feel that state operated service patrols take much of their work away from them. This paper will address these problems and examine how several states have overcome them.

Objectives

The objectives of this report are as follows:

1. perform a synthesis of state operated service patrols in various parts of the United States,
2. summarize the costs and benefits associated with service patrols, and
3. develop procedures to aid in the implementation of future service patrols.

Scope

Service patrols may be sponsored and/or operated by the public sector (i.e., highway agencies or police agencies), the private sector, or a combination of these. For example, a service patrol may be sponsored by a public agency and contracted out to the private sector for operation. Other service patrols exist which are completely operated and sponsored by the public sector or private sector. This paper will focus only on those service patrols which are operated and/or sponsored by public agencies. Patrols completely managed by the private sector will not be addressed.

Organization

This report will begin with a brief background discussion of service patrols and incident management. Next, the study design, which involved performing a literature review and conducting case studies, will be described. The literature review will present the following issues concerning service patrols: typical patrol operations, quantifiable and non-quantifiable benefits, and legislation/funding issues. The case studies will provide a synthesis of service patrols in various parts of the United States. From the results of the literature review and case studies, the costs and benefits of service patrols will be summarized and recommendations made as to the implementation of future service patrols.

BACKGROUND

With the invention of the automobile and improvements in public roads came the need for motorist assistance programs. This was recognized as early as 1920 as shown by the following excerpt from a publication written by W.P. Eno (1):

> Often vehicles break down in crowded thoroughfares at busy hours causing expensive delays. Emergency repair vehicles equipped with derricks and other suitable appliances should be kept on hand by all large cities as an economical measure to quickly relieve the trouble.

Over the years, with increasing highway capacity and the corresponding increasing traffic volumes, the need for motorist assistance programs, or service patrols, has grown. A motorist who has stopped on a freeway may need one or a combination of the following (2):

1. service (i.e., for flat tires, mechanical and electrical problems, fuel, oil, water, towing, etc.);
2. police;
3. ambulance;
4. fire department; and/or
5. information, either general information or emergency traffic routing.

In most situations, a properly trained patroller with the appropriate equipment can assist a stranded motorist. If the patroller can not directly take care of the problem, he can contact someone who can. Providing assistance to stranded motorists not only helps the motorists but also improves the safety and operations of the freeway.

Incident Management

Freeway incidents are a major cause of congestion. The Federal Highway Administration estimates that incidents account for 60 percent of the delay due to congestion (3). One of the main objectives of service patrols is to aid in incident management. Incident management involves detecting, responding, and clearing roadway incidents (4). It is a key element to the successful operation of freeways.

Incident management consists of the following elements: detection, verification, response, removal, traffic management, and motorists information (4). Detection is the recognition that an incident has occurred, while verification is the determination of the severity and location of the incident. Response entails the activation, coordination, and management of the appropriate personnel to handle the incident, and removal involves the safe and timely clearance of the incident from the freeway. Traffic management is the application of the appropriate traffic control measures to manage traffic around an incident. Information is provided to motorists to inform them that an incident has occurred and to help them make travel decisions (3).

Incident duration is the time span between the occurrence of the incident to the time the incident is removed from the operating lanes. This time can have a dramatic effect on the amount of congestion and total delay caused by an incident. Minimizing the time it takes to

amount of congestion and total delay caused by an incident. Minimizing the time it takes to remove an incident will reduce delay, congestion, and the chance for secondary accidents. A major benefit of service patrols is that they are capable of detecting, verifying, responding, and removing most incidents. By performing each of these tasks on their own, the service patrols greatly reduce the incident duration time. Most patrols are only equipped to deal with minor incidents, but as shown in Figure 1 (5), minor incidents (or disablements) comprise the majority of recorded incidents.

Approximately 80% of recorded incidents are disablements. Disabled vehicles include cars and trucks that have run out of gas, had a flat tire, or have been abandoned by their drivers (3). Eighty percent of all disabled vehicles end up on the shoulders of freeways for 15 to 30 minutes. This can reduce freeway capacity by up to 26 percent (6) causing 100 to 200 vehicle-hours of delay to other drivers. Therefore, a disabled vehicle does not have to be blocking a lane to cause significant delay. Removing freeway incidents, even from the shoulder, will help improve safety and operations for the freeway.

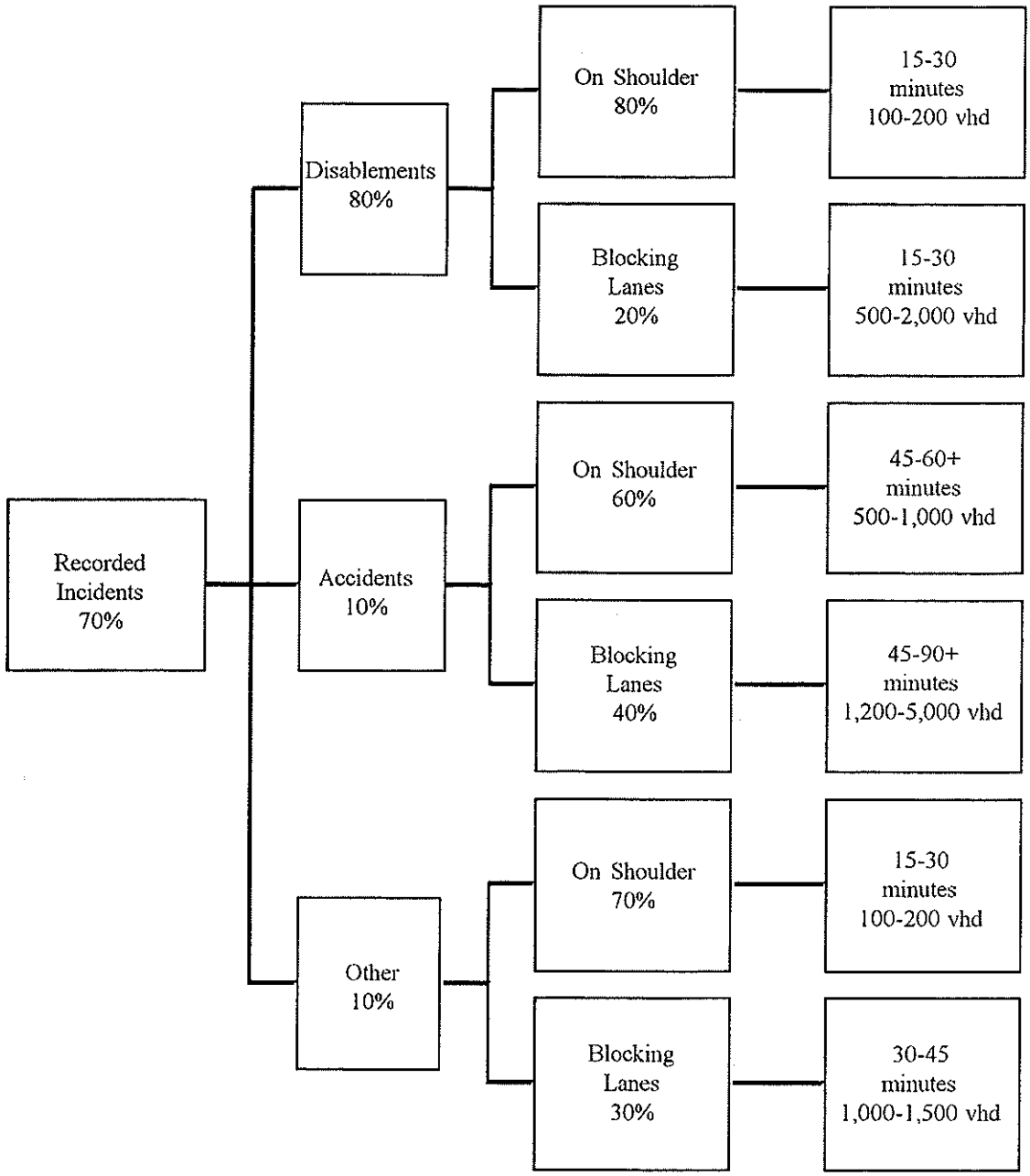

Figure 1. Recorded Incidents (5).

STUDY DESIGN

As previously mentioned, the purpose of this study was to determine the costs and benefits of service patrols, and to study concerns regarding the implementation and operation of service patrols. The latter was examined to develop procedures to aid in the implementation of future patrols. The first step in meeting these objectives was to conduct a literature review. This review helped explain the use and advantages of service patrols.

The next step involved conducting case studies of transportation agencies in various parts of the United States who were operating service patrols. The following agencies took part in this study:

- California Department of Transportation, Los Angeles
- San Francisco Metropolitan Transportation Commission
- Illinois Department of Transportation
- Minnesota Department of Transportation
- New York State Department of Transportation
- Texas Department of Transportation, Ft. Worth
- Texas Department of Transportation, Houston

To collect information from the agencies, a survey was conducted. Each agency was first contacted by telephone to explain the study and determine if they would participate in the survey. Then, a questionnaire regarding service patrols was faxed to each agency. The agencies were also asked to send any literature that might be pertinent. The survey contained the following questions and requests:

1. When was the service patrol organized?

2. Describe the size of the service patrol (i.e., number of patrol vehicles, team members, staff, etc.).

3. Define the location and amount of centerline highway miles covered by the patrol.

4. What are the hours of operation?

5. Is the patrol a roving or fixed operation? If roving, how much time is allowed between successive patrollers on a beat (i.e., what is the maximum time a stranded motorist would have to wait)?

6. Is any part of the service patrol privately contracted, or is it completely state operated?

7. What functional unit supervises and dispatches the service patrols (e.g. traffic management center, police agency, etc.)?

8. What type of incidents does the patrol assist in (i.e., passenger cars,large trucks, hazardous material)? What type of vehicles are used for assisting in these incidents?

9. What range of services does the patrol provide (i.e. gas, water, tow, etc.)?

10. Is there a minimum time period that the service patrol will work to try to get a stalled vehicle going before moving on? If so, what is the minimum time period?

11. Does the service patrol have any advanced ITS technology such as AVL (Automatic Vehicle Location)?

12. Does anyone other than the service patrol have an exclusive right to tow vehicles from the freeway?

13. Briefly describe the steps that were taken in setting up the patrol and any problems encountered.

14. Was there any state or local legislation that had to be passed to get state operated service patrols in your area? Please briefly describe the details.

15. Some privately operated towing companies are currently pushing to get federal legislation passed that would make ISTEA funds available only to privately owned service patrols, and not to state operated service patrols. What is your states' official position (if known) on this issue?

16. What was the initial start-up and additional expansion cost for the service patrol? What is the annual operating cost?

17. What source of funding was used for setting-up and operating the patrol?

18. Has a benefit/cost analysis been conducted? If so, what were the results?

19. What advice would you give to members of an incident management program wanting to start a state operated service patrol?

SERVICE PATROLS

Operations

The responsibilities of service patrols may differ among various areas, but their objectives are usually the same - to help stranded motorists and keep traffic moving. This is achieved by responding to incidents as quickly as possible and taking action to remedy the problem. These actions may include anything from charging a dead battery to assisting in a major accident. Table 1 presents typical duties of service patrol operators as defined by Reiss and Dunn (4).

The size of a particular service patrol depends on what function it is intended to serve. The size of existing patrols ranges from two pick-up trucks patrolling Fort Worth, Texas to 144 tow trucks in Los Angeles, California. The types of patrolling vehicles and equipment needed also varies from agency to agency. Houston's Motorist Assistance Patrol consists of several mini-vans which provide services such as gas, water, jumper cables, etc., while Chicago's Emergency Traffic Patrol includes heavy tow trucks which assist in major accidents. Typical equipment, tools, and supplies need for most service patrols are listed in Table 2 (7):

Operator training is also an important concern in running a service patrol. Patrollers should be competent in handling all incidents. If a patroller is not able to take care of an incident on his own, he should be able to contact someone else who can help. Most service patrollers should at least be trained in the following areas (7):

- minor vehicle mechanics (jump start, tire change, etc.),
- first aid procedures,
- hazardous materials response,
- incident management,
- safety procedures, and
- radio terminology.

Benefits

Service patrols can play an effective role in any transportation agency's program. Perhaps the most noticeable benefits of service patrols are those involving incident management. Through incident management, many quantifiable benefits, such as reductions in travel time and delay, are realized. However, other benefits exist which are difficult to price. These include advantages not only to the travelling public, but also to the agencies responsible for operating or sponsoring the patrols. Following is a discussion of the advantages of service patrols and those people who benefit from them.

Table 1. Typical Duties of Service Patrol Operators (4).

- Continuously patrol a designated area seeking disabled vehicles, stranded motorists, debris in the roadway, spilled loads, accidents, obstructions to traffic, and other potential hazards or abnormal occurrences; notify appropriate highway and enforcement personnel of the location and nature of the situation.

- Assist motorists by towing and/or pushing disabled vehicles off of the roadway; provide gasoline or water; change tires; provide jump starts with booster cables; perform minor repair when needed and if possible.

- Notify enforcement authorities of abandoned vehicles along the roadway - note location, make, color, body type, license number, and whether or not the vehicle is impeding traffic. If not impeding traffic, tag the vehicle for removal under local regulations. If it is impeding traffic, notify the enforcement personnel that: (1) they will remove the vehicle if so authorized, or (2) immediate assistance is required if they are not authorized.

- Assist at freeway accident scenes by providing emergency agencies, removing damaged vehicles from the roadway, supplementing or providing traffic control at the scene, assisting in extricating injured motorists, providing and/or coordinating communications at the scene, providing motorist information, traffic reports.

- Remove debris from the roadway-accident related or otherwise, or call for assistance for more complex cleanups.

- Report on property damage to the highway system.

- Assist in setting up, maintaining, and removing emergency detour routes required because of an incident.

- Assist in the management of traffic in construction and maintenance zones by performing normal service patrol activities and by providing protection to highway workers.

- Provide traffic reports to highway agencies, news agencies, and other traffic sources for distribution to motorists.

- Provide travel information and motorist aid to lost or stranded motorists.

- Remove pedestrians from freeways, bridges, and tunnels, and provide emergency transportation where needed.

- Assists at major accident scenes and other disasters, providing personnel, equipment, and traffic control support.

- Observe work zone traffic controls set up by other agencies and contractors, and report on any problems encountered, unauthorized lane closures, or unauthorized work.

- Provide any other assistance as requested by State and or local enforcement agencies (Highway Patrol, State Police, City Police, Sheriff's Department, etc.).

- Maintain an established service patrol log, completing an entry for each encountered and/or handled.

Table 2. Typical Tools, Equipment and Supplies (7).

- warning lights
- public address (P.A.) system
- push bumper
- dispatch/communication equipment, including cellular telephone
- flares
- first aid kit and blankets
- drinking water
- fire extinguisher
- fluorescent red flags
- traffic cones and/or barricades
- fluorescent vests and hard hats
- flashlights
- jacks (hydraulic and/or floor)
- lug wrenches
- tow straps
- cans and funnel for gasoline/diesel
- cans of water for radiators
- jumper cables
- rope
- pry bar
- sledge hammer
- push brooms
- shovels
- bolt cutters
- oil dry (absorbent material)
- diesel starter fluid
- variety of mechanical tools

As previously discussed, a major advantage of service patrols is that they are capable of detecting, verifying, responding, and, in many cases, removing incidents from the freeway. This results in a reduction in the incident duration time, and a minimization of the overall effects on traffic flow. The question is: How effective are service patrols at performing each of the incident management tasks? Several studies have been conducted to help answer this question.

With service patrols, detection and verification can be carried out in the same step in many cases. Balke and Ullman (8) researched several methods for selecting among various incident detection strategies. Their study involved examining the advantages and limitation of several strategies for detecting incidents, including the following: electronic surveillance, aerial surveillance, call boxes, CB radio monitoring, closed circuit television, service patrols, law enforcement patrols, and cellular telephones. Data collected from Houston's Motorist Assistance Patrol indicated that the patrols provided substantial benefits for incident detection. However, it was noted that even though the service patrol came out ahead of other detection methods, many incident management systems use multiple detection strategies. This is so the strengths of one incident detection strategy can offset the weaknesses of another.

Service patrols are also very effective in reducing response and removal times. Being the first on the scene, patrollers can assess the response needed and take action to clear an incident. This action may involve handling the incident without assistance or contacting the appropriate personnel to deal with the incident (4).

As previously mentioned, most freeway incidents are minor and can be handled by the service patrol alone. The patrollers can make minor repairs quickly and safely. They may also push/pull a vehicle or debris off of the freeway where additional service can be provided. If additional help is needed, the patrollers may assist other response personnel. Trained service

patrol operators may help manage the incident scene by performing any of the following tasks (4):

- directing traffic at the scene,
- setting up alternate or detour route,
- providing emergency medical assistance until additional help arrives,
- coordinating communications among the various responding agencies,
- providing traffic reports of other information to highway or enforcement personnel, local media, or the public, or
- providing emergency transportation to motorists and response to medical personnel.

A study conducted by Fambro, et.al. (2) defined several quantifiable and non-quantifiable benefits realized from service patrols. Benefits which can be priced are termed quantifiable, while non-quantifiable benefits are non-priceable. Both types of benefits add to the effectiveness of a patrol. The subsequent sections will provide a discussion of these benefits.

Quantifiable Benefits

The first type of quantifiable benefit is that realized by the motorists. Most, if not all, service patrols provide service to motorists for free. These services may include towing/pushing, gasoline, water, battery charge, or minor repairs. With free assistance from the patrols, motorists are saved the expense of calling a service facility for help (2).

Other benefits to motorists include reduced delay and travel time savings. The operation of a service patrol allows stranded motorists to receive assistance faster than if no patrol were available (2). This not only effects the stranded motorist, but also other motorists travelling along the freeway in the vicinity of the incident. The Illinois Department of Transportation estimates that their service patrol saves motorists approximately 9.5 million vehicle-hours of delay per year. This translates to an annual savings of $95 million (17). The benefit/cost analyses that were conducted by some of the transportation agencies surveyed in this study all demonstrated positive outcomes (13,17,19,26). The benefit/cost ratios ranged from 2.8:1 in Minneapolis, Minnesota to as much as 36:1 in Houston, Texas. The range in these ratios was due in part to the discrepancies in the way the benefit/cost analyses were conducted; nevertheless, the results were all positive.

Another type of quantifiable benefit is that realized by the state departments of transportation (DOT) and police departments. By performing many tasks that were once the responsibility of the DOT and police, service patrols can save the departments both time and money. Without the service patrols, these departments would have to use other personnel to perform the services that the patrols provide. For example, the patrollers can provide night-time services which were once the responsibility of the state maintenance department. Also, another

benefit to the police department is that the service patrol reduces requests for aid that require no police function (2).

The last type of quantifiable benefit defined by Fambro, et.al. (2) is safety-related. Service patrols make freeways a safer place to drive. Each incident which occurs on the freeway has the potential of causing a secondary accident. Accidents not only cost the motorists involved, but they also cost the response teams time and money. Removing incidents from the freeway as soon as possible will reduce the chance for secondary accidents, saving the potential parties involved both time and money.

Non-Quantifiable Benefits

Service patrols create a sense of security for motorists. Most motorists that break down on a freeway do not know how to repair their vehicles. Others usually do not have the proper tools or supplies to perform the repairs themselves. Therefore, the majority of stranded motorists are forced to either wait at their vehicles and hope for someone to help them or walk to get assistance. Both situations are dangerous for the motorists, and they may become frustrated and scared. Prompt, dependable service patrols help stranded motorists in their time of need and provide a sense of security. Motorists feel safer knowing that service patrols are on duty. Putting a monetary value on this would be impossible; however, these benefits are still recognized (2).

State operated or sponsored service patrols are also very effective in improving public relations. The public perceives the patrollers as rescuers. Patrol operations around the U.S. continually get telephone calls and letters praising their efforts. The following letter was sent to the Illinois Department of Transportation commending their Emergency Traffic Patrol (9):

> ...[M]y daughter...and I were returning home from River Oaks shopping center. The temperature outside was -8 with a wind chill factor of 40 below 0...We had a blow out on a back tire, there is no way either of us could have changed that tire. We started to pray and one minute later up pulled an angel...He asked "what is the trouble?" and when I said a flat tire he smiled and said "If you have a spare you can be on your way in ten minutes". We were! I tried to offer him some money...He smiled and said he could not take any money, he was happy to help...I will never forget his frozen kind smile and warm caring attitude. He is truly an angel...As I drove home I saw at least five other cars in trouble, I smiled to myself because I knew these lucky people would soon meet my angel...

People also see service patrol operations as a good way to spend their tax dollars. Fambro, et.al. (2) conducted a study of freeway service patrols in Houston, Texas. The study included distributing a questionnaire to motorists who were helped by the patrol. One of the questions concerning tax dollars was as follows: *This service is paid for out of the taxes you pay. Do you recommend that it be continued?* Out of the 1429 motorists who filled out the questionnaire, 94 percent answered yes. Six percent did not answer this question, and only three individuals answered no. None of the respondents made any negative comments about the service patrol.

Public support is a very important part of patrol operations. Without it, a service patrol will not last. As shown above, most motorists have very positive feelings toward service patrols. They feel the patrols are worthwhile operations and that their tax dollars are being put to good use. Supporting literature shows that once a patrol has begun, the public will not allow it to stop. Therefore, starting a service patrol, even if small, has a great chance of growing and becoming productive if it can gain public support.

Legislation/Funding

Funding is one of the most critical issues that must be addressed when starting any operation, and service patrols are no exception. Most patrols do not charge motorists for services rendered; therefore, they must rely on other sources of funding. As stated earlier, service patrols may be sponsored and/or operated by public agencies, private companies, or by both. Funding support for the patrols may come from a variety of sources. For many areas, such as New York City, Washington State, and Washington D.C., the service patrols are funded through maintenance budgets (10). Illinois' Emergency Traffic Patrol has a separate budget that competes with all other operations and maintenance sections (4). Other sources of funding include gasoline taxes, local sales tax, DMV fees, bridge or highway tolls, federal construction funds, ISTEA (Intermodal Surface Transportation Efficiency Act) funds, and/or private sponsors (10).

Many of the service patrols in operation today have depended upon federal funding at some time. Federal funds may have been used to assist with the start-up costs, operating costs, or both. One of the newest sources of Federal aid is through the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). ISTEA is a source of funding for incident management and other operational improvements. Under this act, capital and operating costs for incident management programs are eligible for Federal aid (3). By including Projects in the *Transportation Improvement Program*, a spending plan required by the federal government, agencies can receive ISTEA funds. ISTEA permits start-up and operating costs for service patrols to be funded from the following sources: Congestion Mitigation and Air Quality (CMAQ) funds, for two years; National Highway System (NHS) funds, for two years; or Surface Transportation Program (STP) funds, on going with M.P.O. approval (11). Some states, such as New Jersey and California, have used Federal ISTEA funds to support new service patrols (10).

A major concern for future state operated/sponsored service patrols is the legislation being pushed by private towing companies which would make ISTEA funds available only to private service patrols. This bill is entitled the Intermodal Surface Transportation Technical Correction Act (HR 3276). Section 163 of this act states

> ...any funds expended in a fiscal year directly or indirectly for freeway service patrols from amount made available to a state under titles I and III of the Intermodal Surface Transportation Efficiency Act of 1991 shall be expended with privately owned or privately operated business concerns...

The act goes on to state that any public patrol in operation before enactment of the legislation is exempt.

The State of Illinois has made known its concerns about this legislation and has made recommendations toward dealing with this issue. A short paper was written which describes the issue and suggests actions to be taken. The following is a summary of this paper (12).

> HR 3276 was passed by the House on November 8, 1993; however, the Senate has not yet considered this legislation. Enactment of such legislation would forbid states from using federal funds for public or joint public/private ventures for new freeway service patrol operations, even when one of these operations is determined to be the most feasible. To operate a service patrol publicly or jointly, states would have to secure a waiver from the Secretary of the US DOT. This would hinder states in planning for future services because they would not know whether a specific private operation plan would be deemed "not feasible'. In addition, although the legislation would allow for the expansion of existing operations, it would not allow for the expansion of auxiliary operations in other areas of a state.
>
> To battle such restrictions on service patrols, it is important that states come together to show support for state service patrols. Although the Senate has shown little interest in this legislation, it is still important to let members of the Senate Committee on Environment and Public Works know how the provision in the House bill will impact states' proposed freeway service patrol operations. States should inform members of any plans for future service patrol operations, and the benefits that these patrols will provide for incident management and congestion management programs. Members of the Senate should be informed how the House provisions could restrict and limit states from considering options for public or joint public/private ventures. It is also suggested that the states contact their senators and urge them to request and support a provision in any senate legislation which would allow, but not require states to use private operators for new or expanded service patrols.

CASE STUDIES

Case studies of service patrols in several cities across the United States were conducted. A survey was sent to each service patrol involved to gather information about the history and operations of the patrols. The operations for each patrol depended on some type of state involvement; however, the degree of involvement varied. Some of the patrols were completely state operated and funded, while others were operated and sponsored by a combination of public and private agencies. Following is a discussion of the service patrols studied.

Los Angeles, California (13)

Los Angeles has some of the busiest freeways in the world. To help combat the traffic problems associated with these freeways, the California Department of Transportation (Caltrans) has established a freeway service patrol (FSP). The program was organized in 1991 and is currently the largest in the nation. The patrol consists of 144 vehicles which patrol 40 beats on 381 centerline miles of highway in the Los Angeles area. FSP operates during peak periods of the week, from 6:00 AM to 10:00 PM and from 3:00 PM to 7:00 PM.

The fleet consists of tow trucks which are all privately contracted with 20 separate towing companies. The patrol is a roving operation which is designed to pass any given point every 15 minutes. However, this may be longer if a patroller is assisting a motorist. The following range of services are provided: 1 gallon of gasoline; change flat; jump start; refill radiator and/or tape hoses. If a vehicle takes longer than 10 to 15 minutes to fix, it is towed off the freeway to a designated location. FSP only provides assistance for light duty vehicles. If heavy trucks are involved in an incident, the patrollers will call for assistance.

The organization consists of the Caltrans, the California Highway Patrol (CHP), and the Metropolitan Transportation Authority (MTA). Both CHP and Caltrans do the supervision, however CHP is responsible for all dispatching. MTA is responsible for the contracts with private towing companies.

The Los Angeles Freeway Service Patrol, as well as the San Francisco Bay Area Freeway Service Patrol (discussed below), provide efficient surveillance and management with the use of state-of-the-art, computerized communications/automatic vehicle location systems. Communication between CHP dispatchers, CHP supervisors and the tow truck drivers is accomplished using a combination of voice as well as digital messages. These systems provide for rapid response to emergency situations and reduce the dispatchers' workload. Automatic vehicle location systems (AVL) allow the dispatchers to know the exact location of each tow truck, and whether the truck is assisting a motorist or available to answer calls (14).

A portion of FSP's funding comes from a local sales tax (1/2 %) that was passed for congestion relief. Other support comes from legislation passed by California to help pay portions of service patrol costs throughout the state. The first year of operation for the patrol cost approximately $9,000,000. However, this costs has risen to around $15,000,000 to $20,000,000, due to expansions in the service. Nevertheless, FSP seems to be paying for itself. A recent benefit/cost analysis estimated that for every $1 spent, $11 are seen in benefits.

San Francisco, California (15)

The San Francisco Bay Area Freeway Service Patrol (FSP) first began in 1992. San Francisco became interested in service patrols because of the success of the Los Angeles program. Before starting the FSP, key personnel from San Francisco travelled to Los Angeles to learn from their experience. There they gained advice on issues such as programming responsibilities to the strengths of the agencies involved. The program is jointly sponsored by CHP, Caltrans, and the Metropolitan Transportation Commission Service Authority for Freeways and Expressways (MTC SAFE). Following Los Angeles' advice, CHP handles day-to-day supervision and training; Caltrans evaluates the program; and MTC SAFE contracts with private tow contractors to perform the towing service. CHP manages the fleet using a state-of-the-art AVL system similar to Los Angeles's (16).

FSP currently operates 49 tow trucks (40 patrolling and 9 backup) and covers 168 centerline miles of the Bay Area's most congested freeways. The patrol operates mostly during commute hours (6:00 am - 10:00 am, 3:00 pm - 7:00 pm) with all day service in construction areas. The roving operation is designed so that on average a roving truck passes a fixed point every 15 minutes. The service patrol will provide the following services, free of charge: change a flat tire, jump start a battery, tape hoses and refill radiator, and provide a gallon of fuel. If the patrollers cannot get an automobile running within about 10 minutes, they will tow the vehicle to a CHP-designated location off the freeway. They will assist any motorist, however they will not tow large vehicles or handle hazardous material incidents.

As stated earlier, FSP relied on Los Angeles' experience for setting up the patrol operations. The patrol is operated/sponsored by a combination of public and private agencies. The tow truck operation is privately contracted, dispatching is handled by CHP, and supervision is carried out by Caltrans and special CHP Freeway Service Patrol officers. Problems encountered while setting up the patrol operations were as follows:

1. Getting and keeping staff to manage and administer the program when budgets are tight.

2. Maintaining funding in a time of budget cuts.

3. Negotiating with the existing Caltrans tow patrol over specific area of coverage.

The start-up cost for FSP was $1,500,000. The annual operating costs are outlined as follows:

Tow Contractors	$4,400,000
Operating Costs	$225,000
Administrative Costs	$775,000

The Freeway Service Patrol relies on federal, state, and local funding. Federal funding comes from CMAQ funds and from traffic mitigation funds for major freeway construction projects. California supported the patrol by passing legislation specifically providing funds for

FSP. State funds primarily comes from gas taxes. Local funding is provided by a special $1 fee attached to vehicle registration (16).

Chicago, Illinois (17)

The Illinois Department of Transportation (IDOT) has operated a service patrol in the Chicago area for over 30 years. The Emergency Traffic Patrol (ETP), staffed by "Minutemen", was initially deployed in April 1960. The need for a freeway traffic management program became evident after the opening of the Kennedy Expressway and other major urban interstate highways in the late 1950s and early 1960s. These heavily used facilities began to experience congestion soon after opening, and it became apparent that they could not operate without assistance. This led IDOT to propose and gain administrative approval and funding for the initial elements of the freeway traffic management program (18).

ETP operates in the Chicago area providing surveillance and responding to freeway incidents on 79 centerline miles (718 lane miles) of expressway, 24 hours a day, 7 days per week. The patrol handles over 100,000 incidents annually, saving motorists an estimated 9.5 million vehicle-hours of delay. This translates to a savings of $95 million per year. The patrol fleet consists of 36 emergency patrol vehicles (EPVs), 11 light, four-wheel drive trucks, three heavy duty tow trucks, a crash crane, a tractor retriever, a sand spreader, and a heavy rescue and extraction truck. The staff consists of 55 minutemen, 11 supervisors and about 12 management and support staff.

IDOT's service patrol is completely state operated. Dispatching is handled by the District Communications Center located in the district office. IDOT does not currently use automatic vehicle location (AVL) for the patrolling vehicles; however, they see AVL as one of the next steps in improving their program. They are currently looking for funds and an effective format to begin using AVL. IDOT is also interested in replacing their hand written assist sheets, currently used by the patrollers, with mobile data terminals or lap top units.

The patrol operations are designed so that a roving vehicle passes a fixed point every 10 to 15 minutes. Patrollers will work a maximum of 15 to 20 minutes on a vehicle before relocating it off of the freeway. Therefore, a stranded motorist would wait a maximum of approximately 35 minutes. ETP is involved in the full range of urban freeway incidents. Patrollers receive special training in all phases of freeway incident management and specific operational techniques. In addition, they receive training in the following: first aid, cardiopulmonary resuscitation, fire-fighting, basic auto extrication, state and city policy coordination, radio communications, work site protection, traffic control, and heavy equipment use. They also receive training in emergency recovery procedures, including the handling of tank truck emergencies, hazardous materials, and air cushions.

One of the major problems encountered by ETP has been annual funding and competition among other more conventional highway agency needs. ETP has always funded through state motor fuel funds. The program costs approximately $5.5 million/year; however, a recent study has shown that the patrol returns about $17 dollars in benefits for each $1 dollar invested. The annual costs for the program are as follows:

Personnel (Incl., Fringe Benefits)	$2,470,000
EPV (Equip., Maint., Ops.)	$664,812
Heavy Wreckers (Equip., Maint.)	$75,867
Other Costs (Sand, Salt, etc.)	$350,291
Building (Const., Maint.)	$803,300
Overhead (Insurance, Mgmt, etc.)	$1,185,020

The following advice was given by Arland T. Smith, IDOT ETP Manager, for future incident management programs wanting to implement state operated service patrols (17):

1. A service patrol is the single most effective means for reducing incident duration.

2. Start small and let the program evolve.

3. Listen to the feedback from the "troops in the trenches". People make the program work.

4. Do not let the fear of liability problems stifle the development of a program. They are overestimated.

An additional comment was made by Smith concerning the benefits of state operated service patrols. It was as follows (17):

> There is a hidden benefit to a government operated patrol program. The patrol staff become an extension of the freeway management administrators. They are advocates of the highway user in terms of incident duration and impact, and will stick to the congestion reduction agenda.

Minneapolis, Minnesota (19)

The Minnesota Department of Transportation (Mn/DOT) began operating a service patrol (Highway Helper) in December of 1987. The Highway Helper program was developed to minimize the disruption to traffic caused by incidents in the Twin Cities Metro Area. Operation began under the District Maintenance Office. The three initial routes were driven by maintenance workers. The number of routes were expanded to six in January of 1990. In March 1993, management was transferred from the Maintenance Office to the Traffic Management Center (TMC). Currently, the TMC supervises and dispatches the service patrol (20).

The Highway Helpers patrol 68 centerline miles of freeway in the metro area. The staff consists of ten drivers, two Highway Helper Seniors, and one part-time engineer that manages the program. The Seniors duties include assisting with the supervision and administration of the patrol as well as driving certain routes during peak periods. The patrol operates during two shifts: from 4:30 AM to 1:00 PM, and from 12:00 PM to 8:30 PM. The overlapping hour

provides for coordination between the AM and PM shifts (20). Each driver is assigned to one route and works either the AM or PM shift.

The vehicles fleet consists of seven 3/4-ton pickup trucks. Six trucks cover the daily routes, and one is kept as a fully equipped spare. The Highway Helpers provide the following services: changing flat tires, providing fuel or coolant, jump starting, relocating stalled vehicles from potentially hazardous situations, giving rides to stranded motorists, and providing road and travel information (20). There is no set minimum time period that a patroller will work on a vehicle before moving on; however, a recent study (21) showed that the average length of assist for accidents was 16 minutes and nine minutes for stalls. The same study revealed that 33.7 percent of the stranded motorists had to wait less than five minutes for assistance. Approximately 26.4 percent waited from five to ten minutes, and 20.2 percent waited between ten and twenty minutes.

The Highway Helper program is completely state operated; however, they have a good working relationship with private towing companies. The service patrol will push stranded vehicles or debris off the roadway, but they are not equipped to tow. If a tow is required, the Helpers contact designated private towing companies. In an effort to minimize tow truck response time to accidents, Minnesota instituted an "automatic tow" policy. This policy allows dispatchers to call for a tow truck immediately upon notification of an accident instead of waiting for trooper verification. In pilot tests, this policy reduced the average arrival time for tow trucks by 21 minutes (20).

The Minnesota service patrol does not currently have an automatic vehicle location system (AVL), but there are plans to put an AVL system into operation. The system will be capable of providing up-to-the-minute vehicle location data for all Highway Helper units (20). The funding has been allocated, and the system should be operational by the first quarter of 1995.

Initial funding and staff for the Highway Helper came from the maintenance operation budget. In 1992, the Mn/DOT was given funding for permanent staff. The annual operating costs, including salaries, uniforms, vehicles, equipment, and fuel, is approximately $550,000. Expansion costs for two employees to cover one additional route is approximately $92,000.

A benefit/cost analysis was conducted based on the average reduction in the time of an incident when assistance was provided by a Highway Helper. The cost savings were calculated to include all motorists affected from the reduced incident duration. Research showed that service patrol assistance reduced the duration of a stall by eight minutes, and the length of delay due to an accident by two minutes. Using this information and additional data, a benefit/cost ratio of 2.8 was calculated. However, this value is assumed to be conservative because the calculations were based solely on reduced congestion (20).

New York City, New York (22)

The New York State Department of Transportation currently operates a service patrol program, called Commuter Assist Teams or CATS, that consists of four state operated vehicles patrolling 35 miles of the Long Island Expressway (I-495) (11). This program is scheduled to be expanded in September of 1994. Following is a discussion of these expansion efforts.

Initially, New York wanted to implement the Los Angeles program, which contracts with private towing companies to patrol. However, complications with franchised towing companies in New York City led them to drop the use of tow trucks. The expanded patrol will consist of 28 pickup trucks. Twenty three of the trucks will be privately contracted. The additional five vehicles will be operated by state employees.

The patrol will cover 191 centerline miles in the New York City Metropolitan Area. Patrol vehicles will run only on the weekdays during peak periods (i.e., 6 AM to 10 AM, and 3 PM to 7 PM). The patrol will be a roving operation which is designed to pass a fixed point every 10 to 15 minutes. The pickup trucks are equipped to handle minor incidents. If it takes a patroller longer than 10 minutes to assist with an incident, they are instructed to call for assistance. The duties of the patrollers are typical, ranging from fixing a flat tire to assisting in major accidents. There will be a total of four dispatch points consisting of the following: two with the State Police; one with the State DOT operated in the Traffic Management Center, and one with the City DOT operated in the Traffic Management Center. An automatic vehicle location system will be used on all vehicles to enhance surveillance and management of the patrol operations.

The program is initially being funded with State gas tax revenues. Once the program has started, New York will depend on Federal aid. The start-up cost for the patrol will be approximately $800,000. The projected annual operating cost is $3,800,000. This program is anticipated to provide many benefits to traffic operations in the New York City Metropolitan Area.

Fort Worth, Texas (23)

District 2 of TxDOT, headquartered in Fort Worth, began operating a service patrol in 1973. The original purpose of the patrol was to keep the freeways in the Fort Worth area clear and running smoothly. The objectives were to decrease response time to minor roadway incidents, and minimize the need to call out District maintenance forces for minor problems. Helping stranded motorists was not the initial primary focus of the patrol; however, that has changed. Currently, the patrol assists approximately 3,650 disabled vehicles per year. They also help the local police direct traffic at about 730 accidents a year (24).

The service patrol operates 24 hours a day, seven days a week. One vehicle patrols from 8:00 AM to 3:30 PM. At all other times, two vehicles are patrolling. The fleet includes pickup trucks equipped to help with minor repairs. The staff consists of 16 personnel (including three radio dispatchers) plus a supervisor. Currently, a radio dispatcher is in charge of each shift; however, in the future, this responsibility will be given to the Traffic Management Center.

Each vehicle on patrol covers a fixed route that is 80 to 90 miles in length. The typical cycle time for each route is from two and one-half to three hours. As well as helping stranded motorists, the patrols assist with traffic control at accidents. They also assist the fire departments and others with hazardous materials spills. The patrollers provide the usual assistance (i.e., gas, minor repairs, etc.) and will work as long as it takes to help the motorist. The patrol vehicles are equipped with push bumpers to remove vehicles from the roadway. The cities in the area have contracts with private tow companies to do any towing required.

The District 2 patrol is completely operated by state forces. The operating costs for the program are paid for out of the District maintenance funds. It costs approximately $100,000 a year to purchase, equip, operate, and maintain one patrol vehicle. Although District 2 has not performed a benefit/cost analysis, it is believed that from a public reactions standpoint, the service patrol has provided one of the highest "return on investments" that they have made.

Houston, Texas (25)

Houston currently operates two separate service patrols: the Motorist Assistance Patrol (MAP), and the District 12 service patrol. MAP is a much more extensive program which operates 16 hours a day from 6:00 AM to 10:00 PM. The District 12 service patrol is a smaller patrol which covers the night shift (9:30 PM to 8:00 AM). Operating both of these patrols allows transportation agencies in Houston to provide motorist assistance 24 hours a day.

MAP first began operating in 1986. The program began as a public service provided by the Houston Automobile Dealers Association (HADA) in conjunction with the Harris County Sheriff's Office. HADA was responsible for providing and equipping the patrol vehicles (three mini-vans), as well as paying the Sheriff's deputies to drive. The original intent of the program was to provide free assistance to motorists of the greater Houston metropolitan area during peak traffic periods. The program was discontinued in 1987 due to lack of funding (26).

In 1989, TxDOT and METRO (Harris County Metropolitan Transit Authority) began examining options to reduce peak period congestion in the Houston metropolitan area. Drawing upon the success of the HADA patrols, the Motorist Assistance Patrol was re-implemented. It was now operated by a unique combination of public and private agencies: TxDOT, METRO, HADA, the Harris County Sheriff's Department, and Houston Cellular Telephone. TxDOT performs the dispatching functions and provides administrative and supervisory support for the patrols. Most of the operating funds are provided by METRO. The Harris County Sheriff's Department is not only responsible for staffing the vans, but also maintaining and fueling the vans. HADA provides new and replacement vans as the program expands. The program costs approximately $1.3 million annually to staff and operate (26).

The program was expanded to six vans in 1989 and to nine vans in 1991. MAPs currently patrol 129 centerline miles of roadway in the metropolitan area. The services provided can range from providing gas, water, or jumper cables to removing debris or vehicles off of the roadway. The vans cannot tow but are equipped with push bumpers. Motorist can report incidents or summon help through a dedicated emergency line that was established. Cellular telephone users can use this line toll-free (26).

Between 1989 and 1992, MAP personnel responded to more than 24,000 incidents and assisted more than 32,770 stranded motorists. It has been estimated that the program saves from 0.6 to 1.3 million vehicle hours of delay annually. The program also receives widespread public and political support. This is due, in part, to an extensive public awareness campaign. Through media campaigns and information booths, the public is informed about how the program works, told about the successes of the program, and updated on any expansions to the patrol (26).

The TxDOT District 12 service patrol first began operating around 1971. The original patrol consisted of one vehicle operating on a 24-hour basis, 7 days a week. The patrol was expanded to two vehicles in 1972. The patrolling vehicles were pickup trucks equipped with tools and supplies to make minor repairs. The vehicles were also equipped with push bumpers to move disabled vehicles or debris off the freeway. The service patrol provided aid to stranded motorists, TxDOT, and the Houston Police Department. A study conducted by Fambro, et. al. in 1976, revealed that the program provided a benefit/cost ratio of 2:1 (2).

Currently, the District 12 service patrol operates from 9:30 PM to 8:00 AM, seven days a week. The patrol consists of only one vehicle (with two patrol personnel) which covers approximately 150 centerline miles of roadway. An additional fully equipped patrol unit is kept for backup. The patrol is a roving operation, but because only one unit is on patrol, the amount of time a stranded motorist waits ranges from 15 minutes to one hour.

The service patrol is supervised by the Eurkea Special Maintenance Supervisor. Dispatchers are also assigned to the Eureka Special Maintenance Section. The patrol assists citizens as well as police departments and fire departments. They are advised not to handle any type of hazardous material, but to notify proper authorities. In situations such as this, the patrollers help with traffic control. The patrol provides gas, water, battery boosts, minor mechanical repairs, changing of flats, and pushing stranded vehicles off the roadway. Also provided is telephone and radio communications for the motorists.

The District 12 service patrol has always been completely state operated and funded by the maintenance budget. The annual operating cost is approximately $131,000. Although small, this program still plays a significant role in TxDOT's operations. The patrol provides over 800 assists to stranded motorist each year. They also help TxDOT by identifying damage to state property and verifying requests for sanding during the winter months (26).

SUMMARY OF FINDINGS

Service patrols can play an effective role in any transportation agency's program. The literature review and case studies have shown the many advantages that service patrols may provide. However, some of the benefits are not as evident as others.

Perhaps the most noticeable benefits of service patrols are those involving incident management. In most minor incidents, service patrols can perform all of the functions of incident management (i.e., detection, verification, response, and removal). Through incident management, service patrols provide many quantifiable benefits, such as reductions in delay, congestion, and the chance for secondary accidents. This benefits not only the stranded motorist, but the travelling public as well. Additional savings realized by motorists and others include the following:

- Motorists - services which would normally cost motorists money are provided by the service patrols for free.

- State DOTs - the patrollers can provide many services that were once the responsibility of the state maintenance department (i.e., pickup debris on roadway, report damage to state property, etc.).

- Police Departments - the patrollers can handle many traffic problems which were once the responsibility of the local law enforcement agencies.

Some benefits realized from service patrols are hard to put a price on; nevertheless, they are still recognized. Most of these benefits involve the travelling public. Service patrols create a sense of security for motorists. People feel safer driving on crowded freeways knowing that someone is their to help them if they break down. Therefore, state operated service patrols are very effective in improving public relations. People see their tax dollars as being put to good use. These benefits may be impossible to price, but they still play an important role in the success of a patrol.

Four out of the seven agencies surveyed had performed a benefit/cost analysis on their service patrols, and the results were very positive. Following are the agencies who had conducted a benefit/cost analysis and the results:

Chicago, Illinois	17:1
Minneapolis, Minnesota	2.8:1
Houston, Texas (MAP)	7:1 to 36:1
Los Angeles, California	11:1

The case study of service patrols around the United State revealed that each patrol differed in many areas. However, even though the patrol operations varied, all played significant roles in improving traffic operations. Table 3 presents a summary of the results from the case studies.

Table 3. Case Study Results.

State	Location	Sponsoring Agencies	Start Date	Patrol Size	Cntrln. Miles Ptrold.	Annual Operating Costs	Source of Funding	B/C Ratio
California	Los Angeles	Caltrans, CHP, MTA	1991	144 tow trucks	381	$18,000,000	State FSP, Local Sales Tax	11:1
California	San Francisco	Caltrans, CHP, MTC SAFE	1992	49 tow trucks	168	$5,400,000	State FSP, MTC SAFE, ISTEA, Federal TMP	N.A.
Illinois	Chicago	IDOT	1960	36 tow trucks 3 heavy tows 11 pickups 1 crash crane 1 sand spreader 1 heavy rescue	718	$5,000,000	State Gas Tax	17:1
Minnesota	Minneapolis	Mn/DOT	1987	7 pickups	68	$550,000	Maintenance Budget	2.8:1
New York	New York City	NYSDOT	1994	28 pickups	191	$3,800,000	State Gas Tax, Federal-Aid	N.A.
Texas	Fort Worth	TxDOT	1973	2 pickups	200	$200,000	Maintenance Budget	N.A.
Texas	Houston (MAP)	TxDOT, METRO, HADA, Sheriff Dept., Cell. Phone	1986	9 mini-vans	129	$1,300,000	TxDOT, METRO, HADA, Sheriff Dept., Cell. Phone	7:1 to 36:1
	Houston (Dist. 12)	TxDOT	1971	2 pickups	150	$131,000	TxDOT	N.A.

RECOMMENDATIONS

Implementation

As with any state operated program, there are difficulties with getting service patrols implemented. The problems may range from a lack of funding to choosing a program which best fits local needs. The first recommendation for setting up a service patrol operation is to visit existing programs. Talk extensively with those who have had experience in setting up and running patrols. In addition, plan to go to the areas with existing programs to see how they operate (i.e., visit dispatch center, ride in patrol units, etc.). Learning from other people's successes and mistakes will save time and money. Study several patrol operations to determine which will best fit local needs. This will take a small amount of effort in the beginning but will pay off tremendously in the long run.

A beginning service patrol should start small and gain public support first. Funding is always an issue, and it is much easier to get funding for a smaller program than it is a larger one. After the public sees the benefits of a patrol, they will begin to rely on it and support it. Starting small also allows time to determine if the operation provides the maximum benefits or if changes need to be made. It requires less time and money to change an operation when it is still small. Once the program has proved itself, it will continue to grow and improve.

Another important step in operating a service patrol is to publicize the available services. A public awareness campaign should be launched during the development of the program, as well as at strategic points during the operation of the program (i.e, when new services are added). Get the media involved and set up information booths at public events. Teach the public about the benefits of the service patrol and how to use it. The benefits of the patrol go wasted if the public does not know about the program or how to use it. These efforts will help to improve public and political support. This plays a critical role in efforts to improve and expand the program (26).

Many of the patrols surveyed in this study were sponsored by a combination of government agencies as well as private companies. Others were operated solely by the state DOTs. Advantages and disadvantages exist for either alternative. When multiple agencies are involved, the bases from which resources can be drawn are increased, but the complexity of the program also increases. Each agency involved has it own accounting and administrative procedures. Dealing with these different procedures takes time, and therefore, increases the time needed to make necessary changes. A service patrol which is operated by only one agency can usually operate much more efficiently. However, funds are also limited which restrict the program from growing (26).

If an operation is composed of multiple agencies, it is very important to provide cooperation and coordination among those involved. As stated above, the agencies usually have different operational procedures which conflict with one another. Therefore, it is essential to "spell out" the roles that each agency will play. It is important to ensure that there is a permanent source of dedicated funding so that the patrol may continue to operate invariably. The importance of public relations has already been established, and a patrol which is not dependable

will only hinder public support. Providing coordination and cooperation among the participating agencies will ensure an effective service patrol upon which the travelling public can rely on.

Operations

After the patrol is organized and ready for operation, there are a few things that must be done to ensure the success of the program. First, personnel should pre-plan for various types of incidents. For each type of incident, steps should be outlined so that patrol operators will know exactly what steps to take for a particular incident. Pre-planning will allow service patrols to operate more quickly and more efficiently. Next, an emergency telephone line should be set up to allow the public to report any incidents. This service should be free to the public and well publicized. It is also important to continue the public awareness campaign. The public should be informed about the successes of the service patrol and notified of any changes to the patrol operations. Another recommendation is to listen to the feedback from the "troops in the trenches". The patrollers in the field know the most about the day-to-day operations and may have the best ideas for improvements. Again, the public should be provided with a patrol that they can depend on. Hence, stranded motorists can be ensured that help is on the way and will be encourage to stay in their vehicles.

Current Issues

As shown from the case studies, funding support for service patrols may come from a variety of sources (i.e., gasoline taxes, sales taxes, state maintenance funds, etc.). Federal support may by provided through ISTEA CMAQ, NHS, and STP funds. Currently, any state participating in the federal *Transportation Improvement Program* is eligible for such support. However, recently there has been a push by private towing companies to pass federal legislation which would make ISTEA funds available only to service patrols operated by the private sector. Such a bill has already been passed by the U.S. House (HR 3276), but the Senate has not yet considered it. To battle such legislation, every state must take a position on opposing this restriction, and defeat it in the Senate. States need to contact members of the U.S. Committee on Environment and Public Works to inform them how such provisions would impact the future operations of service patrols. States should also contact their senators and urge them to support a provision which would allow, but not require states to use private operators for new or expanded service patrols. To determine further strategies for defeating this legislation, additional studies should be conducted.

Even though there are many obstacles to overcome in setting up and operating a service patrol, all agencies surveyed agreed that the effort is well worth it. A good service patrol will help improve the traffic operations in any area. They not only assist the local police departments and other emergency agencies, but they provide citizens with a unique service that is free of cost to them. Service patrols allow the public to see that State DOTs are interested in assisting the motorists and not just working on highways.

ACKNOWLEDGMENTS

The author would like to first thank GOD for is grace and patience, and for never giving up on me.

The author would also like to thank Walter Dunn, Walter Kraft, Gary Trietsch, Les Jacobson, Dave Roper, and a special thanks to Tom Werner for contributing their time, efforts, and expertise in helping to make this program the success that it is. In addition, Dr. Conrad Dudek is acknowledged for organizing this class and for his contributions in helping me write this paper.

Special thanks are extended to the following transportation agencies and officials for the information and advice that was given:

California Department of Transportation: Larry Hathaway
San Francisco Metropolitan Transportation Commission: Michelle Morris
Illinois Department of Transportation: Arland Smith, Joe McDermott
Minnesota Department of Transportation: Susan Groth, Glen Carlson
New York State Department of Transportation: Paul Cuerdon
Texas Department of Transportation, Ft. Worth: Wallace Ewell
Texas Department of Transportation, Houston: Ervin Ramirez

REFERENCES

1. W. P. Eno. "The Science of Highway Traffic Regulation, 1899-1920." *Brentano's*, April 1920 - Cited in *Better Use of Existing Transportation Facilities*. National Research Council Special Report 153, Transportation Research Board Washington, D.C., 1975.

2. D. Fambro, C. Dudek, and C. Messer. "Cost Effectiveness of Freeway Courtesy Patrols in Houston," *Freeways, Automatic Vehicle Identification, and Effects of Geometrics*. Transportation Research Record 601, Transportation Research Board, Washington D.C., 1976.

3. L. Grenzeback and C. Woodle. "The True Costs of Highway Congestion," *ITE Journal*, March 1992.

4. R. Reiss and W. Dunn. *Freeway Incident Management Handbook*. FHWA-SA-91-056, July 1991.

5. *Incident Management*. Cambridge Systematics, Inc. Alexandria, VA: Trucking Research Institute, October 1990. Cited in Wohlschlaeger and Balke. *Incident Response and Clearance in the State of Texas: Case Studies of Four Motorist Assistance Patrols*. Texas Transportation Institute, Research Report No. FHWA/TX-92/1232-15, October 1992.

6. M. Goolsby. *Influence of Incidents on Freeway Quality of Service*. Highway Research Record 349, Highway Research Board, Washington D.C., 1971.

7. *Courtesy Patrol Guidelines (Draft)*. Texas Department of Transportation, Traffic Operations Division, Austin, Texas, December 1993.

8. K. Balke and J. Ullman. *Methods for Selecting Among Alternative Incident Detection Strategies. Interim Report.* Texas Transportation Institute, Research Report No. FHWA/TX-92/1232-12, February 1993.

9. P. Mann. Letter sent to Illinois Department of Transportation, Emergency Traffic Patrol, January 14, 1994 - Received from A.T. Smith, Illinois Department of Transportation, Emergency Patrol Manager.

10. M. Morris and W. Lee. *A Survey of Efforts to Evaluate Freeway Service Patrols*. Submitted for: The 1994 Transportation Research Board Annual Meeting, March 28, 1994.

11. T. Werner, New York State Department of Transportation, Director of Traffic Engineering and Safety Division. Comments concerning service patrols, July 1994.

12. "Freeway Service Patrol Legislation". Illinois' position on HR 3276 - Received from A.T. Smith, Illinois Department of Transportation, Emergency Patrol Manager.

13. L. Hathaway, California Department of Transportation, Los Angeles. Response to survey, July 1994.

14. *Fact Sheet: Bay Area Freeway Service Patrol Communications/Vehicle Tracking System.* Metropolitan Transportation Commission, Oakland, California, January 1994.

15. M. Morris, San Francisco Metropolitan Transportation Commission, Oakland, California. Response to survey, July 1994.

16. M. Morris. *Programming and Funding Incident Management Programs. A Case Study: The San Francisco Bay Area. A Metropolitan Planning Organization Perspective.* Published as part of the 1994 Transportation Research Board Incident Management Proceedings.

17. A. Smith, Illinois Department of Transportation, Chicago. Response to survey, July 1994.

18. J. McDermott, C. McLean, and A. Smith. "Three Decades of Progress: Freeway Traffic Management in Illinois," *ITE Journal*, March 1992.

19. G. Carlson, Minnesota Department of Transportation, Minnesota. Response to survey, July 1994.

20. *Highway Helper Summary Report. Twin Cities Metro Area.* Report No. TMC 07450-0394, Minnesota Department of Transportation, Metro Division - Traffic Management Center, March 1994.

21. *Mn/DOT Highway Helper Program. Six Month Report. March 1993 - August 1993.* Minnesota Department of Transportation, Metro Division - Traffic Management Center.

22. P. Cuerdon, New York State Department of Transportation, New York City. Response to survey, July 1994.

23. W. Ewell, Texas Department of Transportation, Fort Worth. Response to survey, July 1994.

24. W. Ewell. *TEX-DOT Incident Management Efforts in the Fort Worth Area.* Texas Department of Transportation, District 2, Fort Worth, September 1992 (revised).

25. C. Allen, Texas Department of Transportation, Houston. Response to survey, July 1994.

26. S. Wohlschlaeger and K. Balke. *Incident Response and Clearance in the State of Texas: Case Studies of Four Motorist Assistance Patrols.* Texas Transportation Institute, Research Report No. FHWA/TX-92/1232-15, October 1992.

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