

**WHAT IMPACT WILL EMERGING TECHNOLOGIES
INVOLVING VEHICLES AND HIGHWAYS HAVE ON THE
MANAGEMENT OF TRAFFIC LAW ENFORCEMENT BY THE
YEAR 2002?**

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This Command College Independent Study Project is a FUTURES study of a particular emerging issue in law enforcement. Its purpose is NOT to predict the future, but rather to project a number of possible scenarios for strategic planning consideration.

Defining the future differs from analyzing the past because the future has not yet happened. In this project, useful alternatives have been formulated systematically so that the planner can respond to a range of possible future environments.

Managing the future means influencing the future--creating it, constraining it, adapting to it. A futures study points the way.

The views and conclusions expressed in the Command College project are those of the author and are not necessarily those of the Commission on Peace Officer Standards and Training (POST).

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Introduction

In the forefront of new transportation technologies is a smart highway system with smart cars known as "Intelligent Vehicle Highway Systems" (IVHS).¹ IVHS systems are electronic, computer and communications technologies that provide drivers with everything from map-based travel information to collision avoidance systems. *Their purpose is to improve highway safety and alleviate traffic congestion.* Coupled with law enforcement assisted traffic management centers, motorists and road conditions are tracked. Advanced traveler information systems can then relay real-time traffic conditions between a central control station, the road, and vehicles and drivers.

Another component of the IVHS system is an electronic map that provides drivers with navigational information. These navigational systems were developed to reduce driving time by using data from global positioning satellites, sensors implanted in roadways, reports from law enforcement agencies and video cameras to alert motorists of road construction, congestion and traffic accidents. The in-dash navigational systems provide motorists with visual as well as audio directions to any address. The system will plot a course to the destination showing the driver where to turn and warning of any upcoming traffic problems along the route. Unless one ignores the information it is virtually impossible to get lost.

Perhaps the most sophisticated portion of IVHS is the advanced vehicle control systems. These are technologies designed to alert the driver of potential hazards, such as impending collisions, or to take preventive action, such as applying the brakes. Eventually, computer driven smart cars will allow the operator to put the vehicle on automatic pilot while they nap, read a book or stretch out in the back seat during a long trip.² This system relies on a camera as the vehicle's eyes and a computer as the brain. It has proven successful at keeping vehicles within lanes at speeds of up to 65 mph. Tests have also been successful with a driverless vehicle closely following

another at speeds of 30 mph. *Such a system if fully implemented will allow more vehicles to move faster on highways without the danger of colliding.*

Taking smart cars a step further, consider the development of an extrasensory car.³ Pilots fly safely in pea soup conditions using sensory-enhancing systems. Someday drivers will navigate the roads using similar devices. Under development are cars that use an array of high-tech sensing control and navigation devices that have the potential to greatly expand the senses and reflexes of the average driver. They operate much the same way as aircraft instrumentation, landing and navigation systems that enhance the reflexes and senses of pilots and allow takeoffs and landing under formerly unthinkable conditions. Applications to vehicles will be in the form of night vision systems, radar braking, laser ranging, rearview blind spot detection, and other sensory enhancing systems; *all designed to make travel safer and more efficient.*

Public transit is another source for emerging transportation technologies. High speed commuter trains are rapidly being implemented in major metropolitan cities. In Southern California, commuter trains now connect three counties, Los Angeles, San Bernardino and Orange. Others are soon to follow. In Washington DC Amtrak introduced its new techno-train, the revolutionary X2000.⁴ The train can attain speeds up to 155 mph, significantly reducing commute time between points of operation. Magnetic levitation trains that are currently operating successfully in Japan are now being considered for use in the United States.

Other strategies being considered to enhance the safety and free flow of traffic include high occupancy vehicle lanes, real time traffic control and monitoring devices, toll roads, automated powered roadway systems, and neural network detection of congestion in integrated freeway and arterial traffic networks. Research is ongoing to develop hover cars that fly through the sky on a bed of air. Future wide scale implementation of these strategies and

technologies are expected to significantly reduce the unbearable traffic congestion that currently exists in almost every major metropolitan city in the United States.

What impact will these emerging technologies have on the management of traffic law enforcement by the Year 2002? It is a well-known fact that most major law enforcement agencies commit significant resources to manage and regulate traffic within their jurisdictions. In an era of declining resources, every penny counts. With the implementation of emerging transportation technologies and strategies, it is expected that law enforcement will be able to redirect a significant portion of the money now spent for traffic related responsibilities to other priorities. This will be made possible because it is anticipated that technology will dramatically reduce traffic congestion and accidents that result in injury or death. If this occurs, incidents that now require the presence of an officer will be reduced or totally eliminated. A major reduction in traffic responsibilities will then allow law enforcement agencies to redirect resources previously designated for traffic management to other areas of responsibility or need.

Traffic not being a priority, full service law enforcement agencies will be presented with numerous opportunities to channel money and personnel to programs that reduce rising incidences of crime. Even the smallest agencies will experience some positive results. An agency that is task specific, such as the California Highway Patrol, may have to expand their sphere of responsibility, merge with another law enforcement agency, or even cease to exist.

The need to research this issue and its impact on law enforcement became evident as transportation technologies and strategies began to emerge as a means to reduce traffic congestion. With difficult economic times projected to continue for the next several years, law enforcement agencies must be cognizant of any opportunity that may enhance organizational efficiency. Whether or not the impact is positive or negative will be dependent on an

agency's ability to monitor and forecast transportation related trends and events.

The issues and sub-issues generating this research were developed after monitoring various related trends and events throughout 1992-93, from different media and professional journals-daily newspapers, news magazines, and related studies. The issue identified for study in this research project is:

What Impact Will Emerging Technologies Involving Vehicles And Highways Have On The Management of Traffic Law Enforcement By The Year 2002?

Sub-issues examined were:

What methods will law enforcement use to determine and pay for the cost of implementing change as a result of emerging transportation technologies?

What impact will technology have on the need to provide traffic services?

What legislative changes would be required to implement the technological changes?

The issues and sub-issues were recognized for their potential influence on the implementation of transportation technologies and their impact on law enforcement. This was completed through independent research in the form of literature review as well as input from the California Department of Transportation, California Highway Patrol, City of Los Angeles, and the Los Angeles Metropolitan Transit Authority.

It is believed that this issue will significantly impact the manner in which law enforcement agencies manage traffic in the future. If the technology works as designed and is implemented on a

wide scale, then traffic congestion should be greatly reduced. Personnel who have been routinely assigned to traffic related responsibilities will be available for other assignments. Instead of hiring additional personnel or cutting budgets, agencies will be able to redirect their resources to better address the problems at hand. The number of personnel available for reassignment is dependent upon the size of the agency. However, the greatest impact will be felt by task specific agencies dealing solely with traffic law enforcement -- i.e., highway patrol, state police, etc. The implementation of transportation technologies will also provide numerous opportunities for some law enforcement agencies to expand; especially in the field of mass transit.

The Future?

A panel of professionals representing law enforcement, transportation, communications, and the private sector identified several trends and events they felt were most likely to affect emerging transportation technologies and their impact on law enforcement.⁵

This panel also provided forecasts of these trends and events, and of their future and potential impact through the year 2002. The following is a synopsis of the trends and events with the greatest potential impact to the future of the issue.

• Event: Statewide traffic management agency created. Regional traffic management agencies currently exist in California. The panel forecast that there will be a movement to combine these agencies and form a single state agency that will standardize and regulate traffic on all roadway networks.

Event: Transportation technologies require greater law enforcement response. As new transportation technologies emerge they will initially require greater law enforcement resources to implement. Once the systems are on-line a reduction in personnel needed to provide services is expected.

Event: Funding is unavailable to Implement technology. Numerous technologies will be developed but there will be no funds to support widespread implementation. The public is not willing to pay more in the way of taxes to implement these technologies and because of the fiscal environment, Government cannot assume the lead role.

Trend: Fiscal Environment. Adequate funding will be unavailable to fully implement transportation technologies and mass transit systems. Numerous technologies will exist by the turn of the century that will make highway systems much more efficient. The forecast is that traffic congestion will increase requiring greater law enforcement response.

Trend: Level of alternate funding sources. In order to successfully implement emerging transportation technologies, or fund additional law enforcement personnel to manage traffic, new funding sources will need to be identified. Unfortunately the level of alternate funding sources is declining and will continue to do so into the 21st century. The public is unwilling to foot the bill to implement mass transit and other high cost transportation technologies. The slack will have to be taken up by the private sector in pursuit of entrepreneurial ventures.

Trend: Amount of change in attitudes and abilities of drivers. As the Nation's population grows older the abilities of drivers will decline creating additional demands on law enforcement. Congestion will also take its toll. The lack of efficient and cost effective mass transit will foster the attitude that the personal vehicle is the preferred choice of transportation regardless of the consequences.

The above synopsis of trends and events only addresses six out of the twenty identified by the panel as having an impact on the future. These six were selected for discussion on the basis that they

have an impact on each other in at least seven of the ten comparisons.

The data gathered from the forecasting panel resulted in the development of a most likely future scenario. That is, "What the future of the issue may be like if all continues on course, status-quo, without any change injected." The scenario is representative of what the issue may impart on law enforcement agencies, large or small, with specific traffic management responsibilities between 1993 and the year 2002. It highlights significant occurrences and their resultant impact. Individual imagination may allow this scenario to be adapted to any agency and deserves attention as to how these trend and event relationships affect their organization's operation.

Most Likely Scenario

A number of new vehicle and transportation technologies will be developed including in-vehicle navigation systems and anti-collision avoidance warning devices. This equipment will be standard on all vehicles manufactured after 1995 and will be required to be retrofitted on earlier models if they chose to use the new high speed highway network systems that will see limited operation by the turn of the century.

Although there have been significant gains in the development of rapid transit, construction of magnetic levitation trains, and automated powered roadway systems will be delayed for several more years due to diminishing resources. Current budget problems, and the increasing national debt, will continue to plague California as well as the Nation. Diminishing resources will be the single most insurmountable obstacle affecting the implementation of emerging transportation technologies and mass transit. The identification of alternate funding sources will be the only means by which these obstacles can be overcome. No new taxes will be forthcoming. Gas taxes, already at \$2.00 per gallon, will not be sufficient to cover the costs of planned rapid transit systems.

Law enforcement personnel will be charging at-fault parties for response to emergency incidents, the investigation of traffic accidents, and the removal of damaged vehicles. These charges, as well as others, will be used to fund additional personnel required to maintain minimum staffing levels. Congestion will increase because emerging technologies designed to alleviate congestion, although available, will not be implemented due to a lack of funds. In spite of efforts to educate the public on the values and necessity of mass transit, the personal vehicle will remain the primary mode of transportation for at least the next ten years.

Law enforcement will not be able to redirect resources from traffic responsibilities to other areas of need as originally anticipated. Instead, law enforcement will require additional personnel to respond to increasing demands for information and services. This will occur at the same time that law enforcement budgets are declining. The increased demand for information systems will also tax resources. This demand will require more complex monitoring systems and trained technicians to monitor and direct resources to high congestion areas. Without these systems in place, the forecast that the average commute time in California's metropolitan cities will rise from 45 minutes to two hours could become reality.

As previously mentioned, the personal vehicle will be the preferred choice of travel into the 21st century. As the baby boom generation becomes older the number of elderly drivers will increase. As a result, there will be a gradual decline in the ability and attitude of drivers into the year 2002. There will also be more accidents and a greater need for law enforcement to respond to these incidents.

In conclusion, the lack of funding to implement new traffic technologies will continue to have an adverse impact on traffic congestion. Rapid transit will be slow in both development and acceptance as an alternative to the personal vehicle. Commute times

in metropolitan areas will continue to rise. Instead of fewer resources needed to manage traffic responsibilities, law enforcement agencies will require more personnel to meet the increasing demands for services and information.

The outlook for the future is bright in terms of the technologies that will exist to make life easier and more enjoyable into the 21st century. This is especially true of emerging transportation technologies. Unfortunately, this progress is predicated on the availability of funds. The economy is poor on the national level and is even worse in California. There is little or no chance of the economy improving significantly by the year 2000. Government entities, because of the lack of funds, will have fallen so far behind the private sector in terms of technology and the ability to provide services that it will take more than a decade to begin to catch up. This was also the consensus of the panel of experts that was assembled to assist in this futures forecast. *"Never again will there be as much money to spend as there is today."*

There are a number of emerging transportation technologies and rapid transit systems that will revolutionize travel as it is known today. However, the primary market for implementation of this technology is government. If government has no money, and the public is not willing to pay more taxes, how will these new systems be implemented? The Nation cannot even keep pace with required maintenance of current transportation networks.

It is interesting to note that the panel's forecast of future events in the implementation of transportation technologies is somewhat pessimistic. This may in part be due to the panel being convened at a period of time when California was experiencing a severe fiscal crisis with no foreseeable end in sight. At this time the panel unanimously agreed that technology would exist but that the vast amounts of money needed to implement them would be scarce if not non-existent. The negative forecast may also be attributed to the fact that the majority of panel members were associated with the

public sector and are familiar with the lengthy processes the government must go through to get anything accomplished.

In doing research for this project this researcher formed a somewhat more optimistic opinion and believes that despite the panel's forecast, the private sector will not stand by and let newly developed transportation technologies gather dust. Instead, they will spend billions on research and development and will aggressively seek out markets for their products. It may take time, but these technologies will be implemented. When implemented, there will be a significant impact on the way law enforcement approaches and manages traffic responsibilities. To continue on the same path law enforcement merely has to continue what they have been doing for years--asking for more resources and personnel to do the job. Being futuristic, this researcher focused on how emerging transportation technologies will impact law enforcement from the perspective that these technologies will be implemented, that they will work as designed, and that they will significantly reduce traffic congestion. There will be several new opportunities for law enforcement agencies, especially in the field of mass transit if they have ventured a look into the future and are prepared to seize these opportunities.

The strategic and implementation plan for this research focused on the California Highway Patrol. The impact will be greatest upon this agency, or any other agency, with specific traffic/transportation related responsibilities. However, the concepts apply to any law enforcement agency, large or small, and afford a look at possible future opportunities. The sub-issue "What methods will law enforcement use to determine and pay for the cost of implementing change as a result of emerging transportation technologies?", will not be fully addressed. It was determined that this sub-issue is extremely complex and a study in itself.

Strategic Planning

Strategic planning is the process of formulating and implementing decisions about an organization's future direction. A strategic plan is essential as police administrators look into the future and make decisions today that are consistent with the direction they intend to lead the organization. Strategic planning also recognizes that organizations are shaped by both outside and internal forces. Therefore, strategically it is believed that the implementation of transportation technologies and mass transit will significantly reduce the future need to provide traffic services. The paradox is, how will the Department manage this issue in the future and maintain its position as a leading traffic law enforcement agency? In the development of a strategic plan the overall mission of the agency must be kept in mind so as not to create conflict.

Macro-Mission Statement- The Department's mission is to provide safety , security and service to the public. In carrying out these responsibilities the Department subscribes to the commitment to provide for the safe, lawful and efficient use of the State's transportation networks. It further commits to support local law enforcement and provide disaster and life saving assistance. As a progressive law enforcement agency the Department also commits to support the development and implementation of new technologies as well as strategies that alleviate congestion and promote the free flow of traffic. ⁵

Micro-Mission Statement- To reduce accidents and associated injuries/deaths, congestion, highway violence, and vehicle pollution, the Department stands ready to assist in exploring and implementing relevant transportation technologies that encourage the widespread use of mass transit. The Department will also act as a coordinator in fostering the acquisition and implementation of both strategies and technologies designed to relieve congestion on a Statewide level. ⁶

Situational Analysis

Strategic planning required that an environmental analysis be conducted of external threats and opportunities, and of internal strengths and weaknesses with respect to the future of the issue.

One of the major threats associated with traffic management is the decriminalization of traffic related offenses; thus eliminating this function as a law enforcement responsibility. The possibility also exists that emerging transportation and vehicle technologies will totally eliminate or significantly reduce traffic incidents requiring the presence of an officer. Agencies that have committed significant resources to this end may have to redefine their goals and objectives in order to remain in the forefront as a traffic management organization.

However, the greatest threat impacting the implementation of new transportation technologies is the ability of state and local governments, as well as private industry, to finance new programs that will improve transportation networks. The forecasted trend is that California's economy will remain sluggish and its resources will continue to decline into the 21st century. While significant developments in the area of transportation technologies will exist, there will be no money for implementation. If this occurs law enforcement will require additional personnel to keep pace with the demand for services instead of being able to redirect personnel to other priorities.

Conversely, several opportunities exist. One such opportunity is upgrading informational networks that provide real time information to the public so they can avoid congestion. Another is mass transit and the opportunities it presents for a specialized traffic agency to expand law enforcement responsibilities in the field of transportation. If traffic offenses are decriminalized this may be the only area that ensures the Department's organizational identity as a

law enforcement agency. Opportunities for the private sector are endless. Not only for those who are developing the technologies, but those entrepreneurs willing to venture into the public sector on a contractual basis.

One of the organizational weaknesses identified was that the Department has been traditionally weak in fending off the political influence of the larger more powerful law enforcement agencies. This is due in part to organizational alliances of sheriffs and police chiefs within California and their strong, broad based influence with the legislature. In the same light, a perceived weakness is a constantly changing Governor and Commissioner (potential every 4 years). With this change come new political philosophies and a new agenda. In essence this Highway Patrol has to begin anew every four years, significantly delaying its change as an organization. If the new administration does not embrace the change, expansion of the organization under this type of structure will be difficult if not impossible to accomplish. The future as an organization will be uncertain if new transportation technologies designed to reduce congestion are implemented in a timely fashion.

Critical to the examination of this issue was the identification of key individuals or groups who may have a vested interest in its future. Identifying these people and groups enhances the possibility for successful and desirable outcomes of future strategies. These individuals or groups must also be analyzed as to their assumptions about the issue, therefore providing insight as to what it may require to either gain their support or reduce their opposition.

The state legislature and local law enforcement agencies were felt to be among the key role players in the future of the issue. Of equal importance were the public and existing rapid transit districts.

The state legislature will be supportive of efforts to streamline the efficiency and cost effectiveness of law enforcement services and will initially assist in efforts to consolidate. The legislature will also

recognize that as mass transit expands across local jurisdictional boundaries the consistency of enforcement and services will be compromised. Unfortunately they may ultimately defer support of a state effort to expand into rapid transit as a result of pressures from local government and special interest groups.

Impacted law enforcement agencies will vehemently resist a state agency performing any type of law enforcement function within their jurisdiction. They will oppose any legislation introduced that will allow this to occur and will aggressively lobby the legislature in support of their own interests.

Several of the existing rapid transit districts employ their own personnel to perform law enforcement functions on rapid transit systems. Other districts contract these services to local law enforcement agencies. For the most part, the districts who employ their own security would benefit economically by merging with a single state agency in terms of pay and benefits. Currently most lack the necessary authority to enforce the law across local jurisdictional boundaries. Those that don't would prefer to assume the lead transportation agency role.

The public expects government to solve their transportation problems. And because of the Department's reputation as a leader in the management and regulation of traffic, the public will support expansion of the organization's role in assuming transportation related law enforcement responsibilities. The public will also recognize the merits of a single agency law enforcement role but will resist higher taxes to fund any expansion.

Many strategies were considered for achieving a desirable future state of the issue, a future state much different than the "most likely" future scenario depicted. These strategies ranged from continuing current philosophies by attempting to acquire additional personnel and resources to keep up with projected increases for the demand of traffic services to under the concept of regionalization,

consolidating all state law enforcement services under a single agency.

The selected strategy incorporates a middle of the road approach to implement a standing and aggressive campaign seeking out all state transportation related law enforcement responsibilities. This would also be considered an initial first step in regionalizing all state law enforcement services under the roof of a single agency, a task that goes beyond the scope of this study.

Assumption of mass transit responsibilities will be long and tedious with strong opposition at every corner. It will be up to executive management and state politicians to negotiate reasonable solutions to this opposition. If successful, the opportunities for the Department to expand in the management and regulation of mass transit are endless. Not only will the Department benefit as an organization, but so will the citizens of the State of California by receiving consistent, professional, law enforcement services on the State's emerging mass transit systems.

Administration and Implementation

All members of the Department must accept the responsibility and obligation to ensure the success of the strategy. Therefore, an implementation plan must be formulated. The first step is to appoint a project manager. This individual will oversee the entire process and ensure that the program runs smoothly and that the various tasks are accomplished. This should be an individual who is in a position of decision making authority. He or she must be willing to do the job and have an interest in promoting the strategy. This person will also direct other units to accomplish specific tasks related to their expertise and ability to get the job done.

A task force will have the responsibility to review and analyze current mass transit agencies and develop recommendations. The

task force will be comprised of both field and staff personnel with specific interest and expertise in the field of mass transit. Specific guidelines for accomplishing the goals and objectives of assuming mass transit law enforcement responsibilities will need to be formulated and provided to task force members in written form. A charge of the task force will be to recommend policy to perform the new responsibilities as well as the logistics required for implementation.

The office of special projects will be responsible for researching the issues and developing a comprehensive plan for implementation. The plan will include funding, policy, personnel and other logistical recommendations. The project team will also work closely with the task force to incorporate pertinent recommendations. Due to the complexity of the issue, implementation will occur over a seven year period.

The office of special representative will form a committee to research appropriate legislation impacting the issue. If needed they will also draft the appropriate legislation to transfer responsibilities to the state. Legislation funding the new responsibilities will be of prime concern. Finally, it will be the task of the committee to lobby the legislature for the support needed to enact legislation necessary to accomplish the mission to assume law enforcement responsibilities on all public transportation systems.

For a successful implementation of the strategic plan, it is necessary that the stakeholders support and accept not only the policy, but the course of action in the planning phase. This is accomplished through a negotiating process. Participation of the stakeholders in the development of policy and the resulting stakeholder ownership are key ingredients vital to the success of the strategy. Therefore, they are non-negotiable in accomplishing the mission. When dealing with a highly controversial issue, such as assuming State mass transit law enforcement responsibilities, it is essential that all

parties have complete "buy-in" to the process, or the process is likely to fail.

However, there are components of this strategy which are of lesser importance and are negotiable for the sake of accomplishing the mission. For example, there are a number of personnel issues that will undoubtedly arise in assuming mass transit responsibilities from agencies that currently provide these services--Bay Area Rapid Transit District (BART), Orange County Transit(OCTD), Los Angeles County Metro Transit Authority (LACMTA) etc. State benefits which may or may not be an issue as well as rank structure within the new organization although important can be worked out to accomplish the greater mission of providing better service to the public.

Transition Management Plan

By the end of the decade it is expected that rapid transit will play a significant role in defining California's mode of travel. It is also a new field within law enforcement; one that presents endless opportunities for a proactive law enforcement agency with a vision towards the future. Because of their many years of experience in managing the State's transportation networks, as well as their Statewide jurisdiction, the Department is the most logical agency to provide the consistency needed for effective law enforcement and should assume Statewide transportation related law enforcement responsibilities.

The transition into the strategy is designed to facilitate the movement of the Department from its current state to a desired future state in a smooth, efficient and effective manner. In order to begin fulfilling these objectives, people and groups critical to the strategy's success were identified as were the methods for their involvement. People and groups critical to the success of the strategy were narrowed to the Commissioner, Executive Management, The Secretary of Business and Transportation Agency, State Legislature, Local Government, Peace Officers Associations, and

the Public. These individuals and groups were restricted to the minimal amount felt necessary to create the opportunity for successful transition. It was felt that they were unique in the fact that they have either influence or authority over the contributors required for the successful implementation of the recommended course of action.

The suggested management structure entails bringing all of these critical people together as the foundation for the strategy. All must have a sense of worth, value and perceived contribution. This also allows for participation and input from various levels with an interest and stake in the future of the issue. An important objective is to begin to develop an open and candid dialogue and a sense of mutual trust and cooperation. Ideally this will create a solid alliance that will reduce future obstacles and reduce anxiety and frustration.

The management structure to be employed during the transition phase must place Executive Management responsibilities on the Commissioner. It must be a structure that helps the Department manage the transition from its limited traffic law enforcement role to the desired state of total transportation related law enforcement authority and full State law enforcement responsibilities. The initial management structure will differ somewhat from the ultimate future structure. The Commissioner will act as project manager and will be in charge of details of the program. He will assume the leadership role necessary to gain the partnership arrangement between the Secretary of the Business and Transportation Agency, the Governor and the Legislature.

Additionally, a subcommittee needs to be formed that will be led by the Deputy Commissioner. Although the Commissioner is in the leadership role, the Deputy Commissioner as second in command will serve in the manager role. The committee will be tasked with identifying the goals and objectives, establishing a time line, providing the initial resources to bring the various individuals and groups together, and gaining commitment.

The Commissioner would provide the political base while the Deputy Commissioner would use a "diagonal slice" of representation for his meetings. This method entails getting representatives from various levels and groups, both internal and external, compared to representation by their formal leaders. It will also allow input from the organizations that will be impacted by the consolidation plan.

Consolidation of rapid transit law enforcement services is a complex and controversial proposal, one that faces a number of obstacles that must be overcome to ensure its success. For these reasons, timing is critical in introducing change. Nevertheless, full transition should occur within the proposed seven year strategic planning cycle. Rapid transit is still considered to be in its infant stages and will pose fewer problems if consolidation can be accomplished before it expands further. For this reason expansion efforts should begin as soon as possible.

Conclusions

What impact will emerging transportation technologies involving vehicles and highways have on traffic law enforcement by the year 2002? This is a difficult question to answer. There is significant information available that documents what new emerging technologies are being developed, how they will work and the positive impact they will have on the movement of traffic. What isn't available is information and or documentation that forecasts the impact that new technologies will have on reducing congestion. Subsequently, the impact that these technologies will have on law enforcement is highly subjective. In pursuit of this information, this researcher attempted to have experts within the field of both technology and transportation commit to some percentage of improvement should these new transportation systems become common place. For Example, JHK associates are well known for their work in Intelligent Vehicle Highway Systems and traffic operation centers in Chicago, New York and California. In a best case scenario

they were asked to speculate that if 10 years from now their technology was fully operational and worked as designed, what percentage of a reduction in traffic congestion could be expected? JHK associates declined to venture a guess indicating that there were a number of factors that would need to be studied before an accurate assessment could be made. A public entity (California Department of Transportation) also refused to speculate.

In the futures forecasting portion of this research a panel of experts forecast that implementation of technology would be slow at best due to a lack of funding and the public's unwillingness to give up the comfort and convenience of their personal car. Although the panel predicted there would be significant progress in the development of rapid transit, the public will not seriously consider this mode of transportation as an alternative. A major increase in the price of gasoline and convenient, low cost, mass transportation are the only factors predicted that would have an impact on the personal vehicle remaining the primary mode of transportation into the 21st century.

This forecast coincides with the research information presented in Vision 2010 ⁷ that indicates traffic will get worse, not better. As a result there will be greater demands placed on law enforcement to manage and regulate traffic. This will necessitate that law enforcement plan for and seek out additional personnel to carry out mandated responsibilities. Nevertheless, law enforcement administrators agree that more and more police to do the job is not the answer. This is especially true as a result of a trend in declining funds that the panel predicted will continue for at least the next ten years. Law enforcement administrators also agree that technology is the only means by which to keep pace with increasing demands for traffic services. Unfortunately, this scenario suggests that traffic law enforcement will remain status quo into the 21st century.

In contrast, private industry is continuing to spend billions of dollars in research and development for transportation technologies

and rapid transit that will redefine travel as it is known today. Some of this development is even subsidized by the federal government. The 1991 U.S. transportation act allocated \$660 million over six years for the development and implementation of Intelligent Vehicle Highway Systems. A company currently working on this technology, IVHS America, estimates that the creation and deployment of intelligent vehicles and highway systems in the United States will require nearly \$200 billion over 20 years.⁸ In Europe, the Prometheus IVHS project has the underwriting of virtually the entire European auto industry. Also, industry and government partnerships are conducting traffic automation tests in Japan. The implementation of these technologies depends on whether society decides to spend the resources to develop and deploy these systems.

In taking a contrasting viewpoint, this researcher opted to continue the study taking a position that new transportation technologies would exist, that they would be implemented on a wide scale, and they would work as designed. As a result, the requirement for law enforcement to provide traffic management responsibilities would be significantly impacted. Law enforcement agencies are well versed in maintaining the status quo. A look into the future as to "*what might be*" entails considerable foresight and flexibility. Should these technologies be implemented they will have an impact on every law enforcement agency, large or small, who have traffic management responsibilities. However, the potential impact will be greater on the larger agencies due to the number of personnel and resources assigned. Agencies that are task specific in terms of the management and regulation of traffic, may be presented with significant reductions of personnel and loss of responsibility. An organization could conceivably face partial or total obsolescence.

Subjectively let us assume that there is a 20% reduction in traffic congestion as a result of mass transit and new transportation technologies being implemented. For the Los Angeles Police Department this would provide an opportunity to take 140 of the

702 officers currently assigned traffic management responsibilities and reassign them to other priorities. LAPD would also be able to

redirect more than \$85,000 to other programs. In comparison, the California Highway Patrol could lose more than 1,000 officers and \$120 million dollars of their budget. If the reduction is greater than 20%, and there is significant potential that it could be, the CHP would lose even more personnel and resources. Unless the CHP expands its responsibility, the recognition of the agency as a leader in the field of transportation management could be negatively impacted. The most logical expansion of the organization's responsibilities at this time is in the field of rapid transit. The strategic plan and the implementation plan explore these alternatives and recommend a course of action. The material presented in the plan can be used by even the smallest agency to plan for future traffic management responsibilities as new transportation technologies emerge. The State perspective can be transposed to coincide with a municipal or county government structure.

END NOTES

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