

State of Washington
Joint Legislative Audit and
Review Committee

Washington State Patrol Performance Audit

Report 99-4

February 16, 1999

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Established by Chapter 44.28 RCW, the Joint Legislative Audit and Review Committee (formerly the Legislative Budget Committee) provides oversight of state funded programs and activities. As a joint, bipartisan legislative committee, membership consists of eight senators and eight representatives equally divided between the two major political parties.

Under the direction of the Legislative Auditor, committee staff conduct performance audits, program evaluations, sunset reviews, and other types of policy and fiscal studies. Study reports typically focus on the efficiency and effectiveness of agency operations, impact of state programs, and compliance with legislative intent. As appropriate, recommendations to correct identified problem areas are included. The Legislative Auditor also has responsibility for facilitating implementation of effective performance measurement throughout state government.

The JLARC generally meets on a monthly basis during the interim between legislative sessions. It adopts study reports, recommends action to the legislature and the executive branch, sponsors legislation, and reviews the status of implementing recommendations.



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WASHINGTON STATE PATROL PERFORMANCE AUDIT

Summary

OVERVIEW

This performance audit of the Washington State Patrol (WSP) responds to legislation passed in 1997 (ESSB 6061) that called for performance audits of state transportation agencies. That same legislation created a Temporary Advisory Committee¹ that provided input to the Joint Legislative Audit and Review Committee (JLARC) on the performance audit scope and objectives.

This report focuses on selected subject areas and issues that are of interest to the legislature as reflected in advice from the Temporary Advisory Committee. In addressing these issues, the audit assesses other aspects of performance, as appropriate, relating to efficiency, effectiveness and accountability of program operations.

Throughout the audit process, we found the WSP to be a forward looking agency whose management and line staff put in considerable extra effort to assist in answering the audit questions and in meeting an aggressive timeline for this report. Findings in this report highlight many achievements of the Patrol, and point to areas where additional changes can be of assistance to the agency and the legislature.

The audit questions examined in this report have been grouped into nine subject areas:

Legislative
input on
audit
questions

¹ This committee is comprised of the members of the executive committees of JLARC and the LTC. The state auditor and the director of the Office of Financial Management (OFM) serve as ex officio members.

- Patrol Staffing, Allocation, and Scheduling
- Compensation Issues
- Patrol Activities on County Roads
- Commercial Vehicle Division Transition Planning
- Technology
- Telecommunications
- Patrol Vehicle Replacement and Budgeting
- Collocation
- Indirect Cost Recoveries

Each of these areas comprises a separate chapter in the report. The findings and recommendations from each chapter are summarized below.

PATROL STAFFING, ALLOCATION, AND SCHEDULING

Approximately 700 troopers and sergeants are deployed among patrol areas throughout the state to respond to citizens' calls for service (CFS), detect law violations, and provide proactive law enforcement services.

Focus is on
Patrol's
staffing and
deployment
model...

This chapter answers a question posed by the Legislative Transportation Committee (LTC) and the Office of Financial Management (OFM): *Is the patrol staffing and allocation model, as used by the Washington State Patrol, a valid means of establishing appropriate staffing levels for patrol and for the deployment of troopers?* Other aspects of patrol staffing, allocation, and scheduling are also examined in this chapter.

...and steps
needed to
resolve
problems

Based on an evaluation of this complex model, and how the Patrol has used it, this audit finds that the outputs from the model have not been valid indicators of performance and staffing needs. It is also questionable whether they have provided reliable information for the deployment of troopers. New information provided by WSP, and the cooperation and advice of the Model's author, assisted us in making this finding.

This finding does not mean that the model should be abandoned. The positive steps taken by the WSP and the LTC towards performance-based budgeting can still be continued and

enhanced. Some changes to the Patrol's use of the model, and some structural changes to the model itself, should make it more reflective of the actual patrol environment in Washington State. What is not clear at this time is how much improved accuracy would result from these changes and whether it would be sufficient.

These issues can be resolved by a more thorough follow-through on the recommendations from the 1991 deployment model study sponsored by the LTC. A recommendation in this chapter calls for modification of the model and more work on model validation. Another recommendation is that the WSP should establish performance measures for Patrol that are related to outputs or outcomes that can be affected by the agency itself, rather than limited to those influenced largely by external budget policy decisions.

COMPENSATION ISSUES

We reviewed compensation issues and practices at the WSP. This included reviewing the salary setting process, focusing on the prevalence of specialty, education, and incentive pay, and examining what other states provide in this regard.

Another portion of the compensation analysis focused on the use of overtime, both its purpose and prevalence. We compared the use of overtime by current commissioned staff and recently retired commissioned staff, and assessed the impact of the overtime on pensions, both in terms of added pension benefit to the individual and the resulting cost to the state. We also reviewed the amount of overtime attributable to Department of Transportation (DOT) contracts, and the policies and controls relating to contract overtime assignments.

During the course of this audit we engaged the office of the State Auditor to review the agency's practices of hiring WSP Retirement System retirees into PERS 1-eligible positions. Together with the State Auditor's office we reviewed post-retirement hiring practices, retirement eligibility determination, and whether any additional costs to the state are associated with the pension policy that allows the re-hiring of retirees.

The audit examines questions about WSP compensation practices and retirement issues

Overtime can significantly impact retirement benefits

We found that the Patrol is in compliance with statutes relating to its compensation practices, and that post-retirement hiring practices are proper. Other findings, which relate to specific questions posed to the audit team, include:

- In comparison with other states, a higher proportion of WSP commissioned staff receives some type of specialty or educational pay.
- Paid overtime and compensatory time increase the average commissioned staff's pension by 14 percent. This finding is based on information for those commissioned staff who retired from July 1995 through March 1998. For FY 99-01, the state's portion of the pension liability associated with overtime and compensatory time for these retirees is \$80,000 to the general fund and \$1,230,000 to the State Patrol Highway account.
- The average commissioned retiree worked 42 percent more overtime and compensatory time hours during their last 24 months of employment prior to retirement than currently employed troopers and sergeants who worked overtime during the same period. DOT contract overtime accounted for 35 percent of the overtime worked by the retirees we reviewed.
- Agency policies and procedures relating to certain types of overtime are inconsistent between districts and allow employees to make individual choices about whether they will work overtime. Combined with the magnitude of the impact that overtime can have on an individual's retirement benefit, this can create an additional incentive for working overtime for those who are approaching retirement.
- WSP post-retirement hiring practices do not result in additional salary costs to WSP, nor a material benefit cost increase to pension funds. However, the policy may provide a disincentive for individuals to remain employed as WSP commissioned officers because of the additional income and benefits they may receive from dual retirement.

We make two recommendations in this chapter concerning strengthening agency controls on assignment of overtime and developing district overtime rotation practices that address operational considerations such as how call-out policy affects response time by priority of call.

PATROL ACTIVITIES ON COUNTY ROADS

Although the Patrol's primary responsibility is to provide traffic-related services on state and interstate highways, it does provide some services on county roads. In January 1998, feeling that the current trooper response level was below acceptable levels, the LTC directed the Patrol to take certain actions to limit its activities on county roads, including discontinuing the investigation of non-injury accidents. This chapter quantifies the current level of Patrol services on county roads, and explores the extent of reductions that could result from implementing the LTC's directive.

We estimate that in FY 1998, 51 FTE troopers were devoted to county road activities at a cost of approximately \$3.7 million. These 51 FTEs represent about 7 percent of all the troopers and sergeants assigned to patrol duties. We established two target service levels to reflect reductions that could potentially be achieved through implementing the LTC's directive. Based on these target service levels, we estimate the potential reductions in FTE troopers could range from 14.8 FTE to 22.6 FTE, and the potential reduction in cost could range from \$1.1 million to \$1.6 million.

COMMERCIAL VEHICLE DIVISION TRANSITION PLANNING

In May 1995, the Department of Labor and Industries (L&I) issued a report to the WSP related to the Commercial Vehicle Division (CVD). The report cited four violations related to Commercial Vehicle Officer (CVO) safety. The report indicated the need for personal defensive devices and/or means of defense in the event of assault or other criminal behavior encountered.

Based on these findings, the WSP and representatives of the three bargaining units of the CVD entered into an agreement to address the safety concerns documented in the L&I report. The agreement resulted in a plan to transition current CVO positions into fully commissioned state troopers. This transition would

Activities on county roads equate to an estimated 51 troopers

Labor & Industries citations led to transition of CVD staff to armed officers

entail significant changes in training, arming, authority, salary levels, and vehicle requirements for CVOs. Subsequently, WSP, the collective bargaining units, and an LTC working group submitted additional options for CVD transition to the LTC. These options are currently under consideration.

Our analysis focused on answering the following question: *Is the CVD transition process an efficient and effective means of meeting the division staff resource management objectives as well as the L&I audit report objectives?*

Transition planning should go forward

Because the number of options being considered has changed during the course of the audit (and may continue to change), the report does not support any particular option. Rather, it identifies the features that should be included in any option that may eventually be chosen. The report recommends that the legislature and WSP should proceed with a CVD transition plan that results in transitioning to fully commissioned officers in interior positions and that uses unarmed Commercial Vehicle Officers at ports of entry to the extent possible.

TECHNOLOGY

Investments are needed to support WSP's efforts and to meet critical needs

The major focus of this chapter is to address the legislature's questions concerning the adequacy of the technology and telecommunications systems deployed by the WSP:

- *Are the systems currently in place cost-effective and are they operated efficiently?*
- *Do these systems adequately serve the needs of the patrol and other justice system and local law enforcement users?*

This chapter contains two recommendations that support future enhancements of the state Automated Fingerprint Identification System (AFIS) and strategic planning of the Patrol's Mobile Computer Network. The audit found that the Patrol has generally applied proven technology in an efficient manner to meet critical public safety needs. However, the state has not made sufficient investments in WSP's public safety computer and communications infrastructure, and several key systems have become outdated. State Patrol investments in technology are

dependent on funding decisions made by the legislature. The State Patrol has been directed by the legislature to improve public access to state criminal history records, and has successfully implemented cutting-edge Internet technology to meet this challenge.

TELECOMMUNICATIONS

This chapter contains an analysis of the telecommunications systems deployed by WSP. Two recommendations address opportunities for collocation of telecommunications equipment with other public and private entities, and the need for better coordination of radio communications among state and local jurisdictions. We found that the Patrol has efficiently applied proven technology to establish a reliable public safety communications system. However, to maintain the current high level of service, the Patrol should improve basic maintenance on its telecommunications towers. As recognized in the previous chapter on technology, the Patrol has been nationally recognized for implementing and deploying telecommunications systems.

PATROL VEHICLE REPLACEMENT AND BUDGETING

We evaluated how decisions are made to replace WSP pursuit vehicles. Each new pursuit vehicle costs approximately \$26,000 to purchase and equip. WSP was authorized 828 pursuit vehicles for 1998.

To aid in this evaluation, we developed and relied upon a Fleet Life-Cycle Cost Model, and received extensive cooperation and support from the WSP Fleet Section. This model is currently being used by WSP for decision-making purposes.

Relevant financial and cost data indicate that the increase of WSP pursuit vehicle mileage from the current target of 100,000 miles to 110,000 miles has resulted in a small reduction (one cent per mile, or \$159,000 annually) in the total cost of ownership. Compared to the old target of 75,000 miles, replacing pursuit vehicles at 110,000 miles saves \$660,000 annually. Existing data did not permit an analysis of what total costs would be of

Increase in
pursuit vehicle
mileage has
produced a
small
reduction in
costs

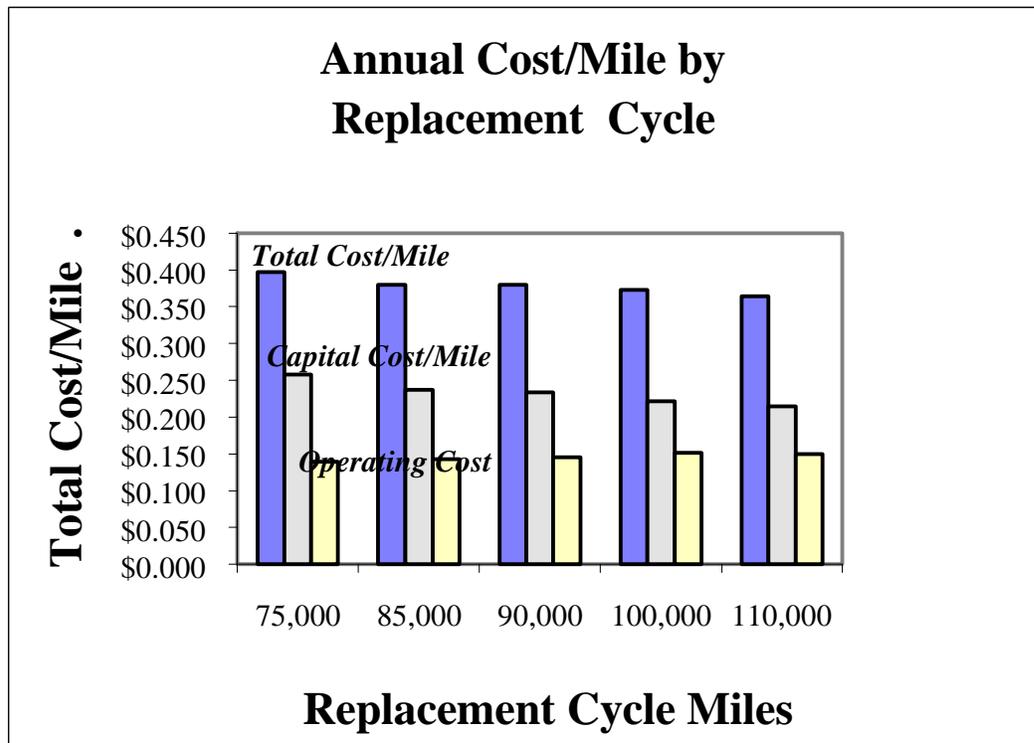
**Budgeting
vehicle-
related funds
separately
would be
beneficial**

extending vehicle mileage beyond 110,000 miles. Exhibit 1 on the below shows how total costs per mile change based on different replacement cycles.

The increase in replacement mileage to 110,000 miles has been due to the use of budgeted vehicle replacement funds for other WSP operating purposes and a legislative budget decision to reduce funding for vehicle replacement by extending the mileage replacement cycle.

So far, these decisions have not resulted in higher overall costs (i.e., capital and operating combined). However, more vehicles than intended must be replaced in subsequent budgets to maintain even the current extended mileage level, and there are higher than intended future operating and maintenance costs. These unplanned future liabilities could be avoided by restricting vehicle replacement funds solely to that purpose.

Exhibit 1



Source: Fleet Life-Cycle Cost Model and cost data provided by WSP Fleet section.

This report contains recommendations for WSP to continue to use the Fleet Life-Cycle Cost Model for evaluating the mileage replacement level for pursuit vehicles, and to extend the use of the model for review of other categories of fleet vehicles as well. Another recommendation is to budget funds for vehicle purchase and operations in segregated accounts with restrictions on the ability to transfer these funds for other purposes.

COLLOCATION

The focus of this chapter is the evaluation of efforts to collocate WSP facilities and programs with other state agencies and programs. The LTC has actively encouraged transportation-related agencies to coordinate their capital activities when possible, to collocate their facilities to enhance or improve service delivery, and to save taxpayer money through efficiencies in acquiring and operating facilities and administering programs.

We evaluated the collocation effort to date, focusing on six projects. In addition, we reviewed the plans for communications tower maintenance (a subject that is also discussed in the Telecommunications chapter).

Our conclusions from this evaluation are as follows:

- WSP is complying with RCW 46.01.330, adopted in the 1993-95 Biennium, that mandated coordination between WSP and the Department of Licensing (DOL) for the siting of facilities. Siting criteria for WSP were met in collocation examples, but this did not necessarily occur for DOL (the Parkland vehicle licensing project breached the criterion related to proximity of subagents).
- Appropriate economic evaluations have been done on WSP projects by use of the model developed as the outgrowth of the JLARC Performance Audit of Capital Planning and Budgeting (1995).
- Projects would benefit from retrospective analysis, since some economic benefits were overstated (e.g., collocation of DOL vehicle licensing services in the Vancouver facility).

**WSP is
fulfilling
mandates for
collocation**

- Collocation opportunities may exist with public/private partnerships in the siting, construction, and maintenance of communications towers similar to the successful WSP collocation with local commercial cellular carriers in Everett.

Audit was asked to look at distribution of indirect cost recoveries

INDIRECT COST RECOVERIES

This chapter explores the issue of indirect cost recoveries, by focusing on the Patrol's contract to provide troopers at DOT construction sites. We were asked to address this issue in the audit over concerns that these funds can fall "outside" what might be considered the regular budget and allotment process; and as a result, a complete picture of the Patrol's budget can be difficult to discern.

In the 1995-97 Biennium, the Patrol received \$2.2 million in reimbursement for the DOT contract; of which, just under one-half million dollars was for indirect costs. These are funds that are not required to be allotted (because the Patrol is the "receiving" agency), yet are available for disbursement throughout the agency.

The amount of indirect costs recovered was likely greater than the costs actually incurred. This is because all work performed under the contract is done on an overtime basis, and the indirect rate is imposed on the overtime salaries which are 50 percent higher than straight time salaries. There is nothing to indicate, however, that the amount of indirect cost incurred actually increases as a result of paying overtime versus straight time.

State's accounting system not set up to track how indirect cost recoveries are spent

In the 1995-97 Biennium, the Patrol allocated the largest single share of its total indirect cost recoveries (not *just* those from the DOT contract) to a sub-program within its budget called "Revolving Accounts." WSP staff indicated that some amount of the funds in this account, presumably those represented by the indirect cost recoveries, are available for use at the discretion of agency management; meaning they can be allocated to areas within the agency that are deemed to be a priority. We asked for a specific accounting or breakdown of what the indirect cost recoveries in this fund were used for. Patrol staff indicated that the state's accounting system is not set up to provide for that type of specific breakdown.

The Patrol's distribution of indirect cost recoveries does appear to fall outside what might be considered the typical budget process. This is not to suggest, however, the distribution is inconsistent with applicable rules and regulations. Under the existing system, the Patrol has access to what are essentially additional funds, above and beyond those appropriated to it by the legislature. A concern is that there is limited outside oversight of these funds, and as such, limited accountability. The report recommends that OFM and the Patrol jointly review and resolve the issues raised in this chapter.

AGENCY RESPONSE

We shared this report with WSP and OFM and provided them an opportunity to submit written comments. Their responses, as well as the Auditor's comments, are provided in Appendix 2

ACKNOWLEDGEMENTS

We appreciate the extensive cooperation of the management and staff of the WSP. In preparing for the audit work, we also received invaluable assistance from the members and staff of the LTC and OFM.

Bob Thomas, Robert Krell and Valerie Whitener, JLARC staff, conducted this audit with technical assistance and review of selected areas by consultants Robert M. Williams (Robert M. Williams and Associates); Michael J Huddleston; and Michael D. Frankfurter and Andrea Wieland (Pacific Consulting Group, Inc.). Dan Contris and Chris Kennedy of the State Auditor's Office (SAO) provided additional technical assistance and audit review under an interagency agreement between JLARC and SAO. Bob Thomas was the team leader of the audit. Cheryle Broom and Thomas M. Sykes were the project supervisors.

We very much appreciate the technical assistance in the analysis of the Police Allocation Model (PAM) provided by Dr. William Stenzel of the Traffic Institute at Northwestern University, and by Mr. Michael Markow of Cambridge Systematics Inc. For assistance and information concerning retirement systems and actuarial information we are indebted to the Office of the State Actuary, and particularly to Steve Nelsen.

RECOMMENDATIONS

Summary

Recommendation 1

The Washington State Patrol should make corrections to its use of the Police Allocation Manual, and should seek expert assistance in making the kinds of modifications to the model that have been identified in this report. Following these changes, the model should be validated to ensure that it replicates reality. Any major discrepancies should be analyzed to determine which variables are causing the differences. An independent review of the validation test should be provided to ensure model credibility.

Legislation Required: None
Fiscal Impact: Unknown. Use of outside expertise may require additional funding; and additional training and/or staff resources may be required to enhance the use and accuracy of the staffing and deployment model.
Completion Date: January 2000, depending on when funding is provided

Recommendation 2

The Washington State Patrol should establish performance measures for Patrol that are related to outputs or outcomes that can be affected by the agency itself. Initial areas to focus on should include response availability by priority of call and response time, taking into consideration the characteristics of individual autonomous patrol areas.

Legislation Required: None
Fiscal Impact: None
Completion Date: WSP is currently working on a pilot project with OFM and LTC to develop and implement performance measures as an integral part of its biennial budgeting process.

Recommendation 3

The Washington State Patrol should pursue implementing district policies relating to regular call-out overtime. These policies should provide controls in terms of rotation of call-out assignments, and address operational considerations such as how call-out policy affects response time by priority of call.

Legislation Required: None
Fiscal Impact: None
Completion Date: January 2000

Recommendation 4

The Washington State Patrol should continue to pursue consistency and compliance in its policies for operations of contract overtime. Controls prohibiting self-reassignment of overtime should be present within policies of each district.

Legislation Required: None
Fiscal Impact: None
Completion Date: January 2000

Recommendation 5

The legislature and the Washington State Patrol should proceed with a Commercial Vehicle Division transition plan that results in transitioning to fully commissioned officers in interior positions and that uses unarmed Commercial Vehicle Officers (CVOs) at ports of entry to the extent possible.

Legislation Required: None
Fiscal Impact: The number of port of entry positions that do not require armed officers needs to be determined based on staffing schedules. Therefore, the cost of our recommendation is not known at this juncture. Based on analyses prepared by WSP, the additional ongoing annual salary and benefits **cost** of upgrading to fully commissioned officers from CVEOs would be approximately \$17,000 per position. The salary and benefit **savings** from using unarmed CVOs rather than fully commissioned CVEOs would be approximately \$19,200 per position.

A comprehensive analysis of costs and benefits should recognize the potential improvements in quality of service in responding to calls for service

and the savings which should result from fewer calls for assistance for commissioned troopers by CVEOs.

Completion Date: Unknown. According to the Office of Financial Management, successful implementation of a transition plan will require that all stakeholders reach consensus on the transition period, training requirements, and enforcement authority.

Recommendation 6

A comprehensive study should be funded to plan, schedule, and budget the statewide implementation of live-scan technology. This study should reflect the overall strategy of the state's Justice Information Network.

Legislation required: None
 Fiscal Impact: A preliminary estimate of the cost of such a study is \$75,000; after implementation of live-scan technology, staff will be freed up for other purposes.
 Completion Date: April 1, 2000, or depending on when funding is provided

Recommendation 7

The Washington State Patrol should develop a detailed implementation plan for the next phase of the Mobile Computer Network (MCN) project to describe patrol coverage, radio communications and potential integration with city and county mobile computers.² The implementation plan should also identify and propose technical solutions to MCN integration challenges posed by the federal National Crime Information Center 2000 project.

Legislation required: None
 Fiscal Impact: \$200,000 for study
 Completion Date: August 1, 2000, or depending on when funding is provided

² WSP review comment: "Any future MCN application or system changes would require legislative support. This implementation plan should be legislatively sponsored as a WSP study project with a hired consultant for approximately \$200,000. Any plan or MCN project should support the agency six-year strategic plan."

Recommendation 8

The Washington State Patrol (WSP) should ascertain which of its telecommunications towers provide opportunities for collocation and partnership with other entities, and should attempt to duplicate the success of the WSP Everett tower project.

Legislation required:	None
Fiscal Impact:	Duplication of the Everett Tower project could result in capital budget savings in the range of \$200,000 to \$500,000 for each tower partnered.
Completion Date:	January 2000 for identification of projects

Recommendation 9

The legislature should consider funding a statewide law enforcement communications interoperability plan. If this planning effort identifies a feasible interoperability solution, the legislature should further consider funding the fix and should authorize the Washington State Patrol to implement the program.

Legislation required:	None for study; implementation may require legislative authorization
Fiscal Impact:	King County conducted a study of similar complexity for \$180,000
Completion Date:	January, 2001, depending on when funding is provided

Recommendation 10

The Washington State Patrol (WSP) should continue to use the Fleet Life-Cycle Cost Model as the basis for evaluating the mileage replacement level. Any replacement policy that differs from the lowest cost alternative identified by the model should be supported with cost-benefit considerations. WSP should also adapt the Fleet Life-Cycle Cost Model for use in the review of other categories of fleet vehicles.

Legislation Required:	None
Fiscal Impact:	For pursuit vehicles, maintaining a vehicle replacement cycle of 110,000 miles would save approximately \$159,000 annually compared to 100,000 miles and \$660,000 annually when compared to 75,000 miles.

Completion Date: Implementation of this recommendation is currently in progress

Recommendation 11

The Washington State Patrol should budget funds for vehicle purchase and operation in dedicated accounts with restrictions on the ability to transfer these funds to other purposes. Any such transfers should demonstrate that excess funds are the consequence of fleet efficiencies and not the consequence of either restricting mileage at the expense of mission availability or deferring costs to subsequent budgets. Funds for emergency purposes and contingent needs should be accommodated through other budget strategies to avoid the use of required vehicle purchase funds.

Legislation Required: None
Fiscal Impact: Unknown
Completion Date: In time for the next budget cycle

Recommendation 12

All parties to the collocation process should review the siting criteria of the various collocation participants.

Legislation Required: None
Fiscal Impact: Should help foster the most economically justified decisions
Completion Date: Can begin immediately

Recommendation 13

Collocation participants should routinely review past projects to enable prospective projects to benefit from improved assumptions relative to location, appropriate mix of collocation participants, and facility programming.

Legislation Required: None
Fiscal Impact: Should help foster the most economically justified decisions
Completion Date: Can begin immediately

Recommendation 14

The Washington State Patrol and the Office of Financial Management should jointly review the basis for the Patrol's indirect cost recovery plan used in the administration of the Patrol's "DOT Master Contract" to determine if there is any need for modification.

Legislation Required: None
Fiscal Impact: Unknown until after the review is completed
Completion Date: January 2000

PATROL STAFFING, ALLOCATION, AND SCHEDULING

Chapter One

SUMMARY

Approximately 700 troopers and sergeants are deployed among patrol areas throughout the state to respond to citizens' calls for service (CFS), detect law violations, and provide proactive law enforcement services.

This chapter answers a question posed by the Legislative Transportation Committee (LTC) and the Office of Financial Management (OFM): *Is the patrol staffing and allocation model, as used by the Washington State Patrol (WSP), a valid means of establishing appropriate staffing levels for patrol and for the deployment of troopers?* Other aspects of patrol staffing, allocation and scheduling are also examined in this chapter.

Based on an evaluation of this complex model, and how the Patrol has used it, this audit finds that the outputs from the model have not been valid indicators of performance and staffing needs. It is also questionable whether they have provided reliable information for the deployment of troopers. New information provided by WSP, and the cooperation and advice of the model's author, assisted us in making this finding.

This finding does not mean that the model should be abandoned. Nor does it mean that the positive steps taken by the WSP and the LTC towards performance-based budgeting cannot be continued and even enhanced. Some changes to the Patrol's use of the model, and some structural changes to the model itself, should make it more reflective of the actual patrol environment in Washington State. What is not clear at this time is how much

This chapter focuses on Patrol's staffing and deployment model

improved accuracy would result from these changes and whether it would be sufficient.

These issues can be resolved by a more exhaustive follow-through on the recommendations from the 1991 deployment model study sponsored by the LTC. A recommendation in this chapter calls for modification of the model and more work on model validation as was originally recommended in 1991. Another recommendation is that the WSP should establish performance measures for the Patrol that are related to outputs or outcomes that can be affected by the agency itself.

BACKGROUND

A decade ago the legislature and OFM had concerns about the deployment techniques and models that had been used by the WSP. These models were based on numerous factors such as average traffic miles, number of vehicles registered in Washington, accident rates and CFS. The WSP was among many other law enforcement agencies nationwide that were searching for a model that would meet their needs. In 1990, the LTC engaged Sterling Associates to help select a model for use by the WSP. Through a collaborative effort involving the LTC, OFM, and WSP, Sterling Associates identified the following criteria for an acceptable staffing and deployment model for WSP.

The PAM
model was
selected nine
years ago

1. *The model must recognize the full spectrum of the WSP's mission.*
2. *The model must determine how many troopers are needed.*
3. *The model must address what levels of service the state is buying.*
4. *The model must determine where the troopers should be deployed.*
5. *The model must stratify personnel needs at district and detachment levels.*
6. *The model must be easy to understand and practical to use.*
7. *The model's assumptions must be reasonable and technically sound.*

In a study published in January 1991, Sterling Associates recommended the use of the Police Allocation Manual (PAM),³ developed at Northwestern University, as the most appropriate deployment model for the Patrol. An important feature of PAM is that it is both time-based and policy-based. It is time-based in that it uses the actual time requirements for reactive, proactive, and administrative duties. It is policy-based in that it allows the user to set service level targets for both the availability and visibility of troopers assigned to patrol districts.

The consultant's recommendation to adopt PAM was contingent, however, on WSP taking the following actions:

- *The current activity reporting system should be modified to ensure that PAM will use reliable historical data.*
- *PAM should be validated to ensure that it replicates reality. If the model can calculate staffing levels with reasonable accuracy for past and/or current service levels, using reliable historical data, it will have met its most critical test. Any major discrepancies should be analyzed to determine which variables are causing the differences.*
- *An independent review of the validation test would ensure model credibility.*

WSP made several efforts to follow-up on these recommended actions (See Appendix 3). For example, beginning in 1991, the agency formed the Time and Activity System (TAS) Evaluation Committee to begin extensive efforts to overhaul and improve TAS. At the time, however, WSP did not generate the kind of historical data needed to validate the model. A study by WSP is now in progress that is specifically designed to provide actual performance data from the Computer Aided Dispatch (CAD) system that can be used in model validation.⁴ This performance

Adoption of
PAM was
contingent
upon
validation

Some
validation is
now in
progress

³ PAM Version 4.0 for statewide agencies, July 1991, prepared by The Traffic Institute of Northwestern University for the National Highway Traffic Safety Administration, U.S. Department of Transportation.

⁴ See "WSP Computer-Aided Dispatch System Improvement Feasibility Study Report: Final Report, May 1998, KMPG Peat Marwick, LLP; and a WSP internal working document entitled "WSP Analysis of CAD/PAM System Improvement Feasibility Study as of 8/11/98.

audit has also provided various validation tests of the model. Together, these efforts constitute part of the validation testing and independent review that the consultant recommended in 1991.

The extent of this current testing sets Washington somewhat apart from other states with regard to validating PAM. Out of 41 states that responded to a JLARC survey, 17 indicated that they use PAM. None of these 17 states⁵ has conducted a validation test to determine how well PAM estimates compare to reality.⁶

RESULTS OF VALIDATION TESTING

In the course of this performance audit, we evaluated PAM against the seven criteria (see above) that were established for a staffing and deployment model. Since there is a risk with any model that it might have conceptual, structural or computational errors, we made review of this risk a high priority.

Technical Soundness

PAM is technically sound but still has limitations

We reconstructed PAM formulas and tables, checked mathematical calculations, and worked through the steps and logic of each part of the model. Based on these particular tests, we found the model to be technically sound.⁷ These tests did not, however, determine whether the queuing modeling assumptions used in the model produce results that with reasonable accuracy will predict actual performance. Later in this chapter we will discuss our reasons for suggesting further testing of a modified or different version of PAM for use by WSP.

⁵ One state no longer uses PAM.

⁶ The author of the model received feedback from eight states that field-tested the model in 1989 indicating that they felt the model outputs were indicative of actual performance. These field tests apparently did not involve, however, the type of validation process that is being described in this audit.

⁷ One referencing problem in the instructions and one calculation problem were identified and were brought to the attention of the model's author. These problems were not located in the parts of the model being used by WSP. Coming across errors of this type is not unusual in a model of such complexity and does not reflect negatively on the overall model design. Our review of the conceptual design of the model did not extend to an evaluation of the underlying queuing theory (the mathematics of waiting lines and systems).

The limitations of PAM (and this would likely apply to any model) stem from the difficulty of having general modeling assumptions closely match the actual operating environment of any particular user jurisdiction.

Washington State Patrol's Use of PAM

PAM is a tool that can be used to make allocations of troopers among Autonomous Patrol Areas (APAs).⁸ We found that WSP pays very close attention to PAM results when making decisions about how staff should be deployed. PAM results are made available to district commanders, and the commanders, in turn, use PAM results and other operational information and professional judgment in making their cases for their share of staffing resources.

PAM can also be used to determine staffing needs in relation to policy-based performance objectives. The performance objective that has been chosen by WSP is to have sufficient troopers so that 80 percent of the time a trooper will be available immediately to respond to a citizen's CFS.

We found that due to an incomplete understanding about the complex design and the assumptions underlying PAM, the WSP has consistently overestimated the percentage of time that troopers are available to respond to citizens' CFS. This finding has been confirmed with both WSP and the model's author.

Because PAM has also been used to determine trooper staffing requests, these requests have consistently underestimated staffing needs *based on the availability measure*. As will be discussed later in this chapter, more detailed performance measures should be considered instead of overall availability of troopers to respond to CFS.

WSP's use of the model has produced errors in both directions—some result in performance being overestimated and others in performance being underestimated. The errors that have

⁸ There are the 39 WSP APAs (in eight districts). They are referred to as "autonomous patrol areas" (APAs) because virtually all the CFS that originate in the area are handled by troopers assigned to the area, and troopers assigned to the area are rarely assigned to CFS outside the area.

Problems in
use of PAM
have
overestimated
performance

overestimated performance (and underestimated staffing needs) have had, by far, the greatest impact.

The problems with WSP's use of PAM are both technical and conceptual, as can be illustrated with the following three examples:

- Based on an incomplete understanding of the model design, the wrong statistical tables have been used for looking up the number of staff needed to meet performance criteria. This has resulted in underestimating staffing needs and overestimating performance.
- Although the time and activity data associated with shift extensions and trooper call-outs has been entered into PAM, the additional trooper time on duty that comes from these activities has not been entered. This has resulted in overestimating staffing needs and underestimating performance.
- PAM can be used in a *prescriptive* or a *descriptive* manner. A *prescriptive* approach would set limits on certain activities (such as administrative time or the time spent on self-initiated contacts) and then estimate what the trooper staffing needs would be if these limits were actually achieved. A *descriptive* approach, in contrast, uses actual data rather than policy limits to estimate staffing needs based on current operations. Problems can arise when the two approaches are used simultaneously.

A practice of WSP has been to set an hourly limit within PAM on the amount of time spent on self-initiated contacts (SICs). The limit has been 10 minutes, which is about one-half of the average time reported by troopers. A study currently being conducted by WSP further suggests that self-initiated contacts may be underreported.⁹ If WSP were actually able to achieve 10 minutes for self-initiated contacts, then the staffing needs described by PAM would be more consistent with this prescriptive assumption.

⁹ Source: WSP audit technical review process comment: "A large number of SICs are not counted in the CAD system. Therefore it is difficult to conclude with certainty what the real average is."

However, since this limit has not been achieved in practice, the outputs from PAM turn out to be estimates of what might be achieved rather than what is achieved. This has resulted in underestimating staffing needs and overestimating performance.

Based on WSP's then-current use of PAM, the outputs for fiscal year 1997 indicated an average availability for immediate trooper response in the range of 60 to 70 percent. When the correct tables in PAM are used instead, and when overtime hours and reported actual time for self-initiated contacts are entered, PAM outputs suggest that the percentage was actually under 50 percent. Data from the CAD system for the same period indicates that performance was in the range of 38 to 49 percent.

Other model limitations and user input problems have been identified, discussed, and confirmed with the model's author. WSP acknowledges the concerns we have raised and agrees that the concerns need to be investigated further. The conclusion to these findings is that PAM, as presently used, is not meeting the original criteria established for a staffing and deployment model.

The next section of this chapter focuses on what can be done to ensure that all of the criteria will be met. The discussion will cover the following topics:

- Identification of model elements that will be more reflective of actual WSP patrol operations
- Needed changes in WSP inputs into the model
- Recommendations for model implementation and validation
- Performance measures appropriate for Patrol

MODEL ELEMENTS

A model developed for use by a variety of statewide patrol agencies cannot always reflect the different operating environments of those agencies. The PAM user's manual explicitly recognizes such limitations:

The PAM model . . . should be viewed as a generic procedure which must be adapted to fit the mission, physical environment, highway system, and operational idiosyncrasies of each state agency.¹⁰

In our evaluation of the version of PAM currently being used by WSP, we identified several limitations which, if addressed, should make the model more reflective of the actual WSP operating environment. Some of these limitations have already been addressed in a more recent version of PAM developed for municipalities.¹¹ Nevertheless, even with the municipal model, limitations that would still need to be addressed include:

Newer
version of
PAM
addresses
some
limitations ...

... but others
remain

- The model does not address the fact that calls-for-service workload and staffing for each APA may vary significantly by time of day. Nor does it sufficiently address the fact that trooper staffing may not be well-matched to when calls-for-service workload occurs. Note: There are good reasons why calls-for-service workload and staffing may not match. For example, rural APAs may require minimum staffing, whereas scheduling strictly to CFS might call for no staffing at times. Also, some efforts such as DUI (Driving Under the Influence) emphasis may be time- and place-related, but not necessarily related to call volume. In short, WSP has operational objectives and challenges in addition to responding to CFS that can and should influence when troopers are scheduled.

Exhibit 2 shows how trooper staffing by time of day compared to calls-for-service workload. This is based on a comparison of trooper schedules to calls-for-service workload for a sample of APAs for a one-month period in 1998. The values in the exhibit express the degree of association between when troopers worked and when the workload occurred. The possible range is from zero to one, with zero indicating

¹⁰ Police Allocation Manual, Statewide Agencies, Version 4.0, July 1991, pages 2-8.

¹¹ Police Allocation Manual, Municipal Police Departments, Version M3.0, October 1993.

virtually no association. A one, or a number close to one, would indicate a high degree of association.¹²

Exhibit 2

Comparison of CFS to Schedules		
APA	Name	Degree of Association
02	Tacoma Freeway	0.02
25	Wenatchee	0.51
26	Ellensburg	0.32
27	Okanogan	0.22
28	Ephrata	0.65
29	Moses Lake	0.22
35	Port Angeles	0.44
36	Bremerton	0.11
37	Hoquiam	0.48
38	Shelton	0.23
39	Raymond	0.00

Sources: WSP District 1, 6, and 8 Schedules 3/16/98 through 4/12/98; WSP Computer Aided Dispatch (CAD) data for the same period; and JLARC Worksheet: Sample APAs Regression Results.

These values suggest that for the sample APAs in this one-month period, there was not a pattern of a strong association between when troopers were assigned to work and when CFS occurred.

- For APAs that are not staffed by troopers 24-hours per day (22 of the 39 APAs), PAM estimates the staffing needs for only those hours that are actually staffed. The calls that are received when the APAs are not staffed may be assumed to have longer wait times than calls that are received when troopers are present.
- PAM enables the user to specify response availability performance objectives of 50, 60, 70, 75, 80, 85, 90, 95, 97, 98,

¹² The method we used was a simple regression with the variables standardized using z-scores, which measure the distance of each variable from the mean in terms of standard deviation. The values indicating association are the coefficients of determination [R squares]. We could not do the same kind of analysis for days of the week because of data reliability problems.

and 99 percent. As mentioned previously, performance of WSP in this regard, as is indicated by our analysis and by data from the CAD system, is likely below 50 percent. PAM would need to be modified with additional tables for lower percentages in order to “run the model backwards” to estimate actual performance based on current or reduced levels of staffing.

A more detailed discussion of model elements is contained in Appendix 4.

CHANGES IN WSP INPUTS

The following changes to how WSP inputs data into PAM would have the result of making model outputs more accurately descriptive of the performance that would actually be achieved based on alternative staffing levels.

Changes to inputs would improve model accuracy

- PAM instructions ask the user to enter the average number of hours that a trooper works during a year. According to the model instructions, “[t]his number should include both regularly scheduled on-duty time and paid overtime.”¹³ As previously indicated, WSP has not been entering the time spent on overtime related to patrol. The reason for including overtime is because the data reported for use in PAM reflects time and activities associated with the overtime.
- WSP policy is to set the ratio of sergeants to troopers in PAM at 1 to 8. PAM also provides for the input of the percentage of field supervisor on-duty time spent on patrol activities. In WSP’s use of PAM, the supervisory percentage is not used, nor is the data concerning their activities. If the percentage and activities for sergeants were used, the model outputs would reflect actual agency performance more accurately.

A similar situation to supervisory time exists with respect to CFS handled by troopers who are not regularly assigned to particular APAs. Motorcycle officers are probably the best example. While

¹³ PAM Version 4.0, p. 3-4.

not including their time and activities results in an incomplete picture of reality, including them in the model could be problematic because the time and location of their activities varies. We do not recommend including such time and activities as model inputs as long as the data from the CAD system that is used to validate the model similarly excludes them. Subsequent model validation efforts, however, may suggest a need to include them.

MODEL IMPLEMENTATION AND VALIDATION

Our review of PAM and WSP's use of it shows that the outputs from the model have not been valid indicators of patrol performance or patrol staffing needs.

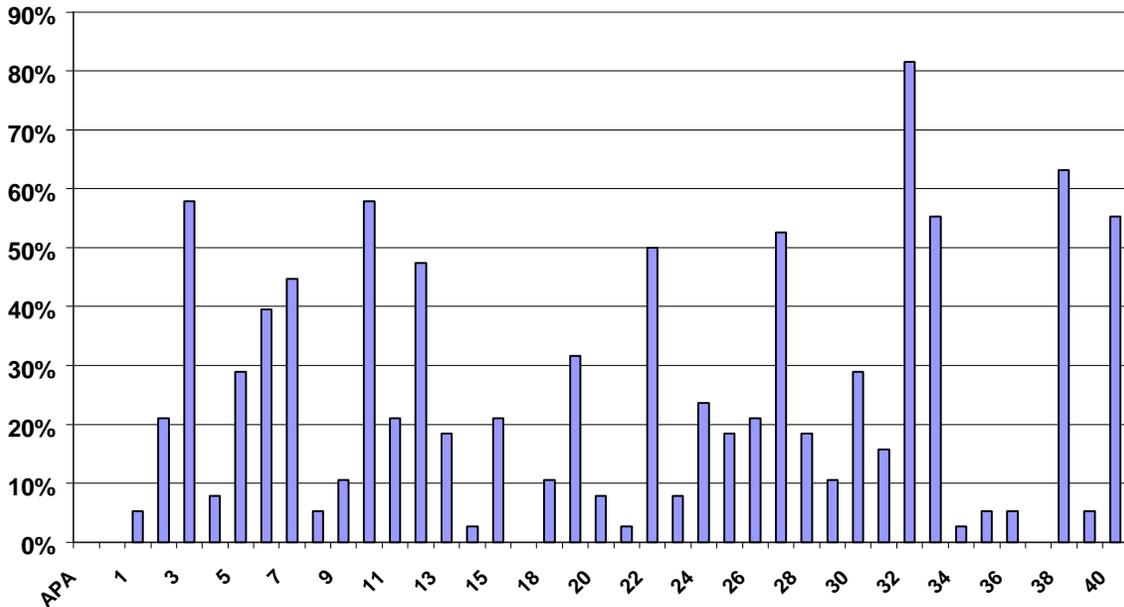
In this audit we have made some of the major and obvious corrections to WSP's inputs and model usage (e.g., using the correct tables and counting overtime and all reported time related to SICs). When we compared the new outputs to data from the CAD system, showing trooper response availability for the same period, we found very little association.

The statistical tests we used to reach this finding are discussed in detail in Appendix 5. Perhaps the best visual representation of the data comes from the comparison of the ranking of APAs by relative staffing needs according to PAM, and relative performance (response availability) according to data from the CAD system. One would expect there to be a high degree of association between these rankings. Exhibit 3 shows how far, in terms of percentages, the two rankings for each APA diverge.

Little
association
between
model outputs
and historical
data from
CAD

Exhibit 3

**Percentage Differences between PAM and Historical Data
by Patrol Area**



Source: WSP PAM and CAD data for FY 1997.

As an example of how to read this chart, for APA 37 there is an exact match between its ranking in terms of staffing needs and relative performance, and therefore there is no bar on the divergence scale. In contrast, for APA 32, the rankings are quite different (82 percent toward being completely different), and the bar on the divergence scale is quite high.

For the model to be useful and reliable in answering questions about how performance by APA might vary given different levels of trooper staffing, a high degree of association between model outputs and historical data would have to be present. Since this has not been shown to be the case, there is clearly a need to conduct further validation of the model and to identify all the reasons why model outputs and data from the CAD system do not have a stronger association.

The municipal version of PAM has features that could possibly make it a more appropriate tool for WSP, especially if the agency

refines performance measures by focusing on performance in relation to call priority. If either version of PAM were to be used in the future, however, the modifications and changes to model usage explained in this chapter and in Appendix 5 would need to be made.

Alternatives

We foresee two alternative courses of action that can be taken in order to achieve the objectives set by WSP and the legislature for a staffing and deployment model:

1. Repeat the process followed in the 1991 LTC study where an independent consultant would evaluate the various types of available models and make a recommendation on one that would best meet the state's needs.
2. Work with the existing model (or more particularly the municipal version of it) and make necessary changes so that model outputs regarding performance are closely matched to actual performance.

An advantage to the first approach is that WSP would learn about the variety of models that may be available now, which is nine years after the last search for a model suitable for Washington State.

An advantage to the second approach is that WSP has experience with PAM and has set up systems and procedures to feed information into the model. Reworking the model and changing inputs may produce outputs that more closely match actual performance. If this reworking is successful, it may not be necessary to evaluate a number of different models. For this option to work, however, WSP would need to seek outside assistance. Consideration should be given to contracting with the author of the model or another professional with appropriate expertise who is familiar with PAM.

Our opinion is that the second course of action—working with PAM—would be the most prudent, given WSP's experience with the model and the opportunity to begin reworking the model almost immediately. Whatever course of action is taken, we

**Further
work with
PAM would
be prudent**

would stress the need for testing model validity. Our recommendation is essentially the same as that from the 1991 consultant study sponsored by the LTC.

Recommendation 1

The Washington State Patrol should make corrections to its use of the Police Allocation Manual, and should seek expert assistance in making the kinds of modifications to the model that have been identified in this report. Following these changes, the model should be validated to ensure that it replicates reality. Any major discrepancies should be analyzed to determine which variables are causing the differences. An independent review of the validation test should be provided to ensure model credibility.

If the model can calculate staffing levels with reasonable accuracy for past and/or current service levels, using reliable historical data, it will have met its most critical test.

PERFORMANCE MEASURES

Current performance measure is useful but also has some weaknesses

In past years WSP listed “percent of CFS where trooper will be available to respond” as an outcome measure within its performance measurement system.¹⁴ WSP’s preference is to attain an average response availability of 80 percent. However, the agency has recognized that the effective policy with regard to this objective is whatever estimated response availability would correspond to funded trooper staffing levels.

As a performance measure, average response availability is useful, but also has some weaknesses:

¹⁴ See for example, the agency’s FY 1997-99 Budget Request Form B11, “Performance Measures.” OFM and LTC staff, as well as WSP, have described PAM outputs as a cornerstone of performance-based budgeting for the Washington State Patrol. In the material WSP uses to provide an overview of PAM, the model and its outputs are described as a means of justifying budget requests and measuring performance budgeting (“PAM” Police Allocation Model: Overview, 1998, WSP).

- It has been used as a means of tying performance outputs to funding and staffing levels. In this respect it is a useful tool for the legislature because it enables decision-makers to know (assuming the output information is reliable) what kind of return the public can expect to receive from the investment of their tax dollars. (It is similar in this respect to the Maintenance Accountability Process used by the Department of Transportation.)
- However, response availability is an *output* rather than a true *outcome* measure. It has not been correlated to a final result, such as accident reduction, fewer fatalities or citizen satisfaction.
- Since this performance output is tied to funding and staffing levels, which are ultimately determined by the legislature, it does not directly relate to WSP's own performance.
- Finally, the current measure of availability to respond to CFS does not distinguish between priority of calls. Presumably, policy makers would want better performance for higher priority calls.

To the extent an agency is to be held accountable for improving its performance, the performance measures used should be related to outputs or outcomes that can be affected by the agency itself. In the case of response availability, WSP could be held accountable for improving its response availability for high priority calls within any staffing level that is provided. For example, with information about priority calls, WSP might find ways to change trooper schedules, to the extent that doing so would not jeopardize other operational needs.

Linking performance measurement to outputs and outcomes within WSP's purview would also serve to demonstrate and give credit to the agency for the initiatives it takes to use technology to increase productivity. The Patrol's utilization of Mobile Computer Technology (MCN) is just one example. With this technology, troopers can make data inquiries on driving records, warrants and car plates. It also allows for car-to-car computer messaging. A result is that troopers can spend more time patrolling and less time performing administrative tasks.

Focus should also be on performance within WSP's purview

**Richer
performance
information
now
available**

Thanks to information now being generated by the CAD system, WSP has information on response availability by priority of call as well as response times, by priority, related to traveling to incidents. Although such measurements are still performance outputs, their richer detail may allow WSP in the future to tie these outputs to measurable outcomes. This new information may also allow more flexibility in how performance is measured. For instance, an advantage of response time, which was not previously available, is that different time objectives can be established for different APAs in recognition of their individual characteristics. More rural APAs that have longer traveling distances might be held to a different standard than urban APAs.

More information, and a discussion concerning WSP's performance in relation to these measures, are included in Appendix 6.

Recommendation 2

The Washington State Patrol should establish performance measures for Patrol that are related to outputs or outcomes that can be affected by the agency itself. Initial areas to focus on should include response availability by priority of call and response time, taking into consideration the characteristics of individual autonomous patrol areas.

COMPENSATION ISSUES

Chapter Two

SUMMARY

This chapter reviews compensation issues and practices at the Washington State Patrol (WSP). We focused our review on salary setting practices and overtime use in order to respond to specific questions posed in these areas to the audit team.

We began our audit of compensation issues and practices by looking at the WSP salary setting process for the 962 commissioned full-time equivalent (FTE) staff budgeted for fiscal year 1999. We reviewed the agency's compliance with statutory requirements for its compensation practices and examined the prevalence of specialty, education, and incentive pay. We also conducted a survey of 41 state patrol organizations in other states. This included a review of specialty and educational incentive pay practices and trooper turnover rates.

We found that the agency is complying with all statutory requirements in its compensation practices. In comparison with most other states, a higher proportion of WSP commissioned staff receive some type of specialty or educational incentive pay, and trooper turnover was found to be lower.

This chapter also provides descriptive information concerning the use of overtime and compensatory time by current and recently retired commissioned staff. This includes analysis of the impact of the use of overtime on pensions, both in terms of added pension benefit to the individual and the resulting cost to the state. We determined the amount of overtime attributable to Department of Transportation (DOT) contracts, and reviewed the policies and controls relating to contract and other overtime assignments.

**This chapter
answers
several
questions
about WSP
compensation
practices**

Overtime can significantly impact retirement benefits

The audit found that paid overtime and compensatory time hours worked by individuals approaching retirement were higher than hours worked by other commissioned staff who worked overtime during the same period. Paid overtime and compensatory time increase the average commissioned staff's pension by 14 percent. This finding is based on information for those commissioned staff who retired from July 1995 through March 1998. DOT contract overtime accounted for 35 percent of that overtime. Agency policies and procedures relating to certain types of overtime were found to be inconsistent between districts and allow employees to make individual choices about whether they will work overtime. This situation, combined with the magnitude of the impact overtime can have on an individual's retirement benefit, creates an additional incentive for working overtime for those who are approaching retirement.

Agency overtime controls should be strengthened

We make two recommendations concerning strengthening agency controls on assignment of overtime. This includes developing district overtime rotation practices that address performance considerations such as coverage and response times to high priority CFS.

Finally, during the course of this audit we engaged the Office of the State Auditor to review the agency's practices of hiring WSP Retirement System retirees into Public Employees Retirement System Plan 1 (PERS 1)-eligible positions. Together with the State Auditor's office, we reviewed the controls relating to post-retirement hiring practices, retirement eligibility, and whether there are any additional costs to the state associated with the pension policy that allows the rehiring of retirees.

We found that WSP post-retirement hiring practices are proper and do not result in additional salary costs to WSP, or in a material benefit cost increase to the pension funds. However, the policy may provide a disincentive for individuals to remain employed as WSP commissioned officers because of the additional income and benefits that are received when compared to remaining as a commissioned officer. The agency did share their perspective concerning the benefit of hiring experienced, trained staff into the non-commissioned positions.

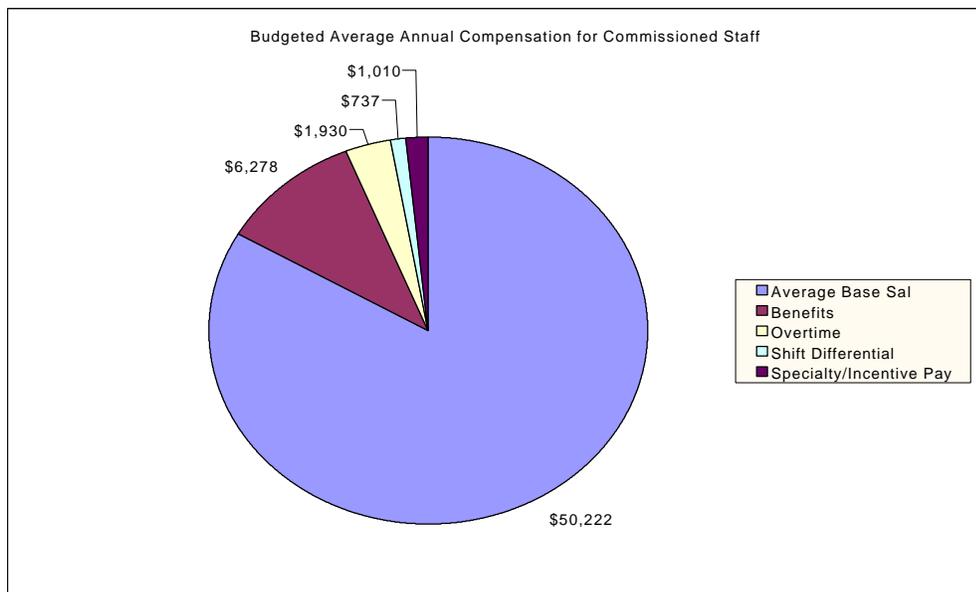
BACKGROUND

The Chief of the State Patrol is the head of the civil service system for the commissioned officers of the WSP. The Chief sets the pay, rank, and advancement schedule for commissioned officers. This authority is granted under RCW 43.43.020. WSP merit system employees are covered under regular merit system rules. Salary setting is also governed by RCW 41.06.167. This requires that the WSP (in consultation with the Department of Personnel) conduct a comprehensive compensation survey for officers and entry-level officer candidates. This is done once every two years. The results of the survey and supporting documents are used by WSP in preparation of budget requests to support the Chief’s compensation plan. A copy of the data and supporting documentation is provided to the LTC and legislative fiscal committees.

State Patrol commissioned staff receive a base salary. Over one-half of the FTEs also receive some combination of longevity, educational incentive, specialty, and shift differential pay. For fiscal year 1999, the average budgeted salary and benefits for commissioned officers is \$60,176 and is broken out as follows in Exhibit 4:

Over one-half of commissioned FTEs receive incentive pay

Exhibit 4



Source: JLARC.

We reviewed fiscal year 1999 budgeted dollars for specialty pay. Specialty pay is provided for certain specialized assignments. Nearly 18 percent of the budgeted FTEs receive some type of specialty pay. These are for a variety of specialized duties with the majority categorized as detectives or motorcycle officers.

Our survey of other states found that 85 percent¹⁵ provide some type of specialty pay. Most provide specialty pay to between 1 and 15 percent of their commissioned workforce.

WSP commissioned staff receive educational incentive pay of 2 and 4 percent for Associate's and Bachelor's degrees. The payroll system does not differentiate incremental increases to salary due to individual pay provisions. Therefore, we were not able to determine the amount of educational incentive pay provided to WSP commissioned staff.¹⁶ Eighty-two percent¹⁷ of the states that responded to our survey reported that they do not provide educational incentive pay.

WSP trooper turnover rate lower than that of other states

During the pre-audit phase of this review, some concern was expressed that comparatively low salary levels could contribute to high turnover rates among troopers. Based on our review, however, trooper turnover rates were lower than those in other states and lower in all but one of the four local law enforcement agencies in Washington State we surveyed.

According to data provided by the Patrol, the total turnover rate among troopers has averaged 4.4 percent over the past three fiscal years. (The rate due to resignations—as opposed to retirements or dismissals—has averaged only 0.9 percent.) We checked with four local law enforcement agencies in Washington, including the Seattle and Spokane Police Departments, and the King and Pierce County Sheriff's Offices, and all but the Pierce County Sheriff reported a higher turnover rate than that of the Patrol. We also inquired about turnover rates in our survey of

¹⁵ Twenty-six states responded to our survey question regarding specialty pay. Six indicated they do not provide specialty pay to their staff. Of the remaining 20, 17 provide specialty pay to between 1 and 15 percent of their workforce.

¹⁶ Incentive pay records are maintained on an individual basis (individual source records in personnel files).

¹⁷ Thirty-nine states responded to our survey question regarding educational incentive pay. Of those, 32 responded that educational incentive pay is not provided to their staffs.

other state patrol-type agencies. Among the 31 states that provided a specific response, 23 reported a higher turnover rate while only 8 reported a lower turnover rate.

In summary, we found that compensation practices at the WSP are consistent with statutory requirements. Statutory authority is provided to the Chief to set pay, rank, and advancement schedules for commissioned officers, and salary survey information is gathered and used in developing compensation plans and budget requests. The results of those surveys are shared with legislative decision-makers. Finally, the compensation system for WSP commissioned staff provides a number of ways commissioned staff can enhance base salaries, and in comparison with other states and other Washington State law enforcement entities, trooper turnover rates were not found to be high.

**Compensation
practices
consistent
with statutes**

OVERTIME USE

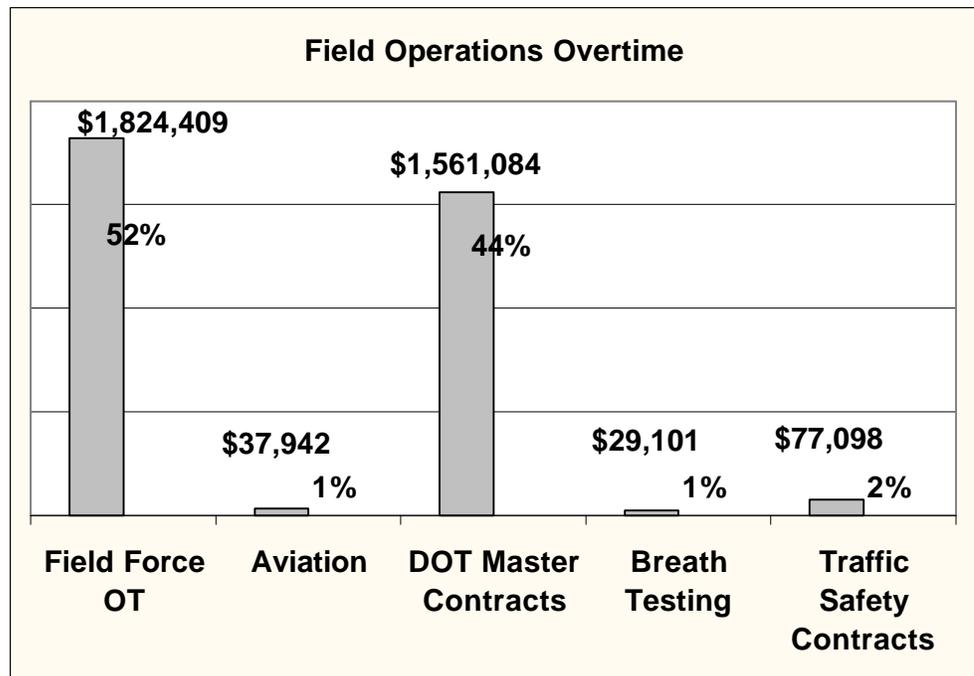
Questions were posed to the audit team concerning the use of overtime at the WSP. We were asked to what extent overtime increases commissioned staff's pensions, and how much of the overtime being worked is attributable to Department of Transportation contract overtime.

We began our overtime analysis by reviewing the agency's overtime expenditures in the Field Operations section, which is the area of the Patrol where most commissioned staff overtime is worked. We then reviewed the pension policy, agency policies and procedures, as well as collective bargaining agreement provisions relating to overtime. Next, we analyzed the type, purpose, and amount of overtime worked by persons who retired between July 1, 1995, and March 31, 1998. The same analysis was then conducted on overtime data for currently employed troopers and sergeants and compared to the overtime activity of the group of retirees. For the retirees, we identified the impact of overtime on individual pension benefits and the resulting cost impact to the state.

The expenditures in fiscal year 1998 for Field Operations overtime were over \$3 million. A portion of those expenditures were reimbursed by the Department of Transportation for

contracts it holds with the WSP to provide a variety of traffic control services at construction sites and for special events. Also reimbursed are overtime expenses for specific federal grants. The year-end accounting system reports do not differentiate between all of the overtime expenditures attributable to each one of the contracts, grants, and interagency agreements. However, the larger-size contracts and grants can be identified in the fiscal year 1998 expenditure information as follows in Exhibit 5:

Exhibit 5



Source: JLARC.

RETIREMENT IMPACT

WSP commissioned staff are in the WSP Retirement System (WSPRS). This system provides retirement at 25 years of service without a minimum age provision, or at 55 years of age with no minimum amount of years of service. Monthly retirement benefits are calculated as a percentage of the highest earnings in a 24-month period of employment. An average final compensation is calculated based on the regular earnings and

cash outs for annual, holiday¹⁸, and compensatory time. Overtime that is worked in the highest 24-month earnings period of employment is included in calculating average final compensation. The monthly service retirement benefit is calculated using the following formula:

Months of service ÷ 12 x 2 percent x average final salary

EXAMPLE: RETIREMENT WITH 25 YEARS OF SERVICE CREDIT

An individual retires with 300 months (25 years) of service credit. Monthly average final salary is \$4,000. The monthly retirement benefit will be \$2,000. Here is how it is calculated:

300 months ÷ 12 = 25 years
 25 years x 2% = .50
 .50 x \$4,000 = \$2,000

In our survey of other states, 35 percent¹⁹ of them indicated that overtime paid by another agency on a reimbursement basis impacted retirement benefits. We did not assess the impact of overtime on those states' pension systems.

WSP provided overtime, holiday credit, compensatory time, leave, and cash out data for commissioned staff who retired between July 1, 1995, and March 31, 1998. The Office of the State Actuary provided average final compensation, retirement effective date, and benefit data for those same retirees. There were 90 individuals in our analysis group.

For each retiree we calculated the regular annual salary (that is the salary excluding paid overtime and other cashouts) for the 24-month period prior to each person's retirement effective date. We

**WSP and
State Actuary
provided data**

¹⁸ Holiday credit is a form of compensatory time that can be taken at a later time for time worked on a holiday. The holiday credit is recorded at time and a half. See WAC 356-15-030(a). Officers may accumulate a maximum of 80 hours of holiday credits and shall be paid for all holiday credits when separating from the department. In the case of retirement, only those hours accrued for holidays actually worked during the 24 months on which retirement benefits are based are used to compute average final compensation.

¹⁹ Ten of 28 states responded to our survey question that retirement benefit is influenced by overtime paid by another agency.

ran this data through a retirement model²⁰ that calculated the retirement benefit each person would receive prior to all cashout and overtime earnings. Then, each retiree's actual average final compensation was put through the model. We then calculated the present value²¹ of the retirement benefit for the regular salary, and then for the average final compensation. For reporting purposes we present our findings by weighted average for our analysis group.

FINDINGS

Are there incentives that may generate overtime use?

Overtime incentives identified

Retirement incentives may generate overtime use. The present value of compensation received during the highest 24-month earnings period of employment is worth more to an employee than compensation earned in prior employment years. This is because of the retirement benefit an employee will receive based on those earnings. If a WSPRS member employee actually received the present value of each overtime hour worked during that period, the present value to the recipient would be 8.14 times the regular hourly rate.

What is the impact of overtime on employee's average final compensation and retirement benefit?

Overtime and cashouts increased AFC by 23 percent

The average WSPRS retiree had an estimated regular salary of \$46,977 and an average final compensation of \$57,633, which was 23 percent above the final two-year regular salary. An estimated 61 percent of that 23 percent was attributable to overtime earnings in the last two years of employment. Persons within the analysis group raised their average final compensation from 3 to 50 percent with cashouts and overtime earnings. The quartile distribution of the analysis group is as follows in Exhibit 6:

²⁰ This retirement model was developed by JLARC and validated by the Office of the State Actuary.

²¹ Present value is a way of calculating the time value of money. The present value is determined by discounting future dollars by the rate that represents the personal cost of capital or opportunity cost of an investment. We used a discount rate of 7.5 percent (which is the same as that used by the State Actuary). Present value presented in this analysis is in 1998 dollars.

Exhibit 6

ANALYSIS GROUP INCREASE BY QUARTILE	
Quartile	Average Increase
1	36 %
2	25%
3	19%
4	13%

Source: JLARC.

The overtime impact, together with the other cashouts included in the average final compensation, increased the annualized²² retirement benefit by \$5,764 or 23 percent above what the benefit would have been had it been calculated on the regular pay. The portion attributable to overtime and compensatory time-only increased the annualized retirement benefit by \$3,519 or 14 percent over what the benefit would have been had it been calculated on the regular pay.

**Overtime
increased
retirement
benefit by 14
percent**

What is the comparison of the retirement benefit to the regular salary received prior to retirement?

The WSPRS provides that an employee can receive up to 75 percent of their *average final compensation* in retirement benefits. On average we found that the first year retirement benefit for WSPRS retirees is 71 percent of their regular salary. It is possible for a WSPRS retirees' pension benefit to nearly be equal to, or greater than their regular pre-retirement salary.

What is the impact of the overtime earnings to the state's contribution rate to WSPRS? (WSPRS employee contribution rates are fixed in statute.)

The total present value of overtime earnings for the retirees in our sample is \$8,430,327. Pension benefits are paid for overtime

²² The annual equivalent takes the present value of the cash flows of the retirement benefit and then translates this present value into an escalating payment. This escalating payment has the same present value as the cash flows within the same period of analysis. Use of this annualized equivalent gives a truer picture of the annual benefit to the retiree because it takes into account the decreased buying power of the benefit due to inflation. The alternative of presenting the first year benefit payment as representative of all future payments would overstate the value of the benefit to the retiree.

\$1.3 million obligation to the state

as a percentage of current employee's salaries. The Office of the State Actuary calculated 1.26 percent as the percentage of total salaries which equates to \$8.4 million. The employer contribution for State Patrol benefit payments come partially out of the general fund and partially out of the Motor Vehicle Fund. This obligation represents FY 99-01 biennial costs to the state of: \$80,000 to the general fund and \$1,230,000 to the State Patrol Highway Account.

What is the type and purpose of overtime and compensatory time worked, and what proportion is attributable to contracts?

Call-out most common type of overtime

Hours worked, including overtime and compensatory hours are recorded in the agency's Time and Activity System (TAS). Staff code the type of overtime and compensatory time worked to five categories, with the highest proportion (41 percent) coded as attributable to call-outs. A call-out is an authorized overtime activity that occurs prior to the start of or after a regular shift. It requires the employee to return to work from an off-duty status. Collective bargaining agreements provide that some types of call-outs provide a minimum of two or four hours of compensation or, if in excess of the minimum, compensation at the overtime rate for actual hours worked. The purpose of hours worked are coded to over 49 activity categories. We reviewed the purpose of the overtime worked for the 90 retirees in our sample and found that most were coded to ten activity categories with the highest three being: CFS (24.38 percent), general management (19.77 percent), and patrol (6.38 percent). Appendix 7 provides a summary of the top ten purposes that overtime was coded to for the retirees in our sample.

WSP explained that coding to general management may be a result of overtime worked by commissioned headquarters and academy staff. The purpose of general management overtime coded in the field could be attributable to activation of a headquarters command post for reacting to a major event such as fire or floods, duty officer responsibilities, or possible miscoding by field staff.

Of the overtime worked by retirees in our sample, contract overtime (overtime primarily for DOT master contracts) represented 35 percent of the overtime worked.

How do the number of hours of overtime worked by persons approaching retirement compare to hours worked by other commissioned staff?

During fiscal years 1997 and 1998, the average current trooper and sergeant worked 121 hours of overtime per year.²³ Commissioned retirees who retired between July 1, 1996, and March 30, 1998, worked an estimated average of 172 hours of overtime per year during the last 24 months of employment prior to retirement, or 42 percent higher than the average.

In order to make the comparison of overtime hours for the retirees with current troopers and sergeants, we had to calculate the number of hours the average retiree worked each year during their last 24 months of employment. To do this, we divided the average regular salary increase for the retirees that was attributable to paid overtime and comp time (\$6506) by 1.67. We used 1.67 (rather than 1.5 for time and one-half)²⁴ because, as explained above, typically there is a portion of the overtime compensation for which an individual receives a minimum of two or four hours of pay.

Agency staff asked us to test the hypothesis that younger staff tend to work a higher amount of overtime than their more senior counterparts. We tested this observation by correlating the monthly salary with hours of overtime worked for the 66 sergeants, and a random sample of 122²⁵ of the 560 troopers who worked overtime in both fiscal years 1997 and 1998. Although we did not have date of birth/age information for the troopers and sergeants in our data, we did have monthly salary information. One could reasonably assume that a lower monthly salary is likely associated with an entry level, therefore younger, employee.

Persons
approaching
retirement
worked more
overtime ...

... as compared
to other
commissioned
staff

²³ This data does not include all persons who were eligible to work overtime, but rather only those who worked overtime during this period, and may contain individuals who are within their last 24 months of employment with the WSP.

²⁴ If we were to use the standard 1.5 overtime multiplier that is used by the agency for budgeting purposes, the overtime hours worked for the average retiree would equate to 192 hours per year during the last 24 months of employment prior to retirement.

²⁵ A random sample of 122 of 560 troopers has a 95 percent confidence level with possible error of 8 percent.

To the extent that there is any association between salary and overtime hours for the current troopers and sergeants, it is very slightly in the direction of more overtime hours associated with higher salary.²⁶

In conclusion, we found that the average current trooper and sergeant works less overtime per year than did the average retiree in our sample in the two years prior to retirement. Further, we found lower paid troopers and sergeants are not working more overtime than those in higher salaried positions.

What controls does the agency have in place for rotation of overtime assignments?

The WSP Regulation Manual, Section 5.07.020 provides directives regarding the use of overtime. It states that any commissioned officer may receive overtime with the express approval of the Chief or designee, and requires that officers shall get pre-approval from a supervisor prior to working overtime if a supervisor is on duty. The regulation also provides for situations where if an officer is unable to contact a supervisor for pre-approval of unanticipated overtime, the officer can still work the overtime and be paid for the necessary overtime.

Call-out
overtime
policies
reviewed

We reviewed district policies and procedures relating to rotation practices and assignment of call-out overtime. As explained earlier in this chapter, call-out overtime accounts for the highest proportion of the type of overtime worked by commissioned staff.²⁷ Call-out overtime can be for a variety of purposes including responding to CFS and collisions. For descriptive purposes we refer to this as “regular” call-out overtime. Call-out overtime is also the type of overtime DOT contract assignments are coded to. Officers voluntarily sign-up to be on a rotation list for DOT contract overtime assignments. We reviewed district policies and procedures relating to rotation and assignment practices for both regular call-out overtime and contract overtime.

²⁶ Multiple R 0.1279; R Square of .0016, Total observations 188. Since the number of retirees within the sample for this correlation is zero, they had no effect.

²⁷ Call-out overtime is overtime which requires an employee to return to work from an off-duty status.

REGULAR CALL-OUT OVERTIME POLICIES

Three of the eight districts have a written policy in place that directs on-duty supervisors in their decisions of calling out a trooper or sergeant. The policies have provisions that describe a rotation process for selection of a trooper/sergeant based on shift start and end times, geographic location of the incident, priority of the incident, and limiting response time. Provisions such as these provide for controls in terms of rotation of call-out assignments based on criteria appropriate for the district. They also address performance considerations such as coverage and response times relative to priority of the call.

Call-out rotation controls

Finding

The general overtime policy in the WSP Regulation Manual is broad because it is written to be applicable for all districts. It does not provide the level of specificity that would include rotation practices for call-out overtime. Due to variations between the districts in staffing, geography, and types of services provided based on client needs, it is appropriate that policies and procedures addressing regular call-out rotation be created at the district level. This is consistent with other district-specific management practices, such as different approaches to court overtime scheduling because of varying practices of the court districts.

Controls in terms of rotation of the call-out assignments among officers, and performance considerations such as coverage and response times relative to priority of the call, presently are left to individual on-duty supervisor discretion in five of the eight WSP districts.

Recommendation 3

The Washington State Patrol should pursue implementing district policies relating to regular call-out overtime. These policies should provide controls in terms of rotation of call-out assignments, and address operational considerations such as how call-out policy affects response time by priority of call.

CONTRACT OVERTIME POLICIES

Inconsistency in district contract overtime policies

We reviewed contract overtime policies and procedures for each of the eight districts. Districts have similar approaches that individuals follow to voluntarily sign up to be placed on a rotation list to work contract overtime assignments. As expected, there were some differences in rotation practices among districts that related to staffing and geographic considerations. We found some inconsistencies in the policies. We brought these to WSP's attention, and they indicated they would be following-up on them during the course of the audit.

Breaks in service vary

The first inconsistency relates to the break in service required between contract overtime shifts and regular shifts. Some of the district policies required an eight-hour break in service between regular shifts and contract overtime shifts in order to address safety considerations (fatigue) of officers. It is reasonable to assume that an officer may be at safety risk or may not perform to a normal standard if fatigued from working regular and contract overtime shifts without a sufficient rest period before returning back to a regular shift. Other district policies require only a four-hour break in service between regular and contract overtime shifts. Collective bargaining provisions require a four-hour break in service. Consistent with that provision, the WSP Regulation Manual 5.02.22 limits the off-duty employment of officers to no more than 8 hours per work day, not to exceed 24 hours during the work week (excluding days off), with the employment ending at least four hours prior to the beginning of a shift. This means that an individual can work an eight-hour regular shift, work an eight-hour contract overtime shift, have a rest period of 4 hours, then return to an eight-hour regular shift.

The second inconsistency relates to prohibition of self-reassignment of contract overtime. As discussed above, all districts have a similar approach for persons to voluntarily sign-up to be placed on a rotation list to be called-out for contract overtime assignments. Half of the districts have provisions in their policies where if an individual accepts a contract overtime assignment, then finds he or she cannot work the assignment, he or she must notify a contract overtime coordinator and that coordinator will reassign the contract overtime to the next available person on the rotation list. These four district policies provide reference to a prohibition of “self-reassignment.” The other four districts do not have provisions to prohibit, nor do they make mention of self-reassignment of contract overtime. This issue was raised by a WSP internal audit conducted in fiscal year 1997.

WSP acknowledges the discrepancies in the policies regarding self-reassignment and the requirements for either eight- or four-hour breaks between regular shifts and contract overtime assignments. During the course of the audit, WSP stated their intention to send an “Interoffice Communication” and discuss with district commanders “...expectations of district compliance with the policy.” The WSP also stated that guidelines and policy regarding self-reassignment of contract overtime would be discussed.

Recommendation 4

The Washington State Patrol should continue to pursue consistency and compliance in its policies for operations of contract overtime. Controls prohibiting self-reassignment of overtime should be present within policies of each district.

Note: Although we are not making a recommendation concerning breaks in service between regular shifts and contract overtime shifts, if the department has identified safety or performance issues associated with current agency regulations and collective bargaining agreement provisions, we propose that this be addressed with the collective bargaining unit.

Inconsistent
reassignment
policies

WSP
acknowledges
discrepancies

POST-RETIREMENT EMPLOYMENT WITH WSP

Is post-retirement employment being conducted for the benefit of the state? And is there an added cost to the state for this practice?

Some WSPRS retirees return to work at WSP in PERS 1 positions

In the course of our review of overtime use by 90WSP Retirement System (WSPRS) retirees, we found that 40 percent of those individuals had returned to employment with the State of Washington in Public Employee Retirement System Plan 1 (PERS 1)-eligible positions. Of the 90, 27 percent had returned to employment with WSP. Most were rehired within six weeks of retirement from WSP.

After making this observation, we engaged the Office of the State Auditor to review the agency's rehiring practices and retirement eligibility criteria. We reviewed whether there are any additional costs to the state associated with the pension policy and agency hiring practices. As described earlier, we also quantified the incentive to the individual of retiring from the WSP in a WSP Retirement System-eligible position and then becoming rehired into positions with the WSP under the PERS 1 system.

WSPRS allows retirees to maintain their full retirement benefit and obtain employment with the state in a non-WSPRS position. WSPRS and the Law Enforcement Officers and Fire Fighters system (LEOFF1, which is now closed), are the only retirement systems that permit this.

WSP rehiring practices are proper

The State Auditor found that the rehired employees' eligibility for PERS1 was appropriately determined and that the agency's post-retirement employment practices were proper. The Auditor's testing indicated that a vast majority of persons hired into a specific unit were previously commissioned WSP officers, and that 21 of the 25 rehired employees reviewed were hired into one specific unit at the WSP.

We did not find that there is an additional salary or material benefit cost increase to the state of the pension policy and subsequent WSP post-retirement employment practices. This is because the positions filled by the WSP were existing vacant

positions. Therefore, the state would incur salary and benefit costs for the positions regardless of whether they were filled by WSP retirees or individuals from outside the agency.

However, as explained below, there is a disincentive for individuals to remain employed as WSP commissioned officers. The loss to the state then is a portion of its training investment and staff experience in a particular field.

There is a disincentive for the average WSPRS retirement-eligible employee to remain in a commissioned position. This is because they can, on average, realize an additional \$183,146 (present value) or an additional \$11,425 (annual equivalent) per year for the remainder of their life for retiring from the WSP and becoming rehired by the WSP in a PERS 1-eligible position.²⁸

We provide the above information because prior to this, rehiring practices had not been reviewed by the State Auditor, nor was the extent of rehiring fully known by the Office of the State Actuary. The agency does make note that from their perspective, there is a benefit to hiring experienced, trained staff into the positions.

**Disincentive
to remain
commissioned
officer**

²⁸ Based on working 13 years in the PERS1-eligible position.

PATROL ACTIVITIES ON COUNTY ROADS

Chapter Three

INTRODUCTION

The primary responsibility of the Washington State Patrol (WSP) is to provide traffic related enforcement services on state and interstate highways. Even though it has no specific mandate to do so, the Patrol historically has also provided some services on county roads. In January 1998, feeling that the current trooper response level on state and interstate highways was below acceptable levels, the Legislative Transportation Committee (LTC) directed the Chief of the State Patrol to take certain actions to limit county road activities.²⁹

This chapter explores the extent of service level reductions on county roads that might be expected to result from implementing LTC's directive, in order to help assess the impact it could have on future Patrol operations.

BACKGROUND

The Patrol has characterized its provision of service on roads other than state and interstate highways as follows:

“ . . . at the request of other local law enforcement agencies, troopers will respond to any collision or incident that requires specialized equipment and expertise. If there is no deputy available to conduct a collision investigation, the State Patrol will also respond to collisions on county roads.”

²⁹ This directive was communicated in a letter signed by the Chairs and Ranking Minority Members of the House and Senate Transportation Committees, as well as the Co-Chairs of the WSP Working Group.

LTC has directed the Patrol to reduce county road activities

County road contacts have been decreasing

The Patrol's goal is to limit statewide calls-for-service on county roadways to no more than "ten percent of all law enforcement activities." It measures this by calculating "county road contacts" as a percentage of all contacts. As recorded in its *Time and Activity Reporting System*, "contacts" are broken down into three main types: collision investigations, other calls for service, and self-initiated contacts. According to the Patrol's data, county road contacts as a proportion of all contacts has dropped from approximately 20 percent in 1990, to between 7 and 8 percent over the past four years.

In terms of total numbers, the Patrol recorded 90,215 county road contacts in FY 1998. To estimate the total equivalent number of troopers devoted to county road activities, the Patrol uses an average of fifteen minutes per contact, and 2,088 hours per trooper per year. On this basis, the Patrol estimates that 10.8 troopers are devoted to county road activities.

As noted, the LTC has directed the Patrol to take certain actions to reduce the Patrol's activities on county roads, effective January 1, 1999. Based upon our reading of the Committee's directive, as well as on conversations with LTC staff, our understanding is that the LTC's expectation is as follows:

Activities to be limited mainly to injury and fatality accidents

Patrol activities on county roads are to be limited almost entirely to just the investigation of injury or fatality accidents. There will be no investigations of non-injury accidents, or routine patrolling of county roads. So-called "self-initiated contacts" are to occur only if a trooper "spots something" while traveling to or from another work-site. Other calls for service are to be similarly limited to what might be considered exceptional circumstances.

In correspondence dated November 2, 1998, the Chief reported that this was consistent with the Patrol's understanding of the LTC's expectations.

ASSESSMENT OF CURRENT SERVICE LEVELS

To quantify the potential impact of implementing the LTC directive, it was first necessary to ascertain the amount of trooper time currently spent on county roads (something more exact than that afforded through using the Patrol's "fifteen-minute-per-contact average").

Although the Patrol's Time and Activity Reporting System (TAS) does maintain data on trooper time by type of activity, that data cannot be extracted separately for just those activities that occurred on county roads. Thus, it was necessary to merge information from two separate data sources. For actual contacts (collision investigations, other calls for service (CFS), and self-initiated contacts), this involved calculating the average amount of time for each type of contact in a given area, and applying that average to the number of contacts of that type that were separately recorded as having occurred on county roads.³⁰

"Patrol" hours were allocated based upon the number of *self-initiated contacts on county roads as a percentage of all self-initiated contacts*. "Administration" hours were limited to the sub-category activities of court time, equipment maintenance and evidence management. These hours were then allocated to county road activities based on the number of *all county road contacts as a percentage of all contacts*. For both patrol and administration hours, all calculations were made separately for each geographic area.

In total, we estimated that in FY 1998, troopers spent 92,399 hours on county road activities. Based on a total of 1,817 hours per trooper per year, which is the average amount actually worked by troopers in FY 1998, this is the equivalent of just under 51 FTE troopers. At an average cost of \$73,126 per trooper per year, which includes regular salary, overtime, benefits and

**An estimated
51 trooper
FTEs used for
county road
activities**

³⁰ Because of some differences in geographic boundaries used in the two separate data sources, it was necessary to group certain counties together, as is shown in exhibits later in the chapter.

patrol car expenses, we estimate the direct annual cost of providing these county road services to be \$3.7 million.

Exhibit 8 shows how the total number of hours are distributed by activity type. Exhibit 9 shows how they are distributed by county.

TARGET SERVICE LEVELS

To quantify the potential impact that might be expected to result from implementing the LTC directive, some “target” level of service needed to be established.³¹ To do so, it was necessary to first establish a common denominator; that is, a measure that would account for differences in traffic volume and roadway miles. With data on vehicle miles traveled by roadway type,³² we translated current county contact numbers—for each contact type and for each geographic area—into “rates per one million annual vehicle miles traveled.”

This allowed us to rank each geographic area in terms of its current “service level” for each contact type. In doing so, it was immediately apparent that there was substantial variation in current contact rates. In particular, some areas had rates that were far in excess of what was typical. Exhibit 7 below provides an example of the high, median, and low rates for self-initiated contacts.

Service
levels based
on rates per
miles
traveled

³¹ The term “target level” is used only as a matter of convenience for referring to potential future service levels. It is recognized that actual service levels will reflect legislative and executive policy decisions.

³² “Approximate Daily Vehicle Miles Traveled,” from the 1997 Highway Performance Monitoring System, Department of Transportation.

Exhibit 7

Example of Current Service Level Rates For Self-Initiated Contacts			
County	Annual Vehicle Miles Traveled On County Roads	Number of Self-Initiated Contacts (SIC)	SIC Rate Per One Million Vehicle Miles Traveled
Pacific (highest)	28,610,525	708	24.75
Thurston (median)	366,086,605	2,051	5.60
Whitman (lowest)	119,540,420	130	1.09

Source: JLARC, based on WSP and DOT data.

Establishing target levels can be done in a number of ways. Initially, we set the target level (for each contact type) at the *lower* of each area’s current number of contacts, or what its number would be if its rate were equal to the **median** of all areas. Because that is the point at which half the areas are above and half are below, it is a level that should not be too difficult to achieve (since, indeed, half of the areas already operate at or below that level).³³

To give a range of possible reductions, we elected to establish a second target level based on the **25th percentile**. This is the point at which three-quarters of all areas are above, and one-quarter are below.

By type of activity, Exhibit 8 shows the total hourly reductions which could be expected under each target level. As can be seen, no reductions are included for injury collisions. This is because the LTC directed the Patrol to continue to provide current levels of service for fatal and injury accident investigations.

Exhibit 9 shows the reductions which could be expected by county in terms of hours, FTE troopers, and cost. Based on the hour and cost figures noted earlier in this chapter (1,817 hours and \$73,126

Report offers two illustrations of possible service level reductions

³³ Using the information from Exhibit 7, the following illustrates how the target level setting process works (based on the “median” target level). Because current rates for self-initiated contacts in Thurston and Whitman Counties are either equal to or less than the median rate, their target number of contacts stay the same as their current numbers; 2,051 and 130, respectively. However, because Pacific County’s current rate is higher than the median rate, its target number is reduced from its current level of 708, to 160, which is what it would be if its rate were equal to the median rate (5.60 x (28,610,525 / 1,000,000)).

FTE trooper reductions: from 14.8 to 22.6

per trooper per year), the reductions in FTE trooper service levels would range from 14.8 to 22.6, with an associated cost impact of from just under \$1.1 million to \$1.6 million, respectively.

Exhibit 8

WSP Workload on County Roads, In Hours Current Level Compared to Two Potential Target Levels By Type of Activity					
Activity Type	Current Hours	Target Hours Based on Median Hours		Target Hours Based on 25th Percentile	
		Hours	Savings	Hours	Savings
Injury Collisions	19,651	19,651	0	19,651	0
Non-Injury Collisions	9,730	1,391	8,339	834	8,895
Other CFS	21,689	16,073	5,615	10,108	11,580
Self-Initiated Contacts	24,409	16,939	7,471	12,375	12,034
Patrol	13,787	9,388	4,399	6,865	6,922
Administration ³⁴	3,133	2,131	1,002	1,554	1,580
TOTAL	92,399	65,572	26,827	51,388	41,011

Source: JLARC.

DISCUSSION

The target reductions presented herein represent potential starting points for determining what might be considered reasonable to expect from implementation of the LTC’s directive. They are limited to the extent they reflect only the measure of service *intensity*, and as such, they implicitly assume that it is appropriate to provide a similar level of service to all localities. The Patrol has noted that there may be legitimate reasons for providing *dissimilar* levels of service in some areas (e.g., due to socioeconomic or demographic variables). We do not disagree. Ultimately, it is up to the legislature to determine what level of service is appropriate, and what factors should be considered in determining those levels.

³⁴ As explained earlier, Patrol and Administration hours were allocated proportionately based upon the number of county road contacts as a percentage of all contacts; for Patrol hours, the calculation was based on self-initiated contacts only, whereas for Administration hours it was based on all contacts. Target reductions in these areas simply reflect a proportionately lower number of the pertinent type of contacts on county roads.

To link to this exhibit, click [here](#).

The LTC indicated in its directive that it was to take effect January 1, 1999. In correspondence, the Chief told us that the Patrol will not be able to fully implement it by that date, and further, that it does not have a “final date for full implementation due to difficulties being encountered in some counties.”

We did not audit what impact implementation of the directive could have on individual counties. We did, however, contact the Sheriff's Office in two counties that rely heavily on Patrol services. In both cases, the individuals we spoke with indicated that implementation of the directive would cause a significant hardship for their counties. Officials in the Spokane County Sheriff's Office reported seeking 15 additional deputies from the County to offset the expected reduction in WSP assistance, while representatives of the Snohomish County Sheriff's Office reported seeking 17 additional deputies for that purpose. It should be noted that these estimates are higher than our estimates of the FTEs currently being provided by WSP, and are substantially higher than the savings in Patrol's FTEs that would result if either of the two illustrative target service levels were achieved (see Exhibit 9).

COMMERCIAL VEHICLE DIVISION TRANSITION PLANNING

Chapter Four

BACKGROUND

In May 1995, the Department of Labor and Industries (L&I) issued a Citation and Notice of Assessment to Washington State Patrol (WSP) operations related to the Commercial Vehicle Division's (CVD) operations. The citation identified safety violations related to the adequacy of personal defense devices and means of self-defense for CVD personnel in the event of assault or other criminal activities. The citation has led to suggestions that CVD personnel be provided body armor, additional training, and protective weapons as a means to improve self-defense.

In February 1996, the WSP and representatives of the three bargaining units of the CVD entered into an agreement to transition unarmed Commercial Vehicle Officers (CVOs) to armed Commercial Vehicle Enforcement Officers (CVEOs). This transition agreement had a short-term component that provided for additional academy training and field coaching. Under this agreement CVEOs are not considered to be fully commissioned troopers, and enforcement powers continue to be limited principally to inspecting commercial vehicles as to compliance with size, weight, and load regulations, and to checking for proper permits and licensing. It is our understanding that the CVD implemented this short-term component of the agreement.

In addition, the agreement provided that over the long-term, fully commissioned officers would fill all CVD position vacancies. Current CVEOs could apply for trooper equivalency training and would be given priority in enrolling in new trooper academy classes. CVD had begun the process of implementing the long-term component of the agreement.

**Labor &
Industries
citations led
to transition
to armed
officers in
1996**

Options for transition were presented to LTC

During the 1998 Legislative Session, a number of bills were drafted proposing that CVEOs be given added powers and duties. While none of these bills passed, the WSP presented a comparison of three transition plan options to the Legislative Transportation Committee (LTC). In addition, a fourth option was developed by a WSP Working Group of the LTC near the completion of our performance audit.

The options are described below.

- Option 1 represents further implementation of the original transition agreement to transition unarmed CVOs to fully armed CVEOs. This option was developed by the WSP.
- Option 2 represents further implementation of the transition agreement to include the opportunity for trooper equivalency commissioning training of additional CVEOs and adding entry level CVO positions. This option was developed by the WSP.
- Option 3 would provide additional commercial vehicle authority to CVEOs, but would provide substantially less additional training than the other options. This option was developed and proposed by the CVEO bargaining units.
- Option 4, developed in November 1998, proposes that the WSP abandon the original plan to transition to fully commissioned officers and that CVEOs fill all open positions. CVEOs would be given additional authority only as it relates to commercial vehicle traffic violations and would not be given additional authority for DUI, arrest, and criminal activities. This option was developed by a WSP Working Group of the LTC near the completion of our performance audit.

We are not aware that any final decision has been made at this time to pursue any of these options as currently defined.

CURRENT ENVIRONMENT AND IMPACT OF TRANSITION OPTIONS

Operations

CVD’s primary mission is to protect the highway infrastructure by enforcing size, weight, and load statutes and to reduce collisions involving commercial vehicles. The division also inspects all school buses and driver education vehicles used to transport students and staff for school-related activities. CVD operations are performed by the following type of units:

- *Interior* - Operates portable, semi-portable, and stationary scales and enforces commercial vehicle regulations at a variety of “interior” locations throughout the state.
- *Ports of Entry* - Operates stationary scales and enforces commercial vehicle regulations at border locations.
- *Compliance* - Performs inspections of operations and commercial motor vehicle equipment at private motor carrier terminal sites.
- *Headquarters* - Provides management and administrative support to CVD operations.

CVD protects highway infrastructure

Staffing

CVD has 174 authorized positions. As of December 4, 1998, CVD had 172 filled positions that are summarized below in Exhibit 10:

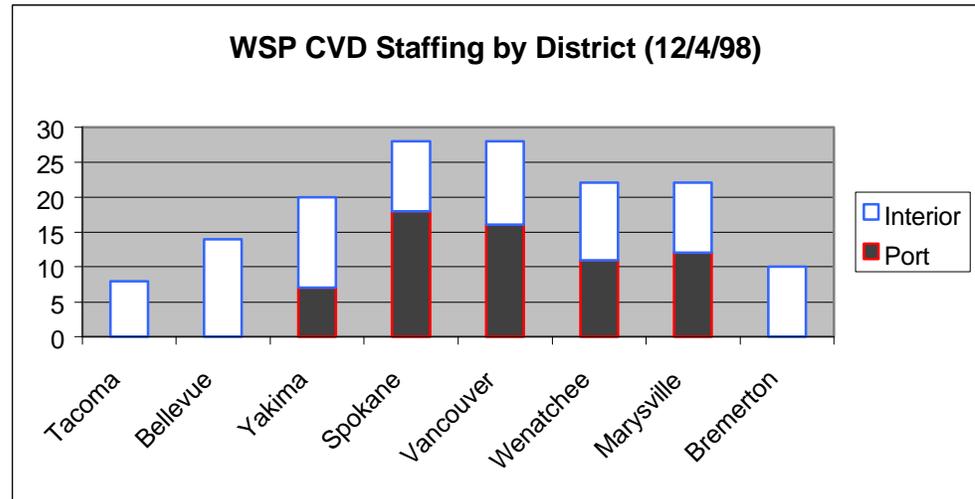
Exhibit 10

	CVEOs	CVOs	Cadets	Total
Interior	70	6	12	88
Ports of Entry	38	3	23	64
Compliance	12	2		14
Headquarters	5		1	6
Total	125	11	36	172

Source: Pacific Consulting Group, Inc., based on data provided by CVD management.

CVD operates in the eight WSP districts with headcount allocated as follows in Exhibit 11:

Exhibit 11



Source: Pacific Consulting Group, Inc., based on data provided by CVD management.

Weighing and Inspection

Washington ranks very high among states in number of safety inspections

A recent CVD Strategic Plan³⁵ indicates that between October 1, 1995, and September 30, 1996, CVD weighed over three million trucks, devoting nearly 95,000 officer-hours to the activity. Four stationary weigh scales (located at the ports of entry) account for 70 percent of all trucks weighed each year, with Vancouver accounting for almost 30 percent with about 800,000 trucks weighed.

In addition to size, weight, and load, Washington State has given a high priority to safety inspections of commercial vehicles and equipment. In the early 1980s, Washington was one of the first states to participate in federal Motor Carrier Safety Assistance Program (MCSAP) grants that funded additional positions to perform safety inspections of commercial vehicles and related equipment. The strategic plan also points out that Washington

³⁵ Washington State Commercial Vehicle Operations Strategic Plan, December 1997.

State ranked second behind only California in total number of commercial safety inspections performed. Such inspections are performed at motor carrier terminals in addition to ports of entry, interior weigh stations, and by mobile patrol units.

Training

Until the transition process began, CVD training was based principally on federal standards developed by the Commercial Vehicle Safety Alliance (CVSA). Most of the training was designed to make CVD officers CVSA certified. Transitioning CVOs to armed CVEOs required additional “arming” training.

The following summarizes approximate total classroom hours of training which were or are considered required for the current enforcement authority and the various transition options.

<u>Training</u>	<u>Hours</u>
Current CVEO training level:	
Basic CVO training	270
CVEO arming training	<u>130</u>
Total CVEO basic training	<u>400</u>
Option 1:	
Initial cadet arming training	352
Subsequent trooper basic training	<u>876</u>
Total for fully commissioned CVD troopers	<u>1,228</u>
Option 2:	
Initial cadet arming training	352
Subsequent trooper basic training	<u>796</u>
Total for fully commissioned CVD troopers	<u>1,148</u>
Option 3:	
Total CVEO current basic training	400
Limited additional enforcement authority training	<u>236</u>
Total for limited authority CVEOs	<u>636</u>

Transitioning results in substantial additional training

Option 4:

Additional training hours are not shown in the current analysis of Option 4, but the document shows total training costs of \$175,000.

The first trooper basic training class accepting CVD cadets who have had the initial cadet arming training began on January 11, 1999. We were informed that 5 CVEOs and 22 CVD cadets were accepted in the training program and transferred out of CVD at that time.

Enforcement Authority

Currently, CVEO and CVO enforcement authority has been limited principally to size, weight, load, and equipment maintenance inspections for commercial vehicles. Even though CVOs who transitioned to CVEOs received additional arming training, they were not granted additional enforcement authority. In situations requiring additional enforcement action (e.g., DUI, speeding, outstanding warrant, etc.), a commissioned trooper must be called in for further action.

Both Options 1 and 2 provide sufficient training for officers to become fully commissioned troopers. They, therefore, would be empowered with full enforcement authority.

Option 3 provides for additional enforcement authority as it relates to commercial vehicles in the areas of moving violations, DUI arrest, warrants, prisoner transport, accident response and assistance, officer assistance, and rendering aid and medical assistance.

Option 4 provides additional authority only for moving violations, accident response (if required) and officer assistance.

Equipment

CVEOs in interior positions use vans that hold portable scales, certain emergency equipment, and other tools. These vehicles are not considered appropriate as pursuit vehicles and are not designed for prisoner transport. Option 3 suggests initially retrofitting 60 vehicles with calibrated speedometers, prisoner

WSP's Options
1 and 2
provide for
full
enforcement
authority...

...whereas
Option 3
provides
additional
authority,

and Option 4
eliminates
transitioning

transport equipment, and preliminary breath testers for a total initial cost of \$41,440. Additional upgrades would occur in future years. Option 4 proposes retrofitting 60 vehicles with calibrated speedometers for a total cost of \$18,000.

Options 1 and 2 contemplate upgrading from vans to acceptable pursuit vehicles that would cost an additional \$10,000 each (i.e., \$30,000 vs. \$20,000).

Salary Costs

Each of the four options includes allowances for increases in salary costs to reflect upgrades to the new positions and/or increases in levels of authority.

WORK PERFORMED

The focus of our review was to evaluate the efficiency and effectiveness of the proposed CVD transition options in addressing the WSP's resource management requirements as well as the Department of Labor and Industries' citation.

To conduct this element of the audit we:

- Interviewed key management of the following areas:
 - Captain and support staff of the Commercial Vehicle Division
 - Commander and support staff of Budget and Fiscal Services
 - Legal Officer, Office of the Chief
 - Information Services Commander
 - Captain and support staff of the WSP Academy Training Division
- Interviewed the following outside of WSP:
 - Department of Transportation CVISN Project Manager
 - LTC staff

- I.F.P.T.E. Local 17 Chapter President
 - Local 17 Union Representative
 - Department of Labor and Industries Field Supervisor
-
- Performed telephone surveys of the commercial vehicle enforcement agencies for Arizona, California, Colorado, Wisconsin, and Texas regarding enforcement classifications, staffing, and other related issues.
 - Reviewed and analyzed a variety of documentation as detailed in this chapter's bibliography.
 - Visited the WSP Training Academy in Shelton and reviewed training operations and curriculum.
 - Performed on-site visits and ride-a-longs with a CVEO; observed operations and interviewed staff at Kelso interior weigh station and Vancouver port of entry scales; observed use of Weigh-in-Motion technology at the Vancouver scales; observed vehicle inspections performed at interior weigh stations and Vancouver port of entry; and observed use of portable scales at remote roadside locations.

FINDINGS

Based on the work performed, we present the following observations:

Department of Labor and Industries Compliance

It appears that L&I's citation precipitated a level of arming and protection beyond the minimum required to effectively address the violations reported. In particular, we believe it is not necessary to require that all personnel be armed in locations staffed by multiple personnel. However, we believe that CVD personnel operating in mobile enforcement units do require adequate training, arming and authority.

Response to
L&I citation
was more than
minimum
required

Interior Locations versus Ports of Entry

There are significant differences in the environment for interior locations compared to ports of entry. In most instances ports have multiple personnel performing a number of functions at CVD fixed stations. CVD interior personnel operate individually or in small teams to perform enforcement activities.

When patrolling, the interior officers' environment is similar to that of a state trooper. The interior position duties, therefore, pose a much wider range of situations to be addressed when compared to personnel at fixed locations.

Conversely, in the larger ports of entry, multiple personnel are present and they operate in a more controlled environment. This environment provides an opportunity for greater specialization and supervision. As we have stated before, not all personnel at a port of entry need be armed if at least one officer is armed.

**Ports have a
more
controlled
environment**

Comparison of Transition Options

Based on our review of the training standards for various levels of authority, we believe that Option 3 does not provide sufficient training to effectively prepare CVEOs to address the range of situations that will accompany the greater enforcement authority. Therefore, we believe that Option 3, as currently defined, should not be pursued.

The WSP prepared a detailed comparison of the three transition options that were being considered as of September 1998.¹ The analysis itself indicated little substantive difference between Options 1 and 2 that were both proposed by the WSP. However, the analysis of Option 2 does not reflect the potentially significant savings from using unarmed CVOs to the fullest extent possible at ports of entry. Rather, it assumes full trooper salary costs for all open positions, as well as full trooper training for all new hires. Option 2 also provides credits to CVEOs for past training thus reducing overall training costs for those transitioning to full commission status.

¹Commercial Vehicle Enforcement Staffing Study, Comparison of Transition Plan Options, WSP Working Group, LTC, September 24, 1998.

As previously mentioned, Option 4, which was not part of the WSP analysis, eliminates the use of fully commissioned officers within CVD and provides for additional authority only for commercial vehicle moving violations.

Transition Planning Cost Analysis

One-time and annual costs should be separated in evaluating alternatives

As indicated above, WSP's Budget and Fiscal Services prepared an analysis to assist in comparing the costs of the three transition options. This document along with its supporting schedules appears to represent the first comprehensive analysis comparing the key differences in the three options.

The analysis of the comparative costs of the three options appears to group together both one-time initial investment and ongoing annual operating costs. Although combining such costs for budget purposes is necessary and appropriate, we believe that separately analyzing one-time and annual operating costs is necessary to effectively evaluate alternatives.

Potential performance improvements and cost savings are not reflected in Options 1 and 2

In addition, the analysis of Options 1 and 2 do not reflect the potential performance improvements and cost savings which should result by:

- Eliminating the need for CVEOs to request commissioned trooper assistance for criminal violations.
- Providing fully commissioned troopers within CVD to respond to calls for assistance outside of normal CVD operations.
- Using less costly unarmed CVOs to the extent possible.

Technology Issues

Weigh-in-Motion technology is in place at some ports. It appears to have a significant impact on the productivity of the stations and, perhaps more importantly, to provide better and more effective service to the trucking industry. Due to the substantial growth in volume, it is questionable if this technology will reduce current staffing levels at the ports, but it most likely reduces the need for increased staffing levels that might otherwise occur.

CVISN is a federally-initiated comprehensive information system designed to transmit up-to-date data related to drivers, trucking companies and equipment. A pilot installation is planned at the Vancouver port in early 1999. The combination of CVISN with weigh-in-motion appears to promise substantially greater productivity and performance for both CVD and truckers. CVISN should enable CVD to quickly identify vehicles and drivers that are more likely to be in noncompliance. This will significantly reduce vehicle stoppages and inspections and therefore, improve productivity of drivers and vehicles that tend to be in compliance.

Technology will significantly streamline operations

STATE SURVEY OF COMMERCIAL VEHICLE OPERATIONS

We performed a telephone survey of five states' commercial vehicle operations to ascertain how their operations were organized and the type of staff used to perform commercial vehicle activities. The five states surveyed were Arizona, California, Colorado, Wisconsin, and Texas.

With the exception of California, the surveyed states use highly trained individuals either classified as troopers/patrolmen or commercial vehicle inspection officers to perform commercial vehicle inspections and other activities. California uses civilians to perform inspections. Currently, Arizona has a specialty officer class in their commercial vehicle operations. This classification is mandated by state law for commercial vehicle enforcement purposes only. However, this classification will be phased out within three to five years, and patrolmen will perform all commercial vehicle activities.

Full arrest authority is given to all troopers/patrolmen in the states we surveyed. In Arizona, the commercial vehicle officers have arrest authority only as it pertains to commercial vehicle enforcement. In California, the commercial vehicle inspection officers also have full arrest authority.

Most surveyed states provide full authority

The survey indicated that all troopers/patrolmen in all the states surveyed as well as the Commercial Vehicle Officers in Arizona

and California are required to wear safety armor and are allowed to carry weapons.

In Arizona, the specialty officers do not go through the academy. They receive the federal commercial vehicle training as well as on-the-job training. In California, the civilians also do not go through the 22-week academy, but receive the federal commercial vehicle training and then on-the-job training. However, in the other states, all troopers/patrolmen go through the 22-week academy. In addition, all receive the federal commercial vehicle training.

The complete survey results are shown in Appendix 8.

Recommendation 5

The legislature and the Washington State Patrol should proceed with a Commercial Vehicle Division transition plan that results in transitioning to fully commissioned officers in interior positions and that uses unarmed Commercial Vehicle Officers (CVOs) at ports of entry to the extent possible.

TECHNOLOGY

Chapter Five

SUMMARY

The major focus of this chapter is to address the legislature's questions concerning the adequacy of the technology systems deployed by the Washington State Patrol (WSP). Specific questions include:

- *Are the systems in place cost-effective and are they operated efficiently?*
- *Do these systems adequately serve the needs of the patrol and other justice system and local law enforcement users?*

This chapter contains two recommendations that support future enhancements of the state Automated Fingerprint Identification System (AFIS) and strategic planning of the Patrol's Mobile Computer Network (MCN). The review found that the Patrol has generally applied proven technology in an efficient manner to meet critical public safety needs. However, in the past the state has not made sufficient investments in public safety computer and communications infrastructure, and several key systems have become outdated. State Patrol investments in technology are dependent on funding decisions made by the legislature. The Patrol has been directed by the legislature to improve public access to state criminal history records, and has successfully implemented cutting-edge Internet technology to meet this challenge.

Audit questions

OVERVIEW

This review focuses on the support services of the State Patrol, also called the *Technical Services Bureau*. State Patrol support service operations that deal extensively with computers and telecommunications include:

1. Accident Records Section, Criminal Records Division
2. Information Services Division
3. Property Management Division (radio tower maintenance)
4. Electronic Services Division
5. Criminal Records Division

WSP owns and operates computer systems to manage criminal histories, traffic accident data, and suspect identification and fingerprint identification. The State Patrol also owns and operates a statewide voice and data communications system that is nearly as complex as many commercial cellular operations.

Exhibit 12 shows major State Patrol technology systems at the state patrol.

Exhibit 12
Summary of WSP Technology

System	Name	Purpose
AFIS	Automated Fingerprint Identification System	Fingerprint imaging
ACCESS	A Central Computerized Enforcement Service System	Communications switch to local, state and federal crime databases
Breath Test Training		Certification of breath test examiners and equipment
CAD	Computer Aided Dispatch	Routes emergency calls to officers
CAS	Cost Accounting System	Budget
CES	Case Evidence Tracking System	Manage evidence
CRASH	Collision Reporting and Statistical History	Traffic collision tracking
ES	Employee Status	Manage payroll
LDS	Labor Distribution System	Track billable hours for accounting purposes
LIMS	Laboratory Information Management System	Forensic data
MCN/OIM	Mobile Computer Network / Officer Information Management	Officer information and field reports
PRS	Personnel Resource System	WSP personnel database
TAS	Time and Activity System	Trooper activity and payroll
TVS	Travel Voucher System	Travel reimbursement
WACIC	Washington Crime Information Center	Warrants, missing persons, stolen property
WASIS	Washington State Identification System	Criminal history
WATCH	Washington Access to Criminal History	Internet access to criminal history data
WATCH-CJ	Washington Access to Criminal History for Intergovernmental Criminal Justice	Criminal history over InterGovernment Network

Source: Michael Huddleston, Contract Auditor, December, 1998.

The State Patrol also coordinates trooper and local law enforcement access to federal criminal history through the National Crime Information Center (NCIC) and Integrated Automated Fingerprint Identification System (IAFIS) information through the state A Central Computer Enforcement Service System (ACCESS)¹ and Washington Crime Information Center (WACIC)/Washington State Identification System (WASIS) systems. The WASIS database provides service to 285 law

¹ Technically, access to IAFIS (to occur after July, 1999) will not be through the ACCESS System, but through the FBI Criminal Justice Services Wide Area Network.

WSP has a substantial investment in several large computer systems

Troopers are using computers for their patrol work more often

enforcement agencies, 234 courts, and hundreds of public and private organizations.

In addition, the State Patrol uses 1,285³⁶ desktop personal computers, 194 laptop computers and 417 MCN computers (primarily assigned to troopers) which are largely inter-connected over an agency "Wide Area Network" also known as WSPNet.

Systems shown in **bold** font in Exhibit 12 above are the primary subject of this report. The other systems did not result in audit findings.

ORGANIZATIONAL STRUCTURE

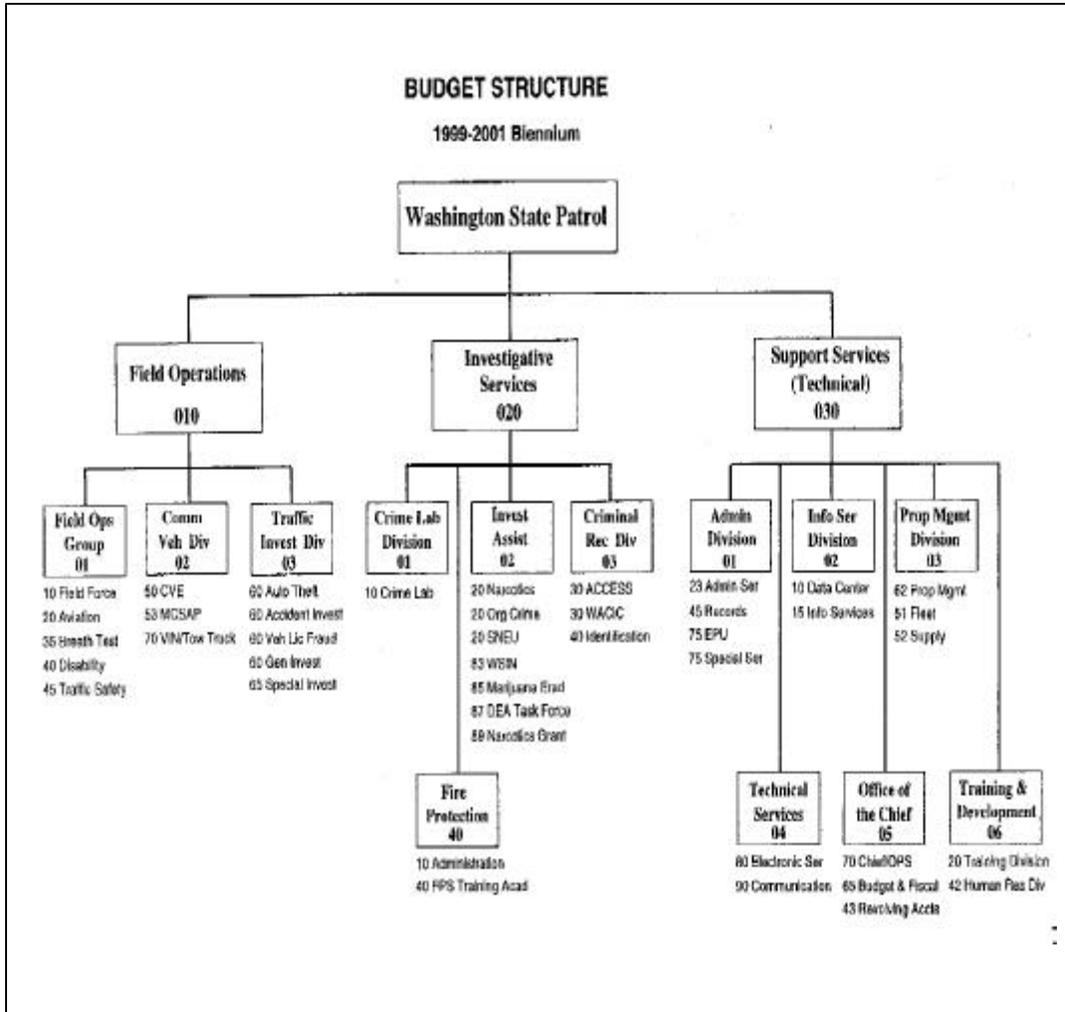
Among the organizational charts provided by the State Patrol for this audit, the "Budget Structure" chart for the 1999-2001 Biennium provides the most useful view of the Patrol's technology-related functions.

The State Patrol is heavily dependent on its computer and radio systems. Mainframe computers are used as the repository of centralized statewide criminal data, while desktop and laptop computers are assigned to investigative staff and officers in the field. The UHF radio system is used to provide data communications between line vehicles and WSP resources. The microwave systems are used to share data between computer systems throughout the state.

The "Budget Structure" organization chart is shown in Exhibit 13 below. Note: the budget structure is not reflective of the management structure as found in the agency's organizational chart.

³⁶ WSP Memo: "Feedback to JLARC – Patrol Technology and Communications" dated December 17, 1998.

Exhibit 13



Source: WSP.

The Budget Structure chart is also helpful because it demonstrates the complex inter-relationships between basic functions of the State Patrol. This perspective shows that the main criminal record activities are focused in the Investigative Services program area, while the remaining technology activities are found under Support Services. This organizational structure creates some interesting management challenges for these complex technology systems.

The Electronic Services Division, Information Services Division, and Criminal Records Division help plan integrated parts of the criminal history system. Another state agency, the Department of Information Services (DIS), has responsibility for monitoring some technology programs. State Patrol functions involved in technology include:

- The Support Services (Technical Services Bureau) is the umbrella agency for most the technology activities of the State Patrol.
- Records Section, Criminal Records Division, handles all traffic collision information for the state of Washington. Information Services Division is the main computer support resource for WACIC and the Identification and Criminal History databases managed by the Criminal Records Division.
- Property Management Division builds, buys, and develops large capital facilities for the Patrol.
- Electronic Services Division installs and maintains the coordinated statewide emergency communication system, WSPNet and the other communication equipment operated by the State Patrol.

WSP TECHNOLOGY

The WSP has several multi-million dollar communications and information technology initiatives underway. Current projects include working with the Federal Bureau of Investigation (FBI) and NCIC to improve criminal history information transfers with transmission protocols such as Transport Control Protocol/Internet

WSP Technological Milestones:

- The first radio was installed on a motorcycle in the Vancouver area in 1933
- Patrol set up its own communications network in 1943
- WACIC (Washington Crime Information Center) created in 1983
- AFIS System implemented in 1988 and upgraded in 1994
- DNA databank established at Seattle Crime Lab in 1989, staffed by specially trained personnel
- Mobile Computer Network (MCN), linking patrol laptops established in 1991

Protocol (TCP/IP) (networking Internet Protocol), and improving access to NCIC, National Law Enforcement Telecommunication System (NLETS), Department of Licensing (DOL), WACIC, WASIS, and Department of Corrections (DOC) by upgrading the ACCESS messaging switch. The narrative below describes in more detail significant WSP technology projects, and presents findings and recommendations for each audited initiative.

Automated Fingerprint Information System (AFIS)

The State Patrol's Identification and Criminal History Section houses the Criminal History Record Information (CHRI) records. This criminal history file is critical to the efforts of all law and justice agencies throughout the state of Washington.

In order to make the CHRI system work, it is critical that some way of uniquely and positively identifying any person in custody is established. Throughout the United States, the means of making this positive and unique identification is through fingerprints. AFIS provides positive identification and generates a unique serial number for each fingerprint set. This serial number is then manually re-entered into to the state CHRI system along with other suspect history and case disposition information submitted by local criminal justice agencies. Since its installation in 1988, the state AFIS computer has amassed fingerprint records for nearly 900,000 individuals screened by law enforcement agencies across the state, and adds approximately 55,000 new records each year.

The state AFIS network includes one central site and sixteen remote locations throughout the state. The Patrol's AFIS staff includes a Tenprint Unit and a Missing/Unidentified Persons Unit (M/UPU) staffed by the Criminal Records Unit. The Tenprint Unit technicians use AFIS to determine the identity of a suspect in custody, and to determine whether crime suspects (or in some cases employees seeking jobs such as teaching or caring for children) have a prior record by comparing fingerprints with the CHRI data files. Crime suspects frequently use aliases to avoid detection.

The Patrol's M/UPU assists local law enforcement agencies in identifying human remains through fingerprint or dental

identification. In addition, the Patrol provides statewide service to many local law enforcement agencies by providing suspect identification based on “latent” fingerprints with staffing provided by the Crime Laboratory Division. Latent prints are residual fingerprints or partial fingerprints that are often left at the crime scene and—if properly processed—can be recovered from a variety of surfaces. The State Patrol and AFIS provide several services to process latent prints:

- Search latent (crime scene) fingerprints to produce possible candidates for comparison.
- Store unsolved latent prints—automatically searching incoming new suspect fingerprint cards against these unsolved fingerprints identifications.
- Search other AFIS databases (western states and FBI) to produce possible candidates for comparison.

Larger police agencies have purchased sophisticated crime scene screening equipment to find latent fingerprints and other residual evidence. These devices are called “Polilights,” and generate a high-intensity 500-Watt xenon light beam on the crime scene. The beam wavelengths can be adjusted to identify different clues on different surfaces. Officers using goggles can find evidence such as footprints left on smooth clean vinyl floors, and special filter devices can help find other trace evidence quickly (for example, a violet filter is used to find tiny blood splatters; blue to find clothing fibers or bone). The Polilights cost approximately \$17,000, and are generally found only in the larger police organizations around the state. WSP uses similar “LumaLight” technology. Officers must be specially trained to use the devices properly. Although these types of devices are powerful tools, they are seldom used because of the additional equipment cost. The AFIS latent print identification features are generally underutilized in Washington State (outside of murder scene investigations) due to high training and additional investigation expense required of state and local law enforcement officers.³⁷

³⁷ WSP response to draft report stated: “Industry wide, AFIS is generally underutilized for latent print searching due to the resources required to process crime scenes for latent prints.” (December 17, 1998, WSP memo.)

In November 1994, the state AFIS computer was expanded to increase its storage capacity to 1,000,000 fingerprints and to provide improved search capabilities. The system can now process 1,500 fingerprint card searches per day. Unfortunately, the current Automated Fingerprint Identification System (AFIS) is not Year 2000 compliant, and the state AFIS computer must now be replaced (at an estimated cost of \$850,000 for Year 2000 solution). The current computer has non-compliant embedded chips and hardware, and also has software that will not function properly on January 1, 2000. In cooperation with state DIS, the State Patrol is proposing to implement the timely replacement of AFIS by June 1999.

Beyond the Year 2000 issue, the FBI has a national initiative to upgrade the federal AFIS system in a program called Integrated Automated Fingerprint Identification System (IAFIS).³⁸ IAFIS envisions a more “paperless” justice system environment and includes electronic arrest and disposition reporting, “live-scan” fingerprint equipment electronically linked to AFIS records, and on-line access by the public to obtain criminal history record information.

The AFIS upgrade will allow the Patrol to eventually link the fingerprint and criminal history computers with the installation of an automated interface, as envisioned in the FBI IAFIS plan. Currently, AFIS and WASIS are two separate computer systems requiring some redundant data entry. The Patrol’s proposed new generation AFIS system would accommodate interfacing criminal history records, AFIS, and eventual installation of “live-scan” electronic fingerprint technology, which will allow county AFIS systems to electronically submit their records into the state AFIS system.

The current state AFIS practices are inefficient—many local government fingerprint records (already digitized and expertly processed into local databases) are printed out on cards and mailed to the WSP’s Identification Section on paper. These local

AFIS must be replaced quickly to avoid critical service disruptions

New AFIS technology will better link federal, state, and local law enforcement agencies

³⁸ FBI IAFIS and federal IAFIS Image Quality Specifications include technology needed for communications, processing, connected Live-Scan systems, Fingerprint Card Scan Systems and Fingerprint Card Printers. The FBI is developing standards; current federal standards are published regularly on the IAFIS site at www.fbi.gov/iafis/.

government paper files are subsequently re-scanned by Patrol technicians for entry into the state database. Some larger local law enforcement agencies (only Pierce County) have their own AFIS systems for local identification, but these local systems are not connected to the Patrol's AFIS system. Pierce County AFIS uses different equipment vendors than WSP and the rest of the state. This redundant AFIS data entry problem is not unique to the Patrol—until 1996, technological limitations and the lack of federal standards necessitated the re-entry of state fingerprint data into the FBI system. The State Patrol tries to re-enter county ten-print fingerprint cards within 30 days of receipt; the FBI usually takes up to 45 days to manually re-enter state records into the federal database.

The AFIS system will require additional investments to allow for justice system efficiency and to remain technologically current

The legislature should be aware that the AFIS system is a critical component of the state criminal history system, and WSP's proposed replacement project to make the system Year 2000 compliant is essential.

The State Patrol hosts an annual Washington State AFIS User's Conference to provide training in system operation and to discuss potential AFIS system improvements. In the performance review process, the Patrol questioned whether it had authority to regulate local government AFIS systems. Statewide implementation of new generation AFIS technology would be expedited by standardization.

During the performance audit process, the Patrol's authority under state law to establish statewide standards for AFIS and live-scan technologies was reviewed. The Patrol's legal counsel has advised that the WSP has sufficient authority to establish and implement statewide standards.

Recommendation 6

A comprehensive study should be funded to plan, schedule, and budget the statewide implementation of live-scan technology. This study should reflect the overall strategy of the state's Justice Information Network.

The live-scan system will free up significant Patrol technician labor and improve service by eliminating the manual re-entry of fingerprint records into the state system (live-scan automates this current manual practice). During the audit process, WSP expressed its intent to develop a staff transition plan to accommodate efficiencies gained by AFIS, live-scan technology, and electronic criminal history reporting. The Patrol further stated that staff would probably be reassigned to address the current backlog of over 150,000 documents, training, records auditing, and data quality review.

Another issue is called to the attention of the legislature. Policy-makers may wish to revisit the decision to fund WSP's AFIS computer system from the state General Fund. The competition for these limited state resources may serve to inhibit necessary and appropriate investments in the AFIS system, which is the core of the state's criminal history database. An alternative mentioned by the WSP may be to deposit all revenue from background checks into the Fingerprint Identification Account so the State Patrol can use revenue from Identification Section programs to provide service to customers.

Year 2000 Compliance

Until recently, computers, software, and microprocessors were constructed with shortcuts to conserve digital "space." These data machines truncated "year" information by deleting the first two digits—thus the year "1990" would be processed as "90" by computer equipment. This Year 2000 problem—ironically abbreviated itself as "Y2K"—impacts businesses and governments worldwide, and unless corrected might interpret year data "00" as the year 1900 instead of 2000. Year 2000 problem solving is an expensive and time-consuming effort and includes contingency planning, program conversion, hardware upgrades, new software and extensive machine and application testing.

The legislature and Governor have centralized monitoring this extensive Year 2000 compliance effort under DIS. DIS has initiated an assessment of 39 state agencies, 99 projects, and 458 "mission critical" computer systems. Current DIS status reports are maintained on the state of Washington ACCESS web site at www.wa.gov./dis/2000/y2000.htm. In all, the legislature has

**"Year 2000"
problems are
manageable
for WSP
systems;
solving Y2K
will require
investment**

provided \$83 million for Year 2000 compliance for all state agencies through 1999.

Year 2000 issues apply particularly to the Patrol's ACCESS, AFIS and WACIC/WASIS systems. AFIS needs to be replaced to be compliant with Year 2000 requirements and is discussed above. The application re-engineering of the WACIC/WASIS system will be completed by mid-1999.

The remaining area of greatest vulnerability for Year 2000 compliance in the State Patrol is the desktop, laptop, and workstation computer environment. The patrol has a substantial number of antiquated desktop computers which either need to be upgraded for Year 2000 purposes or to meet federal compatibility requirements for the National Crime Information Center (NCIC 2000) project,³⁹ as summarized below in Exhibit 14:

Exhibit 14

Microprocessor Class:	# of WSP Computers	Upgrade Cost
586/PENTIUM	779	\$0
486	691	\$3,946,700
386 / 286/ 808X	482	\$1,724,500
Total Upgrade Cost:	1,952	\$5,671,200

Source: WSP Memo: "Feedback to JLARC – Patrol Technology and Communications," December 17, 1998.

About 25 percent of the Patrol's computers (386 and older desktops/laptops) have technology so outdated that—in addition to Year 2000 issues—they are not robust enough to run current operating systems, efficiently link to the WSP network, and properly run Internet and mail functions.

In a budget initiative for the 1999 Legislative Session, the WSP proposes a technology business plan to regularly upgrade its computer equipment on a standard three-year cycle.

³⁹ April-May 1998 NCIC 2000 Newsletter. Specifications for NCIC 2000 compatible systems include Pentium processor, 16 MB memory, at least 1 gigabyte storage, RS232 / 16550 UART port, 17" monitor, two-button mouse, SCSI board and one ISA slot for communications board. FBI also recommends CD-ROM drive.

According to the Patrol's budget documents, the early Pentium-based machines will be outdated in the following biennium (2001-2003).

The State Patrol's Information Services Division will be responsible for administering the computer modernization program if it is funded by the legislature. If the program is funded, the State Patrol intends to lease the replacement desktop and laptop computers. The lease will be structured so that at the end of a lease period, the Patrol may exchange a current upgrade (vintage 1999) for an even newer machine (vintage 2002).

Collision Report and Statistical History System (CRASH)

The Collision Reporting and Statistical History System (CRASH) project was initiated in July 1995 and was supposed to be in operation early last year. Collision records are the responsibility of the Patrol's Criminal Records Division. By statute, the State Patrol is responsible for receiving, tabulating, and analyzing collision reports. The information is shared with state and local agencies, drivers, attorneys, and insurers. Traffic engineers also use collision information to improve roadway safety.

At the request of WSP and DOL, legislation was approved to implement a collision reporting program:

- July 1996: HB 1964 establishing the WSP as the single collection point for collision reports.
- May 1997: SB 5539 made citizen submission of collision reports optional for investigated collisions.
- June 1998: HB 1211 makes collision reports available to the Washington Traffic Safety Commission.

The legislature authorized \$750,000 for implementation of the CRASH system in the 1995-1997 Biennial Budget. The original project completion date reported to the legislature was July 1996.

CRASH is intended to upgrade and replace an older text-based reporting system that was technologically outdated with a modern system capable of imaging, intelligent character recognition, and workflow management in addition to handling collision report narrative. Collision reports prepared by state and

**CRASH is
behind
schedule –
but should be
operational
soon**

local law enforcement are to be scanned into an image database and edited into a data and text database. One additional advantage of the system is that it integrates collision reporting functions needed by DOL, DOT, city, and county agencies, and has a “routing” function to move an accident report along from agency to agency. From the public perspective, the new system offers one standardized “Vehicle Collision Report” which must be submitted only to the State Patrol, as compared to the multiple traffic accident report submittals required by both WSP and DOL under the old system.

The project is described in a press release distributed early this year: “Under the old system, collision reports followed a serial process, going from agency to agency. For example, a report received by WSP would need to stay there for several weeks prior to being sent to other agencies for their processing or collision information. Reports were also microfilmed at both WSP and DOL, a duplication of effort. It could take up to six months for all three agencies to receive the information from one collision report. With CRASH, the reports will be stored electronically in one central computer and each agency can access the reports and information as needed. This could reduce the time needed for the agencies to receive information on one collision report to as little as two weeks.”

The new CRASH forms are now being used by law enforcement to report accidents. The system is now anticipated by the Patrol to be operational and processing 1999 collision reports on January 4, 1999.⁴⁰

With the best of intentions and optimism that the system would be in service by the Summer of 1997—as scheduled, the WSP eliminated eight positions, and DOL reduced three FTE’s as CRASH “automation savings” effective in October 1997. These reductions represented about half of each agency’s assigned staff for collision reporting. The delayed implementation has created a significant backlog of collision reports. According to WSP, beginning in January 1999 the consultant and the Patrol will monitor workloads and develop performance measures to determine future staffing needs.⁴¹

⁴⁰ WSP Memorandum: “Feedback to JLARC” dated December 17, 1998.

⁴¹ Ibid.

At the outset of the project, the CRASH system was poorly scoped and scheduled. The original CRASH feasibility study did not consider some required functions and potentially overestimated savings in others when projecting FTE reductions. The project did not include adequate contingency planning in anticipation of delays, and management of the original project contractor was not adequate. The Patrol has acted to correct earlier project management problems by hiring an independent consultant to assess the CRASH program. The previous CRASH vendor has been bought out by a worldwide vendor committed to providing resources and solutions to fully complete the system in early 1999.

Mobile Computer Network (MCN)

MCN began in 1991 as a research project to study the feasibility of data communications from the patrol car to the centralized state criminal justice databases. The pilot project lasted about 18 months and included installation of 20 laptop computers in three urban counties, plus the central processing and communications infrastructure to support the test. Under the system, troopers can make data inquiries on driving records, warrants and car plates. The system also allows car-to-car computer messaging, and access to state and federal criminal history databases. Communications is provided between the patrol car and the server facilities in Bellevue via radio modem. In 1993 the system was given an "Award for Technology" at the International Association of Chiefs of Police Conference.

The benefits of the MCN system were to include:

- Allow troopers to spend more time patrolling and less time performing administrative tasks
- Elimination of voice radio traffic gridlock
- More data queries for suspicious circumstances
- More arrests/quicker apprehension
- Increased recovery of stolen vehicles

WSP has earned national recognition for implementation of new technology

Trooper laptop computers improve officer efficiency

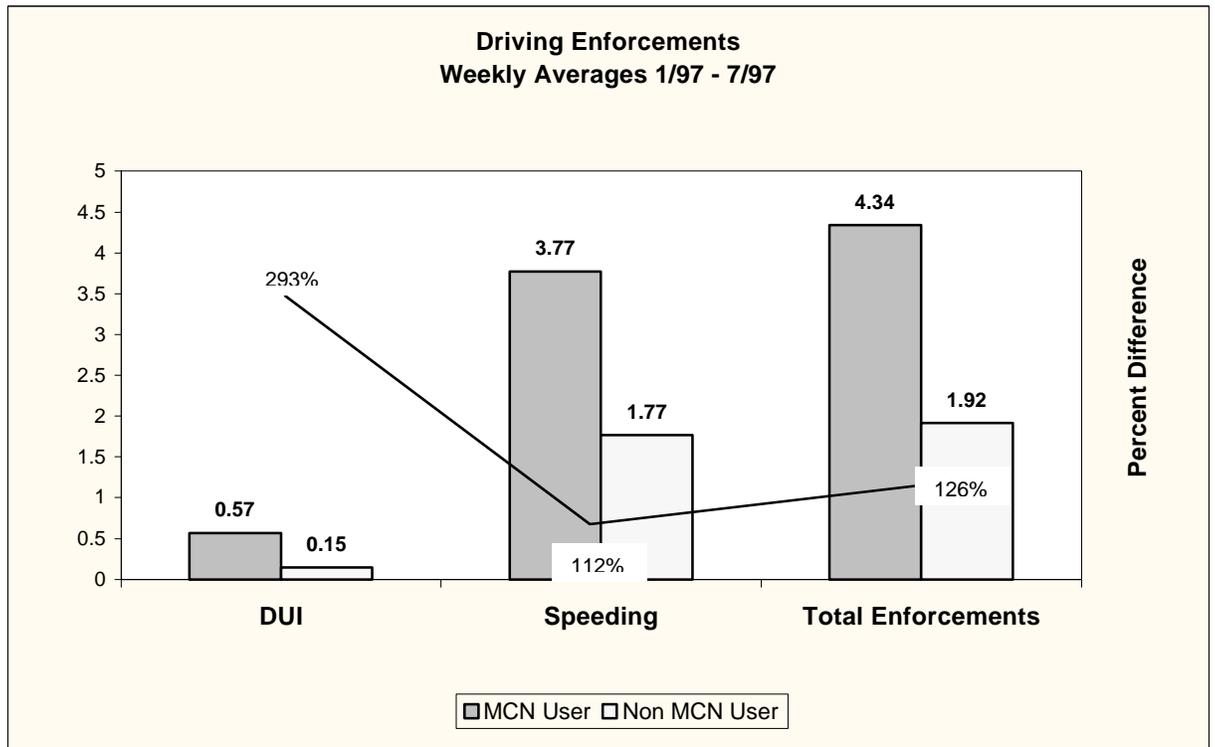
These automation benefits (and others) are described in greater detail in a technical report on mobile computing developed by the Bureau of Justice Assistance, SEARCH program.⁴²

The WSP project implementation has been slowly phased over the past five years to include:

- 1993-1995 Biennium King, Pierce, and Kitsap
- 1995-1997 Biennium Thurston, portions of Snohomish

In a 1997-1999 budget proviso, the legislature directed the State Patrol to conduct a study of the MCN project on trooper productivity. According to the Patrol, the results of the Mobile Computer Network Productivity Study showed that the MCN system had a measurable positive impact on trooper enforcement activity.

Exhibit 15



Source: MCN productivity study, November 1998.

⁴² Issue 1, 1997, "Law Enforcement Mobile Computing: Armed with Information", Kelly J. Harris, BJA Publication 95-DD-BX-0017.

This audit found similar results of 10 to 15 percent increases in officer productivity as a result of laptop computer deployment reported in other jurisdictions:

Agency:	Project Scope:
Alexandria, ⁴³ Virginia Police Department	30 car pilot project
Charlotte ⁴⁴ -Mecklenberg, North Carolina PD	464 car implementation
Lakewood, ⁴⁵ Colorado PD	210 car implementation

National studies document the benefits of trooper laptops

One problem with the current pilot program has been the limited availability of the installed radio system. The Patrol's Electronic Services Division upgraded the radio system in June 1998 to improve responsiveness of the MCN system in King, Pierce, and Kitsap counties. This upgrade allows mobile modems to search several frequencies for the best channel. The laptop applications have also been upgraded to run in the Windows operating system environment.

Recommendation 7

The Washington State Patrol should develop a detailed implementation plan for the next phase of the Mobile Computer Network (MCN) project to describe patrol coverage, radio communications and potential integration with city and county mobile computers.⁴⁶ The implementation plan should also identify and propose technical solutions to MCN

⁴³ February 1997, "Alexandria Police Go Wireless Remote," Federal Computer Weekly article by Barbara DePompa.

⁴⁴ October 1997, "North Carolina Police Going Wireless," Government Technology News.

⁴⁵ August 1997, "Goin' Mobile," Government Technology News article by Blake Harris.

⁴⁶ WSP review comment: "Any future MCN application or system changes would require legislative support. This implementation plan should be legislatively sponsored as a WSP study project with a hired consultant for approximately \$200,000. Any plan or MCN project should support the agency six-year strategic plan."

integration challenges posed by the federal National Crime Information Center 2000 project.

WSPNet

WSPNet is the Patrol's Wide Area Network (WAN), connecting the office computer networks of the State Patrol's crime labs, district offices, communications centers, detachments participating in the MCN project, Olympia headquarters, and other support offices. WSPNet allows each State Patrol district and detachment office the ability to communicate with all other offices as well as with other state and federal law enforcement agencies.

The Electronic Services Division installs, maintains and configures the WSPNet. WSPNet is a mission critical application that requires statewide on-site support 24-hours per day, seven days per week.

**WATCH
program
provides
public access
to state
criminal
history data**

The Washington Access to Criminal History (WATCH)

WATCH Internet application was implemented in January 1998 in response to the large increase in requests for criminal history information. This innovative program combines cutting-edge law enforcement, modern database search engine, and the growing field of Internet commerce, providing users criminal history information from the state system and immediate credit card billing (\$10 per search).

The Patrol's WATCH page can be found at: <http://watch.wsp.wa.gov/WATCHOPEN/default.asp>. The primary customer group the WATCH system is designed to serve is the non-profit organizations that get criminal history record information at no charge. Through December 1998, over 143,800 inquiries have been conducted by the non-profit organizations.⁴⁷ In the interests of checking the ease of use of the system, the audit team accessed the site and obtained the criminal history records of the author. The entire process took less than eight minutes, using a credit card payment for the inquiry. This

⁴⁷ WSP Memo "Feedback to JLARC" dated December 17, 1998.

exercise in using the Patrol's Internet WATCH system determined that:

1. The system is easy to use, with adequate instructions to lead the inquirer through the criminal records access and credit card billing process;
2. Appropriate notices⁴⁸ are posted on the web pages concerning the state's Privacy Act and appropriate use of the information provided; and
3. The process produces instant on-line reports, which can be viewed using a web browser and locally printed (see sample report print out pages in Appendix 9).

The Patrol dedicates one position to WATCH for technical customer support and hires a contractor for computer programming support. Although the background check itself is automated, the WATCH program requires staff support for billing accounts (non-credit card customers), problem resolution, research, and other correspondence. Three customer service specialists handle this workload.

In accordance with federal and state law, the WATCH inquiry only searches state criminal history databases; it does not search National Crime Information Center records. There is no clear disclaimer on WSP's web page regarding this statutory limitation: Uninformed Internet or non-profit customers may incorrectly assume that a "negative result" from a WATCH criminal history search is substantially more comprehensive and meaningful than

⁴⁸ **CRIMINAL RECORDS PRIVACY ACT**- RCW 10.97.050 allows the Washington State Patrol to provide conviction criminal history records to anyone. The records give information about criminal convictions and arrests less than one year old that are pending formal conclusion of any criminal justice proceeding in the state of Washington. The Washington State Patrol charges a fee of \$10 for each record. Redistributing a criminal history record is prohibited, except as described in RCW 10.97.

CHILD AND ADULT ABUSE INFORMATION ACT- RCWs 43.43.830 through 43.43.845 allow the Washington State Patrol to provide criminal history conviction information on prospective employees\volunteers who will have unsupervised access to children and/or vulnerable adults. The conviction information is limited to crimes against persons. Businesses, non-profit organizations, schools, state and other governmental agencies may make this request.

WATCH is a successful implementation of new technologies and has been warmly received by non-profit organizations and school districts

what is actually provided. This issue was discussed with the Patrol,⁴⁹ and can be remedied with the inclusion of written disclaimers explaining which criminal history records are and are *not* accessed by WATCH on the Patrol's WATCH web page.

The program has been well received by employers and volunteer coordinators. Prior to the implementation of the WATCH system, background checks required by law could take as long as 10 to 12 weeks.⁵⁰ The WATCH program has helped state school districts quickly check criminal histories for employee applicants and potential volunteers. Larger school districts such as Northshore and Lake Washington have 400 to 600 volunteers helping coordinate educational activities, meals, tutoring, and outings at any given time.

The audit found that the State Patrol has successfully implemented the technologically-challenging WATCH application in a timely manner; and that the application (developed by private vendors under contract with the Patrol) is easy to use and substantially improves the delivery of criminal history information to other state agencies, school districts, and other employers as required by state law.

⁴⁹ Telephone conversations with Mary Neff and John Broome, December 21, 1998.

⁵⁰ October 19, 1998, Eastside Journal; quote from Jan Graves, Volunteer Coordinator, Northshore School District. According to the Patrol, the current backlog is about five months.

Washington State Crime Information Center (WACIC)

Washington State Identification System (WASIS)

WACIC was established to provide a computerized criminal history file system for all criminal justice agencies throughout the state. The companion WASIS computer is used for identification purposes. These combined criminal records are shared via the ACCESS telecommunications network described earlier in this chapter. The WACIC/WASIS databank is the centralized criminal justice record system for all crimes and criminals of statewide interest. The database also includes locator information for missing persons and stolen property.

The WACIC/WASIS application replacement effort is scheduled for completion in September 1999, and will take advantage of current "relational database" technology to capture, store, and disseminate state criminal history record information. The State Patrol has hired a consultant to design the new criminal history system. The WASIS and WACIC systems have been redesigned to eventually allow access of on-line electronic fingerprints and demographic data from jails at the time of arrest. In the future, the system could be further expanded to allow prosecutor and court interactive access to criminal identification, electronic warrants, sex offender information, protective orders, and case record updates. The WACIC/WASIS rewrite has largely been funded with federal grant money.

DNA

WSP's Crime Laboratory Division provides forensic services for law enforcement agencies across the state. The Crime Lab has established a statewide database of nearly 15,000 preserved biological specimens (i.e., blood) and 9,000 processed DNA identifications for convicted sex offenders and felons. The DNA database is an important criminal justice tool and has been used to solve several homicide and rape cases in Washington State.

Through proviso, the legislature has required the State Patrol to implement a statewide DNA database that is consistent with the new FBI standards.

The WSP Crime Lab Division must convert its DNA typing operations to the federal Short Tandem Repeat (STR) standard for the convicted felon DNA databank. While more discriminating, the STR process is also 27 percent more expensive than the Restriction Fragment Length Polymorphism (RFLP) and Polymerase Chain Reaction (PCR) methods. The cost for supplies and materials using this new DNA identification process are unavoidable. This new technology is currently being used to type convicted felons samples and is also being validated on criminal casework. The Crime Lab will conduct between 140 to 150 DNA identification cases over the 1999-2001 Biennium. Converting DNA typing to the new STR process will increase WSP Crime Lab supply and chemical costs by an estimated \$475,000 for processing these DNA samples over the next two years.

Systems Documentation

As part of this audit various technical support and operating manuals for the WSP technology operations and computer systems were reviewed, including:

- National Crime Information Center Code Manual
- WSP Security Document (June 1996)
- Ready Reference Guide to ACCESS/WACIC
- WSP Information Technology Strategic Plan
- WSP Disaster Recovery/Business Resumption Plan
- WSP ACCESS Manual
- WSP WACIC Manual
- WSP Latent Print Section Policy & Procedures Manual
- Electronic Services Section Handbook
- Electronic Services Section Manual

Tedious work such as adequate documentation of system code and system-operating manuals is sometimes overlooked in large data management operations. The State Patrol maintains current technical support documents and operating guides for training and operation of its technology systems. The documentation is comprehensive and understandable and includes adequate disaster planning, systems recovery, and emergency operating information.

TELECOMMUNICATIONS

Chapter Six

SUMMARY

The major focus of this chapter is to analyze the telecommunications systems deployed by the Washington State Patrol (WSP). This chapter contains two recommendations which address the opportunities for collocation of telecommunications equipment with other public and private entities and the need for better coordination of radio communications among state and local jurisdictions. The Patrol has efficiently applied proven technology to establish a reliable public safety communications system. However, to maintain the current high level of service, the Patrol should improve basic maintenance on its telecommunications towers. As recognized in the previous chapter on technology, the Patrol has been nationally recognized for implementing and deploying telecommunications systems.

MICROWAVE NETWORK AND MICROWAVE CONVERSION

The WSP's communications network includes three basic service components:

- Mobile radio system—allows communications between troopers using radios in their cars or portable radios.
- Data radio system—links laptop computers to vehicle and drivers license records and criminal history information. This system uses UHF so that it does not interfere with VHF mobile radios.

Components of WSP's network

- Microwave system—controls the mobile radio (trooper communications) and data radio (trooper laptops) transmissions across the state which are broadcast from over 90 radio relay stations and microwave tower facilities. These relay stations are in turn operated remotely from eight WSP communication centers. The microwave system serves as the statewide communications system backbone for various federal, state and local agencies in addition to the State Patrol.

WSP microwave system is reliable

The WSP microwave system started in the early 1950s. The microwave system is used for regular radio communication by the WSP, but also handles the work of other agencies (such as DOT) and carries other voice and data traffic such as the state's emergency telephone system, Computer Aided Dispatch, AFIS, and ACCESS. The WSP maintains and operates the system for all users.

The WSP microwave system has been deployed in three interconnecting "loops" across the state. The loop is established by building many transmitters in a circle; signals are sent from tower-to-tower around the loop. Careful placement of the towers and overlapping of the three loops ensures that the telecommunications link is not broken if a tower is taken out of service for maintenance or damaged by natural forces. In the WSP microwave system, up to three paths may be lost—one in each loop—without loss of service. The WSP microwave system has provided uninterrupted service (all day/every day) since 1975. The system has seen tremendous growth in activity. Since 1987, there has been a 70 percent increase in telephone activity and a 127 percent increase in CFS.

Why Have a WSP System?

Most large public safety agencies own, operate, and maintain an independent telecommunications system.⁵¹ These systems are usually justified by one or more of the following arguments:

⁵¹ Wireless Communications and Interoperability Among State and Local Law Enforcement Agencies; January 1998; National Institute of Justice Survey and Analytical Study by Mary J. Taylor, Robert C. Epper, and Thomas K. Tolman.

- The State Patrol must have control of telecommunications in emergencies and disasters.
- As a government entity, the State Patrol is responsible for public safety, and should retain control over facilities needed for that duty.
- Law enforcement needs must have the highest priority for service in emergencies and disasters.
- Ownership of the State Patrol's microwave system puts the Patrol in charge of the level of built-in system security, redundancy, and reliability.
- The State Patrol system is less vulnerable to commercial service interruptions caused by labor-management conflicts.

Public safety radio systems usually require a very high level of reliability (also called "availability")—95 percent⁵² or more. The Patrol believes that its microwave systems have been engineered to over 99.9 percent reliability.⁵³ These terms refer to the statistical likelihood of the system's coverage in connecting a potential user to the radio system in the defined service area. By way of contrast, commercial wireless systems are usually designed to satisfy 80 to 90 percent reliability.

Law enforcement agencies do not generally rely on commercial wireless systems for public safety communications and other critical functions, for a number of reasons. Commercial systems are often overloaded during natural disasters when it is most critical that State Patrol troopers are able to communicate with one another.

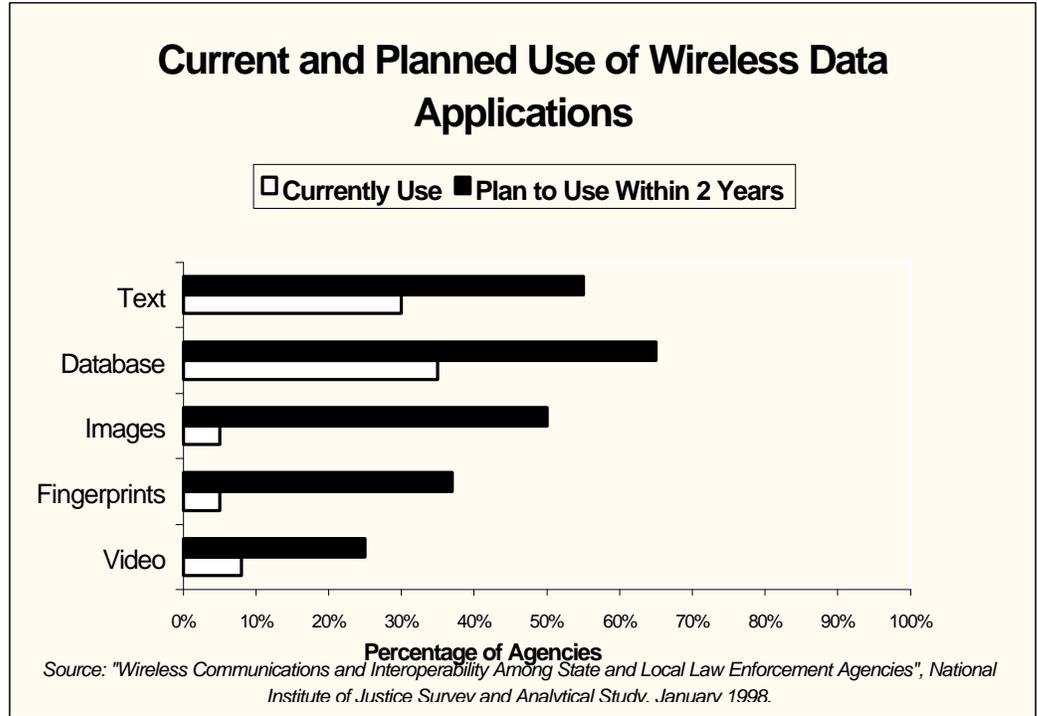
Local and state public safety agencies nationwide participated in a recent National Institute of Justice survey.⁵⁴ Respondents projected substantial increases in the use of their wireless data communications systems over the next five years, as shown in Exhibit 16.

⁵² *King County Comprehensive Radio Plan*, April, 1998 prepared by Hatfield & Dawson Consulting Electrical Engineers, Seattle, Washington.

⁵³ WSP Memo: "Feedback to JLARC" dated December 17, 1998.

⁵⁴ *Wireless Communications and Interoperability Among State and Local Law Enforcement Agencies*; January 1998; National Institute of Justice Survey and Analytical Study by Mary J. Taylor, Robert C. Epper, and Thomas K. Tolman.

Exhibit 16



Future demands on public safety tele-communications

Source: National Institute of Justice Research in Brief: "Wireless Communications and Interoperability Among State and Local Law Enforcement Agencies:", January 1998."

WSP Microwave Migration Project

In 1993, the Federal Communications Commission (FCC) sold the Patrol's old 2 GHz microwave frequency to cellular telephone companies for a new commercial program called *Personal Communications Service (PCS)*. The FCC decision was announced mid-1994. As a result of the displacement, the FCC offered public agencies alternative communication choices: relocate to either 6 GHz or 11 GHz microwave, or use fiber-optic cable. Nationwide, the FCC's auction of the 2 GHz radio spectrum to the cellular companies generated \$7.7 billion for the U.S. Treasury. In the auction process, the FCC made it the responsibility of the PCS companies purchasing the 2 GHz frequencies to negotiate with impacted users, including the Patrol, some payment for relocating to a new 6 GHz microwave frequency band set aside for public agencies. The phone companies and WSP agreed to the following payments:

Exhibit 17

Reimbursement	Amount
Western Wireless	\$ 1,590,000
Sprint	\$ 3,485,125
GTE	\$ 5,032,000
11 "C" Block Paths Pending	\$ 1,000,000
Grand Total	\$11,107,125

Source: WSP Memo "Feedback to JLARC – Patrol Technology and Communications," December 17, 1998.

In making the transition to the 6 GHz frequency, the Patrol decided to also replace the old 2 GHz analog microwave network with modern 6 GHz analog microwave equipment during the 1995-1997 Biennium. In the 1997-1999 Biennium the Patrol constructed a 6 GHz digital backbone paralleling the 6 GHz analog system. Microwave radio links require a "line of sight" path between the antennas at each end of the circuit. Antennas are usually located on top of buildings or at elevated locations on communications towers. Temperature, humidity, rainfall, and obstructions along the propagation path affect microwave radio signals.

The planning document for the Microwave Conversion Project was completed in April 1994. The report was a useful conceptual design document, but since 1994, has not accurately reflected some of the actual tower siting and development costs. For example, the original estimate for development of a new tower site was \$250,000 to \$300,000. Actual experience to date shows that it will cost \$500,000 to \$600,000 to develop each new site. This revised estimate is included in the Patrol's 1999 biennial budget submittal for proposed new sites. Further, the original schedule assumed that approximately 15 sites would be improved over the 1997-1999 Biennium. The Patrol has actually implemented nine tower sites⁵⁵ during this period.

Overall however, the microwave conversion project was completed on time and within \$20,000 of its original budget estimate, according to WSP.

Migration to a new WSP digital system

⁵⁵ Telephone interview with Tom Neff, Property Management Division Commander on November 16, 1998.

Tower Maintenance

Last year, the Patrol commissioned an inventory of its current telecommunications towers in service around the state. The study⁵⁶ investigated 56 existing tower facilities to determine structural, maintenance, paint, and other needs for the facilities. The study determined that the microwave towers had accumulated nearly \$1.643 million in deferred maintenance, and identified five tower sites (Everett, Joe Butte, Rattlesnake Mountain, Skamania and Squak Mountain) that in the judgement of the registered engineer required complete replacement. The needed maintenance repairs included \$641,000 in structural work; almost \$690,000 for new paintwork; \$247,000 in other maintenance and nearly \$65,000 for electrical grounding. Cost estimates provided do not include state sales tax and potentially higher mobilizations costs incurred by spreading the project out over several years.

As part of this audit review, the ten-year Capital Improvement Program submitted by the State Patrol was compared against the recommendations of the tower consultant. The results of this comparative review showed that although the patrol suggests that \$4.25 million for tower maintenance will be sought over the next 10 years (1999-2009), the priorities suggested by the tower consultant are not completely addressed in the proposed ten-year Capital Improvement Plan (CIP) submittal. Despite the fact that the Patrol will suggest a maintenance amount nearly \$2.6 million more than the tower consultant's recommendation, about \$683,000 of tower work suggested by the independent consultant is not specifically addressed in the Patrol's CIP. Exhibit 18 on the following page identifies those tower maintenance projects not specifically addressed:

Many radio towers need substantial maintenance work

⁵⁶WSP Tower Survey, June 1997–Tower Engineering Consultants, Seattle WA.

Exhibit 18

Tower Maintenance Projects Unfunded in WSP Capital Budget Submittal (1999 through 2009)	Amount Recommended by Tower Engineering Consultants, Inc. (June 1997 Report)
Academy	- \$2,265
Baw Faw	- \$895
Bellevue	- \$22,937
Bellingham	- \$38,890
Bremerton	- \$62,950
Calispell Creek	- \$4,231
Capitol Peak	- \$15,965
Chehalis	- \$2,017
Cleman Mountain	- \$888
Creston Butte	- \$8,702
Ellensburg	- \$19,500
Ephrat	- \$39,050
Everett**	- \$116,778
Gardiner	- \$7,980
Goat Mountain	- \$975
Kalama	- \$32,750
Kelso	- \$575
Lewiston Ridge	- \$3,225
Lind	- \$15,430
Marysville	- \$3,890
Mica Peak	- \$735
Mount Vernon	- \$7,555
Octopus Mountain	- \$11,865
Olympia Fleet & Supply	- \$57,155
Rattlesnake Mountain**	- \$81,750
Roosevelt	- \$6,842
Scoggins Hill	- \$5,452
Seattle South Office	- \$8,505
Spokane	- \$3,937
Stacker Butte	- \$16,527
Tacoma	- \$1,645
Vancouver	- \$30,670
Walla Walla	- \$41,760
Wenatchee	- \$735
Yakima	- \$6,665
Yakima Ridge	- \$1,540
Maintenance Not in WSP CIP:	- \$683,231

** Indicates towers recommended for replacement by consultants.

Source: Tower Engineering Consultants, Inc. (June 1997 Report).

Some of these maintenance activities (such as tower grounding) may be budgeted in the Patrol's operating budgets over the next several years. Other maintenance work might be eliminated by total replacement of certain towers. However, the independent consultant suggested and priced the maintenance work as a "lump sum" capital initiative; and all of the maintenance work described in the consulting report should be accounted for, budgeted, and completed. It might be useful for the Patrol to develop a "crosswalk" to compare the consultant's project list with the Patrol's operating and capital budgets to better track these maintenance tasks (see attached spreadsheet in Appendix 10).

**A WSP
success
story:
Collocation
with other
telecom
providers
saves money**

Commissioning the independent assessment of the microwave and radio communications towers was a very prudent business practice. However, the Patrol should implement the recommendations of the engineering consultant in their proposed capital plan in a timely manner.

Recently, the Property Management Division devised an innovative strategy to replace one of the WSP-managed towers that had been recommended for replacement by the engineering consultant. The Everett tower had an estimated \$233,556 worth of rehabilitation costs identified in the independent consultants report. By partnering with local commercial cellular carriers, the Property Management Division was able to avoid this capital outlay and yet was able to replace the tower with a modern "monopole." The new tower was constructed by a cellular carrier on the site of the old WSP tower. In this partnership, the cellular carrier gave ownership of the tower to the Patrol in exchange for rights to collocate WSDOT equipment on the tower in the future. This creative strategy also addresses community concern that fewer, shorter poles are desirable and more aesthetically pleasing to adjacent property owners. The Patrol's property management division is to be commended for this innovative approach, which demonstrates the best advantages of "public/private partnerships" and collocation of facilities with other state agencies.

Recommendation 8

The Washington State Patrol (WSP) should ascertain which of its telecommunications towers provide opportunities for collocation and partnership with other entities, and should attempt to duplicate the success of the WSP Everett tower project.

Communication with Other Agencies

Law enforcement relies on coordination and cooperation among different police agencies with overlapping or adjacent service boundaries. Radio communications are critically important to multi-jurisdictional police work. According to the National Institute of Justice survey on radio communications,⁵⁷ 63 percent of local police agencies coordinated law enforcement activity with state police on a daily or weekly basis. However, a majority of all respondents in this national survey felt that radio “interoperability” was a serious problem in the law enforcement community. Interoperability is defined as the ability for users operating on different radio systems to communicate with each other effectively.

Several large local jurisdictions in Washington State have implemented new radio systems that are not directly compatible with the State Patrol’s radio network. For example, King County voters approved a new “trunked” 800 MHz radio system in September 1992. Levy funds for the \$57 million system were collected in 1993, 1994, and 1995, and the system was recently made operational. The King County Regional Trunked Radio System has been designed to connect 15,000 mobile and portable radios for all city, county, fire and EMS agencies in that county. In a recent independent review of the King County 800 MHz system,⁵⁸ local police agencies were surveyed to identify potential improvements to the new radio communications system. While confident that the new regional network had successfully integrated local law enforcement agencies, city, and King County

Radio communications between WSP and local agencies could be improved

⁵⁷ Wireless Communications and Interoperability Among State and Local Law Enforcement Agencies; January 1998; National Institute of Justice Survey and Analytical Study by Mary J. Taylor, Robert C. Epper, and Thomas K. Tolman.

⁵⁸ King County Comprehensive Radio Plan; April, 1998. *Hatfield & Dawson Consulting Electrical Engineers.*

police stated⁵⁹ that they experience some barriers in accessing other agencies. In particular, the report stated that “. . . the existing interface with WSP is cumbersome and awkward” according to local law enforcement officers surveyed. An inspector with the Spokane County Sheriff's Office expressed similar concerns that radio interoperability among state and local agencies was a problem that had gone largely unresolved in his 25-year public safety career.

It is not possible for WSP troopers and sheriff deputies on an 800 MHz trunked system to talk directly to one another using common "talkaround" features on modern handsets. These communications must go through a repeater or else both officers must switch to a common conventional radio channel. The interoperability complaint was expressed in several jurisdictions and by WSP officials as well; and as noted above, is a national public safety problem.⁶⁰ Law enforcement officials expressed concern that rescue or apprehension efforts might not be well coordinated in situations where a “repeater” facility was unavailable to allow communication between troopers and local officials. This observation is specifically not intended to imply that the State Patrol should create an easy radio communications interface for King County “. . . while sacrificing communications with most of the other counties in the state—to the detriment of statewide public safety communications.”⁶¹ Likewise, the

⁵⁹ Finding 3.2.4; King County Comprehensive Radio Plan; April 1998. Hatfield & Dawson Consulting Electrical Engineers. Full text of recommendation: **“3.2.4 External Communication needs** police activity does not stop at the county's boundaries. Cross-jurisdictional communication is essential for the region's public safety, yet King County Police report that they experience some barriers in accessing other agencies. **For example, the existing interface with Washington State Patrol is cumbersome and awkward.** Responders want to see communication linkages improved between federal law enforcement agencies and the county's communication center. The link to the Port of Seattle through the Mutual Aid Radio System (MARS) is inadequate. Numerous ferries cross Puget Sound carrying passengers between King County and adjacent counties, but there is no satisfactory communication link with these vessels. Some respondents cite an inability to communicate with other police departments, but others believe that access is satisfactory. MARS uses statewide VHF channels for intercommunication between public safety agencies.”

⁶⁰ Wireless Communications and Interoperability Among State and Local Law Enforcement Agencies; January 1998; National Institute of Justice Survey and Analytical Study by Mary J. Taylor, Robert C. Epper, and Thomas K. Tolman.

⁶¹ WSP Memo: “Feedback to JLARC” dated December 17, 1998.

observation is not intended to promote statewide migration to 800 MHz systems, which would not be financially or technically feasible. The finding does recognize the national problem of public safety interoperability as clearly documented in the recent National Institute of Justice survey and acknowledged by local law enforcement officers.

Recommendation 9

The legislature should consider funding a statewide law enforcement communications interoperability plan. If this planning effort identifies a feasible interoperability solution, the legislature should further consider funding the fix and should authorize the Washington State Patrol to implement the program.

Future Technology

Telecommunications technology has changed a great deal in the past decade, and new services such as direct connections with orbiting satellites are literally on the horizon.

The State Patrol's investment in its microwave system has been successful and economical over the past 40 years. However, new demands for "bandwidth" from pending state live-scan AFIS technology and the new Justice Information Network system, federal NCIC 2000 and IAFIS services will require substantial improvements to the state's telecommunications system.

- Where feasible, the Patrol should consider supplementing the microwave system by additional investments in WSPNet and the InterGovernmental Network. Fiber optic cables offer substantially higher capacity than all of the Patrol's combined radio resources are currently capable of providing. The type of loop protection/redundant path schemes that are used in microwave radio systems can also be implemented in fiber optic systems to avoid disruptions in service in the event of a line break. This does not suggest running fiber lines up to the mountainous WSP microwave relay sites to parallel the WSP's microwave network route; it instead suggests rerouting

New communications technologies offer useful solutions to WSP needs, but will require more study and investment

current microwave traffic when possible and economically feasible to conserve radio capacity.

- Many large county and state law enforcement agencies are experimenting with “Cellular Digital Packet Data” (CDPD) technology. This evolving technology makes use of new wireless cellular PCS systems to efficiently transmit computer data. This new commercial service is already available in many urban areas including Seattle and King County. This service could be used to enhance the data radio system currently employed by the State Patrol. One concern with the use of this type of commercial service is the response “latency” or delay in communicating with the laptop computer when the commercial systems experience heavy usage. The Patrol may wish to consider a pilot project using CDPD technology to compare it to the UHF data system now in place. This emerging technology is finding favor with several large police agencies, including the Utah Highway Patrol.⁶²
- Cellular telephones offer another communications link in areas with high quality commercial service. The recent National Institute of Justice survey showed that cellular phones have been widely deployed among larger urban county and state police as a supplemental communications system.

The WSP has already participated in limited trials of a commercial satellite-based mobile data system. Although the early trial results did not offer the promise of satisfactory service for the Patrol, new satellite systems will debut over the next five years that might offer better statewide coverage. The Patrol should continue to monitor and test these cutting-edge technologies in anticipation of the next system update in 2010-2015.

⁶² Report prepared by Utah Highway Patrol, “Utah Highway Patrol Mobile Data Collection System (MDCS) & Cellular Digital Packet Data (C.D.P.D.) Statewide Implementation Plan” dated July 25, 1997.

PATROL VEHICLE REPLACEMENT AND BUDGETING

Chapter Seven

SUMMARY

This chapter evaluates the mileage replacement decision for Washington State Patrol (WSP) pursuit vehicles. Each new pursuit vehicle costs approximately \$26,000 to purchase and equip. WSP was authorized 828 pursuit vehicles for 1998.

In the process of reviewing the relevant costs that are appropriate to consider in support of the replacement decision, other aspects of patrol vehicle budgeting were examined.

Our review of available relevant financial and cost data indicates that the increase of WSP pursuit vehicle mileage from the current target of 100,000 miles to 110,000 miles has resulted in a small reduction (one cent per mile, or 2 percent) in the total cost of ownership. Existing data did not permit an analysis of what total costs would be of extending vehicle mileage beyond 110,000 miles. The increase in replacement mileage to 110,000 miles has been due to the use of budgeted vehicle replacement funds for other WSP operating purposes and a legislative budget decision to reduce funding for vehicle replacement by extending the mileage replacement cycle.

These decisions have so far not resulted in higher overall costs (i.e., capital and operating combined). However, more vehicles than intended must be replaced in subsequent budgets to maintain even the current extended mileage level, and there are higher than intended future operating and maintenance costs. These unplanned future liabilities could be avoided by restricting vehicle replacement funds solely to that purpose.

Our economic evaluation of vehicle replacement relied on a Fleet Life-Cycle Cost Model. In building this model we received

This chapter evaluates budgeting and optimum replacement mileage for pursuit vehicles

extensive cooperation and support from the WSP Fleet Section. This chapter contains recommendations for WSP to use this model for evaluating the mileage replacement level for pursuit vehicles and to extend its use for review of other categories of fleet vehicles as well. Another recommendation is to budget funds for vehicle purchase and operations in segregated accounts with restrictions on the ability to transfer these funds to other purposes.

INTRODUCTION

Replacement mileage has increased from 75K to over 110K

The WSP pursuit vehicle fleet mileage totals approximately 20.7 million miles annually about 25,000 miles for each active vehicle. WSP vehicle replacement policy has increased during the past several years from replacement at an average of 75,000 miles to 100,000 miles. This increase has been the result not of any analysis indicating that a higher replacement cycle is less costly, but rather has been the result of using intended vehicle replacement funds for other WSP operating needs and a conscious budget decision by the legislature to reduce funding for vehicle acquisition. Subsequent to the increase to a 100,000 replacement policy, use of vehicle replacement funds for other purposes and cancellation of planned vehicle purchases has resulted in a current replacement level exceeding 112,500 miles.

Audit identifies total cost of replacement cycles

WSP and the legislature desired to evaluate the mileage replacement decision based on an evaluation of total cost. To satisfy this objective, we have developed a total Life-Cycle Cost Model specific to the cost characteristics of the WSP pursuit vehicle fleet. Based on detailed cost information provided by WSP, this model has been used to calculate the total capital and operating costs at various replacement cycles ranging from 50,000 to 110,000 miles, with total costs expressed as a cost per mile in 1998 dollars.

STRUCTURE OF THE MODEL AND METHODOLOGY

The model used to evaluate replacement cycle alternatives includes all relevant costs. These include:

Capital Costs

- Purchase cost
- Cost to equip (equipment and labor)
- Decommissioning costs (to prepare for resale)
- Resale value

Operating

- Repairs
- Maintenance
- Fuel and oil

In addition, since these costs occur over time, we applied a discount rate to calculate a present value equivalent, which can then be translated into an annual cost per mile.

To create comparable replacement scenarios, we evaluated total costs for each alternative over an eight-year period at the average mileage of 25,000 miles per year. For each replacement scenario, cars were purchased, equipped, operated, then decommissioned at the period when the scenario mileage was reached and sold with the corresponding projected resale value of a patrol car with that mileage. See Appendix 11 for a more detailed discussion of the model.

RESULTS OF THE MODEL

The results of the baseline model are summarized below in Exhibit 19 and corresponding chart. The total life-cycle costs decline with increases in the replacement cycle from 50,000 to 110,000 miles. Decreases in cost/mile become quite small beyond 100,000 miles with the difference between 110,000 and 100,000 totaling about 2 percent, or about \$159,000 annually for the pursuit vehicle fleet traveling an estimated 20.7 million miles. It is important to note that the annual estimated savings of 110,000

mile replacement vs. the former WSP policy of 75,000 miles is \$660,000 (or approximately 9 percent savings).

Exhibit 19

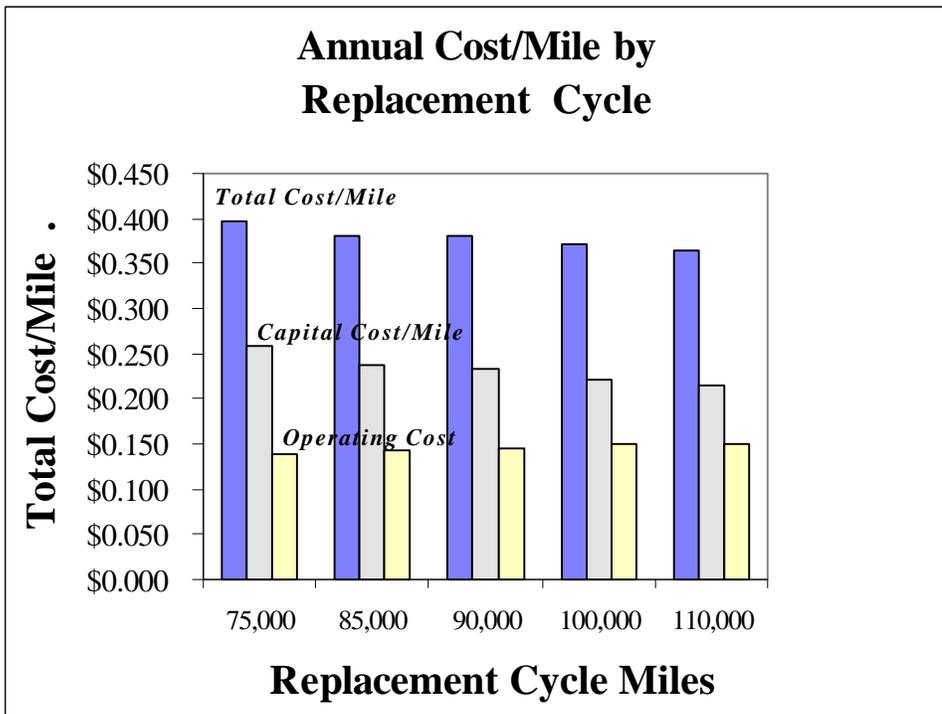
Annual Cost/Mile Based on Replacement Cycle

Replacement Cycle	Annual Cost	Cost/Mile	Capital	Operating	Added Annual Cost	% Above Minimum
50,000	\$10,941	\$0.438	\$0.312	\$0.126	\$1,508,701	20.0%
75,000	\$9,916	\$0.397	\$0.258	\$0.139	\$659,755	8.7%
85,000	\$9,505	\$0.380	\$0.237	\$0.143	\$319,906	4.2%
90,000	\$9,495	\$0.380	\$0.234	\$0.146	\$311,168	4.1%
100,000	\$9,311	\$0.372	\$0.221	\$0.151	\$158,980	2.1%
110,000	\$9,119	\$0.365	\$0.215	\$0.150	\$0	0.0%

Source: Fleet Life-Cycle Cost Model and data provided by WSP Fleet Section.

The shaded area in Exhibit 19 shows the annual cost per mile based on the current replacement policy. Exhibit 20 shows the same data as above, but in a bar chart format.

Exhibit 20



Source: Fleet Life-Cycle Cost Model and data provided by WSP Fleet Section.

Costs decline and then level off as mileage increases

ALTERNATIVE SCENARIOS AND SENSITIVITY ANALYSIS

Values used in projecting scenario costs are based on available WSP fleet historical costs including maintenance and operating records, estimated commissioning and decommissioning costs, and projected salvage values. Because it is necessary to project future costs that are subject to a range of values, the model was constructed to allow for variations in future costs and values as well as for alternative schedules for key values such as salvage and commissioning costs.

We ran the model through a series of scenarios, each time adjusting key variables within the range of likely values. These values were varied to determine the sensitivity of each of these values to the order of results. For example, we evaluated whether the rank order of costs change with lower mileage having a lower cost than 110,000 miles. We found that the order of results remains unchanged through a wide range of values in each of the key costs. Thus, 110,000 miles continued to be the lowest cost alternative.

APPLICATIONS FOR REPLACEMENT OF OTHER TYPES OF VEHICLES

This model has been applied specifically to pursuit vehicles, but it can be easily adapted to other types of vehicles where operating and capital cost data is available. Specific historical cost data on maintenance and operating costs as a function of mileage, costs to commission (i.e., place in service) and decommission (i.e., cost to prepare used vehicle for sale) as well as likely salvage values will need to be revised consistent with the types of vehicles under review.

Recommendation 10

The Washington State Patrol (WSP) should continue to use the Fleet Life-Cycle Cost Model as the basis for evaluating the mileage replacement level. Any replacement policy that differs from the lowest cost alternative identified by the model should be supported with cost-benefit considerations. WSP should also adapt the Fleet Life-Cycle Cost Model for use in the review of other categories of fleet vehicles.

RESULTS FROM SURVEY OF OTHER JURISDICTIONS

We surveyed other states to learn about their mileage replacement policies.

Thirty-nine states responded to our questions concerning vehicle replacement. Most states (26) responded that they replace pursuit vehicles on a regular schedule based on mileage and/or age. The remaining 13 states indicated that they have no set schedule.

The survey results do not clearly indicate the extent to which other states have attempted to identify the optimum mileage at which vehicles should be replaced. Ten states indicate that they perform some sort of evaluation (there may be more, but several states did not answer this question). From the limited descriptions of these evaluations, it would appear that only a few states are using the kind of rigorous, total-cost economic analysis that WSP has been working toward, and is now employing with the Fleet Life-Cycle Cost Analysis.

BUDGETING FLEET REPLACEMENT COSTS

Currently, funds for the purchase and operation of WSP vehicles are not segregated, but are incorporated in general patrol budgets. Consequently, funds intended for purchase of replacement vehicles can be used for other purposes (e.g. floods,

special events). This has resulted in an unplanned and unintended increase in the average age of the fleet.

This increase in average age has a demonstrable impact of increased operating costs. While it can be argued that to date (e.g., current pursuit vehicle mileage of 112,500) this practice of using vehicle replacement funds for other purposes has not resulted in higher overall total costs for vehicles. It does, however, have the impact of increasing future budgets for maintenance of older vehicles or for increasing the number of vehicles that ultimately must be replaced.

Sufficient information is available to identify the total capital and operating costs to operate a vehicle and to establish a budgeted cost per mile. Such information could be translated into a dedicated vehicle budget available only for vehicle purchase and operation. Spending for emergency purposes and contingent needs could be accommodated through other budget strategies. Funds for vehicles would then be available for other patrol purposes only if:

- Mileage were less than expected and not a consequence of restricting the mission availability of staff;
- Fleet management were to develop efficiencies in the purchase, maintenance, and operation of the fleet that would result in a reduced cost per mile.

Recommendation 11

The Washington State Patrol should budget funds for vehicle purchase and operation in dedicated accounts with restrictions on the ability to transfer these funds to other purposes. Any such transfers should demonstrate that excess funds are the consequence of fleet efficiencies and not the consequence of either restricting mileage at the expense of mission availability or deferring costs to subsequent budgets. Funds for emergency purposes and contingent needs should be accommodated through other budget strategies to avoid the use of required vehicle purchase funds.

**Budgeting
vehicle costs
separately
would have
several
advantages**

COLLOCATION

Chapter Eight

SUMMARY

The focus of this chapter is the evaluation of efforts to collocate Washington State Patrol (WSP) facilities and programs with other state agencies and programs. The Legislative Transportation Committee (LTC) has actively encouraged transportation-related agencies to coordinate their capital activities when possible, collocate their facilities to enhance or improve service delivery, and to save taxpayer money through efficiencies in acquiring and operating facilities and administering programs.

We evaluated the collocation effort to date, focusing on six projects. In addition, we reviewed the plans for communications tower maintenance (a subject that is also discussed in the Telecommunications chapter).

Our conclusions from this evaluation are as follows:

- WSP is complying with RCW 46.01.330, adopted in the 1993-95 Biennium, that mandated coordination between WSP and the Department of Licensing (DOL) for the siting of facilities. Siting criteria for WSP were met in collocation examples, but this did not necessarily occur for DOL (the Parkland vehicle licensing project breached the criterion related to proximity of subagents).
- Appropriate economic evaluations have been done on WSP projects by use of the model developed as the outgrowth of the JLARC Performance Audit of Capital Planning and Budgeting (1995).

- Projects would benefit from retrospective analysis, since some economic benefits were overstated (e.g., collocation of DOL vehicle licensing services in the Vancouver facility).
- Collocation opportunities may exist with public/private partnerships in the siting, construction, and maintenance of communications towers similar to the successful WSP collocation with local commercial cellular carriers in Everett.

INTRODUCTION

As early as 1984, the State Patrol and the Department of Transportation (DOT) initiated an enhanced effort to identify areas where both agencies could share resources to improve service delivery and reduce operating and capital costs.

Subsequent events, including legislative direction to review ownership versus leasing, accelerated consideration of collocation. Legislative policy was to look at owning state facilities since some locations were leased by transportation agencies for extended periods of time. Ownership enables the state to build equity in the facilities as they appreciate, and affords the state the option to sell them as the need arises. Additionally, the revenue generated from the sale of the facilities can be applied to the purchase of future or replacement facilities.

In 1991, DOL became an active participant. The three capital budgets were jointly evaluated to identify potential collocation sites. To date, all capital requests are reviewed by program managers on an on-going basis for potential combination of facilities and services.

In 1993, a market-driven siting study of licensing offices identified several collocation projects, which were authorized in the 1995-97 Capital Budget. In the 1993-95 Biennium, the legislature adopted RCW 46.01.330 mandating coordination between WSP and DOL for the siting of facilities. At the end of 1996, 113 separate collocation site efforts had been implemented or were under consideration involving transportation-related agencies and/or another state program (e.g., Wildlife), local (e.g.,

Transportation agencies have coordinated collocation efforts

county government) or private (e.g., Sprint Communications) program. In addition, 43 projects identified as collocation candidates are identified in the 1997-2007 Transportation Agency Ten-Year Capital Improvement Plan. The goal for each of these projects has been to enhance service and increase operating and capital efficiencies.

PROJECTS REVIEWED

We reviewed a representative sample of WSP collocation projects. The projects reviewed included:

- The Parkland Transportation Center
- *Vancouver DOL/WSP Service Center*
- Bellingham Regional Maintenance Center (DOT) and Detachment (WSP)
- *Silver Lake Detachment*
- Union Gap Combined Transportation Center
- Thurston County Light Industrial Project
- Plans for tower maintenance including projects included in the ten-year Transportation Capital Improvement Plan

The first six projects are summarized and described in Appendix 12. The tower maintenance projects, and the Ten-Year Capital Improvement Plan, are detailed in the Chapter Six, Telecommunications.

The collation participation for the first six projects is summarized below:

**Exhibit 21
Summary of Sample Projects**

<u>Site</u>	<u>DOL</u> Driver services	<u>DOL</u> Vehicle Services	<u>WSP</u> VIN	<u>WSP</u> Other (Specify)	<u>DOT</u> (Specify)	<u>Other</u> (Specify)
Parkland	yes	yes	yes	Detachment forensic lab	Emergency response; traffic management center	
Union Gap	yes	yes	yes		Over legal permits	
Vancouver	yes	yes	yes		No	DOE-vehicle emissions
Thurston County Industrial				Fleet, supply, property management, room for Electronic Services	Potential	Various including DNR and GA
Silver Lake				Patrol detachment	reststop	
Bellingham Regional Maintenance Center			Yes	Patrol detachment	Over legal permits	Dual agency refueling

Source: Project summary data as provided by Property Management Section, WSP.

Siting – While collocation has the two-fold purpose of enhancing accessibility to the public (e.g., multiple agencies at single locations) and creating opportunities for capital and operating efficiencies, siting is of paramount importance to WSP programs. WSP has a long-standing policy of locating its facilities near highways and interstates that are easily accessible to the patrol staff and the motoring public. Optimal site locations for WSP functions do not necessarily coincide with optimal locations for other functions including DOL. For example, the collocation at the Parkland site required that DOL siting criteria be breached (e.g., vehicle licensing criteria include minimum distances to existing subagent locations). This occurred due to lack of involvement by DOL in selection of the site, already owned by WSP.

Review of the siting criteria of various collocation participants would help to ensure that collocation criteria of individual programs are sufficiently satisfied in any collocation scenario.

WSP and DOL siting criteria do not necessarily match

This would also help to avoid overstating the benefits of the proposed collocation and to ensure that operating requirements of constituent programs are adequately satisfied.

Recommendation 12

All parties to the collocation process should review the siting criteria of the various collocation participants.

Economics – While service to the public is an important consideration, locations owned by an existing agency which can accommodate shared siting of facilities and operating synergies are significant factors supporting collocation of WSP facilities and programs (i.e., economics and location are the prime considerations of importance to WSP). Each of the sample projects provided sufficient information prior to collocation decision-making to evaluate the economics of the collocation proposal relative to WSP.

Since 1996, collocation proposals have been subject to a cost-benefit analysis in the framework of a lease vs. purchase model developed as the consequence of JLARC's Performance Audit of Capital Planning and Budgeting (1995). While the model is prospectively used, we found no subsequent analysis of completed projects to ensure that collocation assumptions are reasonable. Such retrospective analyses would assist in identifying circumstances that might question the reasonableness of cost assumptions. For example, the Vancouver project designed an area for vehicle licensing services in the expectation that Clark County would acquire that space as an agent or authorize a subagency; neither occurred. Similar circumstances occurred at the Union Gap facility after facility financial commitments had been made by the state.

Recommendation 13

Collocation participants should routinely review past projects to enable prospective projects to benefit from improved assumptions relative to location, appropriate mix of collocation participants, and facility programming.

Future projects could benefit from analysis of past projects

Additional Collocation Opportunities (Private Sector) – Last year, the Patrol commissioned an inventory of its current telecommunications towers in service around the state. The study investigated 56 existing tower facilities to determine structural, maintenance, paint, and other needs for the facilities. The study determined that the microwave towers had accumulated nearly \$1.6 million in deferred maintenance. The ten-year capital program submitted by the state suggests that \$4.25 million for tower maintenance will be sought over the next 10 years (1999-2009).

Recently, the Property Management Division devised an innovative strategy to replace one of the WSP-managed towers that had been recommended for replacement by the engineering consultant. By partnering with local commercial cellular carriers, the Property Management Division was able to avoid this capital expense. This strategy also addresses community concern that fewer, shorter poles are desirable and more aesthetically pleasing to adjacent property owners.

Chapter Six, Telecommunications, contains a recommendation for the State Patrol to ascertain which of its telecommunications towers provide opportunities for collocation and partnership with other entities, and to attempt to duplicate the success of the WSP Everett tower project. (See Recommendation 8, page 85).

INDIRECT COST RECOVERIES

Chapter Nine

INTRODUCTION

A concern brought to the attention of the Joint Legislative Audit and Review Committee (JLARC) during the pre-audit process was as follows: *Monitoring and review of the Washington State Patrol's (WSP) budget is made more difficult because of the agency's relatively high level of grants and interagency reimbursements, and its associated recovery of indirect costs.* Specifically, because these recovered costs (or at least portions thereof) can fall "outside" what might be considered the regular budget and allotment process, a complete picture of the Patrol's budget can be difficult to discern. A related concern was that these moneys could be used to fund items not explicitly authorized by the legislature. This chapter explores these and related issues.

Focus on
interagency
reimburse-
ments and
recovery of
indirect costs

BACKGROUND

WSP receives reimbursement from other agencies for services it provides to or on behalf of those agencies.⁶³ Payments it receives from the Department of Transportation (DOT) for providing troopers at DOT construction sites are a prime example. The Patrol also receives federal grant money for various activities, such as the Narcotics Task Force program.

When providing services for, or on behalf of another agency, both state and federal regulations allow for the recovery of all costs associated with providing the service. This includes both the *direct costs*, which typically include elements such as salaries,

⁶³ In 1995-97, the Patrol received \$17.5 million in interagency reimbursement. Among non-education agencies, this amount was second only to the Department of Social and Health Services.

benefits, and travel, and also the *indirect costs*; costs which are less readily identifiable but which are incurred nonetheless. For the Patrol, these include such things as administration, training and supply services.

**\$4.2 million
in indirect
costs
recovered in
1995-1997**

State regulations provide that, when possible, agencies are to base their indirect cost charges on a set rate that each agency calculates individually as part of an Indirect Cost Plan, developed in accordance with Circular A-87 published by the United States Office of Management and Budget. The Patrol's most recent "A-87 Indirect Cost Plan" is for FY 1997. Pursuant to that plan, the Patrol's indirect cost rate is 30 percent of salaries and benefits.

The Patrol indicates it has been aggressive in pursuing reimbursement for the *full* costs of its contract and grant work. Doing so benefits the Patrol by maximizing the revenue it receives from third-party users of its services. To the extent that these third-party users include the federal government, the state as a whole also benefits through the recovery of additional federal funds. In 1995-97, the total amount of indirect costs recovered by the Patrol was approximately \$4.2 million.

COST RECOVERIES AND THE BUDGETING/ALLOTMENT PROCESS

As noted in the introduction to this chapter, cost recoveries can fall outside what might be considered the regular budget or allotment process. To illustrate how this can occur, the information below focuses on the Patrol's "Master Contract" with DOT (the one used primarily for providing troopers at DOT construction sites). This area represents one of the larger sources of indirect cost recovery for the Patrol, and it also constitutes a separate "program index" within the Patrol's budget; meaning funds for this activity are accounted for separately.

**Review
focused on
DOT Master
Contract**

Exhibit 22 shows the budget for the Patrol's DOT Master Contract for the past two and one-half biennia, highlighting the division between direct and indirect costs, and how both are offset (or nearly so) through interagency reimbursement. As can be seen in Exhibit 22, although the final expenditure amounts are relatively significant, WSP did not allot any of the funds up-front

in either of the last two full biennia. The Patrol has, however, allotted indirect costs funds for the current biennium. (Although the amount allotted was based, according to WSP, on the experience of the prior biennium, it was less than half of the amount actually collected.

Exhibit 22

Washington State Patrol's Master Contract With the Department of Transportation Comparison of Original Allotments to Final Expenditures and Distribution of Direct and Indirect Costs						
	1993-1995		1995-1997		FY 1998	
	Original Allotment	Final Expenditures	Original Allotment	Final Expenditures	Original Allotment	Final Expenditures
Direct Costs (Objects A thru J)	\$0	\$1,606,552	\$0	\$1,734,142	\$0	\$1,849,303
Indirect Costs (Object T*)	\$0	\$475,299	\$0	\$494,492	\$205,200	\$484,810
Inter-Agency Reimb. (Object S)	\$0	(\$2,080,682)	\$0	(\$2,229,275)	(\$205,200)	(\$2,398,567)
Total	\$0	\$1,169	\$0	(\$641)	\$0	(\$64,454)

Source: AFRS Report.

Although an agency can allot interagency reimbursement funds that it knows it will receive, it is not required to do so. This is because only the agency *receiving* the original appropriation is required to allot it. In this case, that would be the Department of Transportation—they are the agency *spending* the money. When we asked WSP staff why the Patrol did not allot these funds upfront, we were told it was unnecessary since it was all reimbursed anyway, and therefore, the amounts cancel each other out. Additionally, they noted that because all of the reimbursement in this area was for overtime work, it didn't affect the "regular" budget numbers (i.e., the budgeted salary amounts and FTE levels for the non-DOT contract work).

Cost recoveries not required to be allotted

Because these funds are not allotted by the Patrol, they are far less visible than they otherwise would be. For the *direct* costs, that is likely not significant. From a budgetary perspective, the funds remain within their own budget area, and are reimbursed on a readily identifiable one-for-one basis. The issue is much less clear-cut when it comes to the *indirect* costs however. This is because the reimbursement basis for these funds is not as easily identifiable and because they are available for disbursement throughout the agency.

Indirect costs are widely accepted as a standard and legitimate component of *full* project costs. Theoretically, such funds should not be an issue since they are intended to provide “for the recovery of only those costs that are actually incurred.”⁶⁴ As such, it would seem reasonable to expect that the funds would be allocated back to the individual sub-programs which incurred the additional expenses. Here, however, there is some question as to whether either of these is the case. Among the issues that come into play are the following:

- ***The amount of indirect costs collected for the DOT Master Contract is likely higher than actual costs incurred.*** From the perspective of interagency reimbursement and indirect costs, the DOT Master Contract may be somewhat unusual in that all of the work performed by troopers under the contract is done on an overtime basis. This raises two issues. The first is that some of the indirect cost centers cited by the Patrol in its A-87 Indirect Cost Proposal, while fully appropriate for allocating costs for “straight time,” may not be applicable for work performed on overtime since additional costs are likely not incurred. Examples of such cost centers include “Human Resources” and “Property Management.”

The second and more significant issue is that the Patrol imposes the indirect rate on the overtime salaries, which are 50 percent higher than straight-time salaries. The effect is that the Patrol collects 50 percent more in indirect charges on salaries (plus a somewhat lesser amount on benefits⁶⁵) than it

⁶⁴ See OFM Budgeting and Accounting Manual, Section 4.3.3.1.2 e.(1).

⁶⁵ The cost of benefits increases for overtime pay, but not proportionately to the increase in salaries.

Question of whether indirect rate should be charged on overtime premium

otherwise would. In the 1995-97 Biennium, we estimate this additional sum equaled approximately \$158,000.⁶⁶ Although we did not specifically audit the amount of indirect cost collections against the amount of costs incurred, there is nothing to indicate that the costs incurred actually increase as a result of paying overtime versus straight-time. Assuming the general accuracy of the Patrol’s existing indirect rate, the “additional” funds collected would be above and beyond the indirect costs actually incurred.

- **The Patrol does not proportionately allocate indirect cost collections back to the cost centers where they were reported to have been incurred.** The Patrol’s federal A-87 Indirect Cost Plan serves as the basis for its indirect cost rate.⁶⁷ In the plan, the Patrol identifies each of its individual indirect cost centers, and the extent to which they contribute to the entire indirect cost. We compared these to the actual distributions recorded for the 1995-97 Biennium. Shown below are *examples* of instances where there were notable differences.

Exhibit 23

Indirect Cost Center	Proportion of Total Indirect Costs Cited in A-87 Proposal	Allocation of Total Indirect Costs Recorded in 1995-97
Communications	20.4%	3.5%
Electronic Services	16.3%	6.7%
Administrative Services	14.3%	5.0%
Property Mgt.	6.8%	17.7%
Revolving Accounts	0.6% to 3.2%	22.6%

Source: Based on WSP data.

We asked WSP staff if the actual distribution of indirect costs should generally be comparable to the amounts cited in the A-87 Plan. They indicated that there was no requirement to do so. They further said their distributions were similar to the plan, but that the agency has discretion, and has “distributed the

Agency has discretion on how to allocate cost recoveries

⁶⁶ Based on \$1,403,771 paid out for overtime salaries, and \$220,079 in benefits.

⁶⁷ As noted previously, the Patrol’s most recent A-87 Plan is for FY 1997. Our understanding, however, is that it is considered by the Patrol to be current.

allocations where it felt the additional resources were most needed.”

In 1995-97, the largest single share of the Patrol’s indirect cost recoveries—22.6 percent, totaling just under \$1 million (\$946,803)—was allocated to “Revolving Accounts,” which is a separate account within the Office of the Chief. According to the Patrol this account:

“. . . is now used as the clearing-house for indirect cost recoveries. Any recoveries in excess of what was anticipated in the base allotments are [directed into the account and are] available for use as an agency resource to address contingencies.”

- **A specific accounting of what past indirect cost recoveries were used for could not be provided.** We asked the Patrol for an accounting or breakdown of what the \$946,803 in indirect cost recoveries (Object T) in 1995-97 were used for. WSP staff told us that the state’s accounting system is not set up to provide for that type of specific breakdown.

Specifically, we were told that although there would be warrants that would show, for example, that money that went into a particular program did come from the Revolving Accounts fund, they would not indicate specifically what the money was for. WSP staff did offer their recollection, however, that as much as a third of the Object T monies had been used to cover over-spending that had occurred in the Patrol’s Electronic Services Division.

The Patrol’s position, as expressed by staff, is that these monies represent a necessary contingency fund, and that they are used in a responsible manner to address legitimate needs, as identified by agency management.

DISCUSSION

In summary, the indirect cost recoveries received by the Patrol for its DOT Master Contract—totaling nearly one-half million dollars during the 1995-97 Biennium—were not allotted (nor did they have to be), even though they have constituted a generally on-

Spending of indirect cost recoveries difficult to track

going source of funds for the agency over the past five years.⁶⁸ Because all work performed under the contract is done on an overtime basis, and the indirect rate is imposed on the higher overtime salary level, the amount of funds recovered was likely greater than the costs actually incurred; assuming the general accuracy of the Patrol's current indirect rate. In essence, this provides the equivalent of additional revenue for the agency. Patrol staff acknowledge that some portion of these funds are used for discretionary purposes, yet because of the structure of the state's accounting system, a specific breakdown of where the funds went cannot be provided.

To our knowledge, the Patrol's actions in this area have not been inconsistent with applicable rules or regulations. Nonetheless, in this instance, the agency's collection and subsequent distribution of indirect cost recoveries could be seen as falling outside what might be considered the typical budget process. Specifically, under the existing system, the Patrol has access to what are essentially additional funds, above and beyond those appropriated to it by the legislature. There is limited outside oversight of these funds, including by the legislature itself.

The Office of Financial Management (OFM) has responsibility for developing accounting policies and procedures related to interagency transactions. The preliminary report for this audit contained two recommendations directed to OFM. Both recommendations would have had OFM establish appropriate policies and procedures concerning the identification of cost recoveries in budgets and allotments, and charging an indirect rate on overtime. OFM agreed that additional review of the Patrol's development and application of cost allocation plans is needed, but expressed reservations about establishing statewide policies and procedures to address issues that were identified in an audit of a single agency. The concern was that implementation changes to address potential issues in one agency might have unintended consequences for other state agencies. We concur with these concerns.

We have discussed with OFM and the Patrol several options for ensuring that the issues raised in this chapter will be addressed.

⁶⁸ The amount of reimbursement received from the DOT Contract was substantially lower in the 1991-1993 Biennium—(\$198,963).

As described above, these issues relate to questions of whether indirect cost recoveries match actual costs, and whether information on the expenditure of these recoveries is adequately detailed and visible. This latter issue is of particular importance to the legislative members who asked that the audit include a review of indirect cost recoveries.

With the concurrence of OFM and the Patrol, we offer the following recommendation.

RECOMMENDATION

Recommendation 14

The Washington State Patrol and the Office of Financial Management should jointly review the basis for the Patrol's indirect cost recovery plan used in the administration of the Patrol's "DOT Master Contract" to determine if there is any need for modification.

SCOPE AND OBJECTIVES

Appendix 1

SCOPE

As mandated in the 1997-99 Transportation Budget,* this audit will examine the transportation-related activities of the Washington State Patrol, focusing on law enforcement operations, communications systems and technology requirements. As appropriate, the audit will assess performance and review issues pertaining to the efficiency, effectiveness, and accountability of program operations.

OBJECTIVES

- Assess the overall efficiency and effectiveness of the Patrol in carrying out its major transportation-related programs and functions. Included will be a review of its overall organizational structure and administrative functioning, an examination of its strategic planning and performance measurement activities, and an assessment of its patrol allocation and vehicle replacement practices.
- Review and assess the budgetary structure and practices of the Patrol.
- Examine compensation-related issues, including the salary setting process, specialty pay provisions, and the Patrol's practices with respect to overtime and contract work.
- Review the nature and extent of coordination between the Patrol and local jurisdictions with respect to such issues as accident investigations and communication and data links.

* ESSB 6061.

- Evaluate capital related issues pertaining to the Patrol, including its performance in securing necessary facilities for the least possible cost, and the legislature's policy decision to encourage collocation of transportation-related agencies.
- Review the adequacy of the Patrol's existing communications systems, and assess its current plans for upgrading those systems.
- Review the Patrol's overall data and technology needs, and assess the adequacy of its planning processes in this regard.

AGENCY RESPONSES AND AUDITOR'S COMMENTS

Appendix 2

- WASHINGTON STATE PATROL
- OFFICE OF FINANCIAL MANAGEMENT
- AUDITOR'S COMMENTS

To link to this appendix, click [here](#).

AUDITOR'S COMMENTS REGARDING WSP COMMENTS ON COUNTY ROADS SECTION

The Patrol's response includes a number of statements concerning the chapter on County Roads that require comment:

- Regarding the comment that “projected reductions are based on an arbitrary association between the number of vehicle miles traveled on county roads and the number of contacts:”

Contacts-per-vehicle-mile-traveled is a *rate*; a measure that allows for direct comparison of service levels among jurisdictions of different sizes and populations (e.g., between highly urbanized King County and sparsely populated Columbia County). It is used in the report to quantify both current service levels, and potential reductions that could be achieved through meeting the LTC's directive.

The target reductions in the report are not based on a presumed association between contacts and vehicle miles traveled. They are based on limiting the number of contacts in each geographical area to a *rate* that is no higher than that which currently exists in either one-half (median) or one-quarter (25th percentile) of all the geographical areas within the state.

- Regarding the comment that the report fails to consider other important variables affecting county road activity:

As indicated in the report, we do not disagree with the Patrol's assertion that there may be legitimate reasons for providing dissimilar levels of service in some areas (such as those cited in the Patrol's response). The report concludes, however that it is up to the legislature to determine what levels of service are appropriate, and what factors should be considered in determining those levels.

- Regarding the statement that the report “does not explain why target service level reductions are needed, when the agency

has already made substantial progress in complying with the LTC directive as noted previously” (where previously the Patrol notes it has made progress in reducing its activities on county roads “over the last five years:”

The LTC’s directive was issued on January 30, 1998. It is evident that the LTC felt that reductions were necessary in the county road service levels that were *current at that time*. That is why all of our analyses use FY 1998 as the current, or base year. While the report acknowledges the Patrol’s efforts to reduce its activity levels on county roads prior to 1998, it is apparent that the LTC wanted and expected reductions beyond those that had previously been achieved.

- Regarding the comment “that in order to achieve the target reductions, troopers would have to ignore *all* non-injury and property damage incidents observed on county roads” (emphasis by the Patrol):

This comment reflects a misunderstanding on the part of the Patrol as to what level of service would still be allowed within the confines of the target reductions. As shown in Exhibit 8, the number of hours established as the target for non-injury collisions is 834 for the 25th percentile target, and 1,391 for the median target. The actual number of non-injury collision contacts represented by these hourly totals is 498 and 824, respectively. In other words, under the median target level, the Patrol would still be expected to investigate up to 824 non-injury collisions on county roads annually.

See the following comment for numbers pertaining to other calls-for-service and self-initiated-contacts.

- Regarding the final comment which implies that the target level reductions go “beyond” the LTC directive:

We disagree with this assertion. The “Background” section of Chapter 3 presents our understanding of what the LTC’s expectations were regarding the level of county road activities that the Patrol should limit itself to under the

Appendix 2: Agency Responses and Auditor's Comments
LTC directive. As is also indicated in Chapter 3, the Chief previously confirmed that our understanding was consistent with the Patrol's. A comparison of LTC service level expectations to the target levels presented in the report is provided below. [Note: The figures below represent the number of *contacts* allowed under the target reductions, whereas the figures in the body of the report represent the number of *hours* associated with those contacts.]

Non-Injury Collisions

- *LTC Expectation:* no investigations of non-injury accidents
- *Target Reduction:* contacts reduced from 5,934 in FY 1998 to either 824 (median) or 498 (25th percentile) annually

Other Calls-For Service

- *LTC Expectation:* limited to what might be considered exceptional circumstances
- *Target Reduction:* contacts reduced from 18,559 in FY 1998 to either 13,250 (median) or 8,407 (25th percentile) annually

Self-Initiated Contacts

- *LTC Expectation:* Should occur only if a trooper "spots something" while traveling to or from another work-site
- *Target Reduction:* contacts reduced from 61,232 in FY 1998 to either 43,201 (median) or 31,756 (25th percentile) annually

WASHINGTON STATE PATROL ACTIONS RESULTING FROM 1991 LTC RECOMMENDATIONS

Appendix 3

To link to this appendix, click [here](#).

Limitations of the PAM Model

Appendix 4

Chapter One of this report contains a summary discussion of some of the limitations of the staffing and deployment model currently being used by the Washington State Patrol (WSP). Recommendations to address these limitations are also included at the end of Chapter One.

This appendix expands on the discussion in Chapter One by providing more detail concerning the limitations and the basis for the conclusions drawn in the audit.

A discussion of the major limitations to the model is discussed below. Addressing these limitations may result in producing model outputs that are more closely associated with actual performance data as reported from the Computer Aided Dispatch (CAD) system. We are unable to say, however, how much improved accuracy would result from these changes. As indicated in Chapter One, and as reflected in our recommendations, further validation efforts would have to be made before reaching a conclusion.

PRIORITIES OF CALLS FOR SERVICE

The version of the Police Allocation Manual (PAM) for statewide agencies (WSP's current model) does not distinguish between different priorities of calls for service. If the legislature and WSP decide to move in the direction of more refined performance measures as suggested in Recommendation 2, a model that estimates service performance in terms of priority of calls will be needed. A different version of PAM for municipal police departments allows the user to distinguish between high priority calls and other calls.⁶⁹ Our review of immediate response data for

⁶⁹ Another difference with the municipal version of PAM is that it incorporates pre-empted calls in determining the number of troopers needed for immediate

each priority of call suggests that calls can be reasonably divided into the two categories used in the municipal model. Generally, the highest priority calls, (1 and 2), are received and are handled differently than the lower priority calls (3 through 6). Data showing patrol performance in relation to the first three priorities of calls are included in Appendix 6.

STAFFING AND WORKLOAD VARIATIONS

Calls for service and trooper staffing can vary significantly by time of day and day of week. For example, we looked at the relationships between staffing and calls for service by time of day for a sample of Autonomous Patrol Area (APA)s during four weeks in 1998. We calculated the following values to determine the degree of association between these two variables. The possible range is from zero to one, with zero indicating virtually no association. A one, or a number close to one, would indicate a high degree of association.⁷⁰

response. However, according to WSP, the CAD system currently does not provide information on pre-empted calls.

⁷⁰ The method we used was a simple regression with the variables standardized using z-scores, which measure the distance of each variable from the mean in terms of standard deviation. The values indicating association are the coefficients of determination [R squares]. We could not do the same kind of analysis for days of the week because of data reliability problems.

APA	NAME	DEGREE OF ASSOCIATION
02	Tacoma Freeway	0.02
25	Wenatchee	0.51
26	Ellensburg	0.32
27	Okanogan	0.22
28	Ephrata	0.65
29	Moses Lake	0.22
35	Port Angeles	0.44
36	Bremerton	0.11
37	Hoquiam	0.48
38	Shelton	0.23
39	Raymond	0.00

Sources: WSP District 1, 6 and 8 Schedules 3/16/98 through 4/12/98, WPS CAD data for the same period, and JLARC worksheet: Sample APAs Regression Results.

These values suggest that for the sample APAs in this one-month period, there was not a pattern of a strong association between when troopers were assigned to work and when calls for service occurred. A comparison involving the same or different APAs over different time periods might show other patterns. These data should not be interpreted as indicating that staffing patterns should change. As discussed in Chapter One, there are a number of factors that determine how troopers are scheduled. If, however, districts can manage to schedule troopers to better match call-for-service workload by time of day without sacrificing other operational objectives, this might be one way to improve performance in relation to response availability and response time.

There are two approaches that can be taken with the current PAM model. The first is a simplified approach whereby the user enters data for time and activities into the model, and then the model divided the data evenly into the number of effective shifts per day.⁷¹ By treating the data this way, this approach implicitly

⁷¹ Effective shifts are calculated as follows: Hours of coverage per week/(7 days per week X 8 hours per shift). For example, 24-hour coverage per week would total 168 hours. 168 hours divided by 56 is three – the number of effective

assumes that workload and staffing are proportionate and do not vary by time or day or by day of week. The second approach divides the day into three shifts, but does not divide the week into days. The user specifies how staffing is divided among the shifts by indicating the percentage of staffing for each of the three shifts. Although this approach recognizes that staffing levels may vary by shift, it still implicitly assumes that workload and staffing during these shifts are proportionate and do not vary.

The problem with these implicit assumptions can be stated as follows:

- If staffing and workload do not actually match, the estimates of staffing needs and performance information from PAM will be different to some degree to real staffing needs and actual performance.
- Assuming that there is a match, when in fact there is none or only a weak one, will result in an overestimation of performance (or conversely an underestimation of staffing needs).

Modeling WSP patrol operations by time of day and day of week would likely provide the most accurate model outputs. It is not clear at this time, however, how much improved accuracy would result over using three shifts, or whether the improvement would justify the additional effort that would be involved.

LESS THAN TWENTY-FOUR-HOUR STAFFING

As currently designed, PAM estimates staffing needs related to performance objectives for APAs *when they are staffed*. Presently, 22 of the 39 APAs have dedicated staffing for less than twenty-four hours per day.

For the 22 APAs that are not staffed for an entire day, PAM treats the calls for service for those APAs as though the calls only occur during the time the APAs are staffed. This workload can

shifts per day. If less than 24-hour coverage is provided, the number of effective shifts will be less than three.

actually occur at any time. In instances where calls are received when an APA is not staffed, troopers have to be drawn from other APAs or called out, or other provisions have to be made.

The staffing estimate derived by PAM is based on what staffing would be needed only during the hours staffed to handle twenty-four hours worth of workload. Sensitivity analysis suggests that the impact of this model feature is to overestimate performance and to underestimate staffing needs.

A way of dealing with this situation is to use a multi-shift modeling approach, or at a minimum the existing three-shift option within PAM with modifications to spread calls-for-service workload data among the shifts. Again, it is not clear whether the more detailed approach would result in a substantially better match between the model outputs and reality.

ESTIMATING ACTUAL PERFORMANCE

PAM enables the user to specify response availability performance objectives of 50, 60, 70, 75, 80, 85, 90, 95, 97, 98 and 99 percent. For the purpose of estimating staffing needs, this limited number of objectives may be sufficient. As an example, WSP has used PAM to estimate its patrol staffing needs based on achieving an 80 percent target for trooper availability to respond immediately to calls for service. Assuming no problems with the model or WSP's use of it, the resulting staffing needs estimate would be directly associated with the 80 percent target.

But when WSP receives less than the estimated number of troopers needed, it has been necessary to "run the model backward" to find what range of performance would be associated with the actual staffing. This is done by setting the performance target at lower and lower levels until the model shows a need of no additional staff (or even fewer staff as the case may be). So, if PAM shows a need for staff at a 70 percent target but a surplus of staff at 60 percent, the process has been to calculate an actual percentage somewhere within the range permitted by PAM. The precision in running the model backward is therefore less than with approach for estimating staffing needs when the performance objective is specified.

As indicated in Chapter One, actual performance of WSP (in relation to availability for immediate response) is below 50 percent. PAM would need to be modified with additional tables for lower percentages in order to “run the model backwards” to estimate actual performance based on current or reduced levels of staffing. Additional tables would also be of benefit in general for using the model to estimate performance and staffing needs based on different scenarios.

PAM Outputs versus Data from the Computer Aided Dispatch System

Appendix 5

We performed regression analyses in which the dependent variable was the data from the Computer Aided Dispatch (CAD) system and the independent variable was relative staffing deficiencies based on Police Allocation Manual (PAM) outputs. We used CAD data showing the percentage of time that troopers were available to respond to citizens' calls for service within different time periods. Regardless of the time period used (e.g., within 1, 2, 3, 5 or 10 minutes), the results were approximately the same. For purposes of illustration here, we are using response availability within 5 minutes.

Before using PAM outputs relating to relative staffing deficiencies, we first made several adjustments to the usage of the model, as are explained in Chapter Two. This involved using the correct tables in PAM, and entering overtime hours and reported actual time for self-initiated contacts. Since the relative staffing deficiencies are based on the staffing needs related to trooper availability, one would expect there to be a strong correlation between this variable and the CAD data.

The resulting coefficient of determination [R square] was only .17. The association improved somewhat when we added another independent variable showing the relative staffing coverage for each Autonomous Patrol Area (APA) (i.e., degree to which an APA is staffed for a full, 24-hour day). We did this because the model tends to overestimate performance for those APAs that are not staffed 24-hours per day. The resulting R square was still only .23. We standardized the variables used in the multiple regression by calculating z-scores.

In another set of tests, we looked at the nine APAs that were within 5 percent of having the appropriate number of staff needed to meet response availability objectives of 50 or 60 percent, according to PAM. In these tests, the R squares from the

regression were in the range of .29 to .33, depending on whether two or three minutes were used to account for call handling time in the communication centers. One would expect these values to be higher if PAM were reasonably predicting actual performance.

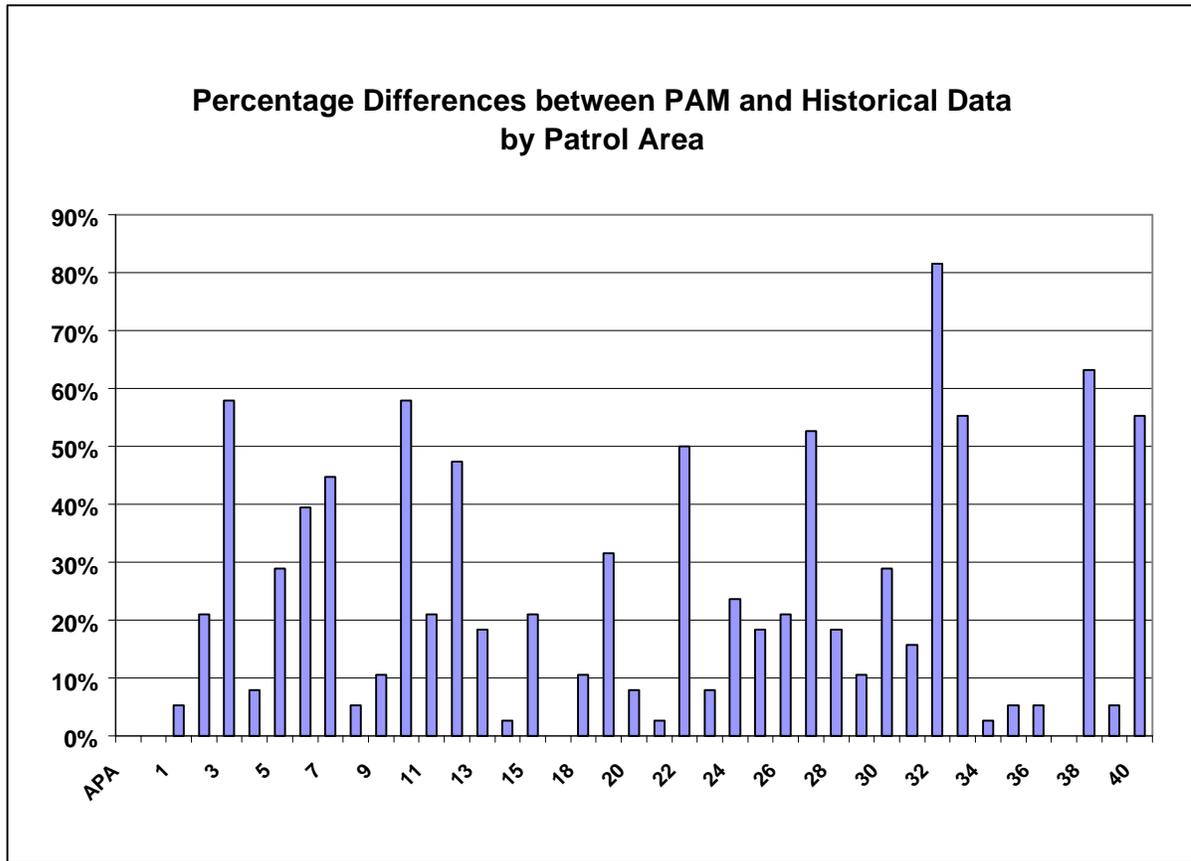
As a final test, we used a method that calculates an R square for two variables, but rather than using z-scores based on the actual data, it uses the rank order of the variables. This method, called the Spearman Rank Correlation Coefficient, is simpler and less precise than regression. However, since ranks are used, it is somewhat easier to actually see the strength of the association between the ranked variables.

The R square calculated by this method was .39. Using rank order, we would have expected to see a stronger degree of association. A visual inspection of the ranking data may help to explain why the degree of association is not higher than was calculated. In the following table, the ranks are shown for each of the two variables for each APA. Also shown are the absolute differences between the rankings for each APA. Although there are many APAs where the rankings are the same or are very close to one-another, there are many others where the rankings are quite different. For several APAs the rankings go in entirely different directions.

The chart that appears on the last page of this appendix uses the same data, but shows how the rankings of the APAs compare in terms of percentages. As an example of how to read this chart, for APA 37 there is an exact match between its ranking in terms of staffing needs and relative performance; in contrast, for APA 32, the rankings are quite different (82 percent toward being completely different).

APA	Relative Staff Need Rank	Response Availability Rank	Absolute Difference
1	7	9	2
2	28	20	8
3	32	10	22
4	18	21	3
5	22	11	11
6	23	8	15
7	29	12	17
8	8	6	2
9	3	7	4
10	38	16	22
11	27	35	8
12	16	34	18
13	30	37	7
14	35	36	1
15	31	23	8
16	2	2	0
18	33	29	4
19	19	31	12
20	14	17	3
21	26	25	1
22	9	28	19
23	15	18	3
24	17	26	9
25	11	4	7
26	13	5	8
27	39	19	20
28	10	3	7
29	5	1	4
30	4	15	11
31	20	14	6
32	1	32	31
33	34	13	21
34	21	22	1
35	25	27	2
36	37	39	2
37	24	24	0
38	6	30	24
39	36	38	2
40	12	33	21

Source: PAM outputs and CAD data for FY 1997.



Source: PAM outputs and CAD data for FY 1997.

Performance Outputs for Patrol

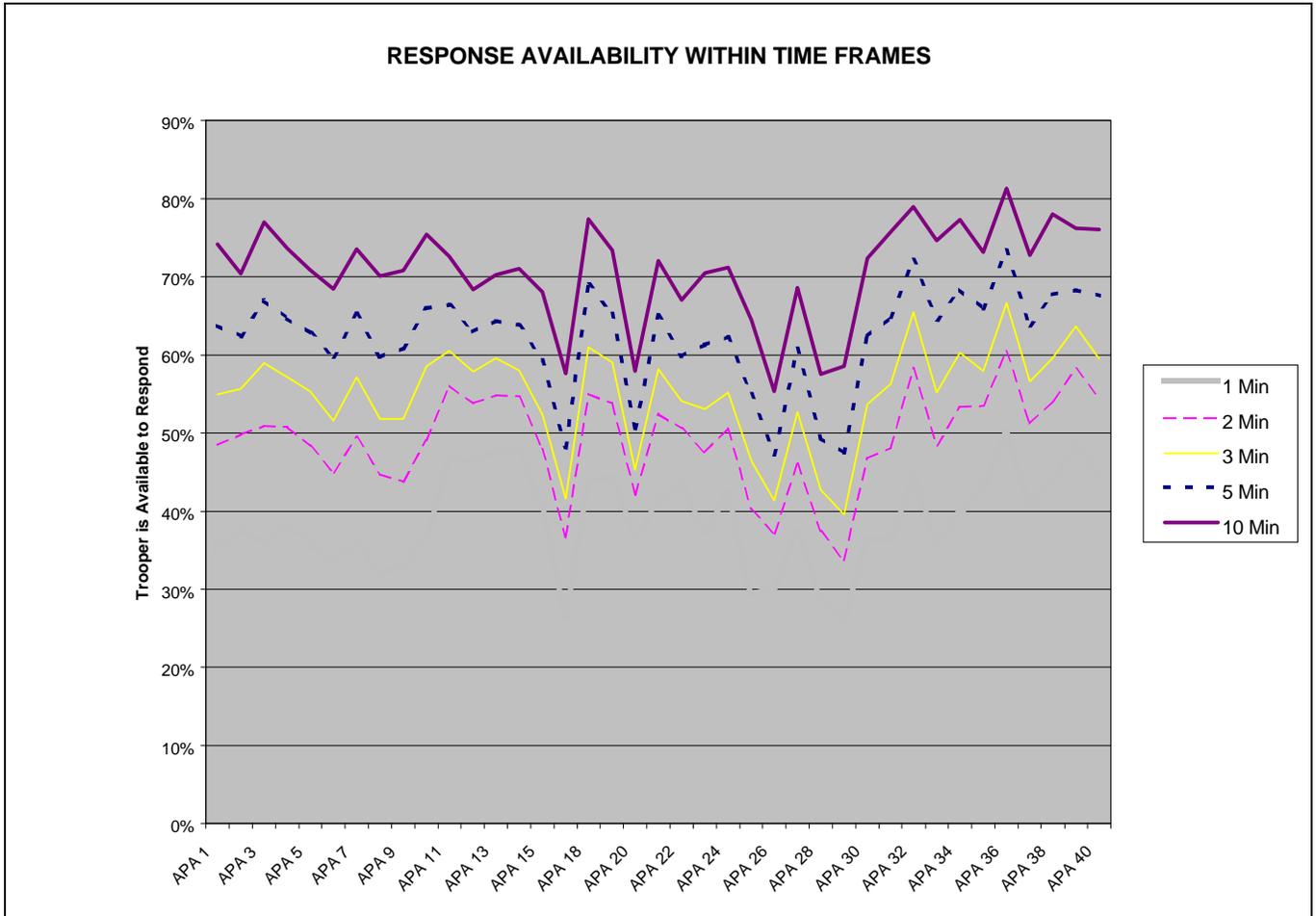
Appendix 6

Until recently, the only performance outcome data for the Washington State Patrol (WSP) that was available to decision-makers was the percentage of time that troopers were available to respond immediately to citizens calls for service. This information, which came from the Police Allocation Model (PAM), did not distinguish performance outcomes among the priorities of calls. Another drawback of this data was that it could only be a rough estimate at best. This is because PAM was not designed to provide precise estimates of performance outcomes based on “running the model backward.”

Now, WSP has data from the Computer Aided Dispatch (CAD) system that shows patrol performance in a number of ways, and is no longer based on estimates.

Chart A shows the percentages of time that troopers are available to respond to citizens’ calls for service within different time periods from the time when the calls are first received at the communications centers.

CHART A



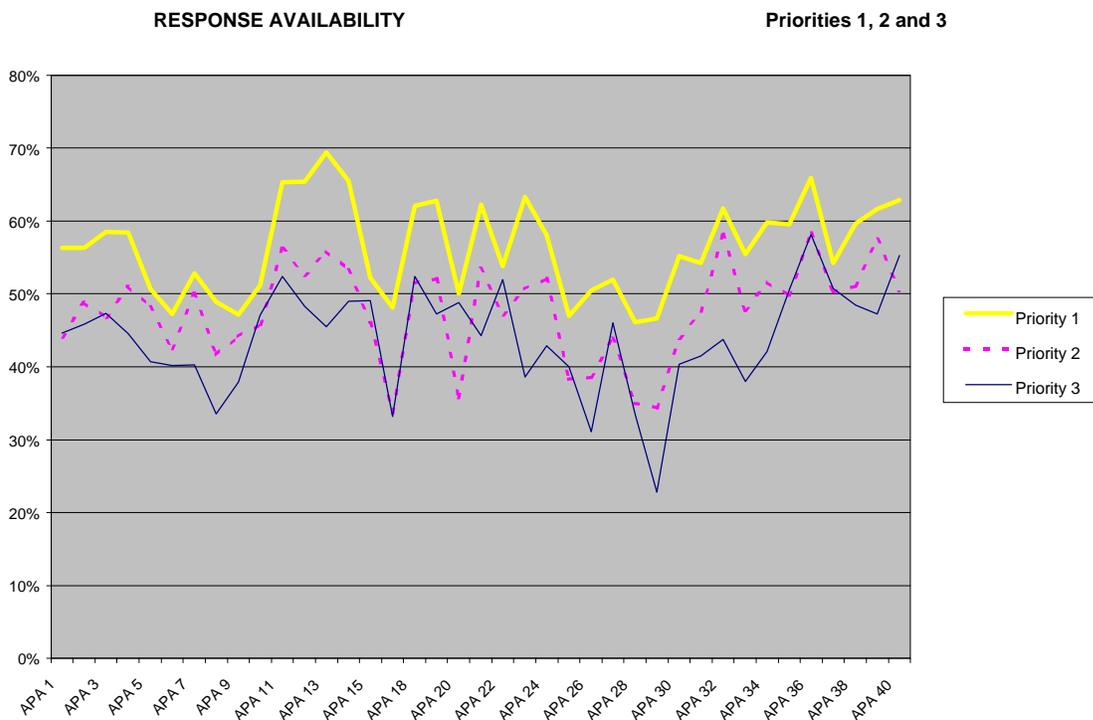
Source: WSP CAD data for FY 1997, Report KDR0050-3.

The vertical axis of Chart A is the percentage of time that a trooper in an Autonomous Patrol Area (APA) is available to respond to a citizen’s call for service. The horizontal axis shows each of the 39 APAs. Note that by current WSP practice, there is no APA 17. That is why the chart shows an APA 40 when there are only 39 APAs. The names for each APA are given in Table 1 (see page six). The data points for delays of one and two minutes may be more indicative of what PAM would count as the “immediate” response. The one or two minutes is WSP’s best

estimate of the call handling time in the communications centers.⁷²

Chart B shows the percentages of time within each APA that troopers are available to respond to priority 1, 2 and 3 calls within two minutes of the call being received. Priority 1 is the most severe type of call, and covers such incidents as fatal hit-and-run and other types of serious calls, emergencies and hot pursuits. Priority 2 is somewhat less serious and pertains to calls for incidents such as non-injury accidents and hazards. Priority 3 calls may be for such things as DUI reports, backup to other agencies, and non-emergency investigations.

CHART B



Source: WSP CAD data for FY 1997, Report KDR0050-3

⁷² One minute was the estimate made by staff in Budget and Fiscal Services, and two minutes (or slightly more) was the estimate of staff in the Communications Division.

The reason why the percentages for Priority 3 calls are in some cases higher than for Priority 2 calls is likely due to the fact that some of the Priority 3 calls can be scheduled, and that dispatchers may delay dispatching these calls until troopers are available. Priority 4 and 5 calls are not shown here because they are relatively few and show wide variations in relation to immediate response for the same reasons as Priority 3 calls.

Table 1 on page six shows response times by two categories:

Received-to-Arrive. This refers to the minutes elapsed from when the call is first received in the communications center to the time when the first trooper arrives at the scene.

Assigned-to-Arrive. This refers to the average minutes elapsed from when the call is first assigned to a patrol unit until the time when that unit arrives at the scene. This is an average for all the units that are dispatched to a call. For instance, a call may be assigned to the first available trooper who is at a relatively far distance from the scene. This trooper may take 20 minutes to respond. Meanwhile, another trooper who is closer to the scene is also dispatched. This second trooper may take only 10 minutes to respond. The time from assignments to the call to the arrivals is the average for the two units, which in this case would be 15 minutes.

[Note that Assigned-to-Arrive cannot be subtracted from Received-to-Arrive to calculate a call handling time for two reasons: (1) it is not necessarily the same units whose times are measured; and (2) call "assignment" means that a trooper has indicated that he or she is taking the call. There can be lapses of time after a call is ready to be assigned until a trooper takes the call.]

These data for the APAs combine the response times for all priorities of calls. As previously indicated, the inclusion of the very low priorities of calls (priorities 4 through 6) might tend to give a less useful picture of performance. Tables 2 and 3 show the breakout of the Table 1 data for priorities 1, 2 and 3 for the two categories of response time: Received-to-Arrive and Assigned-to-Arrive.

Note that in all but one APA for each of the categories of response time, Priority 1 times are shorter than for Priority 2. For reasons previously indicated, there are several instances when Priority 3 calls have shorter response times than higher priority calls.

TABLE 1
RESPONSE TIMES IN MINUTES BY APA

APA	Name	Received to Arrival	Assigned to Arrival
1	Gig Harbor	18	12
2	Tacoma Freeway	14	10
3	Tacoma East	19	13
4	Thurston County	19	13
5	Seattle North	16	10
6	Seattle South	17	11
7	Seattle East	17	11
8	Valley	28	13
9	North Bend	23	13
10	Enumclaw	27	24
11	Yakima	21	14
12	Sunnyside	22	13
13	Kennewick	29	17
14	Walla Walla	32	25
15	Colville	38	29
16	Ritzville	31	18
18	North Spokane	22	16
19	Spokane Valley	18	12
20	Colfax	32	20
21	Vancouver	16	10
22	Goldendale	34	23
23	Kelso	21	13
24	Chehalis	21	13
25	Wenatchee	32	20
26	Ellensburg	38	18
27	Okanogan	36	24
28	Ephrata	37	20
29	Moses Lake	34	18
30	Bellingham	24	14
31	Mount Vernon	22	14
32	Oak Harbor	20	16
33	Everett Central	18	11
34	Everett East	23	17
35	Port Angeles	27	19
36	Bremerton	16	11
37	Hoqiam	31	21
38	Shelton	24	17
39	Raymond	32	22
40	Morton	29	18

Source: WSP CAD data for FY 97, Cadsum file.

TABLE 2**RECEIVED TO ARRIVAL BY PRIORITY**

APA	Title	Priority 1	Priority 2	Priority
01	Gig Harbor	15	19	20
02	Tacoma Freeway	12	14	16
03	Tacoma East	15	20	23
04	Thurston County	16	19	20
05	Seattle North	14	15	21
06	Seattle South	15	17	21
07	Seattle East	15	15	20
08	Valley	17	21	26
09	North Bend	19	23	26
10	Enumclaw	20	25	54
11	Yakima	19	21	20
12	Sunnyside	17	24	22
13	Kennewick	18	22	32
14	Walla Walla	25	30	39
15	Colville	36	40	33
16	Ritzville	23	31	33
18	North Spokane	19	23	23
19	Spokane Valley	14	19	19
20	Colfax	26	36	28
21	Vancouver	12	15	19
22	Goldendale	33	38	30
23	Kelso	18	21	20
24	Chehalis	15	18	27
25	Wenatchee	24	32	28
26	Ellensburg	24	31	43
27	Okanogan	32	36	36
28	Ephrata	32	37	38
29	Moses Lake	24	32	37
30	Bellingham	20	24	26
31	Mount Vernon	18	23	23
32	Oak Harbor	18	22	17
33	Everett Central	14	18	23
34	Everett East	18	24	28
35	Port Angeles	21	30	29
36	Bremerton	14	16	17
37	Hoqiam	24	30	24
38	Shelton	21	25	20
39	Raymond	34	31	31
40	Morton	23	30	30
	Weighted Average for all APAs	16	21	23

Source:WSP CAD data for FY 97, report KDR0050-5.

**TABLE 3
UNIT RESPONSE TIME BY PRIORITY**

APA	Title	Priority 1	Priority 2	Priority 3
01	Gig Harbor	11	13	9
02	Tacoma Freeway	9	10	9
03	Tacoma East	12	14	11
04	Thurston County	14	14	11
05	Seattle North	10	10	10
06	Seattle South	10	11	12
07	Seattle East	11	11	11
08	Valley	12	14	16
09	North Bend	12	13	15
10	Enumclaw	15	17	88
11	Yakima	13	14	13
12	Sunnyside	12	15	13
13	Kennewick	14	16	21
14	Walla Walla	22	22	36
15	Colville	30	30	22
16	Ritzville	15	18	19
18	North Spokane	15	16	14
19	Spokane Valley	11	13	12
20	Colfax	19	21	18
21	Vancouver	9	11	10
22	Goldendale	22	25	20
23	Kelso	14	13	11
24	Chehalis	11	13	14
25	Wenatchee	18	21	17
26	Ellensburg	16	18	20
27	Okanogan	23	25	22
28	Ephrata	18	22	20
29	Moses Lake	17	18	18
30	Bellingham	13	16	12
31	Mount Vernon	13	15	12
32	Oak Harbor	16	17	10
33	Everett Central	11	12	11
34	Everett East	15	18	16
35	Port Angeles	19	19	21
36	Bremerton	11	12	10
37	Hoqiam	19	22	19
38	Shelton	15	19	13
39	Raymond	23	23	20
40	Morton	16	21	16
	Weighted Average for all APAs	12	14	13

Source:WSP CAD data for FY 97, report KDR0050-5

Summary of Most Common Purposes of Overtime Worked by Persons Approaching Retirement

Appendix 7

TYPE	DEFINITION	PERCENTAGE
Calls for Service	Reactive activities related to providing assistance on demand.	24.38%
General Management	Activities relating to management and administrative activities.	19.77%
Patrol	Proactive activities relating to patrolling highways.	6.81%
Field Supervision	Time spent supervising employees in the field.	6.73%
Self-Initiated Contacts	Proactive activities relating to policing the highway and assisting the public that are initiated by the officer.	6.03%
Case Investigation	Activities relating to specific case investigations.	5.64%
Collisions	Reactive activities relating to responding to and conducting investigations of traffic collisions.	4.25%
Administrative Support	All activities related to administrative support.	3.78%
Traffic Investigations	Traffic investigations and all related activities including reports.	3.68%
Gathering and Analyzing Information	Gathering and analyzing intelligence information and related activities. (Criminal investigations only).	3.32%

Appendix 8

Commercial Vehicle Division Survey

Issues	States Surveyed				
	Arizona	California	Colorado	Wisconsin	Texas
- Separate classifications for CVE & commissioned troopers?	Yes Highway Patrolmen & Specialty Officers	Yes Commercial Vehicle Inspection Officers & Civilians	No Uses 13 full-time troopers for Motor Carrier Division.	No Use troopers who are assigned as Size & Weight inspectors.	No; only troopers are used.
- How are Ports of Entry staffed?	Troopers & Specialty Officers	Use both CVIOs & civilians	Ports under jurisdiction of Dept. of Revenue.	Borders locations are staffed with inspectors.	No ports of entry.
- How are interior sites staffed?	Have few interior sites; use mobile scales at rest areas.	Same as ports.	Have few interior sites and are staffed by Ports of Entry staff.	Staffed by inspectors. Also using mobile scales. Roving inspectors have portable scales.	Only have a few fixed weigh stations. Uses portable & semi-portable scales on roadsides.
- Differences in authority between classifications as well as at different sites?	Yes-troopers have full arrest authority. Specialty Officers have full arrest authority only as it pertains to CVE.	Yes-CVIOs have full arrest authority. Civilians have no authority.	Yes-only troopers have full arrest authority. Others can only detain.	Inspectors have full arrest authority.	Troopers have full arrest authority.
- Do CVE staff wear armor and/or carry weapons?	Yes to both	Yes; CVIOs carry weapons and can wear vests. Civilians carry no weapons and do not wear vests.	Troopers wear vests & carry weapons.	Yes to both	Yes to both
- Differences in training between classifications?	Yes-troopers go through academy & 80 hours of N. America commercial vehicle training. Specialty Officers do not go through the academy. Specialty Officers will be eliminated in 3-5 years, leaving troopers to perform all duties.	Yes-troopers go through 6-month academy & on-the-job training. Civilians have 3 weeks of training followed by on-the-job training.	Troopers go through 22-week academy and 2 months of field training.	Inspectors go through 22-week academy. Based upon academy class ranking, each cadet selects which career track to follow. Inspectors go through federal commercial vehicle training.	All go through academy. Troopers transferring into License & Weight Division also receive federal training on commercial vehicles.

WASHINGTON STATE PATROL "WATCH"

Appendix 9

To link to this appendix, click [here](#).

WASHINGTON STATE PATROL TOWER SURVEY RESULTS - June 1997

Appendix 10

To link to this appendix, click [here](#).

WSP Pursuit Vehicle Fleet Life-Cycle Cost Model

Appendix 11

This appendix provides additional details concerning the methodology employed and the information used in the pursuit vehicle fleet, Life-Cycle Cost Model discussed in Chapter Seven.

SUMMARY OF MODEL

This model includes all projected costs for the Washington State Patrol (WSP) pursuit vehicles over a hypothetical total mileage of 200,000, the equivalent of eight years of driving. This period of time and mileage was selected to allow for almost two full cycles even on the higher mileage replacement scenario, 110,000 miles.

Mileage intervals reviewed were:

50,000
75,000
85,000
90,000
100,000
110,000

Cost included were:

Vehicle Purchase: Actual cost in 1998 was \$21,739, and future costs had annual projected cost increases of 3.5 percent in the baseline (model variable).

Vehicle Commissioning: Each vehicle has 22 equipment items, many of which are physically attached to the vehicle (e.g., light bars, jail partitions). The cost of this varies from \$2,960 to \$4,352 per vehicle depending on the mileage replacement level. The

model allows the user to extend the useful life of items as a sensitivity test.

Vehicle Decommissioning: Each vehicle prior to sale must be stripped of patrol-specific equipment, which requires certain cosmetic repairs to allow for sale. This cost totals \$950, including a \$350 per vehicle sales charge.

Vehicle Salvage Value: Working with the Fleet Management, we developed two alternative salvage schedules that are a function of mileage. WSP has some historical experience with higher mileage vehicles (100,000 miles plus) but they used wholesale values for lower mileage. The two alternatives were developed to allow for a sensitivity analysis relative to the replacement timing. The two schedules that will be further refined by WSP as the model gets extended use:

<u>Mileage</u>	<u>Original % of Purchase</u>	<u>New % of Purchase</u>
50,000	47.7%	56.0%
75,000	35.9%	44.8%
85,000	30.9%	42.2%
90,000	28.3%	40.4%
100,000	23.2%	35.8%
110,000	18.5%	33.1%

Repair, Maintenance, and Gas and Oil. WSP has extensive repair and maintenance records as well as gas and oil consumption. Gas and oil cost per mile is currently about \$.07 and does not show a pattern of variation with respect to vehicle mileage. We reviewed a large aggregate sample and a smaller but detailed sample of historical repair and maintenance records. From these two samples plus a previous review in 1997, we developed three alternative patterns of cost increases with respect to increasing

vehicle mileage. The model was built to accept each data set as an alternative that could be tested in the sensitivity analysis. These costs in 10,000-mile increments are detailed below. The model allows for the selection of the data set to be used, and allows the user to adjust the historical data to reflect past inflation with respect to the age of the vehicle (e.g., mileage expenditures at the 100,000 miles + are as much as four years later, with commensurate inflation).

Less than	Jul-97	Aggregate	Detail Sample
10,000	\$153	\$505	\$300
20,000	\$560	\$608	\$366
30,000	\$300	\$968	\$458
40,000	\$317	\$1,280	\$673
50,000	\$845	\$1,597	\$763
60,000	\$231	\$1,558	\$974
70,000	\$1,160	\$1,574	\$1,012
80,000	\$566	\$1,561	\$1,141
90,000	\$526	\$1,487	\$1,106
100,000	\$1,493	\$1,700	\$914
110,000	\$146	\$1,683	\$766

Timing of Expenditures. Expenditures and values are inflated to the relevant time frames and discounted at the estimated cost of capital to allow for calculation of a present value for each alternative. The baseline values used in the model (all variables) are:

Interest Rate (discount rate)	6.00%
Inflation on basic labor	3.000%
Inflation in M _O , and repair	3.000%
Historical inflation on data	2.500%
Inflation in Replacement Costs	3.500%
General COLA	3.000%

Creation of Current-Dollar Equivalents. For the purpose of translating the present value costs of each alternative to a current-dollar annual equivalent and the resulting cost per mile

(25,000 miles per year assumption), a gradient table was created using the above assumptions for discount rate and general inflation.

SUMMARY OF COLLOCATION PROJECTS REVIEWED

Appendix 12

THE PARKLAND TRANSPORTATION CENTER

Constructed in 1995, this 50,000-square-foot facility houses four separate state functions within three state agencies: the Washington State Patrol (WSP) area district headquarters, vehicle inspections, and the regional crime laboratory; the Department of Licensing (DOL) regional service center; and the Department of Transportation (DOT) Emergency Response Unit and Traffic Management Center.

Available Services:

- Drivers and vehicle licenses (DOL)
- DOT permits (DOL)
- Vehicle identification number inspections (WSP)
- Accident reports (WSP)
- Emergency response (DOT)
- General information
- Full-service forensic laboratory
- Traffic Management Center (DOT)

Prior to the construction of this facility, the above services were available at six separate geographic locations.

Benefits/Cost Savings:

- Economy of combined construction
- Shared common areas (lobby, lunch areas, restrooms, etc.)
- Customer convenience (one-stop shopping)
- Reduced operating expenses
- Employee and site security
- Available by public transportation
- Reduced individual maintenance costs (one facility as opposed to six)
- Centralized maintenance (one agency maintenance staff maintains the entire facility as opposed to three)

VANCOUVER DOL/WSP SERVICE CENTER

This project was initiated by legislative direction in 1995 to collocate the services of drivers and vehicle licenses (DOL), vehicle inspection (WSP), and vehicle emissions testing (Department of Ecology). Prior to the initiation of this project, those individual services were available in four different geographic locations.

Available Services:

- Vehicle emissions testing (DOE)
- Drivers licenses (DOL)
- Vehicle inspections (WSP)
- Accident reports
- General information

Benefit/Cost Savings:

- Economy of combined construction
- Customer convenience (one-stop shopping)
- Reduced individual operating expenses (phone and computer systems, facility maintenance, etc.)
- Employee and site security
- Available by public transportation
- State ownership as opposed to lease

BELLINGHAM REGIONAL MAINTENANCE CENTER (DOT) AND DETACHMENT (WSP)

Constructed and occupied in mid-1997, this facility combines the regional functions of two transportation agencies. It combines the needs of two facilities into one location, eliminating the need for duplication of public areas, communications towers, telephone systems, auxiliary power, and refueling facilities.

Available Services:

- DOT over legal permits
- Accident reports (WSP)
- Vehicle identification number inspections (WSP)
- General information
- Dual agency vehicle refueling

Benefits/Cost Savings:

- Employee and site security
- Combined agency facility maintenance program (administered by one agency)
- Economy of combined construction

- Shared common areas (restrooms, lobby, refueling, communications tower, auxiliary power, etc.)
- Reduced operating expenses (one facility as opposed to one)

SILVER LAKE DETACHMENT

Constructed in 1996, on land provided by The Department of Transportation at the Silver Lake rest area south of Everett on Interstate 5, the facility is a 1,100-square-foot modular building providing all necessary elements for two complete State Patrol line-enforcement detachments.

Available Services:

- Provide rest area security for the motoring public
- Accident reports
- General traveler information

Benefits/Cost Savings:

- No land acquisition required
- Minimal construction costs
- Places troopers in their direct area of assignment without travel
- Provides security for DOT rest area maintenance personnel
- Eliminates/reduces controlled substance sales/use at the site
- Eliminates/reduces unacceptable social behavior

UNION GAP COMBINED TRANSPORTATION CENTER:

This project places all available transportation services at one site to include WSP, DOT, and DOL. The project was made possible by the transfer of ownership of approximately five acres from DOT to DOL for the construction of a Regional Service Center. This construction was combined with the State Patrol's

construction of a new district headquarters and vehicle inspection lane to take advantage of economy of scale in the construction process. The total project, 40,000 square feet, is approximately 90 percent complete at this time with the occupancy of the WSP headquarters. Estimated total completion and operational occupancy is anticipated to be December 1998.

Available Services:

- Drivers Licenses (DOL)
- Vehicle identification number inspections (WSP)
- Accident reports (WSP)
- Over legal permits (DOT)
- General information
- District-wide emergency communications center (WSP)

Benefits/Cost Savings:

- Economy of combined construction
- Customer convenience (one-stop shopping)
- Reduced operating expenses
- Employee and site security
- Adjacent to public transportation
- Ability to share large meeting and training areas
- Reduced individual maintenance costs (one agency provides facility maintenance for WSP and DOL facilities, to include preventive and emergency)

THURSTON COUNTY LIGHT INDUSTRIAL:

This project is proposed as an exchange of assets. The State Patrol currently owns 19.6 acres in the city of Olympia at 4242 Martin Way. This site supports the agency's Fleet, Supply, and Property Management functions in facilities constructed in 1950. The facilities have exceeded their useful life and lack the ability

to be renovated or expanded to meet agency programs, current or future. A recent property appraisal placed the value at \$4.9 million dollars. Current buildings have a negative value of \$200,000.

With legislative authorization, the property was offered to the development community as a direct exchange for a 20-acre parcel and three replacement buildings of a specific design with a total verified value of \$10.1 million. The completed project will provide new facilities and adequate property for agency programs for the next 50 years at no cost to the taxpayer. Additionally, the proposal includes an option for an adjacent 25 acres for the DOT light industrial functions to collocate at a later date.

Since developing the collocated light-industrial concept, the Department of General Administration and the Department of Natural Resources have developed capital requests to collocate on adjacent sites to benefit from combined facilities and services.

Currently, the project is in the final stages of contract review by the Attorney General's Office.

Available Services:

- Multi-agency vehicle service and equipping
- Multi-agency vehicle refueling
- Multi-agency communications equipment installation and maintenance
- Light construction for facilities maintenance
- Warehousing and delivery of agency supplies (WSP and Department of Fish and Wildlife)
- Agency surplus vehicle auctions (150-250 per year)

Benefits/Cost Savings:

- Ability to consolidate multi-agency functions, i.e., vehicle refueling, equipping and surplus, repairs, etc.

- Agency (WSP) ability to move the Electronic Services Division to Olympia to avoid equipping patrol vehicles in two different locations, as is now done
- Reduced operating costs (ability to consolidate current decentralized services)
- Reduced facility costs (old vs. new buildings)
- Avoid/eliminate the \$9 million request currently in the capital budget for light industrial